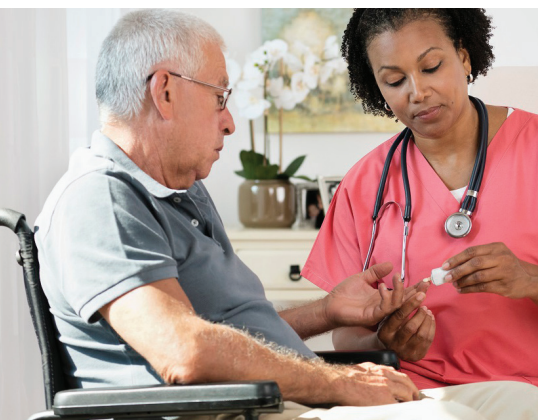


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WHAT'S INSIDE

Challenges in Attaining and Maintaining Good Nutrition _____	1
[7 contact hours]	
Teaching healthcare consumers about nutrition is an essential component of health maintenance and illness prevention and is within the nurse's scope of practice. This course provides current information about nutrition best practices, as well as recommendations related to weight reduction and select eating disorders.	
Child Abuse: Identification, Management, and Reporting _____	30
[6 contact hours]	
This course presents the most common types of abuse, characteristics of each type of abuse, signs and symptoms, risk factors, and management of abuse. An overview of policies in the United States toward abuse and mandated reporting of child abuse is presented. The course will help nurses recognize the signs of child abuse so they can intervene in a timely manner to help save a child's life.	
Communication in Health Care, 2nd Edition _____	58
[4 contact hours]	
This course offers a roadmap toward healthcare professionals' understanding and application of effective communication in patient care settings. The course navigates clinicians through the fundamentals of communication science and its relevance to communication in clinical practice then moves on to explore impediments to effective communication between healthcare professionals and patients. Through this course, practitioners who practice in any healthcare setting will acquire new insight into, or advance their current knowledge of, the cultural, environmental, organizational, and other barriers to communication that disrupt valuable interactions with their patients and colleagues.	
Emerging Infectious Diseases _____	81
[6 contact hours]	
This course provides an overview of emerging infectious diseases (EID), offering useful historic and scientific underpinnings, as well as an introduction to the less obvious consequences of rapidly spreading infections. The course is aimed at empowering nurses to best serve their patients, despite the challenges projected by EID-associated disruptions. In broad strokes, this course provides general ID and EID information, discusses consequences of a pandemic, provides an overview of how governments and organizations prepare for EID, methods to combat the spread of ID, and descriptions of specific nursing approaches useful to prevent and manage EID.	
Nursing Management of Sepsis _____	102
[7 contact hours]	
This course will provide nurses with an overview of the progression and treatment of sepsis, as well as an overview of screening tools available to recognize early signs and symptoms that will improve patient outcomes and reduce mortality associated with sepsis.	
Course Participant Sheet _____	139



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Licenses expire April 30th even years.	30 (All contact hours allowed through home-study)	None

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Course Title	Contact Hours	Price
Challenges in Attaining and Maintaining Good Nutrition	7	\$33.95
Child Abuse: Identification, Management, and Reporting	6	\$33.95
Communication in Health Care, 2nd Edition	4	\$22.95
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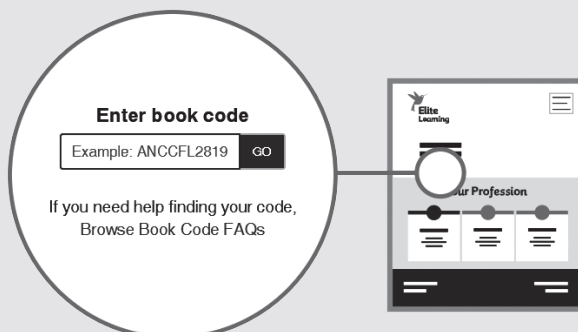
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Challenges in Attaining and Maintaining Good Nutrition

7 Contact Hours

Release Date: February 21, 2020

Expiration Date: February 21, 2023

Faculty

Adrienne E. Avillion, D.Ed, RN, is an accomplished nursing professional development specialist and health care author. She earned her doctoral degree in adult education and her MS in nursing from Penn State University and a BSN from Bloomsburg University. Dr. Avillion has held a variety of nursing positions as a staff nurse in critical care and physical medicine and rehabilitation settings with emphasis on neurological and mental health nursing, as well as a number of leadership roles in nursing professional development. She has published extensively and is a frequent presenter at conferences and conventions devoted to the specialty of continuing education and nursing professional development. Dr. Avillion owns and is the CEO of Strategic Nursing Professional Development, a business that specializes in continuing education for health care professionals and consulting services in nursing professional development. Her publications include the following: *The Path to Stress-Free Nursing Professional*

Development: 50 No-Nonsense Solutions to Everyday Challenges and *Nursing Professional Development: A Practical Guide for Evidence-Based Education*.

Adrienne E. Avillion has disclosed that she has no significant financial or other conflicts of interest pertaining to this course.

Peer reviewer: Shellie Hill, DNP, FNP-BC, is an Assistant Professor in the MSN-NP program at Saint Louis University. Here she teaches the clinical courses for the Family Nurse Practitioner students, and she teaches health assessment and health promotion to MSN students. Dr. Hill has been a practicing Family Nurse Practitioner for 18 years. Most of her practice has been in primary care, but she also has experience in urgent care and cardiology. Her current practice is in corporate health.

Shellie Hill has disclosed that she has no significant financial or other conflicts of interest pertaining to this course.

Course overview

Nurses are in an advantageous position to provide counseling and education regarding healthy eating. Teaching healthcare consumers about nutrition is an essential component of health maintenance and illness prevention, and is within the nurse's scope of practice. As health

care moves from a model of treating illness to a model of prevention, nurses are expected to include dietary education as part of wellness promotion activities. It is, therefore, imperative that nurses incorporate nutritional education as part of routine patient/family education.

Learning objectives

After completing this course, the learner will be able to:

- ◆ Discuss the current state of eating patterns in the United States.
- ◆ Explain the impact of obesity on health and wellness.
- ◆ Describe common eating disorders.
- ◆ Discuss the recommended guidelines for a healthy diet.
- ◆ Describe the components of specific nutrients.

- ◆ Differentiate among the components of various types of diets.
- ◆ Identify nutritional needs for specific populations.
- ◆ Discuss nursing interventions regarding nutritional needs for healthcare consumers.
- ◆ Explain intent to change practice regarding nutrition.

How to receive credit

- Read the entire course online or in print which requires a 7-hour commitment of time.
- Complete the self-assessment quiz questions which are at the end of the course or integrated throughout the course. These questions are NOT GRADED. The correct answer is shown after you answer the question. If the incorrect answer is selected, the rationale for the correct answer is provided. These questions help to affirm what you have learned from the course.
- Depending on your state requirements you will be asked to complete either:

- An affirmation that you have completed the educational activity.
- A mandatory test (a passing score of 70 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
- If requested, provide required personal information and payment information.
- Complete the MANDATORY Course Evaluation.
- Print your Certificate of Completion.

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December 31, 2021; District of Columbia Board of Nursing, Provider # 50-4007; Florida Board of Nursing, Provider #50-4007; Georgia Board of Nursing, Provider #50-4007; and Kentucky Board of Nursing, Provider #7-0076 (valid through December 31, 2023). This CE program satisfies the Massachusetts Board's regulatory requirements as defined in 244 CMR 5.00: Continuing Education.

Activity director

June D. Thompson, DrPH, MSN, RN, FAEN
Lead Nurse Planner

Disclosures

Resolution of Conflict of Interest

In accordance with the ANCC Standards for Commercial Support for continuing education, Elite implemented mechanisms prior to the planning and implementation of the continuing education activity, to identify and resolve conflicts of interest for all individuals in a position to control content of the course activity.

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Course verification

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judgment of a healthcare provider relative to diagnostic and treatment options of a specific patient's medical condition.

every reasonable effort has been made to ensure that the content in this course is balanced and unbiased.

INTRODUCTION

Obesity, a problem that affects more than 90 million adults in the United States, is associated with the development of cardiac disease, stroke, type 2 diabetes, and certain cancers. The purpose of this course is to provide current information about nutrition best practices as well

as recommendations related to weight reduction and select eating disorders.

CURRENT STATE OF EATING PATTERNS IN THE UNITED STATES

Most Americans are aware that a healthy diet should contain an abundance of fruits and vegetables and limited amounts of saturated fats, sugars, and salt. Despite the availability of accessible information, Americans continue to make poor nutritional choices. It is estimated that about 75% of the population has an eating pattern that is low in vegetables, fruits, and healthy oils. The majority of Americans exceed the dietary recommendations for added sugars, saturated fats, and sodium (Health.gov., 2015, 2016a).

The most widely advertised foods tend to be high in calories and low in nutrients, and there are fewer advertisements for healthy foods, such as fruits, vegetables, whole grains, and beans. In

addition, many individuals find it difficult to make lifestyle changes, such as improving dietary habits and incorporating exercise into their regular routines. Busy work schedules often leave little time to prepare healthy meals at home. How can the healthcare community reverse this dangerous trend in nutritional intake in the U.S.?

First, a review of the history of Dietary Guidelines can help to establish a basis for nursing interventions regarding nutrition. In order to understand the current state of eating patterns in the U.S., it is important to understand how dietary recommendations have changed over the course of time.

History of dietary recommendations

The release of dietary recommendations is not a new phenomenon. The U.S. Department of Agriculture has been issuing dietary recommendations for over a century. Although nutritional research has grown in pace and sophistication over the years, many of the current dietary recommendations remain significantly similar to those published many years ago (Davis & Saltos, n.d.).

The first dietary recommendations were published by the U.S. Department of Agriculture (USDA) in 1894. At that time, specific vitamins and minerals had not even been discovered. These initial recommendations were written by W.O. Atwater, the first director of the Office of Experiment Stations in the U.S. Department of Agriculture. His research on nutritional needs and the composition of foods established the foundation of a guide for healthy eating patterns (Davis & Saltos, n.d.).

The first U.S. Department of Agriculture food guide was written by Caroline Hunt, a nutritionist. Published in 1916, *Food for Young Children* classified food into five groups: milk and meat, cereals, vegetables and fruits, fats and fatty foods, and sugars and sugary foods. In 1917, the next publication focused on foods for the general public. *How to Select Foods* was based on the same food groups as the 1916 guide. In 1921, the guide expanded recommendations to suggest

amounts of foods to purchase every week for the average family. Modified in 1923, the guide was written to include households that were different from the average (at that time) five-member size (Davis & Saltos, n.d.).

By the early 1930s, Dietary Guidelines were affected by the financial impact of the Great Depression. In 1933, a U.S. Department of Agriculture economist developed food plans at four cost levels to help persons with varying incomes shop for food (Davis & Saltos, n.d.).

The early 1930s saw the establishment of the U.S. Department of Agriculture Foods program. This program was developed as an outgrowth of government policies written to bolster food prices and help American farmers survive the economic devastation of the Great Depression. Farmers lost their farms while the amount of farmland increased (U.S. Department of Agriculture, n.d.).

Farmers who managed to keep their farms planted more food in an attempt to make up for poor prices, which further reduced food prices while increasing surpluses, since much of the food went unsold. Millions of people in cities and rural areas lost their jobs and were unable to afford food at even low prices. Malnutrition among children became a significant, national concern (U.S. Department of Agriculture, n.d.).

In 1933, the Commodity Credit Corporation was established to provide farmers with loans and help them store nonperishable foods until prices increased. Ultimately, farmers could forfeit their crops to the federal government to repay loans. This meant that the government had to sell or distribute surplus foods to domestic and international food programs to prevent waste and spoilage (U.S. Department of Agriculture, n.d.).

Throughout the 1930s, Congress passed legislation to help support farmers and provide food distribution to those who needed it. For example, in 1935, eligible categories of recipients were established so that needy families had access to food. Eventually, it was the donation of surplus food that started the school lunch and other child-feeding programs (U.S. Department of Agriculture, n.d.).

Nursing consideration: During World War II, food shortages and gasoline rationing that limited food transportation decreased shipments of food to schools. Legislation was enacted to provide financial help for schools and childcare centers to provide food for lunch programs (U.S. Department of Agriculture, n.d.). Nurses have an obligation to be aware of the impact of political and social changes and upheavals that interfere with nutritional intake and work to facilitate programs that support the intake of a healthy diet.

In 1941, the National Nutrition Conference for Defense published the first set of Recommended Dietary Allowances (RDAs) by the Food and Nutrition Board of the National Academy of Sciences. Specific recommendations were given for the intake of calories and nine essential nutrients: protein, iron, calcium, vitamins A and D, thiamin, riboflavin, niacin, and ascorbic acid (Davis & Saltos, n.d.).

In 1956, a new food guide was published that recommended a minimum number of foods from the “Basic Four” food groups: milk, meat, fruits and vegetables, and grain products. This 1956 guide was extensively used throughout the next two decades (Davis & Saltron, n.d.).

By the 1970s, research showed that consuming excessive amounts of certain types of food products, such as saturated fats, sugars, and sodium, increased the risk of chronic diseases (e.g., heart disease and stroke). So significant was the research deemed in terms of health that, in 1977, the Senate Select Committee on Nutrition and Human Needs published *Dietary Goals for the United States*. This publication signaled a new direction for Dietary Guidelines. For the first time the emphasis moved from obtaining adequate nutrients to avoiding excessive intake of food products associated with chronic disease development. However, since this publication’s goals were so different from previous guidelines, the U.S. Department of Agriculture did not incorporate the goals into its own food plans and guidelines (Davis & Saltron, n.d.).

However, the growing body of research linking nutritional intake to health and wellness made a shift in focus inevitable. The following information is a summary of the new direction of Dietary Guidelines from the 1970s through the present:

- **1979:** The U.S. Department of Agriculture began to address the association of fats, sugars, and sodium with chronic diseases in its publication titled *Food*. This was accompanied by a new food guide, *Hassle-Free Guide to a Better Diet*. This new guide introduced

Data on current eating patterns

The media is flooded with information about the poor quality of the average American’s diet and the obesity epidemic. Is there any good news about the way Americans eat? Before providing the grimmer statistics, it seems appropriate to note some positive information as well.

Research indicates that there are decreases in low-quality carbohydrates (primarily added sugar) and increases in high-quality carbohydrates. A study of trends in dietary carbohydrate, protein, and fat intake among U.S. adults from 1999–2016 was conducted on 43,996 adults (Shan et al., 2019). From 1999 to 2016, U.S. adults experienced:

- Significant decreases in the percentage of energy intake from low-quality carbohydrates.
 - Significant increases in the percentage of energy intake from high-quality carbohydrates (mainly whole grains).
 - Significant increases in plant proteins (mainly whole grains and nuts), and polyunsaturated fat.
- (Shan et al., 2019)

a fifth food group: fats, sweets, and alcoholic beverages (U.S. Department of Agriculture, n.d.).

- **1980:** The first edition of *Nutrition and Your Health: Dietary Guidelines for Americans* (issued by the U.S. Department of Agriculture and the Department of Health and Human Services) was published. This began what would be an ongoing process of writing and updating Dietary Guidelines that would eventually be published every five years. The first edition triggered some concerns among consumers, nutrition scientists, and food industry groups about the causal relationship between some of the guidelines and health (U.S. Department of Agriculture, n.d.).
- **1980–1990s:** Throughout the 1980s and the 1990s, the U.S. Department of Agriculture worked on developing and publishing materials to help the general public use the *Dietary Guidelines* (U.S. Department of Agriculture, n.d.).
- **1992:** *The Food Pyramid* was published. This booklet was developed to provide a graphic picture of the food guide to help consumers understand and implement good dietary guidelines. The *Food Pyramid* was widely used until early in the 21st century (U.S. Department of Agriculture, n.d.).
- **2011:** First Lady Michelle Obama unveiled a new graphic representation of recommended food guidelines called MyPlate, which took the place of the once iconic *Food Pyramid*. MyPlate is represented by a plate divided into four sections for fruit, vegetables, grains, and protein. A smaller circle sits beside the plate for dairy products. Its focus is on reminding consumers about the essentials of a healthy diet (The New York Times, 2011).
- **2011:** The Harvard Medical School developed its own graphic representation of food guidelines called the Healthy Eating Plate, as they felt there were certain omissions in MyPlate. According to Harvard experts, MyPlate does not tell consumers that whole grains are better for health; in addition, it does not include a discussion of fats and does not identify which proteins are healthier than others. Moreover, they concluded that MyPlate does not distinguish between potatoes and other vegetables, and seems to show a smaller portion of fruit than vegetables. Harvard experts also note that MyPlate recommends dairy at every meal and does not comment on sugary drinks or juice. Harvard’s Healthy Eating Plate promotes the choosing of whole and less refined grains, identifies healthy sources of protein, encourages an abundant variety of vegetables, and encourages the use of healthy oils and fats. It also encourages the consumption of water and other calorie-free beverages. However, MyPlate remains the government’s graphic representation of Dietary Guidelines (Harvard Health Publications Harvard Medical School, 2017; The New York Times, 2011).

For more information on the Healthy Eating Plate visit: <https://www.hsph.harvard.edu/nutritionsource/healthy-eating-plate/>.

- **2015–2020:** The eighth edition of *Dietary Guidelines for Americans* covers the five-year period from 2015–2020. These current guidelines focus on: (1) stressing that eating patterns have a significant impact on health and (2) that healthy-eating patterns are adaptable to incorporate many types of foods (Healthcare.gov., 2016).

Despite the previous encouraging statistics, there is still a great deal of work to be done when it comes to healthy eating in the U.S. Research also shows that 42% of energy intake is still derived from low-quality carbohydrates, and the intake of saturated fat remains above 10% of energy intake (Shan et al., 2019).

According to information from the President’s Council on Sports, Fitness, and Nutrition:

- The typical American diet exceeds the recommended intake in four categories: calories from solid fats and added sugars, refined grains, sodium, and saturated fat.
- In general, Americans eat less than the recommended amounts of vegetables, fruits, whole grains, dairy products, and oils.
- About 90% of Americans consume more sodium than is recommended for a healthy diet. American adults consume an average of 3,400 mg/day of sodium, which is well above federal guidelines of less than 2,300 mg daily.

- Reducing sodium consumption by 1,200 mg per day could save up to \$200 billion a year in medical costs.
- Since the 1970s the number of fast food restaurants has more than doubled.

Nursing interventions

What impact does the history of food guidelines and current patterns of eating have on nursing interventions? What nursing interventions are important to these issues? Nurses and other healthcare professionals have an obligation to:

- Know the history of American Dietary Guidelines and how they indicate dietary trends.
- Stay abreast of current research pertaining to current eating patterns of Americans.
- Use knowledge of history and current research to counsel patients and families about healthy dietary patterns.

(Davis & Saltos, n.d.; Healthcare.gov, 2015)

- More than 23 million Americans live in areas that are more than a mile away from a supermarket.
- Empty calories from added sugars and solid fats contribute to 40% of total daily calories for 2- to 18-year-olds.

(HHS.gov., 2017)

Self-Assessment Quiz Question #1

Dana, a nursing student in her junior year, is working on a project about nutrition, health, and the American diet. She decided to go to the Student Union and quietly observe the eating habits of students, faculty, staff, and visitors. She saw a wide variety of food choices. Many of her fellow students chose fast food type items such as hamburgers and pizza. Some faculty and students did seem to make conscious choices about adding fruits and vegetables to their diets. Desserts were popular items among all age groups. Still other people, in particular female students, seemed to eat very little. Dana overheard a group of these young women bragging that they only eat 500 calories a day. Many people of all ages were obviously overweight. Overeating, undereating, and good and bad nutrition choices were all observed by Dana. She wonders what steps should, and could, be taken to improve the American diet.

When Dana is presenting her findings to her classmates, she wants to impress upon them the typical diet of an average American. She tells her classmates which one of the following?

- Americans should reduce sodium consumption by 1,200 mg per day.
- Most Americans eat less than the recommended amounts of saturated fat.
- From 1999–2016, there were significant decreases in the consumption of plant proteins.
- Americans should increase the amount of refined grains that they eat.

THE IMPACT OF OBESITY ON HEALTH AND WELLNESS

Obesity statistics

Obesity is not a problem unique to the U.S. In fact, obesity is a global epidemic and one of the most serious health problems in the world. It is estimated that 1.9 billion adults (defined as 18 years of age and older) have excess weight, of which over 660 million are obese. This means that 13% of the world's adult population is obese. In preschool children, (defined as 0–5 years of age), about 41 million throughout the world are obese. Over 340 million children and adolescents aged five to 19 are overweight (World Health Organization [WHO], 2018).

Some statistics related to overweight and obesity in the U.S. adult population include the following:

- The prevalence of obesity was nearly 40% and affected about 93.3 million of U.S. adults in 2015–2016.
- Hispanics (47%) and non-Hispanic blacks (46.8%) had the highest age-adjusted prevalence of obesity, followed by non-Hispanic whites (37.9%) and non-Hispanic Asians (12.7%).
- The prevalence of obesity was 35.7% among young adults aged 20 to 39 years, 42.8% among middle-aged adults aged 40 to 59 years, and 41.0% among older adults aged 60 and older.
- Overall, men and women with college degrees had lower obesity prevalence compared with those with less education.
- Among men, obesity prevalence was lower in the lowest and highest income groups compared with the middle-income group.
- Among women, obesity prevalence was lower in the highest income group than in the middle and lowest income groups.

(CDC, 2018a)

Nursing consideration: Even adults who are strongly motivated to improve their health and achieve/maintain optimal weight will resist making behavioral changes if they are made to feel embarrassed or ridiculed (Kelley, Sbrocco, & Sbrocco, 2016). Nurses should be especially sensitive to the manner in which they provide education and counseling regarding weight loss and any other health issues.

Some statistics related to childhood (2 to 19 years) obesity include the following:

- The prevalence of obesity was 18.5% and affected about 13.7 million children and adolescents.
- Obesity prevalence was 13.9% among two- to five-year-olds, 18.4% among six- to 11-year-olds, and 20.6% among 12- to 19-year-olds. Childhood obesity is also more common among certain populations.
- Hispanics (25.8%) and non-Hispanic blacks (22.0%) had higher obesity prevalence than non-Hispanic whites (14.1%).
- Non-Hispanic Asians (11.0%) had lower obesity prevalence than non-Hispanic blacks and Hispanics.
- The prevalence of obesity decreased with the increasing level of education of the household head among children and adolescents aged 2–19 years.
- Obesity prevalence was 18.9% among children and adolescents aged 2–19 years in the lowest income group, 19.9% among those in the middle-income group, and 10.9% among those in the highest income group.
- Obesity prevalence was lower in the highest income group among non-Hispanic Asian and Hispanic boys.
- Obesity prevalence was lower in the highest income group among non-Hispanic white, non-Hispanic Asian, and Hispanic girls. Obesity prevalence did not differ by income among non-Hispanic black girls.

(CDC, 2019a)

Figure 1: The Food Guide Pyramid

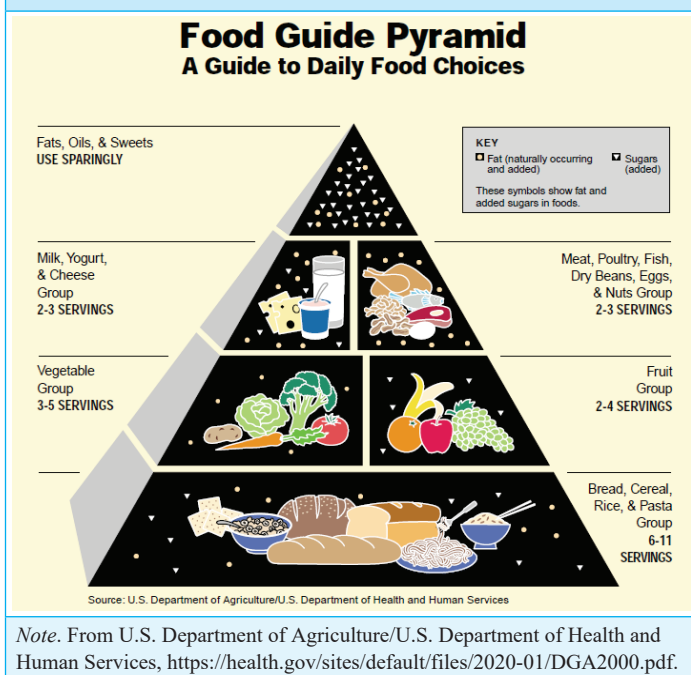
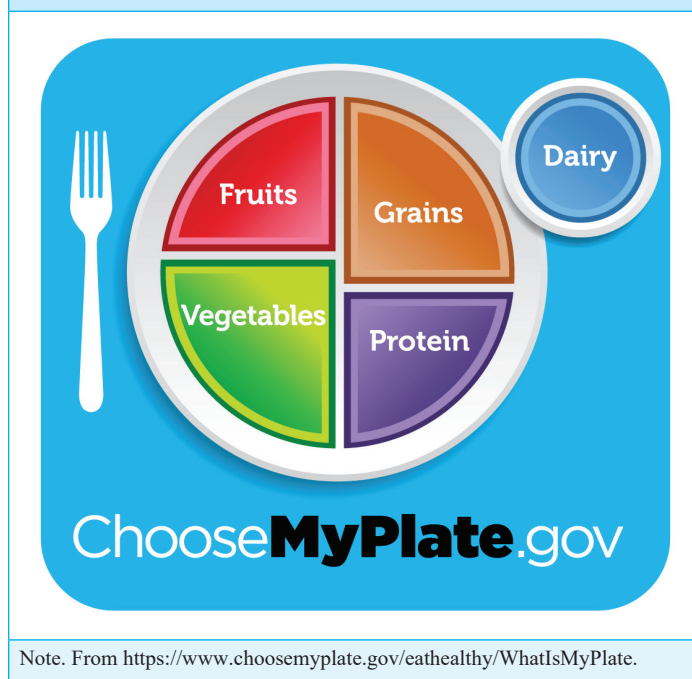


Figure 2: MyPlate



Financial impact of obesity

Overweight and obesity are associated with significant financial consequences. These include the following:

- Obesity-related illness, including chronic disease, disability, and death, is estimated to carry an annual cost of \$190.2 billion.
- Those who are obese have medical costs that are \$1,429 more than those of normal weight on average (roughly 42% higher).

Obesity and disease

Obesity-related conditions include heart disease, stroke, respiratory disease, type 2 diabetes, mental health, and certain types of cancer (CDC, 2018a). The following overview of disease and obesity is not all-inclusive. Research continues to provide evidence that obesity impacts many (if not most) diseases. Therefore, this education program provides general information about several of the most commonly recognized conditions that are significantly impacted by obesity.

Obesity and mental health

Research suggests that mental health disorders that may be triggered by obesity include depression, eating disorders, distorted body image, and low self-esteem (Collingwood, 2018).

A study conducted at the University of Texas Health Science Center in Houston consisted of data gathered from 2,123 participants. The investigators took into account factors such as social class, social support, chronic medical conditions, and life events. Analysis showed that obesity at baseline was associated with an increased risk of depression five years later. However, the reverse was not found to be true: depression did not increase the risk of future obesity (Collingwood, 2018).

Evidence-based practice! Research findings from some studies show that clinically significant depression is three to four times higher in severely obese persons than in similar nonobese persons (Collingwood, 2018). Nurses must be alert to signs and symptoms of depression (e.g., loss of interest in activities that were once enjoyed, isolation from family and friends, changes in sleep patterns, feelings of sadness and hopelessness, lack of energy, emotional outbursts) in obese patients and assess for the disorder.

- The annual cost of being overweight is \$524 for women and \$432 for men; annual costs for being obese are even higher: \$4,879 for women and \$2,646 for men.
- Obesity is also a growing threat to national security. A surprising 27% of young Americans are too overweight to serve in our military. Approximately 15,000 potential recruits fail their physicals every year because they are unfit. (HHS.gov., 2017)

The mental health impact of obesity can become evident in childhood. Children who are overweight or obese have an increased risk of experiencing significant victimization. Peer victimization has been associated with negative psychosocial and health outcomes as well. Peer victimization has been defined as overt (e.g., pushing, hitting) or relational (e.g., teasing, gossiping, excluding) types of aggression carried out by an individual or by a group of peers (Collingwood, 2016).

The following are emotional consequences of childhood obesity:

- **Social stigma:** Society places great value on thinness, even extreme thinness. Research shows that children as young as six years of age may associate negative stereotypes with excess weight. They may believe that overweight or obese children are not as likable as someone who is of normal weight.
- **Self-esteem and bullying at school:** Children who are obese are more likely to have low self-esteem, body shame, and lack of self-confidence than thinner children. Obese or overweight children are more likely to be teased and bullied as well.
- **Depression:** The social stigma, low self-esteem, and bullying may lead to the development of clinical depression.
- **Emotional eating:** Some children who are overweight or obese may seek emotional comfort in food, eat more, and increase the number of calories ingested.
- **Discrimination:** Some adolescents may face discrimination based on their weight alone. Research suggests that they are less likely to be accepted by a prestigious university, find good jobs, date, or marry. (Healthchildren.org., 2017)

Cardiovascular disease

Heart disease is the leading cause of death in the U.S. for both men and women. About 610,000 people die of heart disease every year (one in every four deaths). Coronary artery disease (CAD), which is the most common type of heart disease, kills over 370,000 people every year. About 735,000 Americans have a heart attack every year (CDC, 2017).

The healthcare community has spent many years attempting to find ways to prevent and treat heart disease. Risk factors for such disease include obesity, which has a negative impact on many of the other modifiable risk factors (Cleveland Clinic, 2019).

In fact, obesity has been found to have an impact on the following modifiable risk factors:

- Obesity raises blood cholesterol and triglyceride levels.
- Obesity lowers “good” HDL cholesterol. HDL cholesterol is associated with a reduced risk for heart disease.
- Obesity raises LDL cholesterol. LDL (“bad”) cholesterol is associated with an increased risk for heart disease.
- Obesity increases blood pressure, another known risk for heart disease.
- Obesity increases the risk for diabetes, which is also a risk factor for heart disease.

(Cleveland Clinic, 2019)

Nursing consideration: Obesity is linked to a number of serious heart disease risk factors. When teaching patients and families about weight control, it is important nurses include information about the impact of obesity on the development (or worsening) of heart disease.

Stroke

Obesity increases risk factors for stroke. Many of the risk factors for stroke are the same as for heart disease, such as hypertension, diabetes, and elevated cholesterol (WebMD, 2018a). Therefore, obesity significantly increases the risk for stroke.

Evidence-based practice! Research indicates that losing as few as 10 pounds can reduce the risk of developing heart disease or stroke. Losing even more weight further reduces risk (American Heart Association, 2017). Thus, it is imperative that nurses work with their patients and families to control weight when counseling about stroke and heart disease prevention.

Diabetes

About 9.4% of the U.S. population (30.3 million people) has diabetes. Of these 30.3 million, 23.1 million are diagnosed, and 7.2 million are undiagnosed (CDC, 2018b).

Being overweight or obese significantly increases the risk of developing type 2 diabetes. Obesity is thought to account for 80% to 85% of the risk of developing type 2 diabetes (Diabetes.co.uk, 2019).

Obesity is associated with an increase for the following types of cancers (and possibly others as well):

- Breast (postmenopausal).
- Colon and rectum.
- Endometrial.
- Esophagus.
- Gallbladder.
- Gastric.
- Kidney.
- Liver.
- Meningioma.
- Multiple myeloma.
- Ovarian.
- Pancreatic.
- Thyroid.

(National Cancer Institute, n.d.)

Why does obesity increase the risk for some cancers? While there is no definitive answer to this question, several theories have been proposed, including the following:

- Fat tissues produce excess amounts of estrogens, high levels of which damage DNA and are associated with breast, endometrial, and ovarian cancers.
- Obese people have increased blood levels of insulin (insulin resistance), which is associated with the development of colon, kidney, prostate, and endometrial cancers.
- Fat cells produce adipokines, hormones that may stimulate or inhibit cell growth.

- Fat cells may have direct and indirect effects on tumor growth.
- People who are obese often have chronic low level or “subacute” inflammation, which has been associated with an increased risk for cancer.

(National Cancer Institute, n.d.)

Research continues regarding the link between obesity and cancer. At this time, however, it is important that healthcare consumers and health care providers become aware of the increased risk for certain cancers among obese patients.

Gallbladder disease

Obesity is also linked to gallbladder disease. Gallbladder disease and gallstones are more common among people who are overweight. Paradoxically, rapid weight loss or loss of a large amount of weight may increase the likelihood of gallstones. Losing about one pound a week is less likely to cause gallstones (WebMD, 2018a).

Gout

The prevalence of gout has now reached epidemic proportions and researchers say obesity is to blame. Obesity, BMI, and visceral fat have a linear correlation with the increase of serum uric acid and can influence gout development. Weight reduction and a decrease in the consumption of high-calorie foods can alleviate gout symptoms, and may prevent its development (Galanis, 2018).

Obstructive sleep apnea

The most common cause of sleep apnea in adults is obesity, which is associated with an excess amount of soft tissue of the mouth and the throat. As adults sleep, the muscles of the throat and tongue are more relaxed and soft tissue blocks the airway (WebMD, 2018b).

Patients who have obstructive sleep apnea and gain 10% of their body weight are six times more likely to have disease progression. A 10% weight loss, however, correlates with a 20% improvement in the severity of the disease (Obesity Medicine Association, 2019).

Respiratory disease

Obesity adversely affects the function of the lungs. Obesity can lead to abnormalities in ventilator mechanics, muscle function, ventilator control, pulmonary gas exchange, and cardiac performance, all of which have an adverse impact on the lungs (Dixon & Peters, 2018; Mafort, Rufino, Costa, & Lopes, 2016).

Here are examples of some respiratory diseases and conditions that are linked to obesity:

- **Asthma:** Asthma can be more difficult to control in obese patients because of increased airway inflammation, decreased response to medications, and the impact of conditions that often co-exist with obesity, such as obstructive sleep apnea and gastroesophageal reflux disease (GERD).
- **Chronic obstructive pulmonary disease (COPD):** COPD includes emphysema and chronic bronchitis. Obesity severely and negatively impacts patients experiencing chronic lung diseases. Research shows that “weight loss is the best health strategy for obese patients with COPD.”
- **Obstructive sleep apnea (OSA):** Although obstructive sleep apnea has already been discussed, it is worth mentioning again in the context of the respiratory system. Characterized by abnormalities of the upper airway and facial structures, obstructive sleep apnea can be life-threatening. Weight loss is associated with a decreased risk for this condition as well as a decrease in its severity in patients already diagnosed with the problem.

(Dixon & Peters, 2018; Mafort, Rufino, Costa, & Lopes, 2016)

Pain

Managing pain in patients who are obese can be a challenge. Obesity is a risk factor for pain. In obese people, general and specific musculoskeletal pain is common. Excessive weight increases mechanical stress to the joints and tissues of the body, leading to physical limitations, and ultimately, bodily pain (Zdziarski, 2015).

Exercise is generally recommended as a weight-loss strategy. But it is hard to exercise when exercise causes or exacerbates pain. Health care providers may consult with physical therapists to help obese patients exercise safely, comfortably, and with positive outcomes (Zdziarski, 2015).

Nursing consideration

Pain medication dosage is influenced by the patient's weight. Nurses must be aware how weight impacts the effects of analgesics and how to counsel patients about their use (Comerford & Durkin, 2020).

Pregnancy and obesity

Obesity during pregnancy can have significant negative impact on the health of both mother and baby. Pregnant women who are obese face an increased risk of various types of pregnancy complications, including the following:

- **Birth defects:** Research findings suggest that obesity during pregnancy slightly increases the risk of having an infant who is born with a birth defect.
- **Chronic conditions:** Infants born to obese women are at greater risk for developing heart disease, diabetes, or other chronic conditions than those born to women of normal weight.
- **Emergency C-section:** Obesity increases the risk of emergency C-sections. Obesity also increases the risk of C-section complications such as infection.
- **Gestational diabetes:** Obese women are more likely to develop gestational diabetes than those who are of normal weight.
- **Infection:** Obesity increases the risk of urinary tract infections as well as the development of post-partum infections, whether the baby is delivered vaginally or via C-section.
- **Labor complications:** The need for labor induction is more common in obese women compared to those of normal weight.

Nursing interventions

Nurses have an obligation to be aware of how obesity impacts health and wellness. Many of the nursing interventions related to the impact of obesity on health involve education, including the following:

- Incorporating height and weight measurement as part of the physical assessment.
- Teaching patients and families how obesity impacts the body's vital organs.
- Teaching patients and families recommendations for a healthy diet.
- Reinforcing exercise guidelines per health care provider recommendations.
- Teaching patients and families how to implement treatment regimens for chronic conditions as prescribed by their health care providers.

(American Heart Association, 2019a; WebMD, 2018a)

It is critically important for nurses to be able to provide patient/family education in an objective and supportive manner. In order to do this, nurses must adhere to the following principles of adult education:

- Adults need to know that what they are learning has a practical purpose. In other words, they need a "reason" to learn. In the case of weight loss, patients and families need to learn about the practical, observable benefits of weight loss.
- Adults bring a wealth of life experiences to every learning situation. These experiences include how they earn a living, function as part of a family, develop interpersonal relationships, guide and teach others, and how they learn. Experiences should be acknowledged and used by the nurse and other educators to help patients acquire knowledge and use that knowledge to improve their states of health and wellness.
- Adults are self-directed learners. They are responsible for their own learning. It is the nurse's responsibility to provide education in terms that the patients and families can comprehend and in an objective and supportive manner. However, the responsibility for learning remains with the adult learners. They must be willing to learn and to use what is learned to improve their health status.
- Adults are interested in acquiring knowledge that can be used to improve their daily lives. Adults want to know that devoting time and effort to learning and taking action based on learning (such as losing weight) is going to improve their lives.

(Avillion, 2015; O'Neil, 2019)

A critical component of patient/family education is assessing whether or not the patients and families actually acquired knowledge necessary to improve their health status. Such assessment is performed by establishing measurable learning objectives and determining whether

Obesity can also interfere with the effectiveness of certain types of analgesia, such as an epidural block.

- **Macrosomia:** The risk of delivering an infant with macrosomia (an infant who is significantly larger than average) is higher in women who are obese.
 - **Miscarriage:** The risk of miscarriage is higher in women who are obese.
 - **Overdue pregnancy:** It is more likely that pregnancy will continue beyond the expected due date in women who are obese.
 - **Preeclampsia:** Women who are obese are at greater risk for developing preeclampsia, which is characterized by hypertension and signs and symptoms of damage to other organs, often the kidneys.
- (Mayo Clinic, 2018a)

Nursing consideration: The preceding diseases and conditions (although not all-inclusive) are those that are currently linked to obesity by scientific research findings. However, ongoing research continues to produce evidence that obesity affects all body systems and contributes to negative impacts on most aspects of health (Mayo Clinic, 2019a; National Cancer Institute, 2019). It is essential that nurses monitor the findings of research related to obesity and update their knowledge and skills to work to help healthcare consumers achieve optimal weight.

or not they have been achieved (American Heart Association, 2019a; WebMD, 2018a). For example, when teaching about weight loss, learning objectives might include that patients/families will be able to do the following:

- Describe the components of a healthy diet as described by the recommended Dietary Guidelines.
- Give examples of a healthy breakfast, lunch, and dinner that comply with recommended Dietary Guidelines.
- Demonstrate a weight loss of 12 pounds within a period of six weeks.

These examples show that objectives must include a measurable verb that requires patients/families to actively demonstrate learning. Measuring objectives such as these allow the nurse to determine if learning has actually taken place

Finally, nurses must be sure to make learning objectives realistic. For example, expecting a weight loss of 20 pounds in 3–4 weeks is not realistic. Suggesting that someone who has eaten red meat five times a week should suddenly eat red meat only twice a month may be overwhelming. Nurses must work with patients and families to set realistic goals in a manner that is devoid of judgment.

Self-Assessment Quiz Question #2

Steven is the nurse manager of a large outpatient clinic. As part of the clinic's health initiative, he is planning a series of community education programs on nutrition and healthy eating. Steven researches statistics regarding obesity and the impact of obesity on health and wellness. He wants to be able to explain just how devastating the consequences of obesity can be. But more than that, Steven wants to be able to offer encouragement and practical suggestions for achieving and maintaining an appropriate weight. He knows that being judgmental or critical can have a negative impact on patients' and on families' desire to learn and their commitment to weight loss.

Steven should include which of the following pieces of information in his presentation?

- People who want to lose weight should set a goal of five pounds per week.
- In order to reduce symptoms of obstructive sleep apnea people should lose 20% of their body weight.
- People who are obese should be counseled about their increased risk for breast cancer.
- The prevalence of obesity is greatest in families whose head of household has graduated from college.

EATING DISORDERS

Not all problems related to nutrition are as obvious as obesity. Being thin is often, especially by society's standards, determined to be not only aesthetically pleasing but a sign of good health as well. However,

Anorexia nervosa

Anorexia nervosa, commonly referred to as anorexia, is an eating disorder defined as "restriction of energy intake relative to requirements, leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health" (American Psychological Association, 2013, p.338).

Anorexia nervosa is characterized by an abnormally low body weight, an extreme, intense fear of gaining weight, and a distorted perception of weight. Persons who have anorexia highly value their ability to control their weight, shape, and food intake. They go to extremes to lose weight that significantly impacts their health and interferes with their lives (Mayo Clinic, 2018b).

Anorexia nervosa is a serious disease that can be lethal. As people reach states of near starvation, all body systems are affected, fluid and electrolyte imbalances occur, and considerable stress is placed on the cardiac system (American Psychological Association, 2013; Mayo Clinic, 2018b).

Central features of anorexia nervosa include the following:

- **A distorted body image:** Despite an obviously gaunt, emaciated appearance, the clients still perceive themselves to be fat and unattractive. Even though family, friends, teachers, and/or co-workers try to convince clients otherwise, they firmly believe that they must continue to lose weight. They have an unshakeable belief that they are fat and see themselves as such no matter what evidence to the contrary is presented to them.
- **An extreme, irrational fear of gaining weight:** This fear makes clients go to extremes to lose weight and to avoid gaining weight. Such extremes include literally starving themselves and, possibly, exercising to the point of exhaustion.

(American Psychological Association, 2013; Mayo Clinic, 2018b)

Bulimia nervosa

Bulimia nervosa, commonly referred to as bulimia, is characterized by repeated episodes of binge-eating, which is defined as eating, in a specific period of time, an amount of food that is "definitely larger than most individuals would eat in a similar period of time under similar circumstances" (American Psychological Association, 2013, p. 345). Binge-eating is followed by purging in order to prevent weight gain. Examples of purging behaviors include self-induced vomiting, excessive use of laxatives and/or diuretics, and excessive exercise. Persons suffering from bulimia nervosa feel a significant loss of control over these bingeing and purging behaviors (Psychological Association, 2013; Collingwood, 2018; Mayo Clinic, 2018d).

Nursing consideration: Bulimia nervosa and anorexia nervosa can occur at the same time (American Psychological Association, 2013). When nurses are assessing clients for eating disorders, it is important that they be evaluated for both of these disorders. Not all healthcare professionals know that bulimia nervosa and anorexia nervosa can co-exist. It is important to help educate colleagues, as well as clients and families, about the possibility of this simultaneous occurrence.

A factor that differentiates bulimia nervosa from anorexia nervosa is that clients who have bulimia nervosa usually maintain a normal weight, while some affected persons are slightly overweight. However, like people with anorexia nervosa, bulimic clients are desperate to lose weight and are very unhappy with their body size and shape (American Psychological Association, 2013; Mayo Clinic, 2018d).

that is not always the case. The following common eating disorders significantly impact the nutritional status of patients.

Nursing consideration: Thin does not equal healthy. When assessing nutritional status nurses need to carefully evaluate all patients for healthy nutritional intake and intervene appropriately.

Treatment generally initially involves correction of life-threatening complications, such as fluid and electrolyte imbalances, and cardiac abnormalities (e.g., arrhythmias), and psychotherapy. Treatment requires a team approach that includes physicians, mental health professionals, nurses, and dietitians. It is imperative that persons affected by anorexia nervosa have ongoing therapy and nutritional education to achieve and maintain recovery (Mayo Clinic, 2018c).

Psychotherapy is as important to recovery as the intake of fluids and food. Family therapy is the only evidence-based treatment for teenagers with anorexia. Family therapy may be helpful for all members of the family, as well as for the client. Issues that may be evident among family members include conflict, difficulty handling emotions, unclear boundaries, and controlling behaviors. Therapy is not a short-term process and may take years of work (American Psychological Association, 2013; Collingwood, 2018; Mayo Clinic, 2018c).

Cognitive behavioral therapy (CBT) is another form of psychotherapy used as a treatment intervention for clients with anorexia. Many clients use their control of their weight as a means of gaining control over their lives. Clients are taught appropriate problem solving and coping skills and to recognize that the behaviors associated with anorexia nervosa are not only inappropriate but can be life-threatening. They are also taught to improve self-esteem, assertiveness, life satisfaction, and interpersonal communication (American Psychological Association, 2013; Collingwood, 2018; Mayo Clinic, 2018c).

Bulimia nervosa can lead to significant fluid and electrolyte imbalances, cardiac problems, and alterations in homeostasis (American Psychological Association, 2013; Mayo Clinic, 2018d).

Research indicates that the most effective treatment for bulimia nervosa is cognitive behavioral therapy (CBT). This is an outpatient treatment intervention and requires a detailed strategy to guide treatment. Research indicates the need for highly detailed, manual-guided treatments of 18 to 20 sessions over a period of five to six months. CBT should be conducted by a therapist who is an expert in CBT and who has experience treating persons with bulimia nervosa (Mayo Clinic, 2018e; Videbeck, 2017).

The goal of CBT is to change the client's cognition (thinking) and behaviors. Emphasis is on helping persons suffering from the disorder to identify unhealthy, negative beliefs, thoughts, and behaviors, and replace them with healthy, positive ones. Therapy is designed to stop the client's focus on food and to interrupt the cycle of dieting, bingeing, and purging (Mayo Clinic, 2018e; Videbeck, 2017).

Antidepressants such as selective serotonin reuptake inhibitors (SSRIs) may be prescribed to treat depression even if depression has not been diagnosed. Findings from research indicate that antidepressants were more effective than placebos in reducing the occurrence of binge-eating. These drugs also improved mood and reduced fixation on body shape and weight. Most people with bulimia nervosa recover. However, periods of bingeing and purging may come and go throughout the person's life, depending on life circumstances such as periods of extreme stress (Mayo Clinic, 2018e; Videbeck, 2017).

Binge-eating disorder

Binge-eating disorder, also referred to by some health care providers as compulsive overeating, is a newly recognized eating disorder. It is characterized by the following:

- As a serious mental illness.
- By uncontrollable eating, in a discrete period of time, an amount of food that is larger than what most people would eat in a similar period of time under similar circumstances.
- As similar to the bingeing that occurs in bulimia nervosa but without the accompanying inappropriate behaviors to rid the body of excess calories (purging).
- As a way affected persons use to cope with depression, stress, or anxiety.

(American Psychological Association, 2013; Mayo Clinic, 2018f)

Nursing consideration: Two of three people in the United States who have binge-eating disorder are obese (WebMD, 2019a). Thus, binge-eating can contribute to the already significant problem of obesity in the United States.

Binge-eating disorder has only recently been recognized as a well-defined disorder (American Psychiatric Association, 2013). In the United States, it is estimated that about 5.6 million women and 3.1 million men have the disorder (WebMD, 2019a).

People who are obese are at greater risk for developing binge-eating disorder, but those who are of normal weight can also have the disorder. About two of every three people in the United States who have the disorder are obese (WebMD, 2019a).

Binge-eating disorder can lead to the same health hazards as obesity and requires significant treatment interventions, including psychotherapy and medication (WebMD, 2019a). Psychotherapy can be conducted in individual and/or group therapy sessions. Therapy may also include family members as indicated (Videbeck, 2017).

Nursing interventions

When health care professionals discuss nutritional problems, they may first think of the problems of those who are overweight and obese. However, the descriptions of the preceding eating disorders show that obesity is far from the only problem related to poor nutritional intake.

Nurses must be careful not to equate thinness with good dietary habits. They must carefully measure height, weight, and BMI. They must ask patients and their families about dietary intake and food preferences and dislikes. Nurses must also assess mental health since obesity and eating disorders can be accompanied by mental health disorders.

Self-Assessment Quiz Question #3

Melanie is a popular high school junior who is the captain of the school's prestigious cheerleading squad. She prides herself on her appearance and her leadership role among her classmates. However, a new student has recently joined the squad. She is pretty and very thin and soon becomes quite popular. Melanie overhears her telling some friends, "Melanie would be so much better at cheering if she would just lose a few pounds. She's holding back the whole squad just because she can't control her appetite!" Melanie vows she is not going to lose her leadership position and goes on a strict diet. Her friends and family initially praise her for her weight loss. Melanie vows to become the thinnest person on the cheerleading squad. She eats nothing but a few raw vegetables and is obsessed with getting thinner. Melanie is becoming dangerously thin and shows signs of developing anorexia nervosa.

Melanie has been diagnosed with anorexia nervosa. Treatment initiatives should include:

- a. Antipsychotic medications.
- b. Short-term CBT.
- c. Electroconvulsive therapy (ECT).
- d. Family therapy.

Cognitive behavioral therapy (CBT) is generally recommended as a treatment initiative for persons with eating disorders. Cognitive therapy concentrates on immediate processing of thoughts and feelings. Emotions of sadness, depression, anxiety, and anger are reactions to the environment in which the person lives. Some facets of CBT, as they relate to binge-eating disorder and other eating disorders, include the following initiatives:

- Identification of issues that trigger binge-eating episodes. Examples of such issues are negative feelings about one's body, work, school, or family-related stressors, or co-existing conditions such as depression (Mayo Clinic, 2018f; Videbeck, 2017; WebMD, 2019a).
- Learning coping strategies to deal with negative feelings and triggering stressors (Videbeck, 2017; WebMD, 2019a).
- Learning ways to regain a sense of control over one's life, including binge-eating behaviors (Mayo Clinic, 2018g; Videbeck, 2017; WebMD, 2019a).

Interpersonal psychotherapy concentrates on the individual's current relationships with other people, including family, friends, and co-workers. The goal of interpersonal psychotherapy is to improve interpersonal skills, meaning how one relates to others. This type of therapy may help to reduce bingeing that is triggered by poor communication skills, unhealthy patterns of interaction, and poor interpersonal relationships (Mayo Clinic, 2018g).

Dialectical behavior therapy focuses on techniques to help increase stress tolerance. People learn to improve relationships and regulate emotions. This may help to decrease binge-eating episodes since triggering factors are often negative emotions and unhealthy relationships (Mayo Clinic, 2018g).

Antidepressants such as selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) may be prescribed. These kinds of drugs may help to reduce feelings of depression and negative thought patterns (Mayo Clinic, 2018g; Videbeck, 2017; WebMD, 2019a).

Self-Assessment Quiz Question #4

Dominique is a well-to-do investment banker. At 33 years of age, she is a partner in her investment firm, the wife of a prominent businessman, and the mother of two young children. She is also very attractive and has a slim figure that complements her designer clothes. Dominique is the envy of almost everyone who knows her. Her weight is within the normal range for her height and weight. However, Dominique is, in fact, far from healthy. She suffers from bulimia nervosa. Dominique eats enormous quantities of food in private and immediately takes laxatives and/or induces vomiting so that she will not gain weight. This dangerous cycle of bingeing and purging is increasing at an alarming rate.

When assessing for bulimia nervosa, the nurse anticipates that the patient will be:

- a. Overweight.
- b. Having feelings of control over their eating habits.
- c. Desperate to lose weight.
- d. Violent.

RECOMMENDED DIETARY GUIDELINES

Dietary guidelines from Health.gov

The 2015–2020 *Dietary Guidelines* (8th ed.) were written to provide Americans with information they need to make healthy food choices (Health.gov., 2016a). Dietary principles that are part of these most recent guidelines include the following:

- Americans should follow a healthy-eating pattern across their lifespan.
- Eating patterns have a significant impact on health.
- Healthy-eating patterns are adaptable.
- Healthy eating should focus on variety, nutrient density, and amounts of food eaten.
- Eating patterns should stay within appropriate caloric intake for age, sex, and activity level; they should meet nutritional needs and be achievable and maintainable in the long term.
- Healthy-eating patterns include nutrient-dense forms of the following:
 - A variety of vegetables – dark green, red, and orange in color, including legumes (beans and peas) and other starchy vegetables.
 - Fruits, especially whole fruits.
 - Fat-free or low-fat dairy, including milk, yogurt, cheese, and fortified soy beverages.
 - A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes, soy products, and nuts and seeds.
 - Oils, including those from plants (e.g., canola, corn, olive, peanut, safflower, soybean, and sunflower) and oils that are naturally present in foods (nuts, seeds, seafood, olives, and avocados).
 - Note that the preceding foods are nutrient dense only if they are prepared with little or no added solid fats, sugars, refined starches, and sodium.
- Calories from added sugars and saturated fats should be limited, and sodium intake should be reduced:
 - Added sugars should be limited to less than 10% of total daily calorie intake.
 - Saturated and trans fats should be limited to less than 10% of total daily calories by replacing them with unsaturated fats and limit trans fats to as low as possible.
 - Sodium intake should be limited to less than 2,300 mg daily (for adults and children 14 years and older).

Evidence-based practice! Research shows that most Americans get 50% more sodium than recommended. Sodium is linked with hypertension and heart disease (Health.gov., 2015). Nurses must emphasize the importance of limiting sodium intake to appropriate levels when counseling patients and families.

- Alcohol intake should be limited to no more than one drink daily for women and no more than two for men.
- Americans should shift to healthier food and beverage choices. Examples include a shift from the following:
 - Full-fat cheese or whole milk to low-fat cheese and milk.
 - White bread to whole-wheat bread.
 - Fatty cuts of meat to seafood or beans.
 - Butter to olive or canola oil.
 - Soft drinks to water.
 - Potato chips to unsalted nuts.
- Eating patterns represent the totality of all foods and beverages consumed.
- Nutritional needs should be met primarily from foods.
- Healthy-eating patterns are adaptable. (Health.gov., 2015; 2016a; 2016b)

Healthy physical activity patterns are essential components of all healthy-eating patterns. Only 20% of adults meet the Physical Activity Guidelines for aerobic and muscle-strengthening activity (Health.gov., 2015). These Guidelines state the following:

- Regular physical activity is one of the most important things individuals can do to improve their health.

- Adults need at least 150 minutes of moderate intensity physical activity per week and should perform muscle-strengthening exercises on two or more days each week.
- Young people in the age range of 6–17 years old need at least 60 minutes of physical activity per day, including aerobic, muscle-strengthening, and bone-strengthening activities.
- Strong evidence shows that regular physical activity helps people maintain a healthy weight, prevent excessive weight gain, and lose weight when combined with a healthy-eating pattern lower in calories.
- Strong evidence shows that regular physical activity lowers the risk of early death, coronary heart disease, stroke, high blood pressure, adverse blood lipid profile, type 2 diabetes, breast and colon cancer, and metabolic syndrome.
- Strong evidence shows that regular physical exercise reduces depression and prevents falls.

(Health.gov., 2015; 2016a)

These principles and guidelines are updated every five years. Such regular updating requires ongoing research and evaluation. There are three stages involved in the update process:

- **Stage 1: Review of current scientific evidence:** The secretaries of Health and Human Services and the United States Department of Agriculture appoint a 15-member external advisory committee to be sure that the federal government is getting reliable external scientific advice. Nominations from the public were sought for candidates to serve on the 2015 committee. The goal of the committee was to provide advice and make recommendations to the federal government on the current state of scientific evidence on nutrition and health. Their responsibilities were to review the 2010 edition of the *Dietary Guidelines* to determine the topics for which new scientific evidence was most likely to be available and to review that evidence to help in the development of the 2015–2020 edition. In order to fulfill their responsibilities, committee members completed the following:
 - Conducted original systematic reviews. The members systematically searched the scientific literature for relevant articles, assessed the methodology rigor of each article included in the process, and summarized, analyzed, and graded the evidence provided in each article.
 - Reviewed existing systematic reviews, meta-analyses, and reports by federal agencies or leading scientific organizations. This review involved applying a systematic process to assess the quality of the existing review or report and to ensure that it presented a comprehensive review of the question of interest.
 - Conducted data analysis. The committee members used national data from federal government agencies to address questions regarding chronic disease prevalence rates, food and nutrient intakes of the population of the United States across age, sex, and other demographic characteristics, as well as questions regarding the nutrient content of foods.
 - Conducted food pattern modeling analyses. The committee members estimated the effects of diet quality on possible changes in types or amounts of foods in the United States Department of Agriculture Food Patterns that it was considering recommending.
- **Stage 2: Development of the *Dietary Guidelines for Americans*:** In this stage, Health and Human Services and the United States Department of Agriculture developed the eighth edition of the *Dietary Guidelines*. The eighth edition was built upon the preceding edition, with scientific justification for revisions supported by the advisory committee report and information from public and federal agencies. The strength of the evidence that supported the 2015 recommendations was determined using the following criteria:
 - **Strong evidence:** Reflects a large, high-quality and/or consistent body of evidence. Strong evidence indicates that there is a high level of certainty that the evidence is relevant to the population of interest and that additional studies are not likely to change conclusions based on this evidence.

- **Moderate evidence:** Reflects sufficient evidence to draw conclusions. However, the level of certainty may be constrained by limitations in the evidence presented in the studies.
- **Limited evidence:** Reflects either a small number of studies, studies of weak design or with inconsistent results, and/or limitations on the generalization of the findings.
- **Stage 3: Implementing the *Dietary Guidelines for Americans*:** Federal programs apply the *Dietary Guidelines* via food, nutrition, and health policies and programs, and in nutrition education materials for the public. For example, MyPlate is extensively used to promote the *Dietary Guidelines*.

(Health.gov., 2015; 2016a; 2016b)

To date, the *Dietary Guidelines* focused on persons ages two and older in the United States, including those who are at increased risk of chronic disease. However, as research continues to demonstrate association between early nutrition to health outcomes throughout the life span, it is anticipated that future guidelines (beginning with the 2020–2025 edition) will expand to include guidance for persons under the age of two and for women who are pregnant (Health.gov., 2015; 2016a).

Nursing consideration: Nurses must be knowledgeable in how the *Dietary Guidelines* are developed and their content so that they can adequately provide patient/family education regarding these recommendations. Part of this knowledge is to be able to interpret MyPlate content and explain its recommendations to healthcare consumers.

Harvard Healthy Eating Plate

In 2011, the Harvard Medical School published its own graphic representation of healthy eating guidelines. Harvard’s Healthy Eating Plate was also divided into four sections: vegetables, fruits, whole grains, and healthy proteins. Next to the plate was a glass representing water intake and a canister representing healthy oils (Harvard Health Publishing Harvard Medical School, 2017).

Citing what they felt were inadequacies in MyPlate, Harvard experts encouraged the following healthy-eating habits:

- Choose whole grains, and limit refined grains, which act like sugars.
- Choose healthy proteins such as fish, poultry, beans, or nuts. Limit red meat and avoid processed meat, since eating even small quantities of these foods on a regular basis increases the risk of heart disease, diabetes, colon cancer, and weight gain.
- Eat a variety of vegetables. Americans are especially deficient in their vegetable intake except for potatoes, which contain large amounts of rapidly digested starch. Potatoes have the same effect on

Healthy eating and food groups

Healthy-eating recommendations include various terms about food groups. It is important that nurses be able to teach their patients about the identified groups and what constitutes healthy choices within each group. A number of websites offer the following explanations about food groups:

- **Vegetables:** A healthy diet includes a variety of vegetables from all of the five vegetable subgroups: dark green, red and orange, legumes (beans and peas), starchy, and other. These groups include all fresh, frozen, canned, and dried options in cooked or raw forms. These also include vegetable juices. Legumes are excellent sources of protein and fiber. Green peas and green (string) beans are not considered to be part of the legume subgroup because their nutritional components are not similar to legumes. Green peas are grouped with starchy vegetables, and green beans are grouped in the “other” vegetable subgroup, which also includes onions, iceberg lettuce, celery, and cabbage.
- **Fruits:** Healthy eating includes eating fruits, especially whole fruits. The fruits group includes whole fruits and 100% fruit juice. Whole fruits include fresh, canned, frozen, and dried forms of fruit. One cup of 100% fruit juice counts as one cup of fruit. However, fruit juice can be high in calories and some have added sugars. When consuming fruit juice, 100% juice should be selected without added sugars. Half a cup of dried fruit is equivalent to one cup of fruit. Dried fruits can contribute to extra calories if sugars are added.

MyPlate

MyPlate was introduced by the United States Department of Agriculture in 2011. It is a visual guide designed to provide an easy, quick graphic of how to eat according to the *Dietary Guidelines for Americans* (Dairy Council of California, 2019).

The MyPlate graphic divides a dinner plate into four sections. The fruits and vegetables sections make up half of the plate, emphasizing the guideline that recommends fruits and vegetables make up half of every meal. The second half of the plate is divided into two sections: one section for grains and one for protein. A smaller circle, separate from the plate, is for dairy (Dairy Council of California, 2019).

Recommendations that are part of MyPlate include the following:

- Switching to fat-free or low-fat (1%) milk.
- Making at least half of grain intake whole grains.
- Choosing lean sources of protein.
- Drinking water instead of sugary drinks.
- Avoiding portions that are oversized.
- Comparing the amounts of sodium (salt) in foods like soups, breads, and frozen meals, and choosing foods with lesser amounts of sodium.

(Dairy Council of California, 2019)

MyPlate remains the federal government’s accepted graphic representation of healthy eating.

blood sugar as refined grains and sugars. Their consumption should be limited.

- The Healthy Eating Plate places fruits beneath vegetables on the plate, since not as much fruit is needed each day as vegetables.
- Choose healthy oils such as olive, canola, and other plant oils in cooking, on salads, and at the dining table. Butter and trans fat consumption should be limited.
- Drink water. Avoid sugary drinks. Limit milk and dairy to one to two servings each day. Limit juice intake, even 100% fruit juice, as juice contains as much sugar and as many calories as sugary soda.
- A figure at the bottom of the Healthy Eating Plate reminds people to stay active.

(Harvard Health Publishing Harvard Medical School, 2017)

For more information and to view the Healthy Eating Plate visit: <https://www.health.harvard.edu/staying-healthy/healthy-eating-plate>.

- **Grains:** Grains are either whole or refined. The intake of refined grains should be limited. Examples of whole grains include brown rice and oats. Refined grains are those that have been processed to remove the dietary fiber, iron, and other nutrients. Examples of refined grains include products such as cookies, cakes, and some snack foods.
- **Dairy:** Healthy dietary intake of dairy products includes fat-free and low-fat (1%) milk, yogurt, cheese, or fortified (with vitamins A and D) soy beverages. Products sold as milk but made from plants, such as almond, rice, and coconut milks, may contain calcium but are not included as part of the dairy group because their overall nutritional content is not similar to dairy milk and fortified soy beverages. Recommended amounts of dairy are based on age rather than calories:
 - Children ages two to three years: 2-cup equivalents of dairy per day.
 - Children ages four to eight years: 2 ½ cup equivalents of dairy per day.
 - Persons nine years of age and older: 3 cup equivalents per day.
- **Protein:** A variety of protein foods are part of healthy-eating patterns. Examples of protein foods include a number of subgroups, including seafood, meats, poultry, eggs, nuts, seeds, and soy products. Legumes may be considered to be part of the protein food group and the vegetable food group:

- It is recommended that, for the general population, eight ounces of seafood should be consumed per week. However, mercury can be found in seafood in varying levels. It is recommended that women who are pregnant or who are breastfeeding and young children should eat seafood that is low in mercury. Examples of seafood that generally has lower levels of mercury include salmon, anchovies, herring, shad, sardines, Pacific oysters, trout, and Atlantic and Pacific mackerel.
- Meat, also known as red meat, includes all forms of beef, pork, lamb, veal, goat, and nonbird game. Poultry includes all forms of chicken, turkey, duck, geese, guineas, and game birds. Lean meats should be chosen over processed meats and processed poultry.
- **Oils:** Oils are not a food group, but are part of healthy-eating patterns because they are the major source of essential fatty acids and vitamin E. Healthy oils include those obtained from plant sources and not trans fats.

(Health.gov., 2015; 2016a; 2016b)

Whole foods versus processed foods

All forms of media communication discuss the benefits of “whole” foods. What exactly are whole foods? What makes them better? What is the difference between whole foods and processed foods?

Whole foods are nutrient dense. Processed foods are energy dense. Nutrient-dense foods provide the consumer with nutrients critical to health, such as fiber, vitamins, and minerals with low added sugar and fat. Energy dense foods are often high in calories that have little nutritional value (Jones, 2013; Mission Health, 2018).

Ideally, a whole food is one that consists of only one ingredient, such as an apple or a piece of chicken. These types of foods can help to reduce cholesterol and regulate blood sugar. Processed foods, on the other hand, contain more than one ingredient, and also contain added sugars, preservatives, dyes, and saturated and trans fats (Jones, 2013; Mission Health, 2018).

Additional advantages of whole foods include the following:

- Whole foods are rich in phytochemicals.
- Whole foods contain more vitamins and minerals than processed foods.
- Whole foods contain more fiber and beneficial fats than processed foods.
- Whole plant foods contain combinations of nutrients that work together to protect the body from disease.

(Health Agenda Nutrition, 2017)

Nursing consideration: Examples of whole foods include those listed in healthy-eating guidelines, such as fresh fruits, and vegetables, fresh lean meats, and fresh eggs. Nurses must be able to differentiate the nutritional value of whole versus processed foods and teach their patients the differences as well.

Organic foods

In the not so distant past, organic foods were found only in health food stores, and people who purchased them were viewed by many others as a bit unusual or overly concerned about their diets. Today, however, organic foods are readily available at most grocery stores. But do organic foods really provide more health benefits than conventionally grown food products? Do the benefits outweigh disadvantages of purchasing organic food? For example, organic foods frequently cost considerably more than their counterparts raised by nonorganic methods. Organic foods cost more because they may decompose faster and they are more labor-intensive to produce. Organic meats are costly because the food required to feed the animals is more expensive than foods fed to animals raised by conventional methods. In some cases, organic foods costs twice as much as nonorganic foods (Mayo Clinic, 2018g).

Organic refers to the way farmers grow and process agricultural products. Here are some facts about organically grown food:

- Organic farming practices are intended to help conserve soil and water and reduce pollution.
- Conventional methods of fertilization and weed control are not used by farmers who grow organic produce. Instead, natural fertilizers are used to feed soil and plants. Crop rotation or mulch is used to manage weeds.
- The United States Department of Agriculture (USDA) has established an organic certification program that regulates how these foods are grown, handled, and processed.
- Any product labeled as organic must be certified by the USDA. Food producers who sell less than \$5,000 a year in organic foods

Here are some reasons to avoid processed foods:

- Processed foods contain additives and preservatives and are often high in sodium.
- Processed foods may contain trans fats that elevate cholesterol.
- Processed foods may contain hidden allergens that may be a threat to those who suffer from food allergies.
- Some forms of processed foods contain large amounts of sugar. Examples include candy, sugared cereals, frozen desserts, and soft drinks.
- Processed foods that are high in calories and low in fiber contribute to overeating and weight gain. Foods high in fiber make people feel fuller more quickly compared to processed foods.

(Health Agenda Nutrition, 2017; Mission Health, 2018)

When people are shopping for groceries, they are often in a hurry and grab what is quickly and easily available, but it is worth taking the time to look for whole foods. Here are some tips for swiftly locating healthy, whole foods:

1. Purchase seasonal fresh, whole foods from local farmers or farmers’ markets or through a community-supported agriculture (CSA) group.
2. In grocery stores, shop around the perimeter of the store. That is where whole foods are located. Processed foods are in the aisles.
3. Make a grocery list before leaving home. Make sure the list emphasizes shopping primarily around the periphery of the store for items such as fruits, vegetables, lean meats, and low-fat dairy items. People should travel into only one or two aisles per grocery store trip.

(Health Agenda Nutrition, 2017; Mission Health, 2018)

are exempt from certification, but they are still required to follow the department’s standards for organic foods.

- To be labeled as 100% organic, food products must be either completely organic or made of all organic ingredients.
- To be labeled organic, food products must be at least 95% organic.
- To be labeled made with organic, foods must be composed of at least 70% certified organic ingredients. If less than 70% of a multi-ingredient product is certified organic, it may not be labeled as organic or carry a USDA seal.
- Only foods that are grown and processed according to the USDA standards may be labeled organic.

(Mayo Clinic, 2018g)

A common barrier to buying organic foods is cost. Organic foods are usually more costly than conventional foods because, in part, the farming practices used are more expensive. Additionally, organic products may spoil quicker because they are not treated with preservatives (Maloney, 2019a; Mayo Clinic, 2018g).

Evidence-based practice! There is a growing body of evidence that indicates some potential health benefits of organic foods, including increased amounts of nutrients, higher levels of omega-3 fatty acids, and reduced exposure to toxic metals, pesticide residue, and bacteria (Maloney, 2019a).

Individuals who buy organic foods express certain concerns about nonorganic foods, including the following:

- **Pesticide use:** Conventional farmers spray pesticides that can leave residue on food products. Organic farmers use insect traps, disease-resistant crop selection, predator insects, or beneficial microorganisms to control crop-damaging pests. Thus, organic products typically carry significantly less pesticide residue than conventional food. Pesticide residue on both organic and nonorganic does not exceed government-identified safety thresholds.

Nursing interventions

As noted throughout this education program, nurses play a critical role in educating patients about nutrition. There is an unlimited amount of information available on the Internet concerning nutrition, various types of diets, and how to use nutrition to improve health and wellness. Some of this information is accurate and helpful, while some can be

- **Food additives:** Organic regulations ban or significantly limit the use of food additives, processing aids, and fortifying agents that are commonly used in the production of nonorganic foods. Examples of fortifying agents include preservatives, artificial sweeteners, colorings and flavorings, as well as monosodium glutamate.
- **Environmental concerns:** Organic farmers focus on reducing pollution and conserving water and soil quality. (Maloney, 2019a; Mayo Clinic, 2018g)

downright dangerous to the uninformed consumer. Nurses must not only be able to provide accurate, current information about the latest Dietary Guidelines for healthy eating, but also help patients to differentiate between fact and fiction when it comes to healthy eating.

SPECIFIC NUTRIENTS

Many nutrients are obtained from various food sources. Some of them, such as soy, have been credited with abundant healing properties, as have some vitamins and minerals. The following material, although

not all-inclusive, provides information to help the nurse relay accurate information to patients and families about nutrients.

Phytonutrients

Phytonutrients or phytochemicals are natural chemicals found in plant foods. Good sources of phytonutrients are fruits, vegetables, whole grains, nuts, beans, and tea. Research suggests that phytonutrients may help prevent disease (WebMD, 2018c).

There are more than 25,000 phytonutrients. Here are descriptions of six of the most important phytonutrients and how they may impact health:

- **Carotenoids:** There are more than 600 carotenoids, which provide the yellow, orange, and red colors in various fruits and vegetables. Carotenoids function as antioxidants and convert alpha-carotene, beta-carotene, and beta-cryptoxanthin to vitamin A. They may help to lower the risk of prostate cancer and enhance eye health.
- **Ellagic acid:** Ellagic acid is found most often in berries such as strawberries, raspberries, and in pomegranates. Ellagic acid may help to slow the growth of cancer cells and help the liver to neutralize cancer-causing agents in the body.
- **Flavonoids:** Sources of flavonoids include the following:
 - Green tea, which may help to prevent certain malignancies.
 - Citrus fruits, which work as antioxidants.
 - Apples, berries, kale, and onions, which may help to reduce the risk of asthma, some malignancies, and heart disease.
- **Resveratrol:** Found in grapes, purple grape juice, and red wine, resveratrol acts as an antioxidant and anti-inflammatory.
- **Glucosinolates:** Found in cruciferous vegetables such as brussels sprouts, cabbage, kale, and broccoli, glucosinolates may have some cancer prevention properties.

- **Phytoestrogens:** Phytoestrogens can cause estrogen-like effects, but can also block the effects of the body's natural supply of estrogen. Isoflavones, a type of phytoestrogen, are found in soy foods and may be linked to a lower risk of endometrial cancer and a lower risk of bone loss in women. (WebMD, 2018c)

Self-Assessment Quiz Question #5

Monica is a busy mother of three, including Tracey, a 16-year-old health and fitness enthusiast. Tracey frequently criticizes her family's eating habits and tells her mother that they should all eat more "organic" foods. Monica doesn't really understand the difference between organic and nonorganic food products and doubts if Tracey really understands what she is proposing. One day, Monica asks Tracey to accompany her to the grocery store and tells her, "Now you can show me why you think this organic stuff is so much better than what we've been eating for years!" What should Tracey tell her mother about organic foods?

- Tracey should tell her mother all of the following EXCEPT
- a. Organic foods typically carry significantly less pesticide residue.
 - b. Organic foods are less expensive than conventional foods.
 - c. Organic farmers focus on reducing pollution and conserving water and soil quality.
 - d. Organic regulations ban or significantly limit the use of food additives.

Antioxidants

Antioxidants are synthetic or natural substances that may help to prevent or delay some types of cell damage. Vegetables and fruits are excellent sources of antioxidants. Research shows that people who eat more vegetables and fruits have lower risks of some diseases; however, it is not yet clear whether these results are linked to the amounts of antioxidants in vegetables and fruits, to other components of these foods, to other dietary choices, or to other lifestyle choices (National Center for Complementary and Integrative Health [NCCIH], 2016).

Antioxidants have been found to counteract the effects of free radicals. Free radicals are very unstable molecules that are formed naturally when people exercise and when the body converts food into energy. Free radicals also come from the environment in the form of air pollution, sunlight, and cigarette smoke. Free radicals can lead to what is referred to as oxidative stress, which is believed to play a part in the development of some diseases, including cancer, heart disease, diabetes, Alzheimer's disease, Parkinson's disease, cataracts, and age-related macular degeneration (NCCIH, 2016).

Although the benefits that come from eating fruits and vegetables may include antioxidant-associated benefits, the role of antioxidant supplements is less clear. High-dose supplements of antioxidants may

actually be harmful in some cases. Some research findings indicate that the use of high-dose beta-carotene supplements is linked to an increased risk of lung cancer in smokers, and the use of high-dose vitamin E supplements may increase the risk of hemorrhagic stroke and prostate cancer (NCCIH, 2016).

There is also the danger of interactions between antioxidant supplements and some medications. For example, the ingestion of vitamin E supplements may increase bleeding risk in patients who are taking anticoagulants. There is contradictory evidence regarding taking antioxidant supplements while receiving treatment for cancer. Some study findings indicate that such supplements may be helpful, while other findings suggest that they may actually be harmful. Persons undergoing cancer treatment should talk to their health care provider before adding any supplements to their diets (NCCIH, 2016).

For patients who are thinking about adding antioxidant supplements to their diets, it is recommended that they do the following:

- Not use antioxidant supplements to replace the guidelines for a healthy diet, conventional medical care, or as a substitute for seeking medical help for a health problem.

- Seek the advice of health care providers if they have age-related macular degeneration and are thinking about taking supplements. They should not take supplements without the advice of their health care providers.
- Obtain accurate information from reliable healthcare resources (e.g., healthcare professionals) before adding supplements to their diets.

Soy

Soy has gained great popularity as a health food. It has been part of the human diet for thousands of years. It is not certain if the proposed health benefits of soy come from its isoflavones or from a combination of isoflavones and other nutrients found in soy. Researchers are investigating whether or not soy can help to prevent hormone-related cancers such as breast, prostate, and uterine cancer. They are also investigating the impact soy has on menopausal symptoms and on bone and heart health. However, the results to date have not been definitive (Messina, 2016; WebMD, 2019c).

Here is a review of some of the research findings related to therapeutic uses of soy:

- **Cholesterol reduction:** Some research findings indicate that soy may reduce the risk of heart disease by lowering LDL (bad) cholesterol levels. Evidence indicates that a decrease in LDL cholesterol in response to soy protein is greater in the hypercholesterolemic compared to persons with normal cholesterol levels (Messina, 2016). Some studies indicate that adding soy protein to the diet can help lower LDL cholesterol by four to six percent (WebMD, 2019b).
- **Cancer:** Findings related to soy as a cancer preventive agent are complicated. Most studies that found soy lowers the risk of breast cancer were conducted using Asian women as subjects, since these women generally eat a lot of soy. Additionally, study results suggest that a woman may receive the best protection if she eats a diet high in soy while young, rather than when she goes through menopause (Messina, 2016; WebMD, 2019b).

Some studies suggest that soy consumption decreases the risk of prostate cancer, and others suggest that soy consumption is linked to a lower risk of lung cancer and improves survival chances in patients who have lung cancer. However, not all studies show such benefits (Messina, 2016; WebMD, 2019b).

Evidence-based practice! There is a growing body of evidence that indicates some potential health benefits of organic foods, including increased amounts of nutrients, higher levels of omega-3 fatty acids, and reduced exposure to toxic metals, pesticide residue, and bacteria (Maloney, 2019a).

Fats

Fats are nutrients that provide the body with energy and facilitate the absorption of the fat-soluble vitamins, D, E, K, and A. There are three types of fat: saturated, trans, and unsaturated.

Saturated fat

Saturated fat is solid at room temperature and is found primarily in animal related foods such as milk, cheese, and meat (red meat has more saturated fat than poultry and fish). Food products that are made with butter, margarine or shortening contain significant amounts of saturated fat. Since saturated fat can elevate cholesterol levels, a healthy diet should have less than 10% of daily calories from saturated fat (WebMD, 2019c).

Trans fat

Trans fat is hydrogenated, which increases its shelf life and makes it solid at room temperature. Trans fat is found in items such as processed foods, snack foods (e.g., potato chips), cookies, some margarines and salad dressings, and processed foods. This type of fat can also elevate cholesterol (WebMD, 2019c).

Unsaturated fat

Unsaturated fat, which is liquid at room temperature, is obtained primarily from plants. Unsaturated fats may actually reduce cholesterol levels.

Supplements can interact adversely with medications and other supplements.

- Inform their health care providers about any complementary health care interventions they are thinking about trying. Seek their advice before starting any such interventions. (NCCIH, 2016)

- **Osteoporosis:** Results from studies on the impact of soy on osteoporosis prevention are mixed. Not many studies have been conducted, but some that have been conducted indicate that women who are approaching menopause and eat isoflavone-rich soy protein are more likely to boost bone mineral density than those who do not. However, other studies show that soy isoflavones do not increase bone mineral density in early postmenopausal women (Messina, 2016; WebMD, 2019b).
- **Menopause:** As in other studies, results of whether or not soy reduces menopausal symptoms have been mixed. Studies with the most positive results are associated with a daily intake of soy products with at least 15 mg of isoflavones (Messina, 2016; WebMD, 2019b).

Precautions concerning soy intake

The following issues describe situations that indicate soy should be consumed with caution:

- **Soy allergies:** Persons allergic to soy and soy products should not consume soy or soy supplements.
- **Breast cancer:** Some studies suggest that soy consumption in women who have already had breast cancer may not be safe. However, other studies indicate that soy consumption in such patients is not harmful. Health care providers should be consulted before adding soy to the diet.
- **Renal disease:** Soy contains more phosphorus and potassium than similar quantities of other protein sources, such as meat, poultry, and fish. Thus, persons with renal disease should consult with their health care providers before consuming soy products.
- **Hypothyroidism:** Isoflavones can reduce the amount of iodine in the body. Insufficient amounts of iodine may lead to inadequate thyroid function.
- **Uterine cancer:** Women who have had or who have uterine (endometrial) cancer should not consume large amounts of soy or soy supplements without first consulting with their health care providers.
- **Pregnancy and breastfeeding:** Soy food consumption in women who are pregnant or who are breastfeeding is generally considered safe. However, these women should not take soy supplements without first consulting with their health care providers. (Messina, 2016; WebMD, 2019b)

Types of unsaturated fat include the following:

- **Monounsaturated fat:** Found in avocados, nuts, and vegetable oils, monounsaturated fat may actually help to reduce LDL (bad) cholesterol and help to maintain HDL (good) cholesterol.
- **Polyunsaturated fat:** Found primarily in vegetable oils such as safflower, sunflower, sesame, soybean, and corn oils, polyunsaturated fat is also the main fat in seafood. The two types of polyunsaturated fat are omega-3 and omega-6 fatty acids. Omega-3 fatty acids are found in foods from plants (e.g., soybean oil, walnuts, and flaxseed) and in fatty fish and shellfish such as salmon, anchovies, herring, sardines, trout, Pacific oysters, and Pacific mackerel. Guidelines for healthy diet recommend that eight ounces or more of these types of fish be consumed every week. Omega-6 fatty acids are found primarily in liquid vegetable oils. (WebMD, 2019c)

Nursing consideration: It is important to teach patients that eating greater amounts of unsaturated fat without reducing intake of saturated fat will not help to reduce LDL cholesterol (WebMD, 2019c).

Carbohydrates

Carbohydrates are the body's primary energy source. There are three main types of carbohydrates:

- **Sugar:** Sugars are the simplest forms of carbohydrates. They occur naturally in foods such as fruits, vegetables, milk, and milk products. Sugars also include fruit sugar (fructose), table sugar (sucrose), and milk sugar (lactose).
- **Starch:** Starch is a complex carbohydrate, which means that it is comprised of multiple sugars that are bonded together. Starch is found naturally in vegetables, grains, and cooked dry beans and peas.
- **Fiber:** Fiber, also a complex carbohydrate, occurs naturally in fruits, vegetables, whole grains, and cooked dry beans and peas.

(Mayo Clinic, 2017a)

Carbohydrates are important to good health. *Dietary Guidelines for Americans* recommend that carbohydrates make up 45–65% of the total daily caloric intake (Mayo Clinic, 2017a).

Fiber

Fiber has many health benefits. It can help maintain a healthy weight, lower the risk of heart disease and diabetes, and prevent or relieve constipation. Dietary fiber is found primarily in fruits, vegetables, and legumes (Mayo Clinic, 2018h).

Dietary fiber is also known as roughage or bulk and includes the components of plant foods that the body is unable to digest. This means that it passes nearly intact through the stomach, small intestine, colon, and out of the body (Mayo Clinic, 2018h).

Proteins

Proteins are referred to as the building blocks of life. Every cell in the body contains proteins, which are made of up to 20 different types of amino acids. Proteins will do the following:

- Provide energy.
- Repair cells.
- Stimulate the growth of new cells.
- Promote growth and development in children, teenagers, and the fetus in pregnant women.

(Lawler, 2019)

Protein is found in both animal and nonanimal sources. Animal sources of protein include meat, poultry, fish, and eggs. Nonanimal sources of protein include soy products, beans, nuts, and some grains. The Institute of Medicine (IOM) recommends that adults consume a minimum of eight grams of protein daily for every 20 pounds of body weight. Most adults need two to three servings of foods rich in protein every day (Lawler, 2019).

Vitamins

Vitamins are important to a state of health and wellness and are classified as water-soluble and fat-soluble.

Water-soluble vitamins

Water-soluble vitamins travel throughout the body without inhibition, and excess amounts are typically excreted by the kidneys. It is unlikely that water-soluble vitamins will reach toxic levels. The following are important points about water-soluble vitamins:

- **Thiamine (vitamin B1):** This vitamin is important to nerve function and energy. It is found in pork, whole-grain or enriched breads and cereals, legumes, nuts, and seeds.
- **Riboflavin (vitamin B2):** Vitamin B2 is needed not only for energy metabolism, but is also important for normal vision and integumentary health. Sources of this vitamin include milk and milk products, green leafy vegetables, and whole-grain, enriched breads and cereals.
- **Niacin (vitamin B3):** Also needed for energy metabolism, vitamin B3 is essential for the health of the nervous and digestive systems and integumentary health. Sources of vitamin B3 include meat, poultry, fish, whole-grain or enriched breads and cereals, leafy green vegetables, mushrooms, asparagus, and peanut butter.

Carbohydrates, important components of a healthy diet, must be chosen wisely. Here are some guidelines to incorporate healthy carbohydrates into the diet:

- **Choose fiber-rich fruits and vegetables:** Choose whole, fresh, frozen, and canned fruits and vegetables without added sugar.
- **Choose whole grains:** Whole grains are good sources of fiber and other important nutrients.
- **Choose low-fat dairy products:** Dairy products are good sources of calcium and protein, but choose low-fat dairy products to limit saturated fat and calories.
- **Increase bean and legume intake:** Legumes and beans are good sources of iron, protein, potassium, and magnesium as well as good fats and fiber. Legumes can be a healthy substitute for meat.
- **Limit the intake of added sugars:** There is no health advantage to consuming added sugars, although consuming a small amount of added sugar will probably not have negative health impacts. However, consuming too much added sugar can lead to poor nutritional intake, weight gain, and tooth decay.

(Mayo Clinic, 2017a)

There are two types of fiber. Soluble fiber, which dissolves in water to form a soft, gel-like material, is found in food such as oats, peas, beans, apples, and barley. It can help to reduce cholesterol and glucose levels. Insoluble fiber, found in whole wheat flour, wheat bran, nuts, beans and vegetables, facilitates digestive system movement, increases the bulk of stools, and helps to regulate elimination patterns (Mayo Clinic, 2018h).

Excessive amounts of protein, however, can cause certain adverse effects, including the following:

- Abdominal pain.
- Bloating.
- Diarrhea.
- Eating pattern changes.
- Hepatic complications.
- Hypotension.
- Increased workload on the kidneys.

(Lawler, 2019)

Nursing consideration: The amount of protein consumed as part of a well-balanced diet is generally considered to be adequate and safe (Lawler, 2019). Nurses must advise patients about protein sources and how protein should be consumed as part of a healthy diet.

- **Pantothenic acid:** Needed for energy metabolism, pantothenic acid is found in many food sources.
- **Biotin:** Biotin is needed for energy metabolism and is widespread in foods. It is also produced by bacteria in the intestinal tract.
- **Pyridoxine (vitamin B6):** Vitamin B6 is a part of an enzyme essential for protein metabolism. It also helps in the manufacture of red blood cells (RBCs). Sources of this vitamin include meat, fish, poultry, vegetables, and fruits.
- **Folic acid:** Folic acid is needed for the manufacture of DNA and new cells, red blood cells in particular. Folic acid is found in leafy green vegetables and legumes, seeds, orange juice, and liver. Folic acid is currently added to most refined grains.
- **Cobalamin (vitamin B12):** Vitamin B12 is needed for the manufacture of new cells and is important for nerve functioning. It can be found in meat, poultry, fish, seafood, eggs, milk, and milk products. However, it is not found in plant foods.
- **Ascorbic acid (vitamin C):** Vitamin C is an antioxidant and is needed for the metabolism of protein. It facilitates iron absorption and is important for a healthy immune system. Vitamin C is found only in fruits and vegetables, especially citrus fruits, vegetables in

the cabbage family, cantaloupe, strawberries, tomatoes, potatoes, lettuce, papayas, mangoes, and kiwi. (Medline Plus, 2019; WebMD, 2018d)

Fat-soluble vitamins

Fat-soluble vitamins are stored in body cells and are not excreted as quickly or easily as water-soluble vitamins. Excessive amounts of fat-soluble vitamins can lead to toxicity (Medline Plus, 2019; WebMD, 2018d). The following are important points about fat-soluble vitamins:

- **Vitamin A:** Vitamin A, important for vision, healthy skin and mucous membranes, the growth of bones and teeth, and a healthy immune system, is obtained from animal sources, fortified milk, cheese, cream, butter, fortified margarine, eggs, and liver. Vitamin A's precursor is beta-carotene, which is obtained from leafy, dark green vegetables, dark orange fruits, and vegetables.

Calcium

Calcium is essential for the healthy functioning of the heart, muscles, and nerves, as well as for the safe and appropriate clotting of blood. Research shows that insufficient amounts of calcium are associated with the development of osteoporosis, low bone mass, and high incidence of fractures (National Institute of Health [NIH] Osteoporosis and Related Bone Diseases National Resource Center, 2018).

Adults between the ages of 18 and 50 need 1,000 mg/day of calcium. Men between the ages of 51 to 70 need 1,000 mg/day of calcium daily, and women between the ages of 51 to 70 require 1,200 mg daily (NIH Osteoporosis and Related Bone Diseases National Resource Center, 2018).

It is essential that the body has enough vitamin D, which is needed to absorb calcium. Vitamin D leads to the formation of calcitriol, referred to as active vitamin D. In turn, inadequate amounts of vitamin D lead to insufficient absorption of calcium from the diet. If this occurs, the body takes calcium from the bones, which weakens the skeletal system and prevents new bone formation (NIH Osteoporosis and Related Bone Diseases National Resource Center, 2018).

- **Vitamin D:** Vitamin D is essential for adequate calcium absorption and is stored in the bones. Vitamin D is obtained from egg yolks, fatty fish, fortified milk, and fortified margarine. The skin can make vitamin D when it is exposed to adequate amounts of sunlight.
- **Vitamin E:** Vitamin E is known for its antioxidant properties, which help to protect the walls of the body's cells. Vitamin E is obtained from polyunsaturated plant oils, leafy green vegetables, wheat germ, whole-grain food products, liver, egg yolks, nuts, and seeds.
- **Vitamin K:** Vitamin K is essential for the proper clotting of blood. It may be found in leafy green vegetables, vegetables in the cabbage family, and milk. It is also manufactured by bacteria that live in the intestinal tract.

(Medline Plus, 2019; WebMD, 2018d)

Nursing consideration: Up to the age of 70, a daily intake of 600 IU (International Units) of vitamin D is recommended. Men and women over the age of 70 should increase their intake to 800 IU daily. Nurses should educate their patients about sources of vitamin D: through the skin, from diet, and from supplements. Foods rich in vitamin D include egg yolks, saltwater fish, liver, and fortified milk. People should consult their health care providers about the need for vitamin D supplements (NIH Osteoporosis and Related Bone Diseases National Resource Center, 2018).

Self-Assessment Quiz Question #6

A professor of nursing is preparing a class on nutrients. The professor wants students to comprehend the importance of nutrients to health and wellness.

The professor will include which of the following in the class on nutrients?

- a. Vitamin A is important for vision, healthy skin, and a healthy immune system.
- b. Vitamin E is necessary for the absorption of calcium.
- c. Folic acid is stored in body cells.
- d. Niacin is vitamin B1.

TYPES OF DIETS

There are many types of diets in popular use today. Research shows that some are quite beneficial to health and wellness, while others, despite popularity in the media, have yet to be proven to enhance health. The

Paleolithic (paleo) diet

Gloria is a college freshman. She has made a number of friends who are focused on dieting and losing weight. Several of them decide that the "caveman" diet is a surefire way to lose weight. When Gloria asks them what they mean, they explain, "It's the way the first humans ate before all of these horrible preservatives and the junk they use to spray food crops were invented." Gloria is planning on majoring in nursing and, although she is anxious to lose some weight herself, she decides that she needs to find out more about this diet before she joins her friends in adopting it.

Gloria has made a sound decision. All diets should be carefully investigated for nutritional value before one decides to follow them. The so-called "caveman" diet is known as the paleo diet, the Paleolithic diet, the Stone Age diet, and the hunter-gatherer diet. Proponents of this diet believe that by eating like prehistoric humans, people will be thinner and less likely to develop diabetes, heart disease, and cancer (Mayo Clinic, 2017b; McMillen, 2018).

The paleo diet is high in protein and fiber and is designed to help people lose weight without cutting calories. It is based on foods similar to what might have been eaten during the Paleolithic era (2.5 million to 10,000 years ago) (Mayo Clinic, 2017b; McMillen, 2018).

Proponents of the paleo diet believe that the human body is better suited to eating the way prehistoric humans did prior to the diets that emerged with farming. Farming changed the way humans ate when dairy, grains, and legumes were added as important components of dietary intake.

following diets are widely discussed and have many proponents, as well as some critics.

According to paleo enthusiasts, farming triggered rapid changes in nutritional intake, which did not allow the body enough time to adapt to these dietary changes. They believe that these overwhelming changes contribute to the current prevalence of obesity, cardiac disease, and diabetes (Mayo Clinic, 2017b; McMillen, 2018).

These are the foods allowed by the paleo diet:

- Fruits.
 - Vegetables.
 - Nuts and seeds.
 - Lean meats, particularly those that are grass-fed or wild game.
 - Fish, especially those that are rich in omega-3 fatty acids such as salmon, mackerel, and albacore tuna.
 - Oils from fruits and nuts such as olive oil or walnut oil.
 - Eggs.
- (Mayo Clinic, 2017b; McMillen, 2018)

These foods are not allowed by the paleo diet:

- Any processed foods.
 - Dairy.
 - Grains such as wheat, oats, and barley.
 - Legumes such as beans, lentils, peanuts, and peas.
 - Refined sugar.
 - Salt.
 - Potatoes.
 - Refined vegetable oils such as canola oil.
- (Mayo Clinic, 2017b; McMillen, 2018)

The paleo diet also stresses the importance of drinking water and being physically active every day (Mayo Clinic, 2017b; McMillen, 2018).

Research findings regarding the benefits of the paleo diet are mixed. There are both positive and negative findings.

Clinical trials of 12 weeks or less show that the paleo diet may provide some moderate health benefits when compared with diets of fruits, vegetables, lean meats, whole grains, legumes, and low-fat dairy products. Benefits include the following:

- Increased weight loss.
 - Improved glucose tolerance.
 - Improved blood pressure control.
 - Better management of appetite.
- (Mayo Clinic, 2017b; McMillen, 2018)

Evidence-based practice! Short-term clinical trials do not provide enough data regarding the health benefits (or lack of benefits) concerning the paleo diet. Nurses should promote longer trials with large groups of participants who are randomly assigned to various diets to identify long-term, overall health benefits and possible risks of the diet. To date, there are no long-term clinical trials that identify benefits and risks of the paleo diet (Mayo Clinic, 2017b; McMillen, 2018). ic metals, pesticide residue, and bacteria (Maloney, 2019a).

Some experts in nutrition argue that proponents of the paleo diet have oversimplified the components of the diet of the earliest humans. The evolution of the human diet would have depended on geography, climate, and food availability, not only on the shift to farming as a means of acquiring food:

- Findings from archeological research show that early human dietary intake may have included wild grains as much as 30,000 years ago. This was well before farming existed.
- Genetic research shows that significant evolutionary changes continued after the Paleolithic era. These included changes in the body to help breakdown dietary starches and other food components.

Mediterranean diet

Jason is a 40-year-old high school football coach. He also has his own sports clinic when football season is over. He loves these jobs, but they are accompanied by a great deal of stress and long working hours. This makes it difficult for him to exercise as regularly as he would like, and he often grabs fast food instead of healthy meals. Jason's family is concerned about some of his unhealthy lifestyle choices. Jason's father died at the age of 50 from a massive heart attack. His mother has a history of hypertension and elevated cholesterol. Jason makes an appointment with the nurse practitioner at his family practice office. After doing some research, he is thinking of adopting the Mediterranean diet. But before doing so, he wants some advice and guidance.

The Mediterranean diet has been known as a heart-healthy eating plan for some time. Research indicates that this type of diet can help to prevent heart disease, stroke, and premature death. The most positive impact seems to be correlated with adopting this diet early in life. However, newer studies indicate that adopting it during midlife also has positive results (Mayo Clinic, 2019a).

Additional findings show that the Mediterranean diet is associated with a small reduction in the incidence of some breast cancer and a primary overall protection from colorectal cancer (Schwingshackl, Schwedhelm, Galbete, & Hoffmann, 2017).

What are the components of a Mediterranean diet? Here is a summary of its elements:

- Every meal should be based on plant-based foods, such as whole grains (rather than refined grains), fruits and vegetables, legumes, nuts, olive oil, seeds, herbs, and spices.
- Butter should be replaced with healthy fats such as olive oil and canola oil.
- Fruits and vegetables should be used as snack foods rather than highly salted foods, such as potato chips and crackers.
- Herbs and spices should be used to flavor foods rather than salt.

Strengths and weaknesses of the paleo diet

Proponents of the paleo diet identify the following strengths:

- There is no counting of calories on the paleo diet. The consumption of fiber-rich foods, such as fruits, vegetables and lean meat, will make people feel fuller quicker.
 - There are no requirements for meetings (either in person or online).
 - People can follow this diet without the need for coaches or counselors. However, there are paleo diet forums online (and on social media) to network with other followers of this diet.
 - Eliminating grains, dairy, processed food and sugar will most likely lead to weight loss.
 - Proponents of the diet claim that there is evidence that shows following the paleo diet may lower the risk of heart disease, hypertension, and inflammation, reduce acne, and promote health and wellness.
- (Mayo Clinic, 2017b; McMillen, 2018)

Weaknesses and/or criticisms of the paleo diet include the following:

- Wheat and dairy products are prohibited.
 - Processed foods and packaged meals are prohibited.
 - Followers of vegetarian or vegan diets will not be able to follow a paleo diet. Intake of meat, seafood, and eggs are essential to the paleo diet. Vegetarian sources of protein (e.g., beans and other legumes) are prohibited.
 - Cost may be an issue. Eating large quantities of meat and fish can increase the cost of groceries.
 - The paleo diet may be hard to follow long term because of dietary restrictions.
 - Dieters will need to stock up on approved foods and cook them from scratch. Therefore, they need to plan on incorporating shopping and cooking into their schedules.
- (Mayo Clinic, 2017b; McMillen, 2018)

Nursing consideration: The paleo diet has both advantages and disadvantages. Nurses should advise their patients to consult with their health care providers before starting this or any other diet.

- Intake of red meat should be limited to no more than a few times a month.
 - Fish should be eaten at least twice a week.
 - Moderate portions of poultry and eggs should be eaten every two days or weekly.
 - Moderate portions of cheese and yogurt should be consumed daily to weekly. Dairy products should be fat-free or low-fat.
 - Plenty of water should be consumed every day.
- (Mayo Clinic, 2019a; Schwingshackl, Schwedhelm, Galbete, & Hoffmann, 2017)

The focus of the Mediterranean diet is on making wise choices about what is eaten. For example, the following are good choices:

- Grains in the Mediterranean region are generally whole grain and contain very few unhealthy fats.
 - Bread is an important part of the diet in this region. However, bread is eaten either plain or dipped in olive oil, not with butter or margarine that contain saturated or trans fats.
 - Olive oil, a monounsaturated fat that can help reduce LDL cholesterol, is the primary source of fat.
 - Nuts are an important part of the Mediterranean diet. Nuts are high in unsaturated fat and calories, so they should not be eaten in large amounts. No more than a handful a day should be consumed.
 - Fatty fish (e.g., salmon, albacore tuna, lake trout, herring, sardines, and mackerel) are rich in omega-3 fatty acids and are eaten as a regular part of the Mediterranean diet.
- (Mayo Clinic, 2019a)

Consumption of red wine is also part of the Mediterranean diet. Recent claims have surfaced regarding the heart health benefits of red wine. Red wine contains antioxidants called polyphenols that may help to prevent heart disease by increasing HDL (good cholesterol) levels and protecting arteries from damage, which, in turn, may prevent blood clots (Mayo Clinic, 2019b).

There are other foods that contain resveratrol, such as grapes, peanuts, blueberries, and cranberries. It is not yet known if consuming these foods are comparable to red wine concerning heart health benefits (Mayo Clinic, 2019b).

Both the American Heart Association and the National Heart, Lung, and Blood Institute do not recommend that people start drinking alcohol to prevent heart disease. Alcohol can lead to addiction problems or exacerbate other health problems (Mayo Clinic, 2019b).

Some of the problems associated with too much alcohol intake include the following:

- Elevation of blood pressure.
- Hepatic damage.
- Elevation of triglycerides.
- Obesity.
- Some cancers.
- Lack of coordination leading to accidents.

(Mayo Clinic, 2019b)

DASH diet

High blood pressure runs in Jeffrey's family. His parents and siblings all take medication to control their blood pressure, and Jeffrey, although only 28 years old, has just been prescribed an antihypertensive agent as well. Concerned about Jeffrey's health, he and his wife decide to adopt a healthier lifestyle, including changing their eating habits. After discussing their concerns with Jeffrey's health care provider, they decide to follow the DASH diet, which is designed to help treat or prevent elevated blood pressure.

DASH stands for Dietary Approaches to Stop Hypertension. The DASH diet is designed as a lifelong approach to healthy eating. Its goal is to help prevent or reduce hypertension (Asay, 2019; Mayo Clinic, 2019c).

According to information published by the Mayo Clinic, people who follow the DASH diet may be able to reduce their blood pressure by a few points in just two weeks. By following it over a period of time, systolic blood pressure could drop by as much as 8–14 points (Mayo Clinic, 2019c).

The DASH diet has a number of health benefits in addition to lowering blood pressure. The DASH diet's components are complementary with dietary recommendations to prevent osteoporosis, cardiac disease, some cancers, stroke, and diabetes (Mayo Clinic, 2019c).

DASH diet, like many recommendations for healthy-eating patterns, focuses on consumption of vegetables, fruits, and low-fat dairy foods, and on moderate amounts of whole grains, fish, poultry, and nuts. It also stresses reduction in sodium intake (Asay, 2019; Mayo Clinic, 2019c).

There are two versions of the DASH diet: a standard version and a lower sodium DASH diet. The standard DASH diet allows for the consumption of up to 2,300 mg of sodium a day. The lower sodium DASH limits sodium consumption to 1,500 mg a day. Either version significantly reduces the amount of sodium that is generally consumed in a typical American diet, which may consist of 3,400 mg of sodium a day or more. The standard DASH diet is in accordance with the *Dietary Guidelines for Americans*, which recommend that sodium intake be limited to less than 2,300 mg per day (Mayo Clinic, 2019c).

The DASH diet is low in saturated fat, total fat, and cholesterol. It allows for the consumption of small amounts of red meat, sweets, and fats. Total caloric consumption is 2,000 calories per day according to the following guidelines:

- **Grains:** The DASH diet allows for six to eight servings of grains per day. The focus is on whole grains such as brown rice instead of white rice, whole-grain bread instead of white bread, and whole wheat pasta instead of regular pasta. Consumers are urged to read the labels of food products. Appropriate examples are “100% whole grain” or “100% whole wheat.” Whole grains are low in fat. To maintain this low level of fat, consumers are urged to avoid adding

Too much alcohol has been associated with a weakening of the cardiac muscle and heart failure. People with heart failure or cardiomyopathy (weakened muscles of the heart) should not drink alcohol at all. Alcohol should not be consumed by pregnant women (Mayo Clinic, 2019b).

A drink of alcohol is defined as 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80 proof distilled spirits. In healthy adults, this means that women of all ages and men older than 65 years of age should limit their alcohol intake to no more than one drink per day. Men 65 years of age and younger should drink no more than two drinks per day. The limit for men is higher than for women because men usually weigh more and have more of the enzyme that metabolizes alcohol than do women (Mayo Clinic, 2019b).

Evidence-based practice! Various studies have shown that moderate amounts of all types of alcohol can benefit the heart, not just alcohol found in red wine. It may be that alcohol has these benefits: (1) raises HDL cholesterol; (2) reduces formation of blood clots; (3) helps to prevent arterial damage caused by high levels of LDL cholesterol; and (4) may improve the function of cells that line blood vessels (Mayo Clinic, 2019b).

butter, cream, and/or cheese to grains. An example of one serving of grains is one slice of whole wheat bread or one-half cup of cooked cereal, rice, or pasta.

- **Vegetables:** Four to five servings of vegetables per day should be consumed when following the DASH diet. Vegetables contain high amounts of fiber, vitamins, and minerals. Ways to increase the amount of vegetables consumed per day include using vegetables as main dishes. For example, spread vegetables over brown rice or whole wheat pasta as a main dish. Both fresh and frozen vegetables are appropriate food sources. Examples of one serving of vegetables include one cup of raw leafy green vegetables or one-half cup of cooked vegetables.
- **Fruits:** Like vegetables, the recommended number of servings of fruits is four to five servings per day. Fruits can be part of meals or consumed as snacks. Most fruits are low in fat and high in fiber. One serving of fruit is defined as one medium fruit, one-half cup of fresh, frozen, or canned fruit, or four ounces of fruit juice. It is recommended that the peels remain on fruit whenever possible. Peels of fruits such as apples contain significant amounts of nutrients and fiber. Persons eating canned fruit or fruit juices should read the labels to be sure that they contain no added sugar.
- **Dairy:** The DASH diet allows for two to three servings of dairy products per day. For example, one serving of dairy is one cup of skim or 1% milk or 1½ ounces of part-skim cheese. Persons following the DASH diet should choose dairy products that are low in fat or fat-free. Dairy products are excellent sources of calcium, vitamin D, and protein. Lactose-free products are available for persons that have difficulty digesting dairy products. Over-the-counter products that contain the enzyme lactase can help to reduce or prevent symptoms of lactose intolerance.
- **Lean meat, poultry, and fish:** The DASH diet recommends six ounces or less per day of lean meat, poultry, and fish. When eating meat, consumers should choose those that are lean and eat no more than six ounces a day. Poultry and meat should be baked, broiled, grilled, or roasted and not fried in fat. When choosing fish, people should eat heart-healthy fish such as salmon, herring, and tuna. These types of fish are high in omega-3 fatty acids, which can help to reduce total cholesterol levels.
- **Nuts, seeds, and legumes:** Examples of this food group in the DASH diet include almonds, sunflower seeds, kidney beans, peas, and lentils. These types of foods are rich in minerals, fiber, and phytochemicals. These foods are also high in calories and should be eaten only a few times per week (four to five servings a week). For example, one serving is the equivalent of one-third cup of nuts or one-half cup of cooked beans or peas.

- **Fats and oils:** The recommended number of servings of fats and oils is two to three servings a day. Fats are important to the absorption of essential vitamins and the maintenance of a healthy immune system. However, excessive amounts of fat increase the risk of obesity, diabetes, and cardiac disease. The DASH diet limits total fat intake to less than 30% of daily calories from fat, and intake should focus on healthy monosaturated fats. Consumers

- should be taught to read food labels so that they can select fats and oils that are lowest in saturated fat and without trans fats.
- **Sweets:** The DASH diet does not prohibit sweets, but limits them to five servings or less per week. One serving of a sweet includes such items as one tablespoon of sugar or jelly, or one-half cup of sorbet. When choosing sweets, people should choose those that are fat-free or low in fat.

(Asay, 2019; Mayo Clinic, 2019c)

Raw food diet

Gloria is a breast cancer survivor. She completed treatment 10 years ago and there is no evidence of cancer at this time. She is very interested in nutrition and how diet can impact health. She is especially interested in how diet can help to prevent cancer or facilitate its treatment. One of her friends is an advocate of the raw foods diet, and she tells Gloria, "this is really the only way to eat. If you want to stay healthy you need to check it out!" Gloria has never heard of a raw foods diet and can't imagine what it would be like to eat only raw foods. Could it help her to stay healthy?

The raw food diet is just what it sounds like; it consists of raw fruits, vegetables, and grains. The theory behind the raw foods diet is that heating food destroys its nutrients and naturally occurring enzymes, which enhance digestion and help to prevent chronic diseases. Proponents of this diet claim that it can prevent headaches, cure allergies, enhance the working of the immune system, and improve arthritis and diabetes (Robinson, 2019).

What foods are allowed on the raw foods diet? Allowed foods are uncooked, unprocessed, and mostly organic. Staples of this diet are raw fruits, vegetables, nuts, seeds, and sprouted grains. Some people also eat unpasteurized dairy foods, raw eggs, meat, and fish. Foods can be cold or slightly warm, as long as the food temperature does not go above 118 degrees. Blenders, food processors, and dehydrators can be used in food preparation (Robinson, 2019).

Advantages of the raw foods diet

There are a number of potential advantages associated with the raw foods diet:

- The diet is acceptable to vegetarians and vegans. However, a dietician should be consulted to ensure that nutritional needs are met.
- Persons who need to follow a gluten-free diet can follow the raw foods diet since most raw foods are naturally free of gluten.
- The raw foods diet is low in sodium. This might decrease the risk of stroke, heart failure, osteoporosis, cancer of the stomach, and renal disease.

Gluten-free diet

Amanda has a family history of celiac disease. Amanda, now in her early 20s, is starting to have periods of intense abdominal cramping, diarrhea, and weakness. In consultation with her health care provider, Amanda is going to adopt a gluten-free diet.

Gluten is a protein found in grains such as wheat, barley, and rye. Primarily used to treat celiac disease, gluten-free eating has been gaining popularity among persons who do not have the disease as well. Adopting a gluten-free diet requires a significant change in one's diet. However, it can have a positive impact on gastrointestinal symptoms and enhance the quality of life of people who react negatively to gluten (Mayo Clinic, 2017c).

As the popularity of gluten-free eating has grown, so have the number and variety of gluten-free foods that are available. Various gluten-free breads and pasta products are available, as well as items such as gluten-free pizza (Mayo Clinic, 2017c).

Many foods that are tasty and healthy are naturally gluten-free.

Examples of such foods include the following:

- Natural and unprocessed beans, seeds, and nuts.
- Fresh eggs.
- Fresh meats, fish, and poultry as long as they are not breaded, marinated, or coated with batter.
- Fruits and vegetables.
- The majority of dairy products.

(Mayo Clinic, 2017c)

- Eating a great deal of vegetables and fruits can help to lose weight and help to manage type 2 diabetes.
- The raw foods diet is high in fiber and many vitamins and minerals, as well as in phytochemicals.

(Robinson, 2019)

Disadvantages of the raw foods diet

There are also a number of disadvantages associated with the raw foods diet, such as the following:

- Preparing raw foods can take a great deal of time. For example, the time needed for blending and dehydrating foods and germinating nuts and sprout seeds can be extensive.
- Some uncooked and unpasteurized foods are associated with foodborne illnesses. Thus, foods must be thoroughly washed, especially foods most often associated with foodborne illnesses, such as sprouts, raspberries, green onions, and lettuce.
- Due to the risk of foodborne illness, the raw foods diet is not recommended for pregnant women, young children, older adults, people whose immune systems are compromised, and people who have chronic medical conditions, such as renal disease.
- It may be expensive to follow the raw foods diet. Organic foods are typically more expensive than conventionally grown foods. Appliances used to prepare food such as juicers, blenders, and dehydrators can be expensive.
- The raw foods diet is deficient in some essential nutrients, such as protein, iron, calcium, and vitamin B12.
- Cooking foods can help to prevent foodborne illnesses and can even boost certain nutrients such as beta-carotene.

(Robinson, 2019)

Nursing consideration: Before deciding to follow a raw foods diet, one should consult his or her health care providers to ensure that adequate recommended nutrients are being received.

Foods that should be avoided include the following:

- Food products that contain barley including malt, malt flavoring, and malt vinegar.
- Rye.
- Triticale (a cross between wheat and rye).
- Wheat.

(Mayo Clinic, 2017c)

It is important that nurses provide persons who are on gluten-free diets with adequate education regarding its guidelines and facilitate consultation with a dietician as needed.

Some important patient and family education tips include the following:

- Read labels on all food products before purchasing and/or eating them. Be sure that they are specifically labeled gluten-free or are made with corn, rice, soy or other gluten-free grains.
- Avoid oats and oat products unless they are clearly labeled as gluten-free.
- Check food labels for the addition of food additives that contain gluten, such as malt flavoring and modified food starch.
- Check for use of gluten as a binding agent in medications and vitamins.
- Be wary of cross-contamination. For example, cross-contamination can take place when gluten-free foods come into contact with foods that contain gluten. This can occur during the manufacturing process if the same equipment is used to make many types of foods.

Cross-contamination can occur in the home if foods are prepared on common surfaces or with the same utensils. Even using a toaster for gluten-free and regular bread can be problematic.

- Be cautious when eating in restaurants. Ask how gluten-free items are prepared and what steps are taken to avoid cross-contamination.

The Zone diet

Trudy and her college friends are anxious to lose weight and have obtained information from the Internet about numerous diets, many of which promise significant weight loss. One diet in particular captures their interest. This is the Zone diet, whose proponents say that followers can burn fat as they sleep. Trudy and her friends think that this is the diet for them!

What is the Zone diet? Created by the biochemist, Barry Sears, PhD, the Zone diet was designed to reset the metabolism in order to prevent or reduce the risk of heart disease, diabetes, and other chronic health conditions. The premise of the Zone diet is that by balancing the amount of fat, carbohydrates, and protein in the diet, the body will burn fat, even during sleep (Levitt & Zelman, 2018; Stoppler, 2018).

This diet restricts calorie intake to 1,200 calories a day for women and 1,500 for men. Specifically, 30% of these calories are to come from fat, 30% come from protein, and 40% from carbohydrates (Levitt & Zelman, 2018; Stoppler, 2018).

No food is completely banned on the Zone diet, which includes three meals and two snacks a day. Each of these meals/snacks includes a mix of low-fat protein (e.g., skinless chicken or fish) and a small amount of healthy fat, such as avocado or olive oil. This diet recommends that bread, pasta, grains, and other starches be considered as condiments instead of main or even side dishes (Levitt & Zelman, 2018).

There are a number of benefits to the Zone diet, such as the following:

- **Variety of food sources:** The Zone diet offers considerable variety in comparison to other high-protein diets.
- **Easy to follow:** After understanding the design of this diet, it is relatively easy to adhere to.
- **Frequent meals:** The Zone diet recommends eating small meals and snacks throughout the day.
- **Healthy fats:** The Zone diet is not a low-fat diet. However, it discourages the use of saturated and trans fats and encourages the intake of healthy fats.
- **Sugar management:** Refined sugars are limited and the intake of whole grains, proteins, fruits, and vegetables is emphasized.
- **Realistic, achievable weight loss:** Most people who adhere to its guidelines can lose weight on the Zone diet. The goal of the Zone diet is a weight loss of 1–1.5 pounds per week. The National Institutes of Health (NIH) recommends a good weight-loss program, aiming for the loss of one to two pounds per week.
- **Vegetarian friendly:** Since the Zone diet consists of a large intake of fruits and vegetables, the Zone diet can work for vegetarians.

Vegetarian diets

Sharon is the nurse manager of a large surgical unit and has a hectic work schedule. She is married and is the mother of three teenagers, who range in age from 13 to 18. One evening as she, her husband, and two of her children are preparing dinner, her 16-year-old daughter, Amy, walks in the door and apologizes for being late. She is explaining that her orchestra practice took longer than expected when she stops abruptly in the middle of a sentence. “Is that a steak you expect me to eat? The body of some harmless animal that was slaughtered? I have decided to become a vegetarian! We’ve been discussing animal rights activist activities in current events class. From now on, I will not eat meat or anything that comes from animals!” Sharon shakes her head and realizes that it is going to be a long evening. Sharon must now explain to her daughter that simply giving up meat and animal food products can have serious health consequences, unless the vegetarian diet includes adequate amounts of essential nutrients, such as calcium and protein. Becoming a vegetarian is not going to be as easy as Amy thinks it will be. Sharon will support Amy’s decision as long as she consults with the family’s health care provider and adopts a vegetarian diet that includes adequate amounts of essential nutrients.

- Ask your health care provider or dietician how to obtain nutrients that are not readily provided in a gluten-free diet. Examples of these nutrients are iron, calcium, fiber, thiamin, riboflavin, niacin, and folate. (Mayo Clinic, 2017c)

- **Gluten-free friendly:** It is easy to adapt the Zone diet to the needs of those who must eat gluten-free, since it strongly discourages eating wheat, barley, and rye products.

- **Low-salt friendly:** The Zone diet emphasizes the intake of fresh ingredients rather than high-sodium, processed foods. This facilitates the maintenance of a low-sodium diet.

(Levitt & Zelman, 2018; Stoppler, 2018)

There are also some concerns related to the Zone diet, including the following:

- **Calcium intake:** The Zone diet does not encourage the intake of dairy products. It can be hard to acquire adequate amounts of calcium on this diet. A number of nondairy products contain calcium, but individuals who follow the Zone diet must monitor their calcium intake carefully.
- **Missing nutrients:** Zone diet food restrictions can lead to insufficient intake of fiber, vitamin C, folic acid, and some minerals.
- **Strict dietary balances:** The Zone diet breakdown of caloric intake of 30% from fat, 30% from protein, and 40% from carbohydrates is recommended for everyone who follows it. However, most individuals have different health needs and are in different states of health and wellness. Therefore, The Zone diet may not be appropriate for people who require a different nutritional balance to lose weight and be healthy.
- **Renal risk:** The Zone diet is high in protein, which can be stressful on the renal system. Such stress can be dangerous to some people with impaired renal function.
- **Cost:** Purchasing quantities of food recommended by the Zone diet may be costly for some people.
- **Moderate to high-fat content:** The fats recommended by the Zone diet are, in general, healthy fats. However, the American Heart Association warns that this diet may be too high in fat for persons who need to monitor their blood pressure and cholesterol levels.
- **Calorie restrictions:** Those who strictly adhere to the Zone diet will be eating less than 1,200 calories per day. This can lead to feelings of hunger and trouble adhering to the diet.
- **Long-term challenges:** The Zone diet may be difficult to follow for long periods of time, since it restricts a number of common foods such as rice and pasta, as well as calorie intake.

(Levitt & Zelman, 2018; Stoppler, 2018)

The Zone diet also recommends regular physical exercise as part of its weight-loss program. Its recommendations are closely aligned with those of the American Heart Association (Levitt & Zelman, 2018; Stoppler, 2018).

Vegetarian diets are becoming increasingly popular. There are a number of reasons cited by vegetarian diet devotees, such as health benefits, reduction of risk for certain diseases, and the promotion of animal rights. With adequate planning, a vegetarian diet can meet the needs of people of all ages, including pregnant or breastfeeding women. The goal is to incorporate adequate amounts of recommended nutrients into the vegetarian’s daily diet (Mayo Clinic, 2019d).

What some people do not realize is that there are a number of types of vegetarian diets, each of which has certain restrictions. The important thing is to know what nutrients are required and how to get them on a vegetarian diet. Here are some types of vegetarian diets:

Lacto-vegetarian diet

Sharon is a senior year nursing student. She is preparing to develop a power point presentation for posting on the nursing department’s website on vegetarian diets. She is feeling a bit overwhelmed by all of the different types of vegetarian diets. Sharon decides to talk to a friend who is a vegetarian. He explains that he is a lacto-vegetarian and does not eat meat, fish, poultry, and eggs as well as foods that contain them. He does, however, consume dairy products such as milk, cheese, yogurt, and butter.

The term lacto-vegetarian is derived from the Latin word *lactis*, meaning milk. The lacto-vegetarian diet excludes the following foods:

- Meat.
- Fish.
- Poultry.
- Eggs.
- Foods that contain meat, fish, poultry, and eggs.

(Link, 2019; Mayo Clinic, 2019d)

In addition to fruits, vegetables, grains, soy products, and plant-based proteins, lacto-vegetarians DO eat the following:

- Milk.
- Yogurt.
- Butter.
- Cheese.
- Cream.
- Dairy products.

(Link, 2019; Mayo Clinic, 2019c)

Consumption of dairy products is the main factor that differentiates lacto-vegetarians from vegans. However, lacto-vegetarians do not eat dairy products made with gelatin (e.g., some puddings and custards) because most gelatins contain pulverized animal hooves, bones, or marrow. They also do not eat dairy products that contain animal-based rennet, which consists of a collection of enzymes that cheese-makers generally obtain from calves (Link, 2019; Mayo Clinic, 2019d).

Some studies show that following a lacto-vegetarian diet may improve heart health and facilitate weight loss or the maintenance of a healthy weight (Link, 2019; Mayo Clinic, 2019d).

Ovo-vegetarian diet

An ovo-vegetarian diet excludes meat and dairy products but does include eggs. Very few people follow this type of vegetarian diet. Typically, the individuals who adopt this particular diet do so because they wanted to follow a vegetarian diet but are also lactose intolerant and cannot eat dairy products (Hill, 2019; Mayo Clinic, 2019d).

An ovo-vegetarian diet includes the following:

- Fruits.
- Vegetables.
- Squashes.
- Legumes.
- Beans.
- Grains.
- Seeds.
- Spices and fresh herbs.
- Eggs and products including eggs, such as mayonnaise, egg noodles, and some baked goods.

(Hill, 2019)

The following food products are excluded in the ovo-vegetarian diet:

- Meat.
- Poultry.
- Seafood.
- Dairy products.

(Mayo Clinic, 2019d)

Lacto-ovo vegetarian diet

The lacto-ovo vegetarian diet excludes meat, fish, and poultry but does allow dairy products and eggs. This particular vegetarian diet makes it easier for its followers to meet nutrient needs as compared to people who do not eat eggs and dairy products (Mayo Clinic, 2019d; Spiridakis, 2019).

Pescatarian diet

Nicole's friends know that she is a vegetarian. However, she eats fish, which offends some of her friends who exclude both meat, poultry, and fish from their diets. Mark, a friend who is not a vegetarian, asks Nicole to explain what kind of vegetarian she is. Nicole replies that she follows a pescatarian diet.

A pescatarian is someone who does not eat any meat or animal flesh with the exception of fish and seafood such as shrimp, clams, crabs, and lobster. Pescatarians also exclude eggs and dairy products from their diets (Mayo Clinic, 2019d).

Technically, a pescatarian is not a vegetarian, since a vegetarian diet excludes all animals and fish. Pescatarians often believe that consuming moderate amounts of fish or fish oils is necessary for optimum health because fish are high in omega-3 fatty acids (Hackett, 2019).

Research indicates that the pescatarian diet may increase life expectancy and may reduce the risk of heart disease, type 2 diabetes, and breast cancer (Maloney, 2019b).

There are, however, some potential dangers associated with the pescatarian diet. Fatty fish, although high in “good” fats, contain low levels of pollutants that can accumulate in the body over time. Excessive exposure to these pollutants can increase the risk of cancer, diabetes, and thyroid disease. Pregnant women who consume excessive amounts of fish containing these pollutants are at risk for delivering low-birth weight infants and children who experience developmental delays (Maloney, 2019b).

Mercury is also found in fish in various amounts. Mercury is a natural element that fish process into a toxic substance (methylmercury). Intake of large amounts of mercury-containing fish can increase exposure to the toxin, which, in turn, can affect the nervous system and cause significant development delays in infants who were exposed to mercury in the womb. Recommendations for consumption depend on the type of fish being eaten. Sardines, herring, and tilapia have low amounts of mercury and can be eaten without worry. Bluefin, Chilean sea bass, and yellow fin tuna have high levels of mercury, and their consumption should be limited. (Maloney, 2019b).

Vegan diet

Is a vegan different from being a vegetarian? A vegetarian does not eat meat, fish, or poultry. Vegans, in addition to being vegetarians, do not use other animal products and by-products including eggs, dairy products, honey, leather, fur, silk, wool, cosmetics, and soaps that are obtained from animal products. The key to adopting a vegan diet is to include a variety of foods to obtain necessary nutrients (Mayo Clinic, 2019d).

People choose to adopt a vegan lifestyle for a variety of reasons including improving their health status, protecting the environment, or ethical reasons concerning the treatment of animals. A healthy vegan diet includes fruits, vegetables, leafy greens, whole-grain products, nuts, seeds, and legumes (Mayo Clinic, 2019d).

The more restrictive the vegetarian diet, the more challenging it can be to get all necessary nutrients. A vegan diet eliminates natural food sources of vitamin B-12 and milk products, which are excellent sources of calcium (Mayo Clinic, 2019d).

Vegetarians and vegans can enjoy a healthy diet and healthy lifestyle as long as they make sure to incorporate adequate amounts of nutrients in their diets. The following are some suggestions for obtaining these nutrients:

- **Calcium:** Calcium is necessary for the development and maintenance of strong bones and teeth. Milk and dairy foods have the highest amounts of calcium. For vegetarians who do not consume milk and dairy products, dark green vegetables are good plant sources of calcium when eaten in adequate amounts. Calcium-enriched and fortified products such as juices, cereals, soy milk, soy yogurt, fortified veggie meats (e.g., veggie burgers), and tofu are other good options.
- **Vitamin D:** Vitamin D is essential to the absorption of calcium. Vitamin D is added to some brands of soy and rice milk and some cereals and margarines. If not enough fortified foods are eaten and sun exposure is limited, a vitamin D supplement (one made from plant sources) may be necessary.
- **Vitamin B12:** This vitamin is necessary for the production of red blood cells and the prevention of anemia. Vegans and vegetarians can find it difficult to get enough vitamin B12 as it is found almost exclusively in animal products. Vitamin-enriched cereals, veggie meats, and soy-based beverages can be good sources of vitamin B12. However, it may be necessary to consume vitamin supplements to ensure adequate levels of vitamin B12.

Nursing consideration: Vitamin B12 deficiency may go unnoticed in vegans since the vegan diet is rich in folate, which may conceal such a deficiency until severe problems occur (Mayo Clinic, 2019d).

- **Protein:** Protein is essential for the maintenance of healthy skin, bones, muscles, and organs. Eggs and dairy products are good protein sources, but vegans need to acquire protein from other sources, such as soy products, meat substitutes, legumes, lentils, nuts, seeds, and whole grains.
- **Omega-3 fatty acids:** Omega-3 fatty acids are important for a healthy cardiovascular system. Diets that exclude fish and eggs are usually low in active forms of omega-3 fatty acids. Alternative sources of essential fatty acids include canola oil, soy oil, walnuts, ground flaxseed, and soybeans. Unfortunately, conversion of plant-based omega-3 fatty acids to forms usable by people is inefficient. Therefore, vegans and vegetarians should consider fortified products or supplements, or both.
- **Iron:** Iron is essential for the production of red blood cells (RBCs). Sources of iron for the vegan and vegetarian include dried beans and peas, lentils, enriched cereals, whole-grain products, dark leafy green vegetables, and dried fruit. Iron is not as easily absorbed from plant sources as from animal sources. Thus, it is recommended that vegans and vegetarians eat food rich in vitamin C to help the body absorb iron. Examples of such foods include strawberries, citrus fruit, tomatoes, cabbage, and broccoli. These foods should be eaten at the same time as consuming iron-containing foods.
- **Zinc:** Zinc helps to boost immune system functioning and is important to the process of cell division and protein formation. It is found in ample amounts in soybeans, soy milk, veggie “meats,” whole grains, legumes, nuts, and wheat germ. If dairy products are consumed, cheese is also a good source of zinc.
- **Iodine:** Iodine is an essential component of thyroid hormones. These hormones help to regulate metabolism and the growth and functioning of critical body organs. Vegans may not get enough iodine. This puts them at risk for iodine deficiency and thyroid dysfunction. Just one fourth of a teaspoon of iodized salt per day offers a significant amount of iodine.
- **Riboflavin:** Riboflavin (vitamin B2) helps to convert carbohydrates into glucose. Acceptable vegan and vegetarian sources of riboflavin include almonds, fortified cereals, yogurt, mushrooms, soy milk, and vitamin B2 fortified foods.

(Mayo Clinic, 2019d; Petre, 2016)

In summary, by being alert to sources of nutrients that may not be available in vegan and vegetarian diets in sufficient quantities, it is possible to supplement these nutrients to maintain a healthy diet that provides adequate amounts of nutrients and allows vegans and vegetarians to follow their desired lifestyles and dietary choices.

Keto diet

The ketogenic (keto) diet is a very low-carb, high-fat diet. It involves drastically reducing carbohydrate intake and replacing it with fat, which leads to ketosis. During ketosis the body becomes very efficient at burning fat for energy. Keto diets can cause large reductions in blood sugar and insulin levels. Research suggests that this diet can help in the prevention/treatment of epilepsy, cancer, and Alzheimer’s disease (Mawer, 2018).

There are some disadvantages to the keto diet. There is little evidence to show that this diet is effective or safe for the long term for anything other than epilepsy. Additionally, very low carbohydrate diets have higher rates of side effects such as constipation, headaches, and halitosis. The keto requirements can also make it a challenge to meet micronutrient needs (Mayo Clinic, 2019e).

Nursing interventions

Nursing interventions should focus on assessment and patient/family education. Nurses have an obligation to remain objective and provide adequate information about the diets patients and families have chosen. It is essential that nurses have knowledge of various diets and be able to provide guidance regarding how to obtain adequate nutrition while following them.

Self-Assessment Quiz Question #7

Denise is a 30-year-old college professor. Her parents both died before the age of 60 due, in part, to cardiovascular disease and high blood pressure. Denise’s blood pressure has been gradually increasing over the past few years, and her health care provider is advising her to change her eating habits.

Which of the following diets is best for Denise to adopt, based on having the goal of preventing or reducing hypertension?

- Raw food diet.
- Gluten-free diet.
- DASH diet.
- Keto diet.

NUTRITIONAL NEEDS FOR SPECIFIC POPULATIONS

The older adult

Alice is studying to become a nurse practitioner. Her focus is on gerontology, a specialty she loves. Alice is especially interested in how nutritional needs change as a person ages and how nutrition can impact the older adult’s state of health and wellness.

As the body ages, it becomes less efficient at absorbing some key nutrients. The sensation of taste diminishes, leading to a decrease in appetite. Digestion becomes less efficient as well, making it difficult for the older adult’s body to digest foods. Loss of teeth or ill-fitting dentures may make it difficult for food to be chewed (Mayo Clinic, 2019f; Wolfram, 2018). It is imperative that nurses know how age affects the body’s ability to acquire adequate nutrition and to provide appropriate patient/family education regarding how diet impacts the health and wellness of the older adult.

Age-related changes to the digestive tract

Many age-related changes may occur in the digestive tract of the older adult, including changes in appetite and hydration status. These changes can lead to inadequate nutritional intake (Mayo Clinic, 2019f).

Oral health changes

Missing or loose teeth, poorly fitting dentures, and poor dental hygiene can have an adverse impact on the older adult’s nutritional status (Mayo Clinic, 2019f).

Senses of taste and smell

The older adult’s senses of taste and smell (olfactory) decrease with age. Inability to smell and/or taste food interferes with the ability to enjoy meals. This can lead to a decrease in appetite, nutritional intake, and overall health status (Boltz, Capezuti, Fulmer, & Zwicker, 2016; Mayo Clinic, 2019f).

Thirst mechanism

The thirst mechanism also diminishes with age as does the kidney’s ability to concentrate urine. These issues increase the risk for dehydration in the older adult (Boltz et al., 2016; Mayo Clinic, 2019f).

Nursing consideration: Nurses should teach older adults and their families about the potential for dehydration and how to recognize its signs and symptoms. They should also encourage adequate fluid intake.

Vision changes

Age-related changes in vision can make it difficult to prepare and even consume food. Problems such as cataracts and macular degeneration can exacerbate these problems and interfere with the older adult's adequate nutritional intake (Boltz et al. 2016; Mayo Clinic, 2019f).

Changes in the stomach

The older adult may also have to deal with a decrease or lack of hydrochloric acid production. Important nutrients such as iron and vitamin B12 must have an acid environment to begin the absorption process. Unless the body produces enough hydrochloric acid, these nutrients will not be properly absorbed and supplements may be needed (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).

Social and economic issues

Older adults are often on fixed incomes. They may choose foods that are inexpensive rather than those that provide proper nutrition. Older adults may need financial assistance in order to purchase healthy foods (Boltz et al., 2016; Mayo Clinic, 2019f).

Older adults may also be affected by a lack of social interaction during mealtimes. Traditionally, mealtimes are times for social interaction with families and friends. Older adults who live alone may skip meals or eat poorly (Boltz et al., 2016; Mayo Clinic, 2019f). Nurses need to assess the older adult's social support system when evaluating nutritional status.

Older adults and nutritional deficits

There are several important nutrients that are especially likely to be missing or in low quantities in the diets of older adults. Here are the 7 top nutrients to monitor for the older adult:

1. **Vitamin B12:** Vitamin B12, essential to red blood cell production and the maintenance of healthy nerve function, is one of the nutrients most often lacking in the older adult. Even if their diets contain enough vitamin B12, problems with absorption may necessitate a need for a B12 supplement. However, supplements should not be taken unless under the direction of a health care provider. Foods rich in this vitamin include eggs, milk, milk products, fish, meat, and poultry (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).
2. **Calcium:** Calcium is essential for the formation of strong bones and teeth. Inadequate dietary calcium intake causes the body to utilize calcium from bones, leaving them brittle. This increases the risk of fractures. Older adults should consume three servings a day of low-fat milk and dairy products. Kale and broccoli and calcium-fortified juices are also good sources of calcium (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).

Nursing consideration: Nurses should recommend foods that have high-calcium content and are appealing to an older adult. Smoothies made with yogurt, fruit, and vegetables can be a good source of calcium for older adults. This is especially true for those older adults who have a decreased appetite, trouble chewing, or dry mouths.

3. **Vitamin D:** Vitamin D is essential for the body to absorb calcium, maintain bone density, and prevent osteoporosis. Research has associated vitamin D deficiency with an increased risk for falls. Few foods naturally contain vitamin D. Foods that do contain this vitamin include salmon, tuna, and eggs. Some cereals, milk, yogurts, and juices are fortified with vitamin D. The skin produces Vitamin D when it is exposed to sunlight (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).
4. **Potassium:** Potassium is critical for proper body cell functioning. Many older adults do not consume enough potassium from their daily diets. Good sources of potassium include fruits and vegetables, including bananas, prunes, plums, and potatoes with their skin. However, people should not take potassium supplements without consulting with their health care providers. Too much potassium is just as dangerous as too little (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).
5. **Magnesium:** Magnesium plays many roles in health and wellness including immune system functioning and cardiovascular health. Magnesium absorption decreases with age. Compounding this problem is that some medications (e.g., diuretics) often taken by older adults further reduce magnesium absorption. Therefore, older adults should make sure that their diets contain foods that are good sources of magnesium, such as fresh fruits and vegetables, nuts, whole grains, beans, and seeds (Boltz et al., 2016; Mayo Clinic, 2019f).
6. **Fiber:** Fiber is necessary for the adequate functioning of the digestive process. Whole grains, beans, fruits, and vegetables are high in fiber. Nuts and beans are also good sources of fiber. Fiber supplements are also available. Older adults should consult with their health care providers about taking a fiber supplement (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).
7. **Water:** Water, although technically not an essential nutrient like vitamins or minerals, is absolutely essential to health and wellness. As previously mentioned, older adults are at risk for becoming dehydrated because of a reduction in the thirst mechanism and taking certain types of medications, such as diuretics. Experts recommend that people consume eight glasses of fluids every day unless medically contraindicated (Boltz et al., 2016; Mayo Clinic, 2019f; Wolfram, 2018).

Nursing consideration: Some older adults may reduce their fluid intake because of concerns about incontinence. Nurses must educate older adults and their families about the importance of adequate hydration. They can help to alleviate incontinence concerns by suggesting that older adults limit their fluid intake after the evening meal and by initiating a bladder training program as needed

Nutritional needs of the cancer patient

Nancy is undergoing chemotherapy for an aggressive type of breast cancer. She has no appetite and struggles with nausea and periods of vomiting. Her family is very concerned. They remember when Nancy's father was receiving chemotherapy for prostate cancer; he lost a great deal of weight and had to be hospitalized in order to receive adequate nutrition. Nancy and her family consult the adult oncology nurse practitioner for advice about diet and nutrition.

Unfortunately, malnutrition is a common problem in cancer patients. It has been associated with the following:

- Increased morbidity and mortality.
- Poor prognosis.
- Increased incidence and severity of treatment side effects.
- Increased risk of infection.

(National Cancer Institute, 2019)

The phrase "nutrition impact symptoms" refers to symptoms that interfere with oral intake. Such symptoms include anorexia, nausea, vomiting, diarrhea, constipation, stomatitis, mucositis, dysphagia, pain, depression, anxiety, and changes in taste and smell (National Cancer Institute, 2019). Nurses must promote the early recognition and

detection of malnutrition risk and nutrition impact symptoms to promote adequate nutritional intake for cancer patients.

Alterations in the sense of taste may be different among patients with a cancer diagnosis. Food may lack flavor or taste metallic. Food may also taste too sweet or too salty. Fortunately, these alterations are usually temporary. However, until then, it is important to take steps to maintain appropriate nutritional intake (Mayo Clinic, 2018i).

The Mayo Clinic has published a number of suggestions for selecting and preparing foods for patients with cancer:

- If the patient's mouth or throat is sore, spices, acidic foods, and hot foods or beverages should be avoided since such foods can further irritate the mouth and throat.
- When preparing foods, different sauces and seasonings should be used to add flavor. Examples of alternative sauces and seasonings include:
 - Ketchup.
 - Barbecue sauce.
 - Extracts.
 - Meat marinades.

- Mustards.
- Soy sauce.
- Spices and herbs.
- Vinegar.
- Wine.
- Teriyaki sauce.
- Bacon bits.
- Chopped green or red bell peppers, onion, or garlic.
- Nuts.
- Cheese (particularly sharp cheese).
- Add sugar or syrup to foods. For example, the taste of cereal may be enhanced by the addition of brown sugar, maple, syrup, honey, cinnamon, or raisins instead of white sugar.
- Salty foods may have more taste. Cured meats and cheeses may help to stimulate appetite.
- If foods taste too sweet, the addition of a little salt or lemon juice can help. Beverages that are less sweet, such as lemonade, milk, or sports drinks, should be selected.
- If foods taste too salty, a little sugar may decrease the saltiness. Processed foods, which are high in sodium, should be avoided. When cooking, salt should not be added nor should seasonings be used that contain salt.
- If meat is properly cooked and still does not taste “right” to a patient, other foods that are high in protein may be served. Such foods include:

- Beans or peas.
- Cheese.
- Custard.
- Eggs.
- Eggnog.
- Fish.
- Instant breakfast drinks or other types of nutrition beverages.
- Lentils.
- Macaroni and cheese.
- Milkshakes.
- Nuts.
- Peanut butter.
- Poultry.
- Pudding.
- Tofu.
- Yogurt.

(Mayo Clinic, 2018i)

Nursing consideration: Individuals who are being treated for cancer and were previously following a special diet, such as the low-sodium or low-fat diet, may need to alter their restrictions during treatment and find ways to stimulate their appetites. Patients should talk to their health care providers about easing restrictions before doing so (Mayo Clinic, 2018i).

Nutrition during pregnancy

A woman’s body undergoes many physical and hormonal changes during pregnancy. It is imperative that pregnant women eat a healthy, well-balanced diet to ensure their health and the health of their babies.

Most women who are pregnant can meet the increased nutritional needs of pregnancy by eating a diet that includes a variety of healthy foods.

Specific nutrients provide specific benefits. The following are examples of the benefits from different food groups:

- Whole grains are excellent sources of energy.
- Fruits and vegetables provide fiber, vitamins, and antioxidants.
- Meats, nuts, and legumes provide protein, folate, and iron.
- Dairy products provide calcium and (when fortified) vitamin D.

(Mayo Clinic, 2019g)

The pregnant woman’s body uses specific nutrients in specific ways for her health and the health of her baby. For example, the following are beneficial nutrients:

Nutrition for women

Good nutrition is essential for women of all ages. Diet and nutrition tips for women include the following:

- **Calcium:** Calcium is essential for healthy bones, teeth, regulation of the heart’s rhythm, and nervous system functioning. For women between the ages of 19–50, the recommended daily allowance is 1,000 mg/day. For women over 50, the recommendation is 1,200 mg/day.
- **Magnesium:** Magnesium increases calcium absorption from the bloodstream into the bones. The recommended daily allowance for magnesium is 320 to 400 mg/day.

Nutrition for men

Typically, most men need 2,000 to 3,000 calories a day. Protein needs of men are usually based on body weight and activity levels. The recommended dietary allowance (RDA) for men is 55 grams of protein a day. Men who exercise regularly require up to 1.3 grams of protein per pound of body weight daily (Coleman, 2019).

Men should obtain 45% to 65% of their calorie intake from carbohydrates, and 20% to 35% from dietary fat. Men who eat 2,500 calories a day should aim for 281 to 406 grams of carbohydrates and 56 to 97 grams of fat. Healthy high-carbohydrate foods are vegetables,

- **Protein:** Essential for the growth of fetal tissue and growth of the mother’s breast and uterine tissue during pregnancy.
- **Calcium:** Calcium is necessary for development of the baby’s bones.
- **Iron:** Iron increases blood flow and ensures that both mother and unborn baby are adequately oxygenated.
- **Folate:** Folate (folic acid) helps to decrease the risk of neural tube defects, which are major birth defects affecting the baby’s brain and spinal cord.
- **Vitamin D:** Vitamin D promotes bone strength and helps to build the baby’s bones and teeth.

Health care providers should be consulted before adding any supplement to a pregnant woman’s diet. Typically, a daily prenatal vitamin (ideally begun at least three months before conception) is prescribed (Mayo Clinic, 2017d).

- **Vitamin D:** Vitamin D is also necessary for proper calcium metabolism, and the daily recommended amount is 600 IU daily.
- **Iron:** Many women do not get enough iron. This is often because one of the best sources of iron is red meat, which many women avoid because of the high saturated fat content. Other good sources of iron include poultry, seafood, dried fruit, beans, green leafy vegetables, and fortified cereals, breads, and pastas. For women 14–18 years old, the recommended daily amount is 15 mg. For women 19–50, the recommendation is 18 mg/day. For women 51 and older, the recommendation is 8 mg.

(Help Guide, 2019)

fruits, whole grains, low-fat milk, nuts, seeds, and legumes. Healthy fats should be obtained from plant-based oils, fish oils, nuts, seeds, olives, and avocados (Coleman, 2019). Following a well-balanced meal plan generally provides appropriate amounts of vitamins and vegetables. However, (especially as one ages) health care providers should be consulted about adding any necessary supplements to their diets (Coleman, 2019).

Nutrition for people with heart disease

The American Heart Association points out that adopting a healthy diet and lifestyle is the best way to combat cardiovascular disease (American Heart Association, 2019b).

The American Heart Association makes the following diet and lifestyle recommendations to prevent or limit the extent of cardiovascular disease:

- Use up at least as many calories as are taken in.
- Strive for at least 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity (or a combination of both) every week.
- Adopt a healthy dietary pattern that includes the following:
 - A wide variety of fruits and vegetables.
 - Whole grains.
 - Low-fat dairy products.

- Skinless poultry and fish.
- Nuts and legumes.
- Non-tropical vegetable oils.
- Limited saturated fat, trans fat, sodium, red meat, sweets, and sugar-sweetened beverages.
- Limited intake of foods that are high calorie, high fat, and/or low in nutrition.
- Limited foods that are high in sodium.
- Consumption of alcohol only in moderation. This means no more than one drink per day for women and no more than two drinks per day for men.
- No smoking.
- Avoidance of second-hand smoke.

(American Heart Association, 2019b)

Nutrition for people with chronic obstructive pulmonary disease (COPD)

People who have COPD need more energy to breathe than those without lung disease. The muscles they use during respiration can require up to 10 times more calories than those of people without COPD (Cleveland Clinic, 2018).

The Cleveland Clinic makes the following recommendations regarding nutritional guidelines for people living with COPD:

- Monitor weight at least once a week unless told by health care providers to do so more often. Individuals with COPD who take diuretics or steroids should weigh themselves every day.
- Drink at least six to eight eight-ounce glasses of caffeine-free beverages every day. Some people may be on fluid restrictions due to other health conditions. Therefore, it is wise to consult with health care providers about fluid intake.
- Limit caffeine.
- Incorporate high-fiber foods into the diet. The goal is to consume about 20 to 35 grams of fiber every day.
- Limit sodium intake. Use herbs and spices as food flavoring. Do not have the salt shaker on the table and do not add salt when cooking. Check with health care providers before using salt substitutes, which can contain other ingredients that may be harmful.

- Avoid foods and beverages that cause gas and bloating, which can make breathing difficult. Examples of such foods and beverages include carbonated beverages, fried or greasy foods, heavily spiced foods, apples, beans, and peppers. Many fruits and vegetables can cause gas but are part of a healthy diet. Consult health care providers regarding foods that can cause gas and bloating.

(Cleveland Clinic, 2018)

The Cleveland Clinic also offers the following tips for persons with COPD who are short of breath while eating or immediately after eating:

- Clear airways at least one hour prior to eating.
- Eat slowly.
- Take small bites and chew foods thoroughly and slowly. Breathe deeply while eating.
- Choose easily chewed foods.
- Eat five or six small meals rather than three large ones.
- Drink liquids at the end of meals rather than during meals. Drinking during meals may increase feelings of fullness and feeling bloated.
- Sit up to eat.
- Use pursed lip breathing.

(Cleveland Clinic, 2018)

Nutritional needs of people with gout

Gout is a painful type of arthritis that occurs when high levels of uric acid in the blood cause crystals to form and accumulate around a joint (Mayo Clinic, 2018j). Gout can affect any joint, but most often affects those in the feet and legs. Attacks of gout follow an intermittent course and can leave patients free from symptoms for years between such attacks. Gout can lead to chronic disability or incapacitation. However, prognosis is good with treatment (Gersch, Heimgartner, Rebar, & Willis, 2017).

Part of the treatment for gout includes some dietary restrictions and modifications. These include the following:

- Lose weight if overweight or obese, which can increase the risk of developing gout. Losing weight lowers uric acid levels and reduces the number of attacks of gout.
- Eat more complex carbohydrates, such as fruits, vegetables, and whole grains.
- Avoid foods such as white bread, cakes, candy, sugar-sweetened beverages, and products with high-fructose corn syrup.
- Stay hydrated. Research suggests that an increase in water consumption is associated with fewer attacks of gout. It is suggested that people drink 8–16 glasses of fluids every day with at least half of this amount as water.
- Reduce the amount of saturated fats consumed from red meat, fatty poultry, and high-fat dairy products.
- Limit daily proteins from lean meat, fish, and poultry to 4–6 ounces.
- Add protein sources, such as low-fat or fat-free dairy products. These are linked to reduced uric acid levels.

- Allow high-purine vegetables to be part of the diet, including asparagus, mushrooms, spinach, peas, and cauliflower. Once thought that such foods increased the risk of gout or the number of attacks, research now shows that this is not accurate. A healthy diet includes a variety of lots of fruits and vegetables and can include high-purine fruit and vegetables products.
- Avoid organ and glandular meats, such as liver and kidneys, which can contribute to high blood uric acid levels.
- Avoid seafood that is high in urines, such as anchovies, herring, sardines, mussels, scallops, trout, haddock, mackerel, and tuna.
- Review alcohol intake. Alcohol metabolism is believed to increase the production of uric acid and contribute to the risk of dehydration. Beer is linked to an increased risk of gout and the number of gout attacks as are distilled liquors to some extent. Discuss alcohol intake with health care providers.
- Vitamin C may help to reduce uric acid levels. Discuss the helpfulness of adding a vitamin C supplement to the diet.
- Consider drinking coffee only in moderate amounts. The results of some studies suggest that reducing coffee consumption (especially coffee with caffeine) may reduce the risk of gout. Discuss coffee consumption with health care providers.
- Consider eating cherries. There is some indication from research results that eating cherries is associated with a reduced risk of gout attacks.

(Gersch et al., 2017; Mayo Clinic, 2018j)

Nutritional needs for people with compromised immune systems

Various health problems, such as cancer and HIV/AIDS, can weaken the body's immune system. The American Cancer Society offers the following recommendations when preparing foods and grocery shopping to avoid possible foodborne illnesses, which can be devastating for people with weakened immune systems:

- Handle food carefully by taking the following actions:
 - Wash hands with warm water and soap for at least 20 seconds before and after preparing food and before eating.
 - Refrigerate foods at or below 40 degrees Fahrenheit.
 - Thaw meat, fish, or poultry in the microwave or refrigerator. Place thawing foods in dishes to catch possibly contaminated drippings. Do not thaw foods at room temperature.
 - Use defrosted foods promptly.
 - Do not refreeze foods.
 - Refrigerate perishable foods within two hours of buying them or preparing them. Dishes with eggs, cream, and/or mayonnaise should not be left unrefrigerated for more than one hour.
 - Wash fruits and vegetables thoroughly under running water before peeling or cutting them.
 - Rinse the leaves of leafy vegetables under running water one leaf at a time.
 - Do not consume raw vegetable sprouts.
 - Discard fruits or vegetables that have mold or appear to be slimy.
 - Do not buy produce that has been cut at the grocery store.
 - Wash the tops of canned foods with soap and water before opening.
 - Use different utensils for stirring and tasting foods.
 - Throw away eggs with cracked shells and foods that look strange or have a strange odor.
- Avoid cross-contamination by following these suggestions:
 - Using a clean knife to cut different foods.
 - Store raw meats by tightly sealing them and placing them away from ready-to-eat foods.
 - Use separate cutting boards for cooked and raw foods.
 - Carefully clean counters and cutting boards with hot, soapy water or disinfecting wipes that can be used around food products.
- When cooking or buying food, take the following steps:
 - Cook meats to a temperature of 160 degrees Fahrenheit. Use a meat thermometer to accurately measure temperature.
 - Cook poultry to 180 degrees Fahrenheit. Use a meat thermometer for accurate temperature measurement.
 - Check expiration dates on all foods before buying them. Purchase only the freshest food products.
 - Never buy products that are outdated.
 - Never purchase damaged, swollen, rusted, or deeply dented cans.
 - Avoid eating deli foods.
 - Avoid purchasing cream or custard-containing products sold in unrefrigerated areas.
 - Avoid eating yogurt and ice cream from self-serve machines.
- When eating out, people with compromised immune systems should do the following:
 - Eat early to avoid crowds.
 - Ask for freshly prepared foods at fast food restaurants.
 - Avoid self-serve condiment containers.
 - Avoid eating from sources thought to be high risk, such as buffets, potlucks, salad bars, and sidewalk vendors.
 - Make sure that utensils are set on a napkin or clean tablecloth or clean placemat instead of directly on the table.
 - When taking home leftovers, ask for a container and put the food in yourself. Do not allow the server to take food to the kitchen to box the food.

(American Cancer Society, 2019)

Nutrition for people with irritable bowel syndrome (IBS)

Irritable bowel syndrome (also referred to as spastic colon and spastic colitis) is a common health problem. It is characterized by chronic or periodic episodes of diarrhea and moderate to severe abdominal cramping. The episodes of diarrhea may alternate with constipation. Treatment is generally supportive and focuses on avoiding foods that trigger the problem and controlling or avoiding emotional stress, which can exacerbate the condition (Gersch et al., 2017).

The goals of treatment are to relieve symptoms, identify triggers, and investigate stress reduction strategies (Gersch et al., 2017).

The National Institute of Diabetes and Digestive and Kidney Diseases has published the following recommendations regarding dietary changes that can help relieve the symptoms of IBS:

- **Increase fiber intake:** Fiber may help to improve constipation since it helps to soften stool and facilitate bowel movements. Soluble fiber (found in beans, fruit, and oat products) is thought to be more helpful in IBS symptom relief than insoluble fiber (found in whole-grain products and vegetables). Fiber should be added to the diet gradually to allow the body to assimilate.
- **Avoid gluten:** Gluten is a protein found in wheat, barley, and rye. Foods that contain gluten include most cereals, grains, pasta, and

many processed foods. Health care providers may recommend that gluten be removed from the diet to see if IBS symptoms improve.

- **Eat a low FODMAP diet:** Health care providers may suggest trying the FODMAP diet. This diet requires that certain foods are avoided or eaten in smaller amounts. These foods are generally carbohydrates called FODMAPS. Examples of these foods include the following:
 - Fruits such as apples, apricots, cherries, nectarines, pears, plums, and watermelon.
 - Canned fruit in natural fruit juice, or large amounts of fruit juice or dried fruit.
 - Vegetables such as artichokes, asparagus, cauliflower, garlic, onions, and mushrooms.
 - Dairy products such as milk, milk products, soft cheeses, yogurt, custard, and ice cream.
 - Wheat and rye products.
 - Honey and foods with high-fructose corn syrup.
 - Products such as candy and gum and sweeteners ending in "ol" such as sorbitol, mannitol, and maltitol.

(National Institute of Diabetes and Digestive and Kidney Diseases, 2017)

Nutrition for people with inflammatory bowel disease

Stephanie is undergoing a number of diagnostic tests as part of an evaluation for periodic attacks of bloody diarrhea, which also contains pus and mucus. She also experiences abdominal pain, anorexia, weakness, nausea, and weight loss. The results of a sigmoidoscopy and colonoscopy confirm a diagnosis of ulcerative colitis.

Mark visits his family physician complaining of weakness and fatigue that is accompanied by right lower quadrant abdominal pain, diarrhea with an average of six stools per day, and weight loss. Sometimes his stools are bloody. Stool studies show that his feces contain excessive amounts of fat (steatorrhea). There is no indication of parasites or infectious agents in his stools. A barium enema shows the characteristic string sign (marked narrowing of the bowel) of Crohn's disease.

Inflammatory bowel disease (IBD) is a general term used to refer to two separate diseases, Crohn's disease and ulcerative colitis. Crohn's disease is a chronic inflammatory disease that can affect any part of the digestive tract. Inflammation can affect the entire intestinal wall leading to diarrhea, strictures, fistulas, malabsorption, and the need for surgical resection (Mayo Clinic, 2017e).

Ulcerative colitis is an inflammatory disease of the colon. It is often accompanied by diarrhea. The inflammation caused by ulcerative colitis does not affect the entire intestinal wall, so it does not lead to the development of fistulas. Unfortunately, if the inflammation is extensive, it may ultimately lead to surgical removal of the affected area (Mayo Clinic, 2017e).

No specific diet has been identified that treats or prevents inflammatory bowel disease. There are, however, some dietary recommendations that may help to control symptoms (Mayo Clinic, 2017e; UCSF Health, 2017).

Ulcerative colitis

During an ulcerative colitis flare up, these dietary recommendations may help to control symptoms:

- Follow a low-residue diet (limit foods that are high in fiber and increase bowel activity).
- Avoid foods that increase the amount of stool production, such as fresh fruits and vegetables, prunes, and beverages that contain caffeine.
- Decrease the amount of concentrated sweets that are eaten. These types of foods draw water into the intestine, which may lead to watery stools.
- Decrease the amount of alcohol that is ingested.
- Eat more omega-3 fatty acids, which may have an anti-inflammatory effect.
- Eat smaller, more frequent meals rather than three large meals. This type of eating pattern is often better tolerated.
- Discuss the need for nutritional supplements with health care providers. Their use may be indicated if appetite is poor and nutritional intake is decreased.

(Mayo Clinic, 2017e; UCSF Health, 2017)

Crohn's disease

During a flare up of Crohn's disease, the following recommendations may help to control symptoms:

- Follow a low-residue diet.
- Avoid nuts, seeds, beans, and kernels. This is especially important if strictures are present.
- Avoid high-fiber foods, such as fresh fruits and vegetables, prunes, and beverages that contain caffeine. These kinds of foods and vegetables increase the amount of stool produced.
- Consider eating cold foods since these may help reduce bouts of diarrhea.
- Adhere to a lactose-free diet if lactose intolerant.
- Be alert to signs of fat malabsorption, which is characterized by oily and foul-smelling stools. People with this problem should follow a low-fat diet and discuss the problem with their health care providers.

(Gersch et al., 2017; Mayo Clinic, 2017e; UCSF, 2017)

Nursing interventions

Nurses have considerable responsibilities when it comes to knowing how to facilitate acquisition of proper nutrition for patients with various health problems. They need to educate patients and families regarding how nutritional needs are affected by disease processes. They must also be able to help patients and families establish dietary patterns that meet their nutritional needs.

Self-Assessment Quiz Question #8

Kate is a 25-year-old graphics designer. For the past year, she has been troubled by recurrent bouts of lower abdominal pain and diarrhea; the periods of pain and diarrhea alternate with periods of normal bowel functioning. Kate notices that she is more likely to suffer from these symptoms during periods of emotional stress and after eating particular foods, such as raw peppers, or drinking unusually large amounts of caffeine containing beverages. She undergoes a number of diagnostic tests, including a colonoscopy. Inflammatory bowel disease, celiac disease, diverticulitis, lactose intolerance, and colon cancer have been ruled out. A differential diagnosis of irritable bowel syndrome is made.

When evaluating Kate's state of health, health care professionals recognize all of the following EXCEPT

- IBS is characterized by periodic episodes of diarrhea that may alternate with constipation.
- Patients are advised to increase their fiber intake.
- Proper administration of corticosteroids can lead to a cure for IBS.
- Emotional stress can exacerbate IBS.

A low-residue diet should be followed since a variety of foods should only slowly be reintroduced into the dietary pattern. Examples of foods to be initially reintroduced include diluted juices, applesauce, canned fruit, oatmeal, plain chicken, turkey or fish, mashed potatoes, rice or noodles, and bread (sourdough or white). Fiber should be added to the diet gradually as tolerated (Gersch et al., 2017; Mayo Clinic, 2017e; UCSF, 2017).

Nursing consideration: Corticosteroids have often been used to treat moderate to severe flares of inflammatory bowel disease. These medications can decrease calcium and phosphorus absorption and increase protein needs (Gersch et al., 2017; Mayo Clinic, 2017e; UCSF, 2017). Nurses must be aware of how medications influence diet for persons with inflammatory bowel disease.

There are some nutritional deficiencies specific to each type of inflammatory bowel disease (Gersch et al., 2017; Mayo Clinic, 2017e; UCSF, 2017).

Patients who have ulcerative colitis may have increased needs for the following nutrients:

- Folate.
- Magnesium.
- Calcium.
- Iron.
- Potassium.

(Gersch et al., 2017; Mayo Clinic, 2017e; UCSF, 2017)

It is imperative that patients discuss the need for nutritional supplements with their health care providers.

Patients who have Crohn's disease may be at risk for deficiencies of the following nutrients:

- Vitamin B12.
- Folate.
- Vitamins D, E, and K.
- Vitamin A.
- Magnesium.
- Zinc.
- Calcium.
- Potassium.

(Gersch et al., 2017; Mayo Clinic, 2017e; UCSF, 2017)

Patients, families, and health care providers should discuss the need for nutritional supplements to combat potential or actual deficiencies.

Self-Assessment Quiz Question #9

A nurse practitioner is working with a patient to enhance his nutritional status. This patient has COPD.

Nursing interventions to help the patient with COPD improve their nutritional status include which one of the following?

- Telling patients who are taking diuretics that they should weigh themselves on a weekly basis.
- Telling patients to drink 6 to 8 glasses of beverages with caffeine to help increase energy levels.
- Telling patients to increase sodium intake to stimulate the sense of taste.
- Instructing patients to consume about 20 to 35 grams of fiber every day.

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CHALLENGES IN ATTAINING AND MAINTAINING GOOD NUTRITION

Self-Assessment Answers and Rationales

1. The correct answer is A.

Rationale: Americans consume more than the recommended amounts of sodium in their diets. They should eat less saturated fats and increase the amount of whole grains that they eat. From 1999–2016, there were significant increases of consumption of plant products.

2. The correct answer is C.

Rationale: Obesity has been linked to the development of a number of cancers, including breast cancer. The ideal goal for weekly weight loss is one to two pounds per week. To reduce symptoms of obstructive sleep apnea people should lose 10% of their body weight.

3. The correct answer is D.

Rationale: Family therapy is the only evidence-based therapy for anorexia nervosa.

4. The correct answer is C.

Rationale: Persons who have bulimia nervosa are usually of normal weight. They are, however, desperate to lose weight and feel that they have no control over bingeing and purging behaviors.

5. The correct answer is B.

Rationale: Organic foods are usually more expensive than conventional foods because, in part, the farming practices used are more expensive.

6. The correct answer is A.

Rationale: Vitamin A is important for vision, healthy skin and mucous membranes, growth of bones and teeth, and a healthy immune system. Vitamin D is necessary for calcium absorption. Folic acid is water-soluble, not fat-soluble. Niacin is vitamin B3.

7. The correct answer is C.

Rationale: The DASH diet is designed as a lifelong approach to healthy eating. Its goal is to help prevent or reduce hypertension. According to information published by the Mayo Clinic, people who follow the DASH diet may be able to reduce their blood pressure by a few points in just two weeks.

8. The correct answer is C.

Rationale: Treatment of IBS is generally supportive and focuses on avoiding foods that trigger IBS. Corticosteroids are used in the treatment of inflammatory bowel disease, not IBS.

9. The correct answer is D.

Rationale: High fiber should be incorporated into the diet. The goal is to consume about 20 to 35 grams of fiber every day. Sodium should be limited as well as caffeine intake.

10. The correct answer is B.

Rationale: Nutritional guidance should be part of every patient care plan.

Child Abuse: Identification, Management, and Reporting

6 Contact Hours

Release Date: January 15, 2020

Expiration Date: January 15, 2023

Faculty

Author:

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Margaret Nihoul has disclosed that she has no significant financial or other conflicts of interest pertaining to this course.

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She is currently enjoying taking care of women from menarche to menopause with full scope midwifery and women's health care. Not only does she complete her professional duties, but is also taking on extra projects that enhance her patient's experiences, such as enacting and coordinating a lending library, working with college campus patient health care referrals, and creating patient resource guides. Her professional interests include autoimmune diseases in pregnancy, contraceptive education access, and family planning counseling.

Allison Saran has disclosed that she has no significant financial or other conflicts of interest pertaining to this course.

How to receive credit

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 - Complete the self-assessment quiz questions which are at the end of the course or integrated throughout the course. These questions are NOT GRADED. The correct answer is shown after you answer the question. If the incorrect answer is selected, the rationale for the correct answer is provided. These questions help to affirm what you have learned from the course.
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 - A mandatory test (a passing score of 70 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
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Activity director

June D. Thompson, DrPH, MSN, RN, FAEN, Lead Nurse Planner

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Course verification

All individuals involved have disclosed that they have no significant financial or other conflicts of interest pertaining to this course. Likewise, and in compliance with California Assembly Bill No. 241,

every reasonable effort has been made to ensure that the content in this course is balanced and unbiased.

Learning outcome

Nurses will benefit from this course as it covers the incidence, signs and symptoms, risk factors, and treatment of children who have suffered from the major categories of child abuse: neglect, physical abuse, sexual abuse, emotional abuse, and fictitious disorder imposed on another (FDIA). Children who have been abused and who are at risk for abuse may present to nurses within a variety of medical contexts because of direct or indirect abuse without any obvious physical signs or symptoms. Nurses—whether they work with children on a daily basis,

primarily work with adults, or rarely treat children—will likely come across children in their careers who either are being abused or are at risk for abuse. Nurses are mandated reporters and, therefore, are required to report suspected abuse of children. This course will help nurses identify the types of abuse and learn techniques for taking medical histories and performing physical exams for children who may be suffering from abuse.

Learning objectives

After completing this course, the learner will be able to:

- ♦ Identify the major categories of child abuse and the most common types of child abuse in the United States.
- ♦ Explain the importance of reporting to child protective services as nurses and the general policy toward mandatory reporting of child abuse.
- ♦ Describe the characteristics, signs and symptoms, assessment, and management of different types of child abuse.
- ♦ Explain the importance of efficient and careful history taking with the child and the parent/caregiver.

- ♦ Explain the importance of differential diagnoses in identifying child abuse and other medical conditions that may give the false impression of abuse.
- ♦ Identify risk factors that make certain children more prone to child abuse and certain parents/caregivers more prone to becoming the perpetrators (abusers).
- ♦ Provide the child and parents/caregivers with community resources, such as home visiting programs and mental health services, to benefit children who are abused and at risk for abuse and their families.

Course overview

Child abuse has the potential to cause long-term physical and psychological health issues and even death. Child abuse comes in many forms: neglect, physical abuse, sexual abuse, emotional abuse, and FDIA. Nurses are mandated reporters of child abuse and must report any suspected child abuse to child protective services (CPS). If this is not something that nurses do everyday, they may have many questions: to report effectively to CPS, how can the nurse learn how to identify a child who is being abused or is at risk for being abused in the future? How can the nurse help the child and the family if there is abuse? What is the responsibility of the nurse in reporting child abuse? What

should the nurse do during the medical interview and physical exam to spot the signs and symptoms of abuse? Which children and parents are particularly at risk for child abuse scenarios? This course will cover the most common types of abuse, characteristics of each type of abuse, signs and symptoms, risk factors, and management of abuse, along with an overview of policies in the United States toward abuse and mandated reporting of child abuse. This course will help nurses be aware of the signs of child abuse so if they come across a child at risk of abuse in their workplace, they will be able to intervene in time to help save the child's life.

INTRODUCTION

Child abuse and neglect is defined as “an act or failure to act by a parent, caregiver, or other person defined by state law that results in physical abuse, neglect, medical neglect, sexual abuse, emotional abuse, or presents an imminent risk of harm to a child” (National Academy of Sciences [NAS], 2018).

This course presents a review of the major categories of child abuse, the characteristics of each type of child abuse, the signs and symptoms

associated with child abuse, risk factors for children and for parents/caregivers, and the management of child abuse. The learner will be presented with strategies to efficiently conduct medical interviews with verbal children and with parents/caregivers to reveal critical information that may lead the them to suspect child abuse and report to child protective services.

CASE STUDY

A 5-year-old female presents with her mother to a pediatric primary care clinic for a well-child appointment and catch-up vaccinations. The patient is not up-to-date on vaccinations. She has not been to the office since she was 2 years of age. The patient has missed all of her past scheduled medical appointments because of cancellations by her mother and her mother not “having time” to take the patient for regular checkups. The patient's mother is here today because the kindergarten will not accept the patient to start school unless she is caught up on the vaccinations.

When the mother is asked if she has any concerns about her daughter's health in general, the mother says she does not have any concerns. She states, “I don't really care about that stuff,” and says she “wants to give her the shots” so they can “get out of here so she can run her errands.” The patient appears to be nervous and distressed. The mother does not interact much with the patient and does not try to comfort her. The patient's skin is dirty and her hair is unwashed. Despite it being a cold day outside, the patient is wearing a dirty top, shorts, and flip-flop sandals with no jacket. The patient complains, “I'm hungry”

throughout the visit. Her mother ignores her. When asked about the patient's typical diet, the mother says, "I lock the fridge when she's a bad girl," and "I don't remember what she eats." The patient complains that her teeth hurt. She has never seen a dentist.

Physical examination reveals possible dental caries, skin abrasions on the patient's feet, dirty skin, and dirty hair. The patient appears thin with poor muscle tone. The patient is currently at the 5th percentile for weight and height and has significantly declined on the growth curve since she was last measured for weight and height at age 2 years. She was at the 10th percentile for weight and height at age 2 years.

Vital signs, HEENT, cardiovascular, respiratory, gastrointestinal, genitourinary, and neurological exams reveal no abnormalities. No bruising or skin abrasions are found on the body except for the feet.

The patient has four siblings and lives at home with her mother and father. The patient's mother has health insurance for her daughter through her husband's work and has a car for transportation to get to and from medical appointments. The mother does not work and cares for the patient and her other children during the day. The mother has a history of alcohol abuse.

CHILD ABUSE AND NEGLECT: GENERAL INFORMATION

Child abuse and neglect: Categories and definitions

Each state is responsible for providing its own definitions of child abuse and neglect within the minimum standards set by the Federal Child Abuse Prevention and Treatment Act (CAPTA). The major categories of child abuse and neglect are negligent care (neglect), physical abuse, sexual abuse, and emotional abuse (Child Welfare, 2019). Many states also identify abandonment, parental substance use, and human trafficking as abuse or neglect (Child Welfare, 2019). Though these types of maltreatment may be found separately, they often occur in combination:

- **Neglect:** Is the failure of a parent, guardian, or other caregiver to provide for the basic needs of the child (Child Welfare, 2019). Neglect may be emotional (e.g., inattention to a child's emotional needs, allowing a child to use alcohol or drugs, failure to provide psychological care); physical (e.g., failure to provide necessary food or shelter or lack of appropriate supervision); educational (e.g., failure to educate a child or attend to special education needs), or medical (e.g., failure to provide or withhold necessary medical treatment) (Child Welfare, 2019).
- **Abandonment:** Is also defined in many states as a form of neglect (Child Welfare, 2019). A child is considered to be abandoned when the child has been left alone in circumstances where the child suffers serious harm, when the parent's identity or whereabouts is unknown, or the parent has failed to maintain contact with the child or provide reasonable support for a specified period (Child Welfare, 2019). Some states have enacted laws, usually called "safe haven" laws, that provide safe places for parents to relinquish newborn infants (Child Welfare, 2019).
- **Parental substance use:** Is also considered a form of neglect in many states (Child Welfare, 2019). This includes exposing a child prenatally to a mother's use of drugs; manufacturing methamphetamine in the presence of a child; selling, distributing or giving drugs or alcohol to a child; or using a controlled substance

that impairs the caregiver's ability to care for the child (Child Welfare, 2019).

- **Human trafficking:** Includes both sex trafficking and labor trafficking (Child Welfare, 2019). Sex trafficking is defined as recruiting, harboring, transporting, providing or obtaining someone for commercial sex acts (Child Welfare, 2019). Labor trafficking is forced labor including drug dealing, and begging or working for little pay (Child Welfare, 2019).
- **Physical abuse:** Is intentional physical injury, ranging from minor bruises to severe fractures to death (Child Welfare, 2019). Physical abuse can involve biting, shaking, throwing, stabbing, punching, beating, kicking, choking, hitting (with a hand, stick, strap, or other object), burning, or otherwise harming a child (Child Welfare, 2019). Such injury is considered abuse regardless of whether the abuser intended to hurt the child. Physical discipline (spanking or paddling) is not considered abuse as long as it does not cause bodily injury and is considered "reasonable" (Child Welfare, 2019).
- **Sexual abuse:** Includes fondling a child's genitals, sodomy, indecent exposure, penetration, incest, rape, and exploitation through prostitution or the production of pornographic materials (Child Welfare, 2019).
- **Emotional, or psychological abuse:** Is a pattern of behavior that impairs a child's sense of self-worth or emotional development (Child Welfare, 2019). This includes threats, constant criticism, rejection, and/or withholding support, love, or guidance (Child Welfare, 2019).
- **Factitious Disorder Imposed on Another (FDIA), or Munchausen Syndrome by Proxy:** Is a disturbed parent-child relationship with actual harm or fabrication to produce symptoms of illness that require medical attention (Roesler & Jenny, 2018).

State-specific laws pertaining to child abuse and neglect can be found on the Child Welfare Information Gateway website: <https://www.childwelfare.gov/topics/systemwide/laws-policies/state/>.

Child abuse and neglect: Etiology and incidence

Child Maltreatment 2017 is the 24th edition of the annual Child Maltreatment report series. The reports are prepared by the Children's Bureau, an office of the Administration for Children and Families of the U.S. Department of Health and Human Services (HHS), and rely on data from states provided through the National Child Abuse and Neglect Data System (NCANDS). For federal fiscal year (FFY) 2017, 50 states, including the District of Columbia and the Commonwealth of Puerto Rico, voluntarily submitted data to NCANDS about the dispositions of children who received one or more child protective services (CPS) responses (HHS, 2019).

According to the Child Maltreatment 2017 report, the most recent report that presents national data about child abuse and neglect known to child protective services agencies in the United States, there were 674,000 nationally estimated victims of child abuse and neglect (HHS, 2019). The victim rate was 9.1 victims per 1,000 children in the population (HHS, 2019). It was determined that 74.9% of child abuse victims were neglected; 18.3% were physically abused; 8.6% were sexually abused; 6% were psychologically (emotionally) abused; 2.2% suffered medical neglect; and 7.1% were victims of threatened abuse or neglect, of a parent's drug or alcohol abuse, and of lack of supervision (HHS, 2019). Compared to the national estimate of abuse and neglect victims from

the 2017 report (674, 000) to the 2013 report (656, 000), there was an increase of approximately 2.7% of abuse and neglect (HHS, 2019).

Child fatality

Child abuse is the fourth-leading cause of death in children between one and four years of age (Centers for Disease Control [CDC], 2017). For FFY 2017, 50 states reported a combined total of 1,688 fatalities from abuse and neglect which represented a national rate of 2.32 deaths per 100,000 children (HHS, 2019). Of the children who died, 75.4% suffered from neglect and 41.6% suffered from physical abuse (HHS, 2019). Most of the child fatalities were comprised of White (41.9%), African American (31.5%), and Hispanic (15.1%) victims (HHS, 2019). Younger children who are abused or neglected are the most vulnerable to death: 71.8% of all child fatalities were younger than three years old (HHS, 2019). Children who were younger than one year old died from maltreatment at a rate of 21.92 per 100,000 children (HHS, 2019). Child fatality rates decreased with age indicating that older children are less at risk for abuse or neglect (HHS, 2019).

Victim demographics

Children in their first year of life are more likely to experience abuse and neglect (HHS, 2019). In FFY 2017, the victimization rate was highest for children younger than one year of age: 25.3 per 1,000

children (HHS, 2019). This rate for both boys and girls in the age group has been increasing for several years (HHS, 2019).

Boys and girls had different victimization rates and fatality rates, varying by their ages, according to Child Maltreatment 2017. The victimization rate among children younger than 18 years old was higher among girls overall (HHS, 2019). The victimization rate for girls was 9.5 per 1,000 girls in the population and was 8.6 per 1,000 for boys (HHS, 2019). Regarding fatality rates, girls died of abuse and neglect at a rate of 2.02 per 100,000 girls, whereas boys had a higher child fatality rate than girls at 2.68 per 100,000 boys (HHS, 2019).

Perpetrators demographics

The perpetrator is a person who has been determined to have knowingly allowed or caused the maltreatment of a child (HHS, 2019). Data from the Child Maltreatment 2017 report provide a description of perpetrators:

- The perpetrator, the person responsible for the abuse or neglect of a child, was most likely to be the parent of the child being abused.
- 91.6% of victims are maltreated by one or both parents.
- 69% of victims are maltreated by the mother, either acting alone (40.8%) or with a father and/or non-parent (28.2%).
- 4.7% of perpetrators were a relative other than a parent.
- 1.1% had a relationship to either multiple victims in the same report or multiple victims across reports.

Child abuse and neglect: Reporting to CPS

During FFY 2017, CPS agencies across the United States received an estimated 4.1 million referrals for child abuse and neglect involving 7.5 million children (HHS, 2019).

Child abuse and neglect legal definitions and reporting requirements vary from state to state, but all 50 states have mandated reporting of suspected abuse or neglect by health care providers to a CPS agency (HHS, 2019).

The situations in which a mandatory reporter must contact CPS vary from state to state (HHS, 2019). Usually, the reporter must contact CPS when the reporter suspects or has reason to believe that a child has been abused or neglected, or that the reporter has knowledge of or observes a child subjected to conditions that would reasonably result in harm to the child (HHS, 2019).

Approximately 48 U.S. states, the District of Columbia, Guam, American Samoa, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands designate professions whose members are mandated by law to report child maltreatment. Individuals designated as mandatory reporters usually have frequent contact with children. These professionals include physicians, nurses, and other health care workers; teachers, principals, and other school personnel; social workers; counselors, therapists, and other mental health professionals; child care providers; medical examiners or coroners; and law enforcement officers (HHS, 2019). Mandatory reporters are required to report the facts and circumstances that led them to suspect that a child had been neglected or abused (HHS, 2019).

Nursing consideration: Mandatory reporters do not have the burden of providing proof that abuse or neglect has occurred (HHS, 2019).

According to Child Maltreatment 2017, professionals made 65.7% of the reports of alleged child abuse and neglect (HHS, 2019). The three largest percentages of report sources from 2017 were from legal and law enforcement personnel (18.3%), education personnel (19.4%), and social services personnel (11.7%) (HHS, 2019). Medical personnel were the reports, source of 41.1% of victims with alcohol abuse as a risk factor and 52.7% with drug abuse as a risk factor (HHS, 2019). Nonprofessionals (friends, neighbors, relatives) submitted 17.3% of the reports of abuse and neglect (HHS, 2019).

Nursing consideration: The nurse, when contacting CPS about a possible child abuse or neglect case, does not have to be 100% certain about the maltreatment of the child. The reporter of child abuse and neglect needs only to suspect child abuse and neglect. Certainty about the child's maltreatment is not required, and a lack of certainty should not discourage the nurse from contacting CPS (HHS, 2019).

- 2.9% of perpetrators were an unmarried partner of the victim's parent (HHS, 2019).

The demographic factors associated with perpetrators of child abuse and neglect are:

- More than 83% of perpetrators are between ages 18-44 years old, with 25-34 years old being the most common age.
- 54.1% of perpetrators are female and 45% are male. 0.9% were of unknown sex.
- Perpetrators are most likely to be White (50.3%), African American (20.7%) and Hispanic (18.6%) (HHS, 2019).

For reporting states in Child Maltreatment 2017, 12.1% of victims were reported to be cared for by an alcohol-abusing caregiver and 30.8% of victims were reported with a drug-abusing caregiver (HHS, 2019).

Self-assessment quiz question #1

According to Child Maltreatment 2017, which is the most common form of child abuse/neglect in the United States?

- a. Sexual abuse.
- b. Physical abuse.
- c. Neglect.
- d. Emotional abuse.

A referral, also known as an allegation, made by the reporter may be either screened in (an allegation of child maltreatment that met the state's standards for acceptance and became a report) or screened out (an allegation of child maltreatment that did not meet the state's standards for acceptance as a report). During FFY 2017, of the 45 states that reported both screened-in and screened-out referrals, 57.67% of referrals were screened in and 42.4% were screened out (HHS, 2019). For those states that screened in the referrals, the rate was 31.8 referrals per 1,000 children in the population (HHS, 2019).

A screened-in referral is called a report and may involve more than one child (HHS, 2019). In most states, the majority of reports lead to investigations. These investigations determine if the child was maltreated or is at risk of maltreatment and establish whether an intervention is needed (HHS, 2019). In some states, reports receive an "alternative response" if the child is at low or moderate risk of maltreatment (HHS, 2019). This type of response focuses upon the service needs of the family (HHS, 2019).

Reasons for screening out a referral vary by state policy but include the following:

- The referral did not contain enough information for a CPS to respond.
- The referral did not involve child abuse and neglect.
- The children in the referral were the responsibility of another agency or jurisdiction (e.g., military installation or tribe).
- The children in the referral were older than 18 years old.
- The response by another agency was deemed more appropriate (HHS, 2019).

Self-assessment quiz question #2

Which of the following is *TRUE* about when a nurse should report to child protective services (CPS)?

- a. The nurse should only report child abuse to CPS when the nurse is 100% positive that child abuse is occurring.
- b. The nurse should report child abuse to CPS when the nurse suspects (has reason to believe) that a child has been abused or neglected, or that the nurse has knowledge of (or observes) a child being subjected to conditions that would reasonably result in harm to the child.
- c. The nurse should report child abuse to CPS only when the nurse sees child abuse taking place in front of the nurse.
- d. The nurse should wait to report to CPS until the nurse has let a few weeks pass, and then revisit with the child and family to make sure that the nurse's assumptions are correct.

Nursing consideration: For more information about where and how to report suspected child abuse or neglect, nurses should contact their local CPS agency or police department. State-specific laws pertaining to child abuse and neglect can be found on the Child Welfare Information Gateway website: <https://www.childwelfare.gov/topics/systemwide/laws-policies/can/>

State-by-state phone numbers for contacting CPS can be found at: https://www.childwelfare.gov/organizations/?CWIGFunctionsaction=rols:main.dspList&rolType=Custom&RS_ID=%205

Child abuse and neglect: Psychosocial signs and symptoms

The following psychological signs and symptoms may signal the presence of child abuse or neglect. These be observed by nurses or other health care professionals in a medical context or by teachers, social workers, or other professionals in other contexts. This list is not all inclusive, so it is important for the nurse to pay attention to other behaviors beyond this list that may seem unusual or concerning. Having one or more of the following does not necessarily imply abuse or neglect, just as the lack of one or more of these does not rule out abuse or neglect.

Signs and symptoms must be considered within a larger context of the medical history, physical examination, and social history.

Psychosocial signs and symptoms of child abuse and neglect in the victim:

- Child shows sudden changes in behavior or school performance.
- Child has learning problems or difficulty concentrating that cannot be attributed to specific physical or psychological causes.
- Child has not received help for physical or medical problems brought to the parents' attention.
- Child lacks adult supervision.
- Child is always watchful, as though preparing for something bad to happen.

Child abuse and neglect: Clinical findings within a medical context

- The medical history may change during the course of the interview.
- There was a delay in seeking medical attention for the injury.
- The medical history is vague, inconsistent, or incompatible with the child's developmental stage and severity of injury (e.g., bruises on legs if child is not yet cruising).
- There is a medical history of recurrent injuries.
- There are soft tissue injuries with markings characteristic of the source of abuse, such as the curved mark of a belt, hand marks, or a burn mark in the shape of an electric iron.

Child abuse and neglect: Risk factors

Risk factors for child abuse and neglect involve a complex interplay of factors, including contextual factors and factors associated with the perpetrator and the victim (National Academy of Sciences [NAS], 2018).

Risk factors for the victim:

- Emotional and behavioral difficulties.
- Developmental disabilities.
- Chronic illness.
- Physical disabilities.
- Unwanted child.
- Preterm birth.
- Unplanned pregnancy (Christian & Committee on Child Abuse and Neglect, 2015).

Self-assessment quiz question #3

Which of the following is *NOT* a risk factor for the child (victim) of child abuse/neglect?

- a. Chronic illness.
- b. Preterm birth.
- c. Developmental disabilities.
- d. Planned pregnancy.

- Child comes to school or other activities early, stays late, and does not want to go home.
- Child is overly compliant, passive, or withdrawn.
- Child is reluctant to be around a particular person.
- Child discloses maltreatment (Child Welfare, 2019).

Psychosocial signs and symptoms of child abuse and neglect in the perpetrator:

- Perpetrator denies the existence of or blames the child for the child's problems in school or at home.
- Perpetrator shows little concern for the child.
- Perpetrator asks teachers or other caregivers to use harsh physical discipline if the child misbehaves.
- Perpetrator looks primarily to the child for care, attention, and satisfaction of the perpetrator's emotional needs.
- Perpetrator sees the child as entirely worthless, bad, or burdensome.
- Perpetrator demands a level of academic or physical performance the child cannot achieve (Child Welfare, 2019).

The perpetrator and child together:

- State they do not like each other.
- Rarely touch or look at each other.
- Consider their relationship entirely negative (Child Welfare, 2019).

- There are burn markings on the child characteristic of immersion. Immersion involves forcibly placing the child in water that is too hot for the skin to bear.
- There are bruises on the child.
- The child has poor hygiene.
- The child suffers from malnutrition.
- The child has developmental delays.
- There is an inappropriate parent-child interaction, such as arguing, violence, or lack of emotional interaction (Boos, 2019a; Boos, 2019b).

Risk factors for the perpetrator:

- Low self-esteem.
- Substance abuse or alcohol abuse.
- Poor impulse control.
- Low levels of education.
- The perpetrator was abused as a child.
- Young maternal or paternal age.
- Single parent.
- Antisocial personality disorder.
- Depression or another mental illness.
- Family or intimate partner violence.
- The perpetrator has a negative perception of normal child behavior.
- The perpetrator has poor knowledge of child development or unrealistic expectations for the child (Boos, 2019a; NAS, 2018).

Risk factors caused by the environment:

- Unemployment.
- High density of alcohol outlets.
- Stressful environment.
- Social isolation.
- Violence.
- Poverty.
- Non-biologically related male living in the home (Boos, 2019a; NAS, 2018).

Child abuse and neglect: Differential diagnoses

- Unintentional injury.
- Sudden infant death syndrome (SIDS).
- Birthmarks, Mongolian spots, or other variations in skin pigmentation.
- Underlying disease process (e.g., leukemia, hemophilia, osteogenesis imperfecta).
- Folk medicine and cultural practices (e.g., coin rubbing) (Boos, 2019c).

Child abuse and neglect: Diagnostic tests and findings

- Children with traumatic injuries should undergo urgent imaging and laboratory studies.
- Skeletal survey as indicated by history and physical examination.
- Coagulation studies for severe bruising.
- Screening serum labs including ALT, AST, lipase, and electrolytes to identify occult injuries or medical conditions.
- Urinalysis in children with abdominal trauma, dehydration, or acute renal failure.
- Ultrasound for suspected visceral injury.
- Toxicology in children with suspected poisoning or drug exposure.
- Neuroimaging in children with suspected neurologic injury.
- Ophthalmology consultation in children younger than 5 years in whom head trauma is suspected (Boos, 2019b).

Child abuse and neglect: Management

It is essential that the nurse do the following in response to suspected child abuse or neglect:

- Report suspected neglect or abuse to CPS as mandated.
- Call the police immediately if necessary in addition to CPS if the child's life is in immediate danger.
- Ensure the safety of the child, utilizing relatives or foster care, or even hospitalization if necessary.
- Ensure the safety of other children sharing a household.
- Provide appropriate medical care for the child, including immediate hospitalization if indicated by the severity of the injuries.
- Identify and make appropriate referrals to available community resources to facilitate interagency and interdisciplinary collaboration: CPS, parenting classes, public health, childcare, and school programs (Boos, 2019b).

Child abuse and neglect: Impact on victims

Child abuse and neglect may affect the long-term health and well-being of the child, with effects lasting through adulthood (NAS, 2018). Child maltreatment is a public health problem with lifelong health consequences for survivors and their families. Adults who were maltreated as children have poor health outcomes and there is evidence that early adverse childhood experiences are strong contributors to many adult diseases (Christian & Committee on Child Abuse and Neglect, 2015). Both retrospective and prospective studies have identified strong associations between cumulative traumatic childhood events (e.g., family dysfunction, maltreatment, and social isolation) and adult physical and mental health disease (Christian & Committee on Child Abuse and Neglect, 2015).

The child's family and social context, their personal characteristics, and the frequency, severity, and timing of the abuse or neglect can affect outcomes for the child (NAS, 2018). A child's ability to cope and even thrive after trauma is called resilience. With help, some child victims of abuse or neglect may be able to work through and overcome their past experiences and traumas.

Long-term effects of child abuse or neglect may affect the following aspects of the child's health and well-being:

- Impaired psychological health: Posttraumatic stress disorder, depression, heightened anxiety.
- Increased risk behaviors: Early sexual activity, alcoholism.
- Impaired brain development: Changes to the stress response system, changes in the prefrontal cortex of the brain.
- Impaired relational skills: Aggression, poor peer relations, difficulty at work.
- Cognitive delays.
- Emotional difficulties such as low self-esteem, difficulty establishing or maintaining relationships, challenges with intimacy and trust, and an unhealthy view of parenthood.
- Impaired nervous system development.
- Impaired immune system development.
- Inability to cope with stress and frustrations.
- Eating disorders.
- Sleep disturbances.
- Attachment disorders (Mayo Clinic, 2019; NAS, 2018).

Evidence-based practice! Adverse childhood experiences (ACEs), as described by the Centers for Disease Control and Prevention (CDC), are comprised of childhood experiences, both positive and negative, that, according to research, have a significant impact on future violence victimization and perpetration and on lifelong opportunity and health (CDC, 2019c). According to an ACE study, adverse childhood experiences, such as child abuse, influence health and well-being throughout the person's lifespan (CDC, 2019c). ACEs can lead to disrupted neurodevelopment; negative effects on social, emotional, and cognitive development; adoption of health-risk behaviors; disease, disability, and social problems; and even early death (CDC, 2019c). ACEs can be prevented through the intervention of nurses and other health care workers in detecting and stopping child abuse as soon as possible.

Child abuse and neglect: Education and prevention

The goal in preventing child abuse and neglect is to stop the violence before it happens. The CDC (2019b) identifies the following strategies:

- Strengthen economic supports to families by improving household financial security and encouraging the adoption of family-friendly work policies.
- Change social norms to support parents and positive parenting. This can be achieved through public campaigns and legislative approaches to reduce corporal punishment.
- Provide quality care and education early in life by enriching preschool with family engagement and improving the quality of child care through licensing and accreditation.
- Enhance parenting skills by early childhood home visitation and teach parents skills and family relationship approaches.
- Intervene to reduce future risk of abuse by enhancing primary care, implementing behavioral parent training programs, and preventing problem behavior.

Services provided in home visitation programs by a nurse or other health care professional in a family's home include the following:

- Parent education on normal child development.
- Linkage to community services.
- Promotion of positive parent-child interactions.
- Counseling.
- Problem solving.
- Free transportation to health clinic appointments.
- Enhancement of informal support systems.
- Ensuring a source for regular health care.

- Classes for preparing for motherhood.
- Promotion of environmental safety (American Academy of Family Physicians: U.S. Preventive Services Task Force, 2018).

Aspects of the child’s community and family can help protect the child from child abuse and other forms of violence. For example, strong family support and nonviolent problem-solving skills have been shown

to protect against almost all forms of violence (CDC, 2019a). Children who live in communities that are violent can be protected from the effects of violence if they have nonviolent, supportive relationships with family and friends, and supportive relationships within faith-based organizations and schools (CDC, 2019a).

NEGLECT

Neglect: Definition, incidence

Neglect (or deprivation of necessities) is defined by the Federal Child Abuse Prevention and Treatment Act as “any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse, or exploitation” or “an act or failure to act which presents an imminent risk of serious harm” (Child Welfare, 2019). Neglect is the failure of a parent, guardian, or other

caregiver to provide for a child’s basic needs, including providing food, clothing, shelter, medical care, or supervision (Child Welfare, 2019).

According to the Child Maltreatment 2017 report, 74.9% of child abuse victims were neglected, making it the most common type of child maltreatment (HHS, 2019). More than 75% of all cases in the United States are classified as “neglect,” with the remaining 25% classified as “abuse” (HHS, 2019).

Neglect: Types of neglect

There are various types of neglect:

- **Medical neglect:** Is defined as “a type of maltreatment caused by failure of the caregiver to provide for the appropriate health care of the child although financially able to do so, or offered financial or other resources to do so” (HHS, 2019). According to Child Maltreatment 2017, 7.4% of child abuse victims suffered from medical neglect (HHS, 2019).
- **Physical neglect:** Includes a failure to provide necessary shelter, hygiene, and food, and lack of appropriate supervision (Child Welfare, 2019). It also includes child abandonment and refusal of accepting custody (Child Welfare, 2019).
 - Abandonment is now defined in many states as a form of neglect. A child is considered to be abandoned when the parent’s identity or whereabouts are unknown, the child has been left alone in circumstances where the child suffers serious harm, or the parent has failed to maintain contact with the child or provide reasonable support for a specified period. Some states have enacted laws, often called “safe haven” laws, that provide safe places for parents to relinquish newborn infants (Child Welfare, 2019).
- **Emotional neglect:** Includes the failure to provide psychological care, inattention to a child’s emotional needs, isolating the child, and exposing the child to domestic violence or substance use (Child Welfare, 2019).

- **Educational neglect:** Is a failure to educate a child, to attend to special education needs, or permitting chronic absenteeism from school (Child Welfare, 2019).
- **Inadequate supervision:** Includes leaving the child unsupervised, not protecting the child from safety hazards, not providing the child with adequate caregivers, or engaging in risky behavior (Child Welfare, 2019).

Chronic neglect comprises multiple incidents over time that can severely impact the child in a negative way (Child Welfare, 2019). It occurs when three conditions exist:

1. At least one basic need is not met.
2. The neglect is perpetrated by the child’s parent or caregiver.
3. The neglect occurs on a recurring or enduring basis (Child Welfare, 2019).

In summary, neglect includes failing to provide any of the following for the child:

- Adequate supervision.
- Clothing.
- Food.
- Safe and hygienic shelter.
- Protection from known dangers.
- Medical care.
- Education.
- Nurturing and affection (Child Welfare, 2019).

Neglect: Signs and symptoms

The following are possible signs and symptoms of neglect that may be seen in a medical context or in school or daycare:

- The child begs or steals food or money.
- The child lacks needed medical or dental care, immunizations, or glasses.
- The child is frequently absent from school.
- The child lacks sufficient clothing for the weather.
- The child abuses alcohol or other drugs.

- The child is consistently dirty and has severe body odor.
- The child states that there is no one at home to provide care.
- Parent/caregiver seems apathetic or depressed.
- Parent/caregiver appears to be indifferent to the child.
- Parent/caregiver is abusing alcohol or other drugs.
- Parent/caregiver behaves irrationally or in a bizarre manner (Child Welfare, 2019).

Neglect: Physical examination

The physical examination of a child may reveal the following evidence of neglect:

- Malnutrition. Physical abuse and neglect are sometimes concurrent, and on occasion, children may be intentionally starved.
- Extensive dental caries.
- Neglected wound care.
- Untreated diaper dermatitis (Christian & Committee on Child Abuse and Neglect, 2015).

It is important to carefully measure and plot all growth measures on a growth chart. Obtaining previous growth measurements can help determine whether the growth velocity has been appropriate over time. Plotting growth parameters is important because the health care professional may miss significant growth failure in infants and children if the professional relies on clinical impression alone (Christian & Committee on Child Abuse and Neglect, 2015).

Neglect: Intervention

If the nurse suspects that a child is suffering from neglect, the nurse should contact CPS immediately. The interventions for neglect depend on the type of neglect, the severity, and underlying risks and strengths of the caregivers and child (Child Welfare, 2019). The nurse should encourage parents who are experiencing mental health problems or

substance abuse to consider the effects of these issues on their parenting (Child Welfare, 2019). Nurses should assist parents in accessing appropriate resources, such as referrals to housing, mental health professionals, and substance abuse treatment programs (Child Welfare, 2019).

Self-assessment quiz question #4

Which of the following is *NOT* a sign of a child suffering from neglect?

- Malnutrition.
- Neglected wound care.
- Extensive dental caries.
- Bruising.

PHYSICAL ABUSE

Physical abuse: Definition, etiology, incidence

Physical abuse is defined as “a type of maltreatment that refers to physical acts that caused (or could have caused) physical injury to a child” (Child Welfare, 2019).

According to Child Maltreatment 2017, 18.3% of child abuse and neglect victims in the United States were physically abused (HHS, 2019). Physical abuse ranges from minor bruises to severe fractures to death as a result of beating, punching, kicking, biting, throwing, shaking, stabbing, choking, hitting (with a hand, stick, strap, or other object), burning, or otherwise harming a child (Child Welfare, 2019). Soft tissue injuries are the most common (bruises, abrasions, and lacerations) (Boos, 2019a). Head injuries, including shaken baby syndrome, are less frequent but cause the majority of deaths (Boos, 2019a). Burns comprise 14% of physical abuse injuries (Leatherby, 2016). Possible abdominal injuries from physical abuse include blunt injuries from hitting or kicking, liver lacerations, and contusions of the kidney or pancreas (Boos, 2019b). Possible fractures can include rib fractures, spiral fractures, and multiple fractures (Boos, 2019a).

Physical abuse is usually inflicted by a parent, caregiver, or other person who has responsibility for the child (Child Welfare, 2019). These injuries are considered abuse regardless of whether the caregiver intended to hurt the child (Child Welfare, 2019).

Physical abuse: Impact on victims

Child physical abuse is a significant cause of pediatric morbidity and mortality and is associated with major mental health and physical problems that can extend into adulthood (Christian & Committee on Child Abuse and Neglect, 2015). Adults who self-report physical abuse when they were children are more likely as adults to report chronic mental and physical health conditions (Christian & Committee on Child Abuse and Neglect, 2015). Adolescents who are victims of physical abuse have high rates of drug abuse, depression, conduct disorders, and cigarette smoking (Christian & Committee on Child Abuse and Neglect, 2015).

For some children, physical abuse results in permanent disability affecting their health in profound ways for their lifetime (Christian & Committee on Child Abuse and Neglect, 2015). Victims of abusive head trauma (AHT), for example, have high rates of neurologic disability, including sight and hearing impairment, cerebral palsy, epilepsy, and developmental and cognitive delays (Christian & Committee on Child Abuse and Neglect, 2015). Abused children may also suffer from

Nursing consideration: The role of the nurse may include identifying abused children with suspicious injuries who present for care, reporting suspected abuse to the agency for investigation, coordinating with other professionals and community agencies to provide immediate and long-term treatment to victimized children, supporting families affected by child abuse, providing preventive care and anticipatory guidance for parents and families, and advocating for programs and policies that support families and protect vulnerable children (Christian & Committee on Child Abuse and Neglect, 2015).

Self-assessment quiz question #5

Which of the following is *FALSE* regarding physical abuse?

- Soft tissue injuries are the most common type of physical abuse (bruises, abrasions, and/or lacerations).
- Head injuries are less frequent but cause the majority of deaths.
- Shaken Baby Syndrome is altered consciousness with or without signs of head injuries.
- Burns comprise 50% of physical abuse injuries.

permanently disfiguring injuries (Christian & Committee on Child Abuse and Neglect, 2015).

Victims of physical abuse in childhood are at risk for developing a variety of behavioral problems, including conduct disorders, poor academic performance, physically aggressive behaviors, depression, and decreased cognitive functioning (Christian & Committee on Child Abuse and Neglect, 2015).

There is acknowledgment in the medical community that adverse childhood experiences, including physical abuse, influence biological adaptations (Christian & Committee on Child Abuse and Neglect, 2015). These biological adaptations are associated with how the brain, the neuroendocrine stress response, and the immune system work (Christian & Committee on Child Abuse and Neglect, 2015). Decades later, after the abuse, these changes experienced by child abuse victims are associated with physical and behavioral health impairments (Christian & Committee on Child Abuse and Neglect, 2015).

Physical abuse: Signs and symptoms

The following are possible signs and symptoms of physical abuse that may be seen in a medical context or in school or daycare:

Infants:

- Remote, withdrawn, detached.
- May not smile or play.
- May whine, cry and not turn to adults for help.
- State of frozen watchfulness or fear of physical contact.
- May display clinging dependency.
- Severely physically abused children may appear to be autistic and not relate to people and to their environment in normal ways (Kansas Department of Children and Families, 2017).

School-aged children:

- Child has unexplained bruises, burns, bites, broken bones, or black eyes.
- Child shrinks (moves back or away) at the approach of adults.

- Child seems frightened of his parents and protests or cries when it is time to go home.
- Child has fading bruises or other marks noticeable after an absence from school.
- Child reports injury by a parent or another adult caregiver.
- Child abuses animals or pets (Child Welfare, 2019).

Adolescents:

- Low levels of academic achievement.
- Lying or stealing to protect themselves from abuse.
- Fighting, angry outbursts, belligerence, and aggression.
- Abuse of alcohol or drugs to self-medicate.
- Truancy.
- Emotional and social withdrawal, depression.
- Anti-social behaviors, including delinquency and sexually acting out (Kansas Department of Children and Families, 2017).

Parents or caregivers' characteristics:

- Parent or other adult caregiver uses harsh physical discipline with the child.
- Parent or other adult caregiver offers unconvincing, conflicting, or no explanation for the child's injury or provides an explanation inconsistent with the injury.

- Parent or other adult caregiver describes the child as "evil" or in some other very negative way.
- Parent or other adult caregiver has a history of abusing pets or animals.
- Parent or other adult caregiver has a history of abuse as a child (Child Welfare, 2019).

Physical abuse: Risk factors

Child abuse, including physical abuse, is a highly complex phenomenon in which child, parent, and environmental characteristics interact to place children at risk.

Risk factors for physical abuse in children:

- Infants and toddlers are at the highest risk of fatal and severe physical abuse because of their small size and vulnerability.
- Children with disabilities are at high risk for physical abuse, as well as sexual and emotional abuse. This includes speech and language disorders, learning disabilities, conduct disorders, and non-conduct psychiatric disease.
- Boys experience slightly higher rates of physical abuse than girls.
- Adolescents are more likely than older children to receive injuries from physical abuse.
- Children who live in households with unrelated adults are at exceptionally high risk of fatal abuse.

- Children who live in poverty are more at risk for physical abuse.
- Children who have parents who lack empathy for their children, have inappropriate developmental knowledge and expectations of their children, have harsh or inconsistent parenting practices, and reverse parent-child roles create a higher risk of physical abuse for the children (Boos, 2019a; Christian & Committee on Child Abuse and Neglect, 2015).

Risk factors for physical abuse specific to infants:

- The presence of more than two siblings.
- Maternal smoking.
- Low infant birth weight.
- Being born to an unmarried mother (Christian & Committee on Child Abuse and Neglect, 2015).

Physical abuse: Preventive factors

Some family and community preventive factors may mitigate some of the risks of physical abuse, including the following:

- Social connections for the child and family.
- Parents' resilience.
- Concrete support for the child and family in times of need.
- The parent's/caregiver's knowledge of child development and parenting.

- The presence of safe, stable, nurturing relationships and environments.
- The child's ability to form positive relationships.
- Adequate housing and access to health care and social services (Christian & Committee on Child Abuse and Neglect, 2015; CDC, 2019a).

Physical abuse: Challenges identifying the abuse

The identification of physical abuse can be difficult for nurses and other health care professionals for the following reasons:

- Perpetrators of the physical abuse seldom admit to their actions.
- Other than the perpetrator and the child, there are few witnesses to the physical abuse.
- The child may be too severely injured or too frightened to disclose the abuse.
- Child victims are often preverbal, making interviewing the child impossible, thus relying completely on parents or caregivers or others to provide the information.

- Nurses and other health care professionals are taught to rely on parents for accurate information about the child's history and may not be critical or skeptical of the information provided.
- Disbelief of parents' medical history or explanation of injury may cause the parents to intimidate or threaten the nurse or other health care professional who raises concerns of abuse (Christian & Committee on Child Abuse and Neglect, 2015).

Physical abuse: Reporting suspicions to CPS

Identifying suspected abuse and reporting suspicions to CPS can be challenging because of the difficult conversations with families. However, early identification and intervention to protect abused children is crucial. Sometimes health care professionals miss opportunities for early identification and intervention for child victims which puts children at risk for possibly life-threatening situations, especially for infants and toddlers (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: Nurses, along with other health care professionals, have the potential to stop physical abuse, secure a child's safety, and mitigate toxic stress in victims. Early recognition of child abuse can be life-saving (Christian & Committee on Child Abuse and Neglect, 2015). Contacting CPS is essential if child abuse or neglect is suspected by the nurse.

Physical abuse: Clinical presentation

Children who have been abused come to a nurse's attention in a variety of ways:

- Abusers seek medical attention because they believe the injury to the child is severe.
- A mandated reporter or other adult identifies and reports a suspicious injury to the nurse.
- Individuals report an abusive event they witnessed to the nurse.
- A child or adolescent tells the nurse that he/she has been hurt in an abusive manner.
- A caregiver observes symptoms related to an injury and brings the child in for medical care but may not be aware that the child has been injured (Christian & Committee on Child Abuse and Neglect, 2015).

Abused children present with a range of injuries—from minor to life-threatening. A severely injured child needs to be stabilized before further evaluation. This initial evaluation may require pediatric specialists in surgery, emergency medicine, critical care, and a trauma response team (Christian & Committee on Child Abuse and Neglect, 2015). The child may require radiologic and laboratory evaluations (Christian & Committee on Child Abuse and Neglect, 2015). If the child presents to the nurse in a primary care setting with a serious injury that requires further medical care in a hospital setting or specialty clinic, the nurse should gather the minimum information needed to report to CPS (Christian & Committee on Child Abuse and Neglect, 2015). Injuries suspicious for abuse or neglect are required by law to be reported to CPS (Christian & Committee on Child Abuse and Neglect, 2015).

Evidence-based practice! It is important for the nurse not to assume that the child is injury free just because the child does not cry or look upset. In a recent study of accidental fractures in children younger than six years of age, a notable minority of children with long-bone fractures did not cry or use their affected limb abnormally after injury (Christian & Committee on Child Abuse and Neglect, 2015). This caused some delay in the seeking of medical care (Christian & Committee on Child Abuse and Neglect, 2015).

Children with fatal head injuries are usually comatose immediately after the injury (Christian & Committee on Child Abuse and Neglect, 2015). In

Physical abuse: The medical history

Once the child is stabilized after suspected physical abuse, it is important that the nurse take a detailed medical history. If both parents are present, it may be helpful to interview each parent separately to document and compare both parents' histories (Christian & Committee on Child Abuse and Neglect, 2015). The nurse should ask parents (or other responsible caregivers) to describe in detail the following facts:

- The events surrounding the reported injuries.
- Information about the child's behavior before, during, and after the injury occurred.
- The day's activities or events leading up to the injury.
- The child's level of responsiveness.
- The child's feeding times.
- When the child was last noticed to be normally active and well appearing. This may assist with identifying the timing of an injury.
- Description of the reported mechanism of injury or injuries.
- Onset and progression of symptoms.
- The child's developmental capabilities for comparing the injured child to normal baseline for the child.

(Christian & Committee on Child Abuse and Neglect, 2015)

Injuries are common in childhood, and injuries of ambulatory, active children are often not witnessed by their caregivers (Christian & Committee on Child Abuse and Neglect, 2015). In these scenarios, parents can describe the events surrounding the injury, but they cannot describe the exact mechanism of the trauma (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: The best approach to taking the child's medical history is to allow the parent or other caregiver to provide a narrative without interruptions so that the history is not influenced by the nurse's questions or interpretations. Clarifying questions can then follow (Christian & Committee on Child Abuse and Neglect, 2015).

If there is no history of trauma provided, the nurse can specifically ask whether the child has had any trauma. The nurse should record any denials by the parents or caregivers in the medical record. Information should be gathered in a non-accusatory way, without placing blame on the parents/caregivers (Christian & Committee on Child Abuse and Neglect, 2015). For example, the nurse can ask the caregivers whether they have any concerns that someone might have harmed the child (Christian & Committee on Child Abuse and Neglect, 2015).

It is not the nurse's responsibility to identify the perpetrator of the abuse or the exact details of an abusive event. Instead, the nurse should do the following:

- Recognize potential abuse.
- Obtain a thorough medical and event history and perform a physical examination.
- Report the suspected abuse to CPS.
- Refer the patient or involve the specialists who are expert in completing the medical evaluation and investigation (Christian & Committee on Child Abuse and Neglect, 2015).

Physical abuse: The physical examination

A type of injury pattern rarely is in itself a diagnosis for either abuse or accident without a careful consideration of the explanation (medical history), a physical examination, and a radiographic or laboratory

analysis (Christian & Committee on Child Abuse and Neglect, 2015). In some rare circumstances, young victims of fatal head trauma may present with some level of neurologic alertness before death, although this is not normal. (Christian & Committee on Child Abuse and Neglect, 2015).

Some victims of abusive head trauma (AHT) may have nonspecific symptoms for several hours or more before developing either seizures or coma. Such nonspecific symptoms include the following:

- Lethargy.
- Reduced activity.
- Irritability.
- Poor feeding.
- Apnea.
- Vomiting (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: School-aged children and adolescents might not disclose their abuse. These children may be scared of the consequences of revealing the abuse (e.g., getting in trouble with the abuser) (Christian & Committee on Child Abuse and Neglect, 2015). They may have feelings of loyalty to their abuser or they may be afraid of being removed from their family home even though they might be in danger if they do stay at home (Christian & Committee on Child Abuse and Neglect, 2015). For adolescents, providing privacy and interviewing them alone when they present with concerning injuries is important (Christian & Committee on Child Abuse and Neglect, 2015).

Additional information that may be useful to collect in the medical assessment of suspected physical abuse includes the following:

- Social and financial stressors and resources.
- Medical, developmental, and social history.
- Family history—especially of bone disorders, bleeding, and metabolic or genetic disorders—to explore possible differential diagnoses that may mimic physical abuse.
- Pregnancy history: Planned or unplanned, wanted or unwanted, prenatal care, delivery in non-hospital settings, postpartum complications, postpartum depression.
- Child temperament: Whether the child is easy or difficult to care for, whether there is excessive crying in an infant, parents' expectations of the child's behaviors and development.
- Family's patterns of discipline.
- Parents'/caregivers' history:
 - Substance abuse by caregivers or others living in the home.
 - Mental health problems of parents.
 - Past arrests of parents, incarcerations, or interactions with law enforcement.
 - Domestic violence. It may be necessary to ask parent/caregiver individually if they have a history of intimate partner violence.
 - History of abuse to child, siblings, or parents.
 - Previous and present CPS involvement with the family (Christian & Committee on Child Abuse and Neglect, 2015).

The following are items in medical histories that raise a concern for abusive trauma:

- There is a delay in seeking medical care.
- There is a denial of trauma in a child with obvious injury.
- There is either no explanation or a vague explanation for a significant injury.
- An important detail of the explanation changes during the medical history.
- The explanation of the injury is inconsistent with the age, pattern, or severity of the injury.
- The explanation of the injury is inconsistent with the child's physical or developmental capabilities.
- Different witnesses provide different explanations for the injury (Boos, 2019b).

analysis (Christian & Committee on Child Abuse and Neglect, 2015). If child abuse is suspected, a thorough physical examination with the child undressed, in a gown, is necessary.

Head, eyes, ears, nose, and throat

The head, eyes, ears, nose, and throat (HEENT) examination includes the following:

- An inspection of the scalp for traumatic wounds or traumatic alopecia.
- A mouth examination that may reveal dental trauma, healing mucosal tears, or dental caries.
- An examination of the frenula in infants that may reveal an acute or healing injury (Christian & Committee on Child Abuse and Neglect, 2015).

Skin exam

The skin exam may reveal the following:

- Lacerations.
- Bruises.
- Burns.
- Bites.
- Other injuries (Christian & Committee on Child Abuse and Neglect, 2015).

The skin examination should be documented with the size, location, shape, and other details of the injury (Christian & Committee on Child Abuse and Neglect, 2015). Adolescents may display defensive wounds on the hands, forearms, or other parts of the extremities as though they tried to protect themselves from their abuser (Christian & Committee on Child Abuse and Neglect, 2015). Skin injuries can be documented in the medical record by photographs in addition to written descriptions (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: Skin injury in unusual locations—such as the pinna, the hairline behind the ear, the back of the ear, the buttocks, and thighs—are seen in abused children (Christian & Committee on Child Abuse and Neglect, 2015). These areas of the child’s skin exam require special attention from the nurse (Christian & Committee on Child Abuse and Neglect, 2015).

Chest and abdomen exam

The chest and abdomen may reveal injury and should be thoroughly examined (Christian & Committee on Child Abuse and Neglect, 2015).

Physical abuse: Skin injuries

Skin injuries from physical abuse include: bruises, bleeding, bite marks, and burns.

Bruises

Bruises (or contusions) are the most common and readily visible injuries from physical abuse but are missed in almost half of near-fatal and fatal abusive injuries (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: Bruising may be the only external indicator of more serious internal injury (Christian & Committee on Child Abuse and Neglect, 2015). Nurses should perform a thorough skin examination and take bruises seriously as a possible indication of internal trauma.

Bruising from accidents and normal activity of ambulatory children

The prevalence and average number of bruises increases with age (Boos, 2019c). The older the child, the more bruises they might have because of normal activity (Boos, 2019c). Most preschool-aged and school children have accidental bruises (Boos, 2019c). The most common sites of bruising in ambulatory children who have not been abused are to the scalp, knees, shins, and thighs (Boos, 2019c).

Bruising from physical abuse

The ear, neck, torso, and buttocks are the most common sites of bruising in abused children (Boos 2019c). Bruising in the following circumstances should contribute to concern for abuse:

- Any bruising in an infant younger than six months of age.
- More than one bruise in a pre-mobile infant and more than two bruises in a crawling child.

Musculoskeletal exam

The nurse should carefully palpate the legs, arms, feet, hands, ribs, and head. This could reveal acute or healing (callous) fractures (Christian & Committee on Child Abuse and Neglect, 2015).

Neurological exam

A full neurologic assessment—including assessment of the cranial nerves, anterior fontanelle, reflexes, sensorium, and gross and fine motor abilities—is important and should be appropriate to the child’s development and age (Christian & Committee on Child Abuse and Neglect, 2015). The level of the child’s alertness and the child’s demeanor may reflect their degree of discomfort and pain and neurologic status (Christian & Committee on Child Abuse and Neglect, 2015). Abnormalities in the neurological exam may indicate current or past injuries to the central nervous system (Christian & Committee on Child Abuse and Neglect, 2015).

Developmental assessment

Abused children may have developmental disabilities because of deprivation in the home environment (Christian & Committee on Child Abuse and Neglect, 2015).

Physical examination findings that suggest physical abuse

Comparing the provided mechanism of the injury, the age and development of the child, and the severity, age, and timing of the injury helps the nurse to identify children that require further investigation for physical abuse (Christian & Committee on Child Abuse and Neglect, 2015).

General physical examination findings that suggest physical abuse include the following:

- Injuries to multiple organ systems.
- Multiple injuries in different stages of healing.
- Patterned injuries.
- Injuries to non-bony or other unusual locations, such as over the face, neck, ears, torso, or upper arms.
- Unexplained significant injuries that are additional evidence of child neglect.
- Any injury to a pre-ambulatory infant:
 - Bruises.
 - Mouth injuries.
 - Fractures.
 - Intracranial injury.
 - Abdominal injury (Christian & Committee on Child Abuse and Neglect, 2015).

- Bruising located on the torso, ear, neck, or buttocks.
- Bruising with a pattern of the striking object (handprints or looped marks from extension cords).
- Human bite marks (Boos, 2019c).

Abused children tend to have more bruises identified than children who have not been abused (Christian & Committee on Child Abuse and Neglect, 2015). Abused children may have clustering of bruises, sometimes representing defensive injuries. Bruises to the torso, ears, or neck in children 4 years of age or younger predict abuse (Christian & Committee on Child Abuse and Neglect, 2015).

The mnemonic **TEN 4** is an easy way to identify bruises that are of concern for physical abuse:

T = torso.

E = ear.

N = neck.

4 = in children 4 years of age or younger and in any infant under 4 months of age (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: Bruises are notably rare in pre-ambulatory infants. There is a strong correlation between bruising and mobility in infants and toddlers, and any bruising identified in an infant not yet walking requires careful consideration and medical evaluation for possible abuse (Christian & Committee on Child Abuse and Neglect, 2015). It may be helpful to remember the phrase: “Those who don’t bruise rarely bruise” (Christian & Committee on Child Abuse and Neglect, 2015).

Suspicion of child abuse in ambulatory children based on the characteristics of bruises:

- Less suspicious for child abuse: Location:
 - Forehead.
 - Tip of nose.
 - Chin.
 - Elbows.
 - Lower arms.
 - Hips.
 - Anterior shins.
- More suspicious for child abuse: Location:
 - Face.
 - Ears.
 - Eyes.
 - Mouth.
 - Forehead.
 - Posterior hands, back.
 - Posterolateral thighs.
 - Neck.
 - Upper arms.
 - Genitalia.
 - Buttocks.
 - Anterior medial thighs.
- More suspicious for child abuse: Pattern:
 - Slap or hand marks.
 - Object marks.
 - Bite marks.
 - Bruises in clusters.
 - Multiple healed scars or abrasions, and new bruises.
 - Large cumulative size of bruising (Patel & Butterfield, 2015).

The age of a bruise

The age of a bruise cannot be determined accurately. The various colors of the bruise can occur at any stage (American Society for the Positive Care of Children [SPCC], 2018a). Areas painful to palpation may require a repeat examination in 12 days, at which time the bruise may be visible (Christian & Committee on Child Abuse and Neglect, 2015). Soft tissue swelling is associated with recent trauma and can persist for several days (Christian & Committee on Child Abuse and Neglect, 2015).

Alternative reasons for bruising and bleeding in children

Bruising or bleeding in a child can raise the concern for child abuse. Many bleeding disorders are rare and not every child with bruising and bleeding needs an evaluation for bleeding disorders. The American Academy of Pediatrics (AAP) encourages careful review of the child's past medical history, family medical history, and physical examination (Boos, 2018). It is important to remember that abusive bruising is more common than inherited or acquired coagulopathy (Boos, 2018). When child abuse is suspected, it is critical to report to child protection immediately and not wait for lab results of coagulation testing (Boos, 2018).

The following are some bleeding disorders that can produce patterns of bruising or bleeding that mimic abuse:

- Coagulation factor deficiencies and abnormalities.
- Fibrinolytic defects.
- Defects of fibrinogen.
- Platelet disorders (Boos, 2018).

Nursing consideration: Assessing whether the bruising and bleeding findings in the child are the result of trauma, with or without child abuse, or whether the child has a bleeding disorder is critical (Boos, 2018). The nurse should not automatically assume that bruising and bleeding are caused by trauma or abuse or automatically assume that they are caused by a bleeding disorder or other medical condition (Boos, 2018). All possibilities (trauma and abuse and a bleeding disorder or other medical condition) should be considered in the evaluation of the child.

The medical history and clinical evaluation can be used to determine the necessity of an evaluation for a possible bleeding disorder. Laboratory evaluations should be completed with the understanding that the presence of a bleeding disorder does not rule out child abuse as

the etiology for bruising or bleeding (Boos, 2018). At the same time, the history of trauma, accidental or intentional, does not rule out the presence of a bleeding disorder or other medical issue (Boos, 2018).

Evaluating for bleeding disorders in a child with bruising

If the child presents with bruising, the clues to the presence of a bleeding disorder include the following:

- Petechiae at clothing line pressure sites.
- Bruising at sites of object pressure, such as in the pattern and location of infant seat fasteners.
- Excessive diffuse bruising. Severe bleeding disorders may present with excessive diffuse bruising (Boos, 2018).

The initial testing panel for a child with the above clues to the presence of a bleeding disorder is as follows:

- Prothrombin time.
- Activated partial thromboplastin time.
- von Willebrand factor antigen.
- VWF activity (ristocetin cofactor).
- Factor VIII level.
- Factor IX level.
- Complete blood count with platelet count (Boos, 2018).

Testing for bleeding disorders in a child with intracranial hemorrhage includes the following:

- Prothrombin time.
- Activated partial thromboplastin time.
- Factor VIII level.
- Factor IX level.
- Complete blood cell count with platelet count.
- DIC panel (d-dimer and fibrinogen) (Boos, 2018).

If there are abnormal test results or further testing is desired, a pediatric hematologist should be consulted (Boos, 2018).

Situations in which a bleeding disorder evaluation may not be needed for a child with bruising include the following:

- Clear disclosure of or independently witnessed abuse or nonabusive trauma.
- Other medical findings that are consistent with abuse or nonabusive trauma.
- Object or hand-patterned bruising.
- The medical history provided by the parent/caregiver clearly explains bruising (Boos, 2018).

Factor abnormalities and deficiencies in children:

- Von Willebrand disease (VWD) type 1 (frequency: 1 in 1000; screening test: PFA100 [PFA100 = platelet function analyzer]).
- VWD type 2A (frequency: uncommon; screening test: PFA100).
- VWD type 2B (frequency: uncommon; screening test: PFA100).
- VWD type 2M (frequency: uncommon; screening test: PFA100).
- VWD type 2N (frequency: uncommon; screening test: aPTT).
- VWD type 3 (frequency: 1 in 300 000–1 000 000; screening test: PFA100).
- Factor II deficiency (prothrombin) (frequency: 1 in 12 million; 26 reported cases; screening tests: aPTT (aPTT = activated partial thromboplastin time), PT (may be normal) (PT = prothrombin time)).
- Factor V deficiency (frequency: 1 in 1 million; screening tests: aPTT, PT).
- Combined factor V/Factor VIII deficiency (frequency: 1 in 1 million; screening test: aPTT > PT).
- Factor VII deficiency (frequency: 1 in 300 000–500 000; screening test: PT).
- Factor VIII deficiency (frequency: 1 in 5000 male births; screening test: aPTT).
- Factor IX deficiency (frequency: 1 in 20 000 male births; screening test: aPTT).
- Factor X deficiency (frequency: 1 in 1 million; screening test: aPTT, PT, RVV [Russell viper venom]).
- Factor XI deficiency (frequency: 1 in 100 000; screening test: aPTT).
- Factor XIII deficiency (frequency: 1 in 25 million; screening test: clot solubility) (Anderst, Carpenter, Abshire, & the Section on Hematology/Oncology and Committee on Child Abuse and Neglect, 2013).

Fibrinolytic defects in children:

- Alpha 2-antiplasmin deficiency (frequency: 40 reported cases; screening test: euglobinlysis test).
- PAI1 (plasminogen activator inhibitor-1) deficiency (frequency: very rare) (Anderst et al., 2013).

Defects of fibrinogen in children:

- Afibrinogenemia (frequency: 1 in 500 000; screening tests: PT, aPTT).
- Hypofibrinogenemia (frequency: less than afibrinogenemia; screening tests: PT, aPTT).
- Dysfibrinogenemia (frequency: 1 in 1 million; screening tests: thrombin time, fibrinogen level) (Anderst et al., 2013).

Platelet disorders in children:

- Idiopathic thrombocytopenic purpura (ITP) (frequency: age related; screening test: CBC).
- Glanzmann thrombasthenia (frequency: very rare; screening test: PFA100).
- Bernard-Soulier syndrome (frequency: rare; screening test: PFA100).
- Platelet release and storage disorders (frequency: unknown, more common than other platelet function disorders; screening test: PFA100) (Anderst et al., 2013).

Vitamin K deficiency

Vitamin K deficiency (VKDB) in infants can result in the following:

- Bleeding in the skin or from mucosal surfaces; or bleeding from circumcision.
- Generalized ecchymoses.
- Large intramuscular hemorrhages.
- Intracranial hemorrhage (Boos, 2018).

Because of the widespread provision of vitamin K at birth, VKDB is rare. However, it is important to consider that some infants may not receive Vitamin K at birth (such as home births, less developed health care environments, alternative medicine) and that not all states require vitamin K to be administered at birth (Boos, 2018). In VKDB, there is a prolonged PT and possibly INR for age (Pazirandeh & Burns, 2019).

Intracranial hemorrhage

Intracranial hemorrhage (ICH) in a child who is not yet mobile is highly concerning for child abuse except for obvious known trauma (Christian, 2019). Although rare, a child can suffer from an ICH, such as a subdural or epidural hematoma, from the impact of a short fall (Christian, 2019). Additionally, birth trauma and some medical conditions can lead to ICH in infants (Christian, 2019).

Bleeding disorders can also cause ICH (O'Brien, 2019). A child with ICH and concerns for abuse may also require an evaluation for a bleeding disorder (O'Brien, 2019). If a child presents with ICH but does not have other findings strongly suggestive of abuse (e.g., fractures, burns, significant abdominal trauma, patterned bruising), the child will need an evaluation for other medical conditions (O'Brien, 2019).

Diagnosing a bleeding disorder in children

The following should be considered when assessing children with bruising and bleeding for possible abuse:

- The age and developmental capabilities of the child.
- A medical history of trauma.
- The location and pattern of bruising.
- In the case of intracranial hemorrhage, neuroimaging findings.
- A medical history of symptoms suggestive of a bleeding disorder (O'Brien, 2019):
 - Significant bleeding after a circumcision or other surgery.
 - Epistaxis.
 - Bleeding from the umbilical stump.
 - Excessive bleeding after dental procedures (Anderst et al., 2013).

Physical abuse: Skeletal injuries

Fractures

Most fractures in childhood are caused by accidents (Christian & Committee on Child Abuse and Neglect, 2015). Of the small percentage of fractures that do result from abuse, most are found in infants

Bite marks

Bite marks can be important evidence of suspected child abuse. Bite marks are characterized by ecchymoses, lacerations, or abrasions and are often found in elliptical or ovoid patterns (Christian & Committee on Child Abuse and Neglect, 2015). The marks may have a central area of ecchymosis caused either by positive pressure from the closing of the teeth with disruption of small vessels or by negative pressure caused by suction and tongue thrusting (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: The nurse should keep in mind that bite marks can be inflicted by an adult, another child, an animal, or the patient (Christian & Committee on Child Abuse and Neglect, 2015).

Identifying the abuser is determined by the location of the wound, the size, the dentition characteristics within the wound, the presence of puncture marks, arch form, and the intercuspid distance (Christian & Committee on Child Abuse and Neglect, 2015). Dental professionals are helpful resources for identifying wound patterns suspicious for bites. When in doubt, the nurse should seek the advice of a dentist or forensic odontologist, if available, to assist in the evaluation. Occasionally in the emergency department, swabs of a fresh bite may be sent to a crime laboratory for DNA analysis (Christian & Committee on Child Abuse and Neglect, 2015).

Burns

Burns inflicted on children by abusers tend to be more severe than accidental burns because inflicted burns are often associated with a delay in seeking medical care and are more common in young children (Christian & Committee on Child Abuse and Neglect, 2015). It is important to note that accidental burns are common childhood injuries and only a small percentage of burns are associated with physical abuse (Christian & Committee on Child Abuse and Neglect, 2015). The nurse must still investigate all burns for the possibility of physical abuse. Inflicted burns need the same treatment as any other burn, but children with inflicted burns have a higher morbidity and longer hospital stays than children with accidental burns (Christian & Committee on Child Abuse and Neglect, 2015).

Scald burns

Scald burns, including immersion burns, are the most common cause of severe burns requiring hospitalization. Following are characteristics of inflicted immersion burns:

- Sharp lines of demarcation that are symmetrical.
- Often involve the genitals and the lower extremities in symmetric distributions.
- Often associated with soiling accidents or other behaviors that require cleaning the child.
- Seen most often in children under age 5 (Christian & Committee on Child Abuse and Neglect, 2015; American SPCC, 2018a).

Object contact burns

Object contact burns are inflicted with hot solids, such as irons, radiators, stoves, stun guns, and cigarettes (Boos, 2019). Inflicted contact burns leave a clear imprint of the hot instrument and are characteristically deep. Cigarette burns are typically 8 to 12mm in diameter and can produce a 3rd degree burn (Boos, 2019). Burns inflicted with hot objects can be difficult to differentiate from accidental burns because both may be patterned (Christian & Committee on Child Abuse and Neglect, 2015).

Differential diagnoses for burns

Some dermatologic and infectious diseases can mimic abusive burns, including impetigo, toxin-mediated staphylococcal and streptococcal infections, chemical burns of the buttocks from senna-containing laxatives, phytophotodermatitis, and complementary and alternative therapies (such as garlic application) (Christian & Committee on Child Abuse and Neglect, 2015; Boos, 2018).

(Christian & Committee on Child Abuse and Neglect, 2015). Abused infants and children may present with skeletal trauma as their initial injury from physical abuse (Christian & Committee on Child Abuse and Neglect, 2015). Fractures, as well as other conditions, are often

identified by skeletal radiographs during the medical evaluation of suspected abuse (Christian & Committee on Child Abuse and Neglect, 2015).

Fractures: Etiology and incidence

Fractures are a common childhood injury and account for between 8% and 12% of all pediatric injuries (Christian & Committee on Child Abuse and Neglect, 2015). Fractures are common injuries caused by child abuse and are the second most common injury caused by child physical abuse (the most common is bruising) (Christian & Committee on Child Abuse and Neglect, 2015). In infants and toddlers, physical abuse is the cause of 12% to 20% of fractures (Flaherty et al., 2014).

Fractures: Signs and symptoms

Children with recent fractures are usually symptomatic, with visible swelling, crying, or refusal to use the affected area (Christian & Committee on Child Abuse and Neglect, 2015). Sometimes the child's symptoms are minimal, which can lead to a delay in seeking medical care (Boos, 2019b).

Fractures: Accidental fractures

Most fractures sustained by healthy children are not associated with bruising either at the time of presentation (only 10% with bruising) or within the first week (28% with bruising) after trauma (Christian & Committee on Child Abuse and Neglect, 2015). Skull fractures are common injuries in infants who have not been abused (Christian & Committee on Child Abuse and Neglect, 2015).

Fractures from abuse

Parietal and linear skull fractures are most common in abuse and other causes (Christian & Committee on Child Abuse and Neglect, 2015). When fractures are suspected from abuse, skin surfaces can be carefully examined for "grab marks" that may indicate restraint or areas that were twisted or pulled to create the fracture (Christian & Committee on Child Abuse and Neglect, 2015). The absence of such bruising does not exclude a fracture or an abusive mechanism of injury (Christian & Committee on Child Abuse and Neglect, 2015). The femur, humerus, and tibia are the most common long bones to be injured by child abuse (Flaherty et al., 2014).

Physical abuse should be considered in the differential diagnosis for fractures in the following situations:

- Children with multiple fractures.
- Fractures in infants not yet walking, especially in those without a clear history of trauma or a known medical condition that predisposes bone fragility.
- Infants and children with rib fractures.
- Infants and toddlers with midshaft humerus or femur fractures.
- A fracture of the humeral shaft in a child younger than 18 months has a high likelihood of having been caused by abuse.
- Infants and children with unusual fractures, including those of classic metaphyseal lesions (CMLs) of the long bones, the scapula, vertebrae, and sternum unless explained by a known history of underlying bone disorder or severe trauma.
- The history of trauma does not explain the fracture in the child (Christian & Committee on Child Abuse and Neglect, 2015; Flaherty et al., 2014).

Nursing consideration: A negative clinical examination does not preclude the need for a skeletal radiologic survey when inflicted trauma is suspected, particularly in children younger than 2 years old (Christian & Committee on Child Abuse and Neglect, 2015).

Fractures: Diagnosis

To identify child abuse as the cause of fractures, the nurse must consider the history, the age of the child, the location of the fracture, the type of fracture, the mechanism that caused the particular type of fracture, and the presence of other injuries (Flaherty et al., 2014). Delay in obtaining medical treatment, the presence of multiple fractures, fractures of different ages or stages of healing, and the presence of other injuries suspicious for abuse (e.g., coexisting injuries to internal organs, skin, or central nervous system) should alert the nurse to possible child abuse (Flaherty et al., 2014).

The nurse should consider the child's age and level of development when considering child abuse as the cause of a fracture. Approximately

80% of all fractures caused by child abuse occur in children younger than 18 months (Flaherty et al., 2014). About 25% of fractures in children younger than one year are caused by child abuse (Flaherty et al., 2014).

Nursing consideration: Physical abuse is more likely to be the cause of humeral fractures and femoral fractures in children who are not yet walking compared with children who are ambulatory (Flaherty et al., 2014). The percentage of fractures caused by abuse decreases significantly after the child begins to walk (Flaherty et al., 2014). The nurse should determine the child's ability to walk when gathering and documenting the child's medical history.

Radiographic skeletal survey is the standard tool for detecting clinically unsuspected fractures in possible victims of child abuse. Skeletal surveys should conform to American College of Radiology standards. Any concern for abuse in a child younger than 24 months is an absolute indication in obtaining a skeletal survey (Boos, 2019b).

Repeating skeletal surveys 23 weeks after an initial presentation of suspected abuse improves diagnostic specificity and sensitivity for identifying skeletal trauma in abused infants (Christian & Committee on Child Abuse and Neglect, 2015). Repeat skeletal surveys can assist in dating of injuries, identifying fractures not visible on initial skeletal survey, clarifying questionable findings, and altering the clinical diagnosis (Christian & Committee on Child Abuse and Neglect, 2015).

Evidence-based practice! Not all abusive fractures (e.g., rib fractures and CMLs) are visible by radiograph right away (Christian & Committee on Child Abuse and Neglect, 2015). Studies have shown that repeat skeletal imaging increases the number of fractures diagnosed by more than 25% in abuse victims (Christian & Committee on Child Abuse and Neglect, 2015). Nurses should encourage repeat radiograph skeletal surveys for suspected child abuse victims, especially in children younger than 2 years old (Christian & Committee on Child Abuse and Neglect, 2015).

Fractures: Indications for obtaining a skeletal survey:

- All children younger than two years old with obvious abusive injuries.
- All children younger than two years old with any of the following suspicious injuries:
 - Bruises or other skin injuries in infants not yet walking.
 - Oral injuries in infants not yet walking.
 - Injuries inconsistent with the history provided.
- Infants with unexplained, unexpected sudden death. Consult with medical examiner or coroner first.
- Infants and young toddlers with unexplained intracranial injuries, including hemorrhage and hypoxic-ischemic injury.
- Infants and siblings younger than two years old and household contacts of an abused child.
- Twins of abused infants and toddlers (Boos, 2019b; Christian & Committee on Child Abuse and Neglect, 2015).

Fractures with high specificity for abuse in children:

- Rib fractures, especially posteromedial.
- Classic metaphyseal lesions.
- Spinous process fractures.
- Scapular fractures.
- Sternal fractures (Boos, 2019b).

Fractures with moderate specificity for abuse in children:

- Fractures of different ages.
- Multiple fractures, especially bilateral.
- Epiphyseal separations.
- Vertebral body fractures and subluxations.
- Complex skull fractures.
- Digital fractures in children younger than 36 months or without a corresponding history (Boos, 2019b).

Fractures with low specificity for abuse in children:

- Subperiosteal new bone formation.

- Clavicular fractures.
- Long-bone shaft fractures.
- Linear skull fractures (Boos, 2019b).

Self-assessment quiz question #6

Which of the following fractures does NOT have HIGH specificity for abuse in children?

- Rib fractures, especially posteromedial
- CMLs (classic metaphyseal lesions)
- Clavicular fractures
- Spinous process fractures

Rib fractures

Rib fractures are highly suggestive of child abuse (Flaherty et al., 2014). Most abusive rib fractures result from anterior-posterior compression of the chest (Flaherty et al., 2014). These rib fractures are frequently found in infants who are held around the chest, squeezed, and shaken (Flaherty et al., 2014). The positive predictive value of rib fractures for child abuse in children younger than three years old was 95% in one study (Flaherty et al., 2014). Other less common causes of rib fractures in infants include significant trauma during childbirth, trauma from a motor vehicle crash, and minor trauma in infants who have increased bone fragility (Flaherty et al., 2014).

Classic metaphyseal lesions

Classic metaphyseal lesions (CMLs), planar fractures through the primary spongiosa of the metaphysis, also have high specificity for child abuse when they occur during the first year of life (Flaherty et al., 2014). CMLs are the most common long-bone fracture found in infants who die with evidence of inflicted injury (Flaherty et al., 2014). These fractures are caused by vigorous pulling or twisting of an infant's extremity (Flaherty et al., 2014).

Why fractures from physical abuse may be overlooked

Physical abuse may not be considered in the nurse's differential diagnosis of childhood injury because the caregiver may have intentionally changed the history to conceal the abuse. In children younger than three years old, about 20% of fractures caused by abuse may be misdiagnosed initially as accidental or as a result of causes other than abuse (Flaherty et al., 2014). Fractures may also be missed because radiography is done before changes are obvious or the radiographic images are misread (Flaherty et al., 2014).

Fractures: Differential diagnosis

It is important for the nurse to not overlook an abusive injury, but it is also important not to assume that an injury is caused by abuse without considering other differential diagnoses. Even though the consequences of failing to diagnose an abusive injury in a child can be serious, incorrectly diagnosing child abuse in a child whose fractures have another etiology can be upsetting and stressful for a family (Flaherty et al., 2014).

Nursing consideration: Preexisting medical conditions and bone disease may make a child's bones more vulnerable to fracture. Some conditions may present as skeletal changes, such as metaphyseal irregularity and subperiosteal new bone formation (Flaherty et al., 2014). The nurse should consider the child's preexisting medical conditions when determining the differential diagnoses for fractures in a child (Flaherty et al., 2014).

Falls, syndromes, metabolic disorders, and systemic diseases can all cause fractures. Alternative reasons for fractures should be considered in the differential diagnoses for fractures in children:

- **Falls are common in childhood:** Short falls can cause fractures, but they rarely result in additional significant injury (e.g., neurologic injury) (Flaherty et al., 2014). In a study of short falls, parents reported that 40% of the children younger than two years of age had suffered at least one fall from a height of between six inches and four feet (Flaherty et al., 2014). Approximately 25% of these children suffered an injury (Flaherty et al., 2014). Bruises were the most common injury observed (Flaherty et al., 2014). Supracondylar fractures in ambulatory children are usually injuries resulting from short falls (Flaherty et al., 2014).

- **Osteogenesis imperfecta (OI):** Is a rare inherited connective tissue disorder that may cause a child to have brittle bones along with poor linear growth, macrocephaly, triangular-shaped face, blue sclerae, or hearing impairment as a result of otosclerosis; hypoplastic, translucent, carious, late-erupting, or discolored teeth; easy bruisability; inguinal or umbilical hernias; limb deformities; hyperextensible joints; scoliosis or kyphosis; wormian bones of the skull; or demineralized bones (Beary, 2019). The diagnosis of OI is usually suggested in an individual with bone fragility, a positive family history, blue sclera, short stature, poor dentition, and radiographic evidence of low-bone density or osteopenia. (Beary, 2019). OI has been misdiagnosed as child abuse since both may present with multiple fractures in various degrees of healing (Beary, 2019).
- **Osteopenia of prematurity:** Preterm infants have decreased bone mineralization at birth (Flaherty et al., 2014). After the first year of life, bone density normalizes (Flaherty et al., 2014). Osteopenia of prematurity is a complication in low birth weight infants; infants born at less than 28 weeks gestation or who weigh less than 1500 grams at birth are especially vulnerable (Flaherty et al., 2014). Osteopenia usually presents between six and 12 weeks of life (Flaherty et al., 2014). Fractures associated with osteopenia of prematurity usually happen in the first year of life (Flaherty et al., 2014). It is important to keep in mind that preterm infants are also at an increased risk of abuse as well as being vulnerable to osteopenia of prematurity (Flaherty et al., 2014).
- **Vitamin D deficiency and rickets:** Suboptimal vitamin D concentrations and rickets have been proposed as causes of fractures in infants (Flaherty et al., 2014). Vitamin D insufficiency in otherwise healthy infants and toddlers is common. In one study, about 40% of infants and toddlers aged eight to 24 months in an urban clinic had laboratory evidence of vitamin D insufficiency (serum concentrations of 25-hydroxy vitamin D of less than or equal to 30 ng/mL) (Flaherty et al., 2014). Risk factors for vitamin D deficiency include prolonged breastfeeding without vitamin D supplementation, increased skin pigmentation, and lack of sunlight exposure (Flaherty et al., 2014). Rickets is characterized by demineralization, widening and irregularity of the physis, loss of the zone of provisional calcification, and fraying and cupping of the metaphysis (Flaherty et al., 2014). Despite the high prevalence of vitamin D insufficiency in infants and toddlers, rickets is uncommon (Flaherty et al., 2014).
- **Osteomyelitis:** In infants can present as multiple metaphyseal irregularities potentially resembling CMLs (Flaherty et al., 2014). Usually the lesions become progressively lytic and sclerotic with substantial subperiosteal new bone formation (Flaherty et al., 2014). Signs of infection are often present, such as fever, elevated C-reactive protein concentration, increased erythrocyte sedimentation rate, and elevated white blood cell count (Flaherty et al., 2014).
- **Fractures secondary to demineralization from disuse:** Any child with a severe disability that limits or prevents ambulation can be at risk for fractures secondary to disuse demineralization even with normal handling (Flaherty et al., 2014). The fractures are usually diaphyseal rather than CMLs (Flaherty et al., 2014). Usually these fractures happen during range-of-motion exercises and physical therapy (Flaherty et al., 2014). The nurse should keep in mind that children with disabilities are at an increased risk of being maltreated, so child abuse should not be ruled out when there are fractures in a disabled child who is not mobile (Flaherty et al., 2014).
- **Scurvy:** Is caused by insufficient intake of vitamin C, which is important for the synthesis of collagen (Flaherty et al., 2014). Scurvy is rare today because formula, human milk, fruits, and vegetables contain vitamin C (Flaherty et al., 2014). But it is possible that scurvy may develop in children who eat no foods containing vitamin C and in older children who drink only cow's milk without vitamin supplementation (Flaherty et al., 2014). Scurvy can result in metaphyseal changes similar to those seen with child abuse, so it may be misinterpreted as child abuse (Flaherty et al., 2014).

- **Copper deficiency is a rare condition:** Copper plays a role in cartilage formation and copper deficiency may be complicated by bone fractures (Flaherty et al., 2014). Preterm infants are born with lower stores of copper than term infants are because copper is accumulated at a faster rate during the last trimester of pregnancy (Flaherty et al., 2014). Copper deficiency is not likely to be observed in full-term children younger than six months of age or preterm infants younger than 2.5 months of age because fetal copper stores are adequate for this length of time (Flaherty et al., 2014). Human milk and formula contain enough copper to prevent deficiency (Flaherty et al., 2014). Psychomotor retardation, pallor, hypotonia, hypopigmentation, and sideroblastic anemia are some of the characteristic findings of copper deficiency in infants (Flaherty et al., 2014).
- **Menkes disease, also known as Menkes “kinky hair” syndrome:** Is a rare congenital defect of copper metabolism (Boos, 2019c). Menkes disease is an X-linked recessive condition occurring only in

boys (Boos, 2019c). Metaphyseal fragmentation and sickle-shaped metaphyseal spurs may be observed on radiographs (Boos, 2019c). These findings may be difficult to distinguish from fractures caused by abuse. Other signs of Menkes disease include sparse kinky hair, retinal hemorrhages, acute neurological deterioration, calvarial wormian bones, failure to thrive, developmental delay, and anterior rib flaring (Boos, 2019c).

- **Systemic diseases:** Chronic renal disease can cause renal osteodystrophy that results in the same radiographic changes as nutritional rickets (Flaherty et al., 2014). Chronic liver disease (e.g., biliary atresia) interferes with vitamin D metabolism, and children may be at increased risk of fractures (Flaherty et al., 2014). Renal tubular acidosis, Fanconi syndrome, hypophosphatasia, hypophosphatemic (vitamin D resistant) rickets, and hyperparathyroidism also cause clinical variants of rickets (Flaherty et al., 2014).

Physical abuse: Thoracoabdominal injuries

Thoracoabdominal injuries: Etiology and incidence

Injuries to the chest are common in abuse (Christian & Committee on Child Abuse and Neglect, 2015). Clinically significant internal organ injuries occur less frequently than chest injuries (Christian & Committee on Child Abuse and Neglect, 2015). Most thoracic injuries are caused by crush injury or blows to the abdomen or chest (Christian & Committee on Child Abuse and Neglect, 2015). Abusive injuries that involve the heart, including dysrhythmias and direct cardiac trauma, are rare (Christian & Committee on Child Abuse and Neglect, 2015).

Thoracoabdominal injuries: Types of injuries

The following thoracoabdominal injuries have been reported from child abuse:

- Myocardial contusions.
- Commotio cordis.
- Hemopericardium.
- Shearing of the thoracic duct resulting in chylothorax.
- Cardiac aneurysms and rupture.
- Pulmonary injuries: Contusions, lacerations resulting in pneumothorax, hemorrhagic effusions, or pneumomediastinum.
- Pulmonary edema associated with suffocation or head trauma (Christian & Committee on Child Abuse and Neglect, 2015).

Physical abuse: Abusive head trauma

When head trauma is caused by child abuse, it is known as abusive head trauma (AHT). AHT is defined as a “constellation of brain injuries” caused by the “directed application of force to an infant or young child, resulting in physical injury to the head and/or its contents” (American Academy of Pediatrics [AAP], 2015). Head trauma is most common in infants and is the leading cause of child physical abuse fatality under age two years (National Center on Shaken Baby Syndrome, 2019). Inflicted injuries tend to occur in infants less than six months old (National Center on Shaken Baby Syndrome, 2019). Most fatal head injuries in infants and young children are the result of abuse (Christian, 2018). Approximately 25% of victims of head trauma die (National Center on Shaken Baby Syndrome, 2019). These inflicted injuries result in higher mortality and longer hospital stays than accidental head trauma (Christian & Committee on Child Abuse and Neglect, 2015).

Abusive head trauma: Shaken baby syndrome

“Shaken Baby Syndrome” has been replaced by AHT, allowing for consideration of multiple mechanisms of injury, and is thus a subset of AHT (Christian, 2018).

Abusive head trauma: Causes

Several mechanisms contribute to the spinal, cerebral, and cranial injuries that result from inflicted head injury to infants and young children, including the following:

- Blunt impact.
- Shaking.
- Suffocation.
- Strangulation (Christian & Committee on Child Abuse and Neglect, 2015; AAP, 2015).

Thoracoabdominal injuries: Laboratory tests and radiographic studies

Screening laboratory tests, including liver and pancreatic enzyme levels, are important to collect in all children who present with serious trauma. These lab tests are needed even if the child does not display acute abdominal symptoms. A urinalysis may also identify trauma to the urinary tract and kidneys. Radiographic studies, especially contrast-enhancing computed tomography (CT), are helpful in determining the type and severity of intraabdominal trauma. Radiographic studies are needed when screening laboratory tests indicate possible abdominal trauma, in all cases of symptomatic injury, and in most cases when the physical examination is unreliable. The physical exam may be unreliable because of the patient’s age, the presence of other injuries that may complicate the abdominal examination, or the presence of a head injury. Surgical consultation is required for children with inflicted abdominal injury (Christian & Committee on Child Abuse and Neglect, 2015).

Abusive head trauma: Signs and symptoms

The symptoms that most caregivers most often seek medical care for children with AHT are seizures, difficulty breathing, apnea and lifelessness (Christian, 2018). Other signs and symptoms of AHT include:

- Lethargy/decreased muscle tone.
- Extreme irritability.
- Decreased appetite, poor feeding or vomiting.
- Grab-type patterned bruises on arms or chest.
- No smiling or vocalization.
- Poor sucking or swallowing.
- Rigidity or posturing.
- Difficulty breathing.
- Decreased level of consciousness.
- Head or forehead appears large.
- Bulging over fontanelles.
- Inability to lift head.
- Inability of eyes to focus or track movement.
- Unequal pupil sizes Baby Syndrome, 2019).

Compared with children with severe accidental trauma, children with AHT are more likely to have subdural hemorrhage, retinal hemorrhages, or associated cutaneous, skeletal, and visceral injuries (Christian, 2018). Infants with intracranial injuries may have no neurologic symptoms and are sometimes identified during a medical evaluation for other injuries (Christian & Committee on Child Abuse and Neglect, 2015).

Abusive head trauma: Diagnosis

AHT in children is diagnosed through a thorough medical history, physical examination, laboratory tests, and imaging (Choudhary et al.,

2018). The nurse may consult with experienced pediatricians who have been trained in making these diagnoses or with specially trained, board-certified child abuse pediatricians (AAP, 2015).

A history of previous abuse or CPS investigation is common in children with AHT (Christian, 2018). Studies show that 60% of victims with AHT have a history and/or clinical evidence of prior abuse (Christian, 2018).

The hallmarks of child abuse and AHT are retinal hemorrhage with or without additional injury—including spinal, skin, and skeletal injuries—and subdural hematoma with concomitant brain injury (AAP, 2015). Individually, however, these hallmarks are not specific for the diagnosis of abusive head trauma (AAP, 2015).

Other consequences of AHT include: learning, physical, or visual disabilities, hearing impairment, speech disabilities, cerebral palsy, seizures, behavioral disorders, cognitive impairment, and death (National Center on Shaken Baby Syndrome, 2019).

Infants being evaluated for abuse benefit from brain imaging whether or not they have neurologic symptoms, especially because the potential morbidity of AHT is high (Christian & Committee on Child Abuse and Neglect, 2015). All infants and children with suspected AHT require cranial CT, MRI, or both (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: For symptomatic children, CT of the head will identify abnormalities that require immediate surgical intervention. CT of the head is preferred over MRI for identifying scalp swelling from blunt injury and acute hemorrhage and skull fractures. MRI is preferred for assessing intracranial injury, including cerebral hypoxia and ischemia, and is used for asymptomatic infants with abusive injuries other than to the head, all children with abnormal CT scans, and for follow-up of identified trauma (Christian & Committee on Child Abuse and Neglect, 2015).

Investigation by child welfare or law enforcement can help to distinguish accidental from abusive head injury. Several factors contribute to health care professionals missing the detection of AHT:

- Caregivers do not or cannot provide an accurate history of the injury.
- The presenting symptoms can be mild and nonspecific.
- Young infants are difficult to evaluate clinically, which makes accurate diagnosis impossible in some cases (Christian & Committee on Child Abuse and Neglect, 2015).

Abusive head trauma: Retinal hemorrhages

Retinal hemorrhages (bleeding in the back of the eye) can result from medical disease or trauma, including accidental or birth trauma, and AHT (AAP, 2015). Retinal hemorrhages are common (approximately 60-85% of cases) but not universal in child victims of abusive AHT (Christian, 2018). Severe retinal hemorrhages are highly associated with abuse, especially in young infants (Christian & Committee on Child Abuse and Neglect, 2015). When a severe retinal hemorrhage

Physical abuse: Diagnostic testing and documentation

When abuse is suspected as the cause of an injury in a child, the nurse or other health care provider may need to conduct tests to screen for other injuries and underlying medical causes that may be considered in the differential diagnosis of abuse (Christian & Committee on Child Abuse and Neglect, 2015).

The extent of diagnostic testing depends on several factors:

- Type of injury.
- The severity of the injury; the more severe the injury, the more extensive is the need for diagnostic testing for other injuries.
- Age and developmental level of the child; the younger the child, the more extensive is the need for diagnostic testing for other injuries (Christian & Committee on Child Abuse and Neglect, 2015).

is identified in a child, the cause is almost always severe head trauma, leading to brain injury and neurologic compromise (AAP, 2015).

When considering possible child abuse with a child with retinal hemorrhages, it is important to consider possible differential diagnoses. Retinal hemorrhages are occasionally identified in critically ill children who have not been abused, especially those with coagulopathy, leukemia, or severe accidental injury (Christian & Committee on Child Abuse and Neglect, 2015). Retinal hemorrhages caused by one of these alternative reasons are distinguished from abuse by medical history and laboratory testing (Christian & Committee on Child Abuse and Neglect, 2015).

An examination using indirect ophthalmoscopy is required in the evaluation of AHT, preferably by an ophthalmologist with pediatric or retinal experience (Christian & Committee on Child Abuse and Neglect, 2015). The location, depth, and extent of the retinal hemorrhages may distinguish between abusive and other causes of head trauma (Christian & Committee on Child Abuse and Neglect, 2015). Hemorrhages that involve multiple layers of the retina and extend to the ora serrata (serrated junction between the retina and the ciliary body) are strongly associated with AHT (Christian, 2018).

Abusive head trauma: Subdural hematoma

Subdural hematoma is the medical term for bleeding that occurs inside the skull but outside the brain (AAP, 2015). Subdural hematoma is most commonly caused by trauma in infants, children, and adults and is found in the majority of victims of AHT (AAP, 2015). The majority of neurologically symptomatic subdural hematomas identified in infants and toddlers are the result of child abuse (AAP, 2015). Subdural hematomas can result from accidental or abusive trauma or secondary to medical disease (AAP, 2015).

Abusive head trauma: Hypoxic ischemic encephalopathy

Hypoxic ischemic encephalopathy (HIE) is an injury to the brain caused by lack of oxygen and blood flow to the brain (AAP, 2015). HIE is a common feature of AHT and is largely responsible for the poor outcomes of victims (AAP, 2015).

The pathophysiology for HIE in victims of AHT includes the following:

- Apnea (inadequate breathing) attributable to injury.
- Traumatic axonal injury to the brainstem and spinal cord.
- Alterations in blood flow to the brain after trauma.
- Seizures.
- Unmet metabolic demands of the injured brain.
- Secondary cerebral edema (brain swelling) (AAP, 2015).

Potential causes of HIE in infants and children include the following:

- Birth asphyxia.
- Accidental or intentional trauma.
- Suffocation.
- Infection.
- Metabolic disease.
- Congenital anomalies.
- Drowning.
- Choking (AAP, 2015).

When one child is identified as a suspected victim of physical abuse, the nurse should assess the siblings, other young children in the household, and other child contacts of the suspected abuser. A skeletal survey is extremely useful for children under two years of age. Occult fractures are detected in more than 10% of siblings or other household members of abused children (Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: When documenting the encounter with a child with suspected abuse, the nurse should remember that medical records and additional testing are important to assist CPS or police investigation (Christian & Committee on Child Abuse and Neglect, 2015).

PHYSICAL ABUSE: TREATMENT AND PREVENTION

Medical assessment and stabilization should first be achieved along with a timely report to investigative agencies. A report to CPS for further

investigation is mandated by law when the nurse has a reasonable suspicion that the child has been abused (Christian, 2018). The nurse

should continue to advocate for the child involved, helping to make sure that the child receives necessary follow-up services. The child's primary care physician, if not already involved, should be notified. Mental health providers should be contacted and an evaluation arranged because of the psychological effect of abuse or neglect on the child, the siblings, and the caregivers not involved in the abuse (Christian & Committee on Child Abuse and Neglect, 2015). Family members may require medical and mental health assistance because adult intimate partner violence, drug abuse, and other adult stressors often occur along with child abuse (Christian & Committee on Child Abuse and Neglect, 2015). Once the decision has been made to report a concern of physical abuse to CPS, it is important for the nurse to discuss the report with the child's parents and raise concern about an injury (Christian & Committee on Child Abuse and Neglect, 2015).

The following are some steps the nurse can take to help prevent physical abuse:

- Work as a trusted adviser to families, parents, and caregivers about health, development, and discipline.

- Assess caregivers' strengths and deficits.
- Connect families with supportive community resources that address parent and family needs.
- Provide education to parents to enhance parenting skills.
- Provide quality care and education early in life.
- Promote evidence-based parenting practices that are nurturing and positive.
- Partner with home-visiting and parenting programs in the community.
- Recognize abuse and intervene on behalf of an abused child (CDC, 2016; Christian & Committee on Child Abuse and Neglect, 2015).

Nursing consideration: By recognizing child abuse, the nurse can save a life and protect a vulnerable child from a lifetime of negative consequences (Christian & Committee on Child Abuse and Neglect, 2015).

SEXUAL ABUSE

Sexual abuse: Definition, etiology, incidence

Sexual abuse is defined as "a type of maltreatment that refers to the involvement of the child in sexual activity to provide sexual gratification or financial benefit to the perpetrator, including contacts for sexual purposes, molestation, statutory rape, prostitution, pornography, exposure, incest, or other sexually exploitative activities" (HHS, 2019). This definition includes situations in which a child engages in sexual activity for which he/she cannot give consent, is developmentally unprepared, unable to comprehend, and violates the law or social taboos (Bechtel & Bennett, 2019a). It includes fondling and all forms of oral-genital, genital or anal contact with the child (whether clothed or not), as well as non-touching abuses such as exhibitionism, voyeurism or involving the child in pornography (Bechtel & Bennett, 2019a).

According to Child Maltreatment 2017, 8.6% of child abuse victims were sexually abused in the United States (HHS, 2019). Worldwide, an estimated 25% of girls and 9% of boys are sexually abused in childhood (Bechtel & Bennett, 2019a). National studies have found that one in four girls and one in six boys will be sexually abused before age 18 (American SPCC, 2018a). Approximately 34% of perpetrators are family members of the child (American SPCC, 2018a). Perpetrators of sexual abuse may also often be trusted male acquaintances (Bechtel & Bennett, 2019a). "Father" or "other relatives" were responsible for 21% and 19%, respectively, of sexual abuse victims (Bechtel & Bennett, 2019a).

Sexual abuse: Evaluation in the medical setting

The medical assessment of suspected child sexual abuse should include the following:

- Obtaining a medical history.
- Performing a physical examination.
- Obtaining appropriate laboratory tests, including sexually transmitted infection (STI) testing.
- Collecting forensic evidence. Most states have the Sexual Assault Nurse Evaluator (SANE) system which consists of nurse examiners for evidence collection.
- Reporting suspected sexual abuse to CPS.
- Performing a psychological assessment.

- Coordinating with other health care professionals regarding the suspected sexual abuse.
- Providing comprehensive treatment and follow-up of children exposed to sexual abuse (Bechtel & Bennett, 2019a).

Urgent evaluation is necessary in the following circumstances:

- The abuse occurred within 72 to 96 hours.
- There are genital or anal injuries.
- There is obvious forensic evidence on the child's clothes or body.
- There is danger of continued abuse from the perpetrator.
- The child reports homicidal or suicidal ideation (Bechtel & Bennett, 2019a).

Sexual abuse: Long-term effects of abuse

A history of childhood sexual abuse can have lifelong negative effects on a child's mental and physical health. Factors associated with more severe psychological outcomes include: longer duration of abuse, use or threats of violence, fathers as perpetrators or multiple perpetrators, adolescent age at onset of abuse, multiple episodes of abuse, and genital penetration (Bechtel & Bennett, 2019a).

Children exposed to sexual abuse are more likely to face the following consequences:

Sexual abuse in childhood increases the risk of developing the following problems:

- Posttraumatic stress disorder (PTSD).
- Depression.
- Suicidality.
- Anxiety disorder.
- Social phobias.
- Low self-esteem.
- Sexual behaviors.
- Sexually transmitted infections (STIs), including infection with human immunodeficiency virus (HIV) (Bechtel & Bennett, 2019a).

- In the short-term (within two years of the assault), the child may experience fear, disturbances in eating and sleeping, phobias, guilt, shame, anger, depression, school problems, delinquency, aggression, hostility, antisocial behavior, inappropriate sexual behavior and truancy.
- Long-term effects include depression, sleep problems, eating disorders, obesity, feelings of isolation, stigmatization, poor self-esteem, problems with interpersonal relationships, negative effect on sexual function, revictimization, substance abuse, suicidal behavior, and psychosis (Bechtel & Bennett, 2019b).

Nursing consideration: Sexual abuse evaluations are best performed in a nonemergency setting where the examination can be performed in a calm, quiet environment, such as a child abuse advocacy center (Bechtel & Bennett, 2019a).

Sexual abuse: Responding to a parent's concerns

In all suspected sexual abuse cases, the nurse should do the following:

- Carefully document the parent's concerns.
- Take a detailed history of the nature of the child's disclosure.

- The contents of statements or other caregivers should be documented.
- Document a complete medical history, social history, and review of systems, especially changes in bowel or bladder habits (Bechtel & Bennett, 2019a).

Nursing consideration: The history concerning sexual abuse and any symptoms should be obtained from the parent or caregiver separately from the child (Bechtel & Bennett, 2019a). Most parents appreciate sharing their concerns in a private, calm, unhurried manner (Bechtel & Bennett, 2019a).

Sexual abuse: Important issues to address

When there is a possibility of child sexual abuse, the nurse should address several important issues.

The child's safety:

- Is the child likely to be harmed or punished for disclosing abuse?
- Is the child safe to go home?
- Is the child at imminent risk of additional harm if sent back to an environment where a possible perpetrator has access to the child?
- Is there concern that the child might be coerced or intimidated to recant the disclosure?

If any of these questions are answered yes or maybe, this is a child protection emergency, and the appropriate authorities (child protective services or law enforcement) should be contacted immediately.

Reporting to child protection authorities

It is important to remember that every state mandates that professionals report suspected child abuse and neglect to the appropriate government agency: CPS or police agencies, including tribal agencies (HHS, 2019).

The need for a physical examination

If sexual abuse is suspected, a thorough examination should be performed. It should not result in additional emotional or physical trauma (Bechtel & Bennett, 2019a). Parents should understand that

physical evidence is rarely present in children presenting for sexual abuse (Bechtel & Bennett, 2019a).

The need for collecting forensic evidence

Children who have had recent sexual contact involving the exchange of bodily fluids should be immediately referred to a specialized clinic or emergency department capable of collecting evidence using a forensic evidence kit, such as a SANE nurse. Many states recommend that forensic evidence be collected if fewer than 72 hours have passed since the assault. Some states require evidence kits to be performed as late as 96 hours after assault. Studies show that the yield of forensic examination in children is low and that most evidence is found on clothing and linens (Bechtel & Bennett, 2019a). The referral center should also be capable of evaluating the child for the appropriateness of post-exposure prophylaxis for sexually transmitted infections (STIs), antiretroviral HIV prophylaxis, and pregnancy prophylaxis (Bechtel & Bennett, 2019b).

The child's mental health

In every case, the patient should be assessed for possible mental health problems. If any are identified, appropriate emergency mental health care should be obtained (Bechtel & Bennett, 2019b).

Sexual abuse: Interviewing children about possible sexual abuse

Obtaining a thorough history from a child who may have been sexually abused is of utmost importance since physical findings are usually absent (Bechtel & Bennett, 2019a). The child, ideally, should be separated from the parent for the interview (Bechtel & Bennett, 2019a). Parents can influence the child's statements, so separation from the parent is especially important if the parent is a suspected perpetrator or supports the suspected perpetrator (Bechtel & Bennett, 2019a).

If the nurse has not already established a relationship with the patient, time should be spent talking about non-threatening issues (e.g., friends, school, pets). It is difficult for a child to be asked embarrassing or painful questions without first feeling safe and supported by the adult who is asking the questions. The nurse should explain the reason for the visit and describe the examinations that may follow (Bechtel & Bennett, 2019a).

The nurse should not ask leading or suggestive questions. It is important to begin with open-ended, general questions (Bechtel & Bennett, 2019a).

Examples of effective, open-ended questions:

- Has someone ever touched you in a way you didn't like or that made you feel uncomfortable?
- The interviewer should not display shock or disbelief and should maintain a "Tell me more" approach (Bechtel & Bennett, 2019a).

Examples of incorrect or ineffective questions:

- Mr. X touched your bottom, didn't he?
- Did Mr. X touch your bottom? (Bechtel & Bennett, 2019a).

The following information must be obtained when sexual abuse is disclosed:

- Who was the person who did this?
- With what part of their body?
- What part of the patient's body was touched?
- How many times was the child touched?
- When was the last time it happened?
- Where did the abuse occur?
- Was there any exposure to blood or body fluids?
- Did the child experience pain to the affected body part?
- For male assailants, was there ejaculation?
- Did the child tell anyone about the incident? (Bechtel & Bennett, 2019a).

Any descriptions of abuse given by the child should be recorded word for word, using quotation marks, in the medical record, using the child's own language (Bechtel & Bennett, 2019a). Careful notes should be taken during the interview (Bechtel & Bennett, 2019a).

Nursing consideration: When interviewing a child regarding suspected sexual abuse, the nurse should be empathic and supportive. The nurse should treat the patient with the same respect and care given to all other patients. If the child tells the nurse about abuse, the nurse should show appropriate concern and should not act outraged, shocked, or dismissive (Bechtel & Bennett, 2019a).

Sexual abuse: Signs and symptoms

The following are possible signs and symptoms of sexual abuse that may be seen in a medical context or in school or daycare. The child:

- Has nightmares or sleep problems.
- Seems distant or distracted.
- Has a change in eating habits, refuses to eat, or has trouble swallowing.
- Has sudden mood swings.
- Leaves 'clues' that seem likely to provoke discussion about sexual issues.
- Writes, draws, plays, or dreams of sexual or frightening images.
- Develops new or unusual fear of certain people or places.

- Refuses to talk about a shared secret with an adult or older child.
- Talks about a new older friend.
- Suddenly has money, toys, or gifts without reason.
- Thinks of self or body as bad or dirty.
- Exhibits sexual behaviors, language, or knowledge.
- Signs in younger children:
 - An older child behaving like a younger child (thumb sucking or bed-wetting).
 - Has new words for genitals.
 - Resists removing clothes during toileting, bathing.
 - Asks other children to behave sexually or play sexual games.

- Mimics adult-like behaviors with toys.
- Wetting and soiling accidents.
- Signs in adolescents:
 - Self-injury.
 - Poor personal hygiene.
 - Drug and alcohol use.

- Sexual promiscuity.
- Truancy from home.
- Depression, anxiety.
- Suicide attempts.
- Fear of intimacy or closeness.
- Compulsive eating or dieting (Stop It Now!, 2019).

Sexual abuse: Physical examination

The examination should include the mouth, breasts, genitals, inner thighs, perineal region, buttocks and anus. Most sexually abused children have normal anogenital examinations. Many types of molestation (e.g., oral genital contact or fondling) leave no permanent scars or marks. Even children who have been sexually penetrated often have normal physical exams. The rate for abnormal physical exams in children who reported anal or vaginal penetration is only 5 to 15% (Bechtel & Bennett, 2019a).

Nursing consideration: A normal examination of the genitals and anus neither confirms nor rules out sexual abuse. This fact should be mentioned in the assessment portion of the medical record. Most sexually abused children have normal physical exams, including their anogenital examinations (Bechtel & Bennett, 2019a).

The physical examination should be explained to the child in age-appropriate language before the examination takes place. A supportive adult who is not suspected to be involved in the abuse should be present (Bechtel & Bennett, 2019a).

The nurse should keep in mind the following when examining the child:

- The examination of the genitalia and anus does not require the use of instruments in most cases.
- Speculum examinations are contraindicated in prepubertal children in the office setting unless there is active bleeding of unknown etiology. If a speculum exam is needed, the child should be sedated.
- In adolescents, speculum examination is usually indicated after acute vaginal sexual assault to document injuries and to collect forensic specimens. Saline or water should be used instead of petroleum-based lubricants so that it does not affect sperm motility or culture results.
- The use of appropriate gowns and drapes can make the child feel less vulnerable and protect the child's modesty.
- For girls, separation of the labia and gentle labial traction while the child is supine with the knees bent and hips abducted (frog-leg position) will expose the genital structures.
- For boys, the examination of the genitals should also be done in a frog-legged position and should consist of inspection of the penis

and scrotum, documenting any noted trauma, including bruising, erythema, bite marks, abrasions or any other abnormalities.

- Examination of the anus is performed by external inspection with gentle traction of the buttocks to expose the anal sphincter while the child is supine with the knees pulled up to the chest. If penetration is suspected, a stool guaiac test should be done.
- An ultraviolet (UV) or Wood's lamp may be used for detecting semen hours after the abuse.
- Anoscopy or a digital rectal examination is not routinely indicated.
- The anogenital examination should be preceded by a thorough general physical examination (Bechtel & Bennett, 2019a).

Nursing consideration: The physical examination should not cause additional emotional or physical trauma to the child. The purpose of the exam should be explained to the child and their caregivers before it is performed. Many children are comforted knowing that "adults need to have these examinations too" and that such exams can help the child know that his or her body is "okay" (Bechtel & Bennett, 2019a).

Nurses should consult with other medical professionals regarding conducting the physical examination of a child with possible sexual abuse. Every institution that provides care to victims of sexual abuse should have an organized approach to the collection of forensic evidence (Bechtel & Bennett, 2019a). Many states have Sexual Assault Nurse Evaluators (SANE) who are trained for evidence collection from adults and children (Bechtel & Bennett, 2019a). Forensic evidence should be collected within 24 hours of the alleged abuse in the following circumstances:

- There is reasonable concern that sexual abuse has occurred.
- The child has a genital injury.
- Clothing or linen associated with the abuse is available.
- There are other concerning clinical features.

(Bechtel & Bennett, 2019a)

For children who present after 24 hours, institutional protocols should be followed recognizing that the yield in forensic collection decreases after 24 hours (Bechtel & Bennett, 2019a).

Sexual Abuse: Testing for STIs

STI incidence in sexually abused children

A study of 536 children evaluated for suspected sexual abuse revealed the following:

- 8.2% of the female children younger than 14 years had an STI.
- *Neisseria gonorrhoeae* infections were found in 3.3%.
- *Chlamydia trachomatis* infections were found in 3.1% of the girls.
- None tested positive for HIV.
- 1 girl tested positive for syphilis (0.3%).
- 5 of 85 symptomatic girls (5.9%) had *Trichomonas vaginalis* identified on a wet mount.
- 5 of 12 girls with genital lesions tested positive for herpes simplex virus.
- Girls with vaginal discharge were more likely to have an STI (Jenny, Crawford-Jakubiak, & Committee on Child Abuse and Neglect, 2013).

Following are factors that should lead the nurse to consider screening for STIs:

- There is a high likelihood of sexual abuse.
- The child has been abused by a stranger.
- The child has signs or symptoms of STIs, such as genital discharge.
- The child has a sibling or other relative in the household with an STI.
- The child has been abused by a perpetrator known to be infected with an STI or at high risk of STIs: men who have sex with men, intravenous drug users, or people with multiple sexual partners.

- The child has experienced penetration of the genitalia or anus.
- There is evidence of ejaculation on the exam.
- The child has been diagnosed with one STI already.
- Sexually abused adolescents are at higher risk of STIs and should be screened for all STIs, as would any sexually active adolescent presenting for routine care (Bechtel & Bennett, 2019a).

STIs and concerns for sexual abuse in children

The following should be considered when diagnosing STIs in children:

- *C. trachomatis* infections in children older than three years old are likely to be sexually transmitted. Chlamydia can be acquired at birth and can remain asymptomatic until age three years.
- *T. vaginalis* can occur in newborns but is rare in a prepubertal child. In a child older than one year, an infection should raise a concern of possible abuse.
- HIV infections in children who have not been exposed to the virus perinatally, by needle sticks, or through blood products are highly likely to be caused by abuse.
- Herpes simplex virus (HSV) and genital warts (human papillomavirus) can be sexually transmitted in children, but these infections are not diagnostic of abuse by themselves. However, genital warts after age two should be suspect for genital abuse (Bechtel & Bennett, 2019a).

The need for STI prophylaxis depends on the age of the child. In a prepubertal child, antibiotic prophylaxis is not recommended due to the low incidence of STIs following sexual abuse and the lower risk of ascending infections (Bechtel & Bennett, 2019b). All postpubertal children should receive antibiotic prophylaxis (Bechtel & Bennett, 2019b). In this population, there is a higher prevalence of STIs, as well as a preexisting asymptomatic infection; the risk of pelvic inflammatory disease is high; and there is greater probability of not following up (Bechtel & Bennett, 2019b).

When there is a possibility that the child has been exposed to HIV, appropriate follow-up and prophylaxis is needed for the child. The risk of transmission is higher in girls than adult women because the vaginal epithelium is thinner, and adolescents have more cervical ectopy than adults (Bechtel & Bennett, 2019b).

Sexual abuse: Working with families

When children disclose sexual abuse, people in their family or those close to them are often affected significantly. Parents might experience a variety of emotions, including intense anger at the abusers, or have feelings of guilt for not protecting their children (Yamamoto, 2015). A child's disclosure can also bring up a parent's own feelings about adverse childhood experiences as they may have experienced their own traumatic events (Yamamoto, 2015). Some parents may express disbelief at the painful reality of the abuse (Yamamoto, 2015).

Nurses should provide families with guidance about responding to children who disclose sexual abuse. They should make sure that parents understand that medical professionals are required to report suspected abuse to the proper authorities. It is not an option for the nurse to keep the disclosure secret. It is important for families to cooperate with agencies investigating the suspected abuse.

Nurses can also provide guidance to families by recognizing the importance of mental health assessment after childhood trauma. Nurses should become familiar with mental health treatments that have been shown to be effective in treating the effects of abuse. Children should be

Sexual abuse: Treatment

The child or adolescent victim of sexual abuse may be provided with the following:

- Access to emergency contraception in the absence of confirmed pregnancy. The overall risk of pregnancy from sexual assault is 5%.
- Treatment of physical injuries. Hospitalization may be necessary in victims with severe injury or when the home environment is unsafe.
- Appropriate collection and preservation of forensic evidence consistent with chain-of-custody requirements.
- Identification and management of psychological issues related to sexual assault, including PTSD. A social worker with experience in child abuse should be involved.
- HPV vaccination should be offered because there is evidence of a higher risk for early sexual debut in children who have been sexually active.
- Prophylactic treatment of sexually transmitted diseases: HIV/AIDS, chlamydia, gonorrhea, trichomoniasis, and hepatitis B.
- Age-appropriate psychiatric services (Bechtel & Bennett, 2019b).

EMOTIONAL ABUSE

Emotional abuse: Definition, incidence

Psychological or emotional maltreatment is defined as "a pattern of intentional verbal or behavioral actions or lack of actions that convey to a child the message that he or she is worthless, flawed, unloved, unwanted, endangered, or only of value to meet someone else's needs" (Gluck, 2019). Emotional abuse frequently occurs as "verbal abuse or excessive demands on a child's performance" (HHS, 2019). It includes constant criticism, rejection, threats, and withholding love, support, or guidance (HHS, 2019).

According to the Child Maltreatment 2017 report, 1.4% of child abuse victims were emotionally (psychologically) abused (HHS, 2019). A review of the burden and consequences of psychological abuse concluded that a number of large population-based self-report studies in the United Kingdom and United States found that approximately 89%

Self-assessment quiz question #7

Which of the following is *FALSE* regarding STIs and concerns for sexual abuse in children?

- C. trachomatis* infections in children older than three years old are *likely* to be sexually-transmitted.
- T. vaginalis* infection should *not* raise a concern of possible abuse.
- Genital warts in children after age two *should* raise concern for possible sexual abuse.
- HIV infections in children who have been exposed to the virus perinatally, by needle sticks, or through blood products are *unlikely* to be caused by abuse.

seen by therapists with proper training and experience in dealing with child trauma (Bechtel & Bennett, 2019a).

Some communities have child advocacy centers that provide social services, law enforcement and legal services, and medical evaluation (Bechtel & Bennett, 2019a). They can be used as an additional resource for evaluation and treatment of sexual abuse victims, as well as the prosecution of perpetrators (Bechtel & Bennett, 2019a).

Evidence-based practice! Studies have shown that the short and long-term psychological outcomes of children who have experienced sexual abuse are better if they have supportive parental figures. Parent support is more important than abuse-related factors in predicting psychological recovery (Bechtel & Bennett, 2019a).

Self-assessment quiz question #8

Which of the following is *TRUE* about important issues that need to be addressed regarding sexual abuse?

- It should be assumed that the child is safe to go home and the parent/caregiver should not be embarrassed by investigating whether it is safe for the child to go home.
- A physical examination is not needed (a verbal interview with the parent/caregiver is enough information).
- If HIV and pregnancy prophylaxis are needed, the child can wait three to four days to receive the prophylaxis until the child has recovered emotionally from the sexual abuse encounter.
- The child should be assessed for possible mental health problems, and if any are identified, appropriate emergency mental health care should be obtained.

maltreatment involves “a relationship between the parent and the child rather than an event or a series of repeated events occurring within the parent-child relationship” (Hibbard et al., 2012). Therefore, the nurse should be sensitive to subtle cues from the child-parent interaction that indicate emotional abuse.

Nursing consideration: Emotional abuse is usually present when other types of maltreatment are identified (HHS, 2019). The nurse should consider that a child victim of another kind of abuse may also be emotionally abused.

Emotional abuse: Types of emotionally abusive behaviors by caregivers

It is important to remember that isolated incidents of behaviors identified in the following list do not necessarily constitute emotional abuse. Nonetheless, it is important for the nurse to be sensitive to these behaviors when considering the potential for emotional abuse.

Scorn

To demean children, to ridicule or to humiliate them, to cause them to be ashamed, to criticize or insult them.

Isolation

- Restricting social interactions in the community.
- Confining within environment by physically or socially isolating the child.

Terrorism

- Placing in chaotic or dangerous circumstances.
- Having unreasonable or rigid expectations accompanied by threats if not met.
- Threatening or destroying the child’s possession.
- Perpetrating or threatening violence against the child or the child’s loved ones or objects.

Emotional abuse: Signs and symptoms

The following are possible signs and symptoms of emotional abuse that may be seen in a medical context or in school or daycare:

- The child is withdrawn, depressed, or apathetic.
- The child is clingy and forms indiscriminate attachments.
- The child is either inappropriately infantile (e.g., frequently rocking or head-banging) or inappropriately adult (e.g. parenting other children).
- The child “acts out” and displays behavioral problems (i.e. bullying others, using profanity).
- The child suffers from bed-wetting or fecal soiling.
- The child makes comments such as “Mommy/Daddy always tells me I’m bad.”
- The child pays extreme attention to details or exhibits little or no verbal or physical communication with others.
- The child is overly rigid to following rules from teachers, healthcare providers or other adults.

Exploitation and corruption

- Permitting, tolerating, or encouraging antisocial or deviant and inappropriate behavior.
- Encouraging children or coercing them to participate in sexual activities.
- Treating the child as a slave.
- Absence of an emotional response.
- Being inattentive or indifferent towards the child.
- Ignoring the child’s emotional needs, avoiding visual contact, kisses or verbal communication.

Rejection

- Rejecting children, pushing them away, making them feel like they are useless or worthless.
- Undermining the value of their ideas or feelings.
- Refusing to help the child.

Exposure to domestic violence

- Exposing the child to violent words and acts between the parents (Gluck, 2019).

- The parent/caregiver constantly belittles, blames, or berates the child.
- The parent/caregiver overtly rejects the child.
- The parent/caregiver is unconcerned about the child and refuses to consider offers of help for the child’s problems (American SPCC, 2018b).

Self-assessment quiz question #9

Which of the following is *TRUE* regarding possible signs and symptoms of emotional abuse in a child?

- a. The child reports a strong attachment to the parent.
- b. The child shows no extremes in behavior.
- c. The child is either inappropriately infantile (e.g. frequently rocking or head-banging) or inappropriately adult (e.g. parenting other children).
- d. The child shows maturity in emotional or physical development.

Emotional abuse: Medical history and assessment

Nurses need to be alert to the possibility of emotional abuse and consider emotional abuse in any assessment of psychological and behavioral conditions in childhood. When the nurse is considering whether a child is being exposed to emotional abuse, it is important to obtain a medical history from multiple informants whenever possible.

It is important for the nurse to develop approaches for asking verbal children about the child’s relationship with caregivers, the child’s feelings of safety, self-worth, and being loved, and the child’s experiences of discipline (Hibbard et al., 2012). Some emotional abuse happens in this context.

An individual interview with the child is important for the assessment of any concerns of major behavioral or psychological problems. Very young children, once they can speak in sentences, can usually provide ample information in an interview (Hibbard et al., 2012).

Emotional abuse: Physical exam

There are no specific physical indicators for emotional abuse. However, it is essential to assess a child’s growth and development because these can be impaired in association with exposure to emotional abuse (Hibbard et al., 2012).

Severe forms of psychological deprivation can be associated with psychosocial short stature, a condition of short stature or growth failure, formerly known as psychosocial dwarfism (Hibbard et al., 2012).

Nursing consideration: If the nurse suspects emotional abuse, it is important to interview children alone, away from their caregivers, because they may be experiencing emotional abuse from the very caregivers who accompanied them to a medical appointment (Hibbard et al, 2012).

For children of all ages, major caregivers should be interviewed. Interviews should be performed individually to ensure the safety of both the parent/caregiver and child safety when asking about such issues as intimate partner violence (Hibbard et al., 2012). In addition, information should be gathered from childcare personnel or teachers (Hibbard et al., 2012).

Consultation with a mental health professional and a pediatrician expert in assessing child maltreatment can assist the nurse in completing an assessment and plan (Hibbard et al., 2012).

The nurse should observe the child and parents together. The interaction or lack of interaction can provide valuable information about the quality of the child-parent relationship and ability of a parent to respond to a child (Hibbard et al., 2012).

Nursing consideration: The nurse should remember that appropriate behavior by a parent in the context of a brief health care visit does not rule out the possibility that a child is experiencing emotional abuse. At the same time, a single interaction observed by the nurse that is of concern between a parent and child is generally not diagnostic of emotional abuse (Hibbard et al, 2012). Nonetheless, the nurse should not hesitate to contact CPS if he/she suspects emotional abuse.

Emotional abuse: Risk factors

Emotional abuse occurs in a wide range of families and is often associated with multiple family stresses, including such factors as adult mental health problems (e.g., psychiatric illness, including depression), family conflict, and parental substance abuse (Hibbard et al., 2012). Substance abuse on the part of one or both parents is associated with high rates of child maltreatment. (Hibbard et al., 2012).

Some parental mental health problems are associated with unpredictable and frightening behaviors (Hibbard et al., 2012). Other mental health problems, especially depression, are linked with parental neglect and withdrawal (Hibbard et al., 2012).

Emotional abuse: Effects on the child victim

Emotional abuse can negatively affect the child's cognitive, emotional, social, and physical development. Emotional abuse is considered one of the most damaging forms of maltreatment (Prevent Child Abuse America, 2019). Studies show that emotional abuse is a stronger predictor of impairments and trauma than physical abuse (Prevent Child Abuse America, 2019).

Emotional abuse of children has been linked with the following:

- Disorders of attachment and inability to trust or difficulty forming relationships.
- Developmental delays.
- Drug and alcohol use.
- High-risk sexual behaviors.
- Destructive, aggressive, anti-social behaviors.
- Difficulty regulating emotions
- Suicidal thoughts or attempts.
- Psychopathology later in life, including depression, anxiety, low self-esteem, lack of empathy (Prevent Child Abuse America, 2019; Kidshepline, 2019).

Evidence-based practice! Research involving Romanian orphans with little to no human interaction demonstrated the effects of severe emotional and sensory deprivation on later IQ, psychological processing, executive function and memory, attachment, and psychiatric disorders (Hibbard et al, 2012) The reporting of suspected emotional abuse to CPS, therefore, is essential for nurses to complete as soon as possible to protect children from further harm in the short term and long term.

The effects of emotional abuse during the first three years of life can be particularly significant because of the rapid and extensive growth of the brain and biological systems during this period of the child's life (Hibbard et al., 2012). During this time, the child's growth is significantly influenced by the environment and, specifically, the early parenting the child receives (Hibbard et al., 2012).

Studies have suggested a strong association between emotional abuse and psychiatric morbidity (Hibbard et al., 2012). For example, one

Emotional abuse: Intervention

Intervention should focus on ensuring the child's safety and a thorough assessment of the child. Effective treatments include cognitive behavioral parenting programs and other psychotherapeutic interventions (Hibbard et al., 2012). Nurses should be alert to the possibility of emotional abuse and identify ways to support families who have risk indicators for or evidence of this problem (Hibbard et al., 2012). If the nurse suspects emotional abuse, the nurse should contact CPS, especially if the child's safety is at risk (Hibbard et al., 2012).

It is important that the nurse record specific statements from the child, the family, and other sources (Hibbard et al., 2012). The nurse should be systematic in assessing the child's behavioral, psychological, and physical status in relation to the baseline assessment (Hibbard et al., 2012).

In terms of family conflict, attacks on a parent usually frighten a child even if the child is not the direct target (Hibbard et al., 2012). Threats or actual violence as part of a pattern of aggression against one parent will sometimes exploit the other parent's or the child's fears (Hibbard et al., 2012).

Children exposed to violence in the home are at disproportionate risk of injury, eating disorders, and self-harm even when they are not themselves victims of physical violence (Hibbard et al., 2012).

study found that psychological unavailability and neglect in early childhood were associated with the following in adolescence:

- Delinquency.
- Increased social problems.
- Aggression.
- Attempted suicide.
- At least one diagnosis of mental illness (Hibbard et al., 2012).

Attachment problems because of emotional abuse in childhood

Emotional abuse negatively affects the organization of the child's attachment to important adults in their life. Studies have shown that the security of attachment are associated with later problems for the child (Hibbard et al., 2012). Early parenting plays a significant role in influencing children's beliefs about themselves, in terms of the extent to which they are lovable, and about themselves in relation to other people (Hibbard et al., 2012). Through healthy attachment, children learn that when they have needs, people will respond appropriately to them (Hibbard et al., 2012). Research suggests that these internalized beliefs regarding attachment can affect the child's later cognitive schemas and psychological adjustment (Hibbard et al., 2012).

Emotional abuse in early childhood is also associated with insecure attachment in adulthood. A recent overview of the evidence found that as the child grows older, such attachment problems interfere with a number of aspects of later functioning, including the following:

- Peer relations.
- Caregiving and caretaking.
- Intimacy.
- Conflict resolution.
- Sexual functioning.
- Relational aggression (Hibbard et al., 2012).

Factors that may influence the effects of emotional abuse on the child

The following factors may influence how the child is affected by emotional abuse:

- Early caregiving experiences.
- Factors intrinsic to the child, such as self-esteem, behavioral and coping strategies, and disposition of the child.
- The intensity, frequency, and duration of the emotional abuse.
- The availability of supportive relationships (Hibbard et al., 2012).

The nurse should encourage parents experiencing intimate partner violence, mental health problems, or substance abuse to consider the effects of such conditions on their parenting and should assist parents in accessing appropriate resources (Hibbard et al., 2012). Resources may include referrals to mental health professionals and substance abuse treatment programs (Hibbard et al., 2012).

Children showing signs of psychological and behavioral problems should be assessed as soon as possible to identify the specific conditions, such as posttraumatic stress disorder or depression, for

which there are evidence-based treatments for children. (Hibbard et al., 2012).

Careful follow-up is very important for parents who are emotionally abusing a child because parents who are psychologically abusive may not be reliable in providing information about their own response to interventions or about their child's functioning (Hibbard et al., 2012).

Emotional abuse: Prevention

Prevention of emotional abuse requires interventions aimed at promoting the type of parenting that is now recognized to be necessary for optimal child development, in addition to targeted interventions directed at improving parental sensitivity to a child's cues. Raising public awareness about the signs and effects of child emotional abuse is also important (Prevent Child Abuse America, 2019).

A meta-analysis of attachment-based interventions, including home-visiting programs and parent-infant psychotherapy, found significant improvements in maternal sensitivity and infant attachment insecurity (Hibbard et al., 2012). Greater effectiveness was associated with programs that had a clear behavioral focus and included several sessions (Hibbard et al., 2012).

Without intervention, the cycle of emotional abuse is often repeated in the next generation. Emotional abuse carries a significant burden for society through the costs of crime, educational failure, and health services as a result of the poor mental health of emotional abuse victims (Hibbard et al., 2012).

Evidence-based practice! One targeted program that has been shown effective in preventing child maltreatment is Nurse-Family Partnership (NFP), an intensive home-visitation program provided by nurses to low-income first-time mothers beginning prenatally and during infancy. The goals of NFP include assisting women to promote healthy prenatal behaviors and parents' competent care of their children (Hibbard et al., 2012). Nurses can participate in NFP or learn more about the partnership at <https://www.nursefamilypartnership.org/>

FACTITIOUS DISORDER IMPOSED ON ANOTHER (FDIA)

Factitious Disorder Imposed on Another: Definition, incidence

Factitious Disorder Imposed on Another (FDIA), also formerly known as Munchausen Syndrome by Proxy, is defined as a "child receiving unnecessary and harmful or potentially harmful medical care due to a caregiver's overt actions, including exaggeration of symptoms, lying about the history or simulating physical findings (fabrication), or intentionally inducing illness in their child" (Roesler & Jenny, 2018). FDIA is also known as medical child abuse or caregiver-fabricated illness in a child.

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines FDIA as meeting the following criteria:

- "The Perpetrator engages in the deceptive falsification of physical or psychological signs or symptoms, or of induction of injury or disease in another.
- The Perpetrator presents the victim to other as ill, impaired or injured.
- The deceptive behavior is present also in absence of external incentives (e.g., in the case of malingering).
- The behavior is not better accounted for by another mental disorder (e.g., psychotic or delusional disorder)" (Faedda et al., 2018).

In FDIA, the child receives unnecessary and harmful or potentially harmful medical care at the recommendation of the child's caretaker (Roesler & Jenny, 2018). The essential feature of the condition is the caregiver's falsification and inducement of physical or psychological symptoms or signs in a child that place the child at potential risk (Roesler & Jenny, 2018).

FDIA in a child is relatively rare, but best estimates suggest that nurses and other health professionals will encounter at least one case during

their career (Roesler & Jenny, 2018). Based on observational studies, the estimated annual incidence of FDIA is 0.4 to 1.2 per 1,000 children younger than age 16; however this number is likely underestimated (Roesler & Jenny, 2018).

Although FDIA is a relatively uncommon form of child maltreatment, it can result in significant morbidity and mortality. Because of the potential for morbidity and mortality, it is important that nurses have a high index of suspicion for FDIA when faced with a persistent or recurrent illness that cannot be explained and that results in multiple medical procedures or discrepancies between the history, physical examination, and the health of the child (Roesler & Jenny, 2018).

General features seen in children with FDIA include:

- The history the parent gives is different than what is observed or does not make sense (the parent describes serious symptoms in a normal appearing child).
- Histories vary significantly by different observers suggesting the perpetrator's history is distorted.
- The illness is recurrent, unexplained, unusual or prolonged and does not respond to treatment.
- Family history may indicate that the child's siblings have died or have had similar illnesses.
- The child is subject to repeated office visits, multiple diagnostic tests and medical interventions, as well as management by many specialists, without improvement of the illness.
- Signs or symptoms only begin in the presence of the caregiver. Clinical improvement occurs when they are separated from the caregiver (Roesler & Jenny, 2018).

FDIA: Perpetrator features

The offending perpetrator/caregiver may have the following characteristics:

- Over 95% are female, mostly mothers. Fathers, grandparents, boyfriends, and childcare providers have also been found responsible.
- Caregivers who appear to need or thrive on attention from medical staff or from people more powerful than themselves.
- Caregivers who are either directly involved in professions related to health care or at least have a familiarity with medical terminology.
- Caregivers accept invasive diagnostic and surgical procedures without concern.
- Caregivers who have no healthy adult relationships and have family and marital problems.
- History of factitious, somatoform, or other psychiatric disorder. Alcoholism, mood and anxiety disorders have been reported in 35% of perpetrators.

- History of deprivation and abuse as a child.
- History of self-harm, alcohol or drug abuse, and criminal activity (Roesler & Jenny, 2018; Faedda et al., 2018).

Nursing consideration: Many attempts have been made to develop a "profile" of a typical perpetrator. The profile includes the following characteristics: having extensive medical knowledge, exhibiting calm during otherwise stressful medical events, being a medical provider, and becoming angry at medical providers who do not agree with them (Roesler & Jenny, 2018). While these may be helpful in raising one's suspicion, they have little predictive value and thus the nurse should remain focused on the experience of the child rather than the personality of the caregiver (Roesler & Jenny, 2018).

FDIA: Perpetrators' methods of fabricating an illness

The offending perpetrator/caregiver may do any of the following:

- Exaggerate symptoms of a real disease.
- Fabricate or invent a history of illness (altering or fabricating medical records, reporting symptoms that have not occurred, simulation of symptoms, or failing to report significant medical information).

- Actually produce the signs and symptoms of illness by administering medications, inducing coma, seizures, apnea or rashes, for example.
- Convince the child and family members that the child has an illness.
- Coach the victim or others into misrepresenting the victim as ill (Roesler & Jenny, 2018).

FDIA: Victim demographics

Most of the victims of FDIA are infants and toddlers. The median age of victims at diagnosis ranges from 20 to 39.8 months (Brannon, 2015). Females and males are victimized equally in FDIA (Brannon, 2015). Of the victims, it is estimated that 8.5 to 25.8% have siblings who are victims of the same abuse (Brannon, 2015).

Nursing consideration: Siblings of children who are victims of FDIA are also frequently abused. In one study of 27 infants who were suffocated, 48% had a sibling who had allegedly died of sudden infant death syndrome (SIDS) (Brannon, 2015). The nurse should always investigate the child's siblings if the nurse suspects FDIA.

Red flags for FDIA in the victim include:

- Atypical presentation of a disorder.
- Work up, physical exam, and observations are normal.
- Medical problems don't respond to treatment.
- Signs and symptoms occur only in the caregiver's presence and disappear in their absence.
- Multiple hospitalizations and surgeries.
- Presence of multiple medical illnesses.
- Occurrence of complications or new illness when the findings prove negative. Father is absent in the life of the child (Faedda et al., 2018).

FDIA: Signs and symptoms

There is no typical presentation of FDIA. Almost every disease category has been implicated in FDIA and there is a broad range of manifestations (Roesler & Jenny, 2018).

The following are the most common signs and symptoms for FDIA:

- Apnea.
- Anorexia or feeding problems.
- Bleeding, including blood in urine, vomit or stool.
- Diarrhea.
- Vomiting.
- Seizures.
- Fever.
- Rash (Unal et al., 2017).

FDIA includes not only fabrication of physical conditions but also fabrication of emotional and behavioral conditions:

- Attention-deficit hyperactivity disorder.
- Bipolar disorder.
- Anorexia.
- Allegations of sexual abuse (Roesler & Jenny, 2018).

Nursing consideration: There is no consistent psychological presentation or psychiatric diagnosis among caregivers who have fabricated illness in a child. Nevertheless, the nurse should never assume that a child's illness is fabricated. The nurse may keep FDIA in the differential, but never assume that the illness is not real just because the caregiver presents with one of the risk indicators listed earlier.

FDIA: History taking and assessment

If a child with the possible fabricated illness is verbal, the child should be interviewed separately from the caregiver (Roesler & Jenny, 2018). It is also important for the nurse to take a careful family and social history, including information about any unusual or frequent illnesses in the extended family and siblings (Roesler & Jenny, 2018).

A multidisciplinary evaluation involving medical and psychosocial professionals, child protective services, law enforcement agency, hospital risk management and legal professionals is important when considering FDIA (Brannon, 2015). Because of the complexity of the diagnosis of FDIA in a child, the nurse should consult with a specialist in child abuse pediatrics, the child's pediatrician, and other relevant medical professionals.

FDIA: Diagnosis

FDIA, like other forms of child maltreatment, is not a diagnosis of exclusion. The nurse should evaluate the child for illness fabrication while simultaneously searching for other medical explanations for the illness, including an investigation of unusual and rare medical problems or unexplored illnesses.

The signs and symptoms reported by a caregiver may not actually be present during the nurse's evaluation, so the diagnosis of FDIA in a child can be difficult. Although it is challenging to diagnose FDIA in a child, there are aspects of FDIA that the nurse can consider to aid in the diagnosis. The nurse should remember that when illness is induced or fabricated, the signs and symptoms may be inconsistent with normal physiology (Roesler & Jenny, 2018).

Following are indicators that should cause the nurse to consider fabricated illness:

- A caregiver who insists on painful procedures or hospitalization despite reassurance that they are not necessary.
- A caregiver who goes "doctor shopping" and seeks another medical opinion when told that the child does not have an illness.

- Repeated office or emergency department visits that do not yield abnormal findings.
- Failure to respect professional boundaries (contacting healthcare personnel via social media or cell phone) (Roesler & Jenny, 2018).

It also may be helpful to review the child's old medical records, as well as investigate the mother's medical history, as many perpetrators also have factitious disorder imposed on themselves (Brannon, 2015).

Self-assessment quiz question #10

Which of the following is *NOT* an indicator of possible FIAD (fabricated illness) in a child?

- a. Signs or symptoms are unusual.
- b. The child's sibling has or had an unusual or unexplained death or illness.
- c. The diagnosis matches the objective findings.
- d. Caregiver publicly solicits sympathy or donations or benefits because of the child's rare illness.

FDIA: Morbidity and mortality

Children who are victims of fabricated illness can suffer significant morbidity and mortality. Victims of FDIA are at higher risk for behavioral problems, such as emotional and conduct disorders, achievement problems, poor school attendance, fears and avoidances of specific places or situations, sleep disorders and PTSD (Brannon, 2015).

According to one study that looked at 451 published accounts of FDIA, there was a fatal outcome in 6% of cases and prolonged or permanent disability in 7.3% of cases (Yates & Bass, 2017). There are reports of surgeons performing pancreatectomies, hemicolectomies, and limb amputations under pressure from caregivers (Yates & Bass, 2017). Furthermore, it has been hypothesized that approximately 10% of sudden infant death cases are related to FDIA (Yates & Bass, 2017).

FDIA: Management

Nurses should report any reasonable suspicions of child abuse promptly to CPS authorities. Nurses should collaborate with physicians, the child's pediatrician, mental health professionals, and other specialists together with CPS as FDIA is a complex diagnosis.

Nursing consideration: Many state child protective services systems do not list FDIA, fabricated illness, or any of its various names as a specific form of child maltreatment. When reporting suspected fabricated illness in these states, the nurse should focus on how the child was affected: for example, suspected physical abuse, emotional abuse, or other categories that apply to the child's suspected abuse. If the child protective services system's response seems inadequate, the nurse should ask a local specialist in child abuse pediatrics for advice and assistance.

FDIA: Outcomes

According to one study, the factors associated with better outcomes for children who had been victimized by FDIA included the following:

- An identifiable stressor that is present at the time of abuse.
- The perpetrator admits to false reporting and/or induction of illness.
- The perpetrator works cooperatively with CPS, pediatric and psychiatric services.
- CPS, social work, medical and psychiatric follow up is in place for the child and the perpetrator (Roesler & Jenny, 2018).

REVISITING THE CASE STUDY

The patient likely has been experiencing neglect in the form of medical neglect, physical neglect, and emotional neglect. Neglect, the most common form of child abuse or neglect, comprises about 75% of child abuse or neglect cases (AAP, 2016) and is defined as "a type of maltreatment that refers to the failure by the caregiver to provide needed, age-appropriate care although financially able to do so or offered financial or other means to do so" (HHS, 2019). The patient's mother has health insurance for the patient and has the means to bring the patient to her well-child checkups (the mother has a car). The mother is financially able to provide needed care for the patient.

The patient is experiencing: 1) medical neglect: failure to provide necessary medical treatment through missed vaccinations, missed medical visits, lack of dental care; 2) physical neglect: failure to provide necessary food, locking the fridge, punishing the child by withholding food, the child's visible decline in weight and height on the growth curve, skin abrasions on the feet that are likely because of poor footwear, lack of adequate clothing for the weather conditions, lack of bathing, lack of washing of clothes; and 3) emotional neglect:

inattention to a child's emotional needs during the office visit and a lack of a parent-child bond during the visit that may or may not indicate an ongoing emotionally neglectful parent-child relationship.

The nurse can, therefore, suspect neglect and should take the next step to report to CPS while collaborating with a health care supervisor, the child's primary care physician, a mental health specialist, and any other relevant health care professionals in determining the next steps for the child and family. The nurse should clean and examine the foot skin abrasions, noting if there are any skin infections because of the abrasions, and treat foot wounds as necessary. The mother and possibly other parent/caregiver, if needed, could benefit from counseling and an intervention involving parenting education and substance abuse treatment.

This case study stresses the importance of the nurse's being already familiar with the home state statutes about child abuse and neglect because statutes vary state to state. The nurse's being already familiar with their home state's child abuse and neglect statutes prepares the nurse to handle potential child abuse and neglect cases more efficiently.

Conclusion

Child abuse comes in many forms with some forms being more physically obvious than others. A bruise may be easily spotted but emotional abuse may be subtler. A child may be at risk for abuse and neglect in the future but could have a normal physical examination the day the child presents to the nurse. The nurse, after reviewing the major categories of child abuse, must be able to recognize the signs and symptoms and risk factors for neglect, physical abuse, sexual abuse, emotional abuse, and FDIA. These signs and symptoms may not be obvious physically and may need to be discovered through efficient medical history taking, including family history and social history. History taking may reveal present dangers and future dangers for the child and possibly for the child's siblings.

The nurse may be the first or the only health care professional within a medical community to notice a sign of child abuse. For this reason, it is imperative that the nurse report any suspicion of abuse to child protective services (CPS) to prevent current and future child abuse. The nurse does not need to be 100% sure of child abuse to report to CPS, but only needs to suspect abuse or the potential for abuse.

It is important to include child abuse in the differential diagnosis when examining a child. It is also important to keep in mind alternative reasons for bruising, bleeding, fractures, and other possible signs and symptoms of abuse that may be caused by medical conditions, vitamin deficiencies, or reasons other than abuse. An investigation of child abuse should occur in parallel with an investigation for alternative medical reasons for typical abuse-related signs and symptoms.

RESOURCES FOR NURSES REGARDING CHILD ABUSE AND NEGLECT

- U.S. Department of Health and Human Services: Child Welfare Information Gateway:
<https://www.childwelfare.gov/>
- Within the Child Welfare Information Gateway, a Child Abuse and Neglect User Manual series:
<https://www.childwelfare.gov/catalog/serieslist/>
- *The Role of Professional Child Care Providers in Preventing and Responding to Child Abuse and Neglect*, chapter 3, “Reporting Suspected Child Abuse or Neglect”:
<https://www.childwelfare.gov/pubs/umnew/>
- State-by-state phone numbers for contacting CPS:
https://www.childwelfare.gov/organizations/?CWIGFunctionsaction=rols:main.dspROL&rolType=custom&rs_id=5
- A state-by-state database of state statutes related to child abuse and neglect:
<https://childwelfare.gov/topics/systemwide/laws/policies/state/>
- More information about mandatory reporters and state-by-state information about reporting:
[https://www.childwelfare.gov/pubPDFs/manda.pdf?page=5&view=Summaries of State laws](https://www.childwelfare.gov/pubPDFs/manda.pdf?page=5&view=Summaries%20of%20State%20laws)
- The Child Maltreatment 2017 document:
<https://www.acf.hhs.gov/sites/default/files/cb/cm2017.pdf>
- Prevent Child Abuse America:
<https://preventchildabuse.org>

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CHILD ABUSE: IDENTIFICATION, MANAGEMENT, AND REPORTING

Self-Assessment Answers and Rationales

1. The correct answer is C.

Rationale: According to Child Maltreatment 2017, the most common form of child abuse/neglect in the United States is neglect (74.9% of the total number of child abuse victims were neglected). According to Child Maltreatment 2017, 18.3% were physically abused; 8.6% were sexually abused; 6% were psychologically (emotionally) abused; 2.2% suffered medical neglect; and 7.1% were victims of threatened abuse or neglect, victims of a parent's drug or alcohol abuse, and lack of supervision (HHS, 2019).

2. The correct answer is B.

Rationale: The nurse should report to CPS even if the nurse is not 100% positive that child abuse is occurring. The nurse should not hesitate to contact CPS if child abuse is suspected, even if there is a chance that abuse is not occurring. The nurse should also consider alternative reasons for signs and symptoms of abuse and be sure to conduct a thorough medical history with the child (if verbal) and the parent(s)/caregivers(s).

3. The correct answer is D.

Rationale: Risk factors for child maltreatment (abuse/neglect) for the child (victim) include: emotional/behavioral difficulties, developmental disabilities, chronic illness, physical disabilities, unwanted child, preterm birth, and unplanned pregnancy.

4. The correct answer is D.

Rationale: The physical exam findings of a child suffering from neglect may include malnutrition, extensive dental caries, neglected wound care, and untreated diaper dermatitis. Bruising is commonly seen in physical abuse victims.

5. The correct answer is D.

Rationale: Burns comprise 14% of physical abuse injuries. Soft tissue injuries are the most common (bruises, abrasions, and/or lacerations). Head injuries are less frequent but cause the majority of deaths, including Shaken Baby Syndrome (altered consciousness with or without signs of head injuries).

6. The correct answer is C.

Rationale: Fractures with HIGH specificity for abuse in children include rib fractures, especially posteromedial; CMLs (classic metaphyseal lesions); spinous process fractures; scapular fractures; and sternal fractures. Clavicular fractures are fractures with LOW specificity for abuse in children.

7. The correct answer is B.

Rationale: *T vaginalis* infection should raise a concern of possible abuse. The other statements are correct.

8. The correct answer is D.

Rationale: The nurse should investigate whether or not it is safe for the child to go home. If it is not safe for the child to go home, this is considered a child protection emergency. A physical examination is needed following suspected sexual abuse. A thorough examination should be performed to rule out injury, especially if a child is reporting genital or anal pain or bleeding. If the child reports dysuria, a urinalysis is indicated. Rarely, acute sexual assault can cause severe genital or anal injury that can lead to excessive blood loss (a medical emergency). HIV and pregnancy prophylaxis should be given as soon after the sexual contact as possible. HIV and pregnancy prophylaxis are NOT recommended more than 72 hours after contact. In every case, the patient should be assessed for possible mental health problems, and if any are identified, appropriate emergency mental health care should be obtained.

9. The correct answer is C.

Rationale: Consider the possibility of emotional abuse when: the child shows extremes in behavior, such as overly demanding or compliant behavior, extreme passivity, or aggression; the child reports a lack of attachment to the parent; the child is either inappropriately infantile (e.g. frequently rocking or head-banging) or inappropriately adult (e.g. parenting other children); or the child is delayed in emotional or physical development.

10. The correct answer is C.

Rationale: An indicator of possible FDIA (fabricated illness) in a child is that the diagnosis **does not** match the objective findings. The rest of the statements are indicators of possible FDIA (fabricated illness) in a child.

Communication in Health Care, 2nd Edition

4 Contact Hours

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Faculty

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After completing this course, the learner will be able to do the following:

- Examine the historical and theoretical basis of communication concepts.
- Demonstrate understanding of the fundamentals of human communication and their application to communication in healthcare.

- Describe barriers to healthcare professional-patient communication that impede therapeutic communication and positive patient outcomes. Compare ways to improve the effectiveness of communication with patients.

INTRODUCTION

Few things bind us as humans as tightly as communication. We all do it – communicate, that is – in a variety of forms and with varying degrees of efficacy. On its most fundamental level, communication among humans amounts to the transfer of information or ideas from one person to another. This point-A-to-point-B transmission process seems a simple enough concept, and it is so universally understood and accepted that it tends to be taken for granted. Yet communication between people is not necessarily a straightforward endeavor, nor even an easy one. Rather, communication represents a complex, dynamic social activity that pervades every aspect of our interaction with others. It is the “on” switch that powers all of human connection. It is the means by which we form and manage relationships, however simple or complicated those relationships may be.

In healthcare settings, few things promote the development of successful patient-provider relationships – and the positive impact of those relationships on patient outcomes and satisfaction – as indispensably as effective communication. Put simply, good relationships, built with good communication skills, make for good outcomes. Evidence supports this formula: The quality of patient-provider relationships has been shown to improve patient satisfaction and health outcomes (2016; Haverfield et al., 2020; Kornhaber et al.). The effective communication between healthcare clinicians and their patients demonstrates such wide-ranging benefits as improved adherence to treatment regimens, better utilization of healthcare resources, and lower costs (Drossman & Ruddy, 2020; Okunrintemi et al., 2017). On the other hand, lack of effective communication among healthcare providers can jeopardize patient safety. Miscommunication among clinicians, particularly during patient handoffs, has been found to be a leading cause of preventable adverse clinical events (Mardis et al., 2017; Muller et al., 2018). Inadequate or ineffective communication also

can impact clinicians' job satisfaction, a key marker of patient safety and quality care. For example, nurses who perceive communication positively in their work settings are less likely to experience burnout or leave the profession (Sullivan Havens et al., 2018; Vermeir et al., 2017).

Healthcare professional consideration: Successful communication in clinical practice requires skill, sensitivity, and intuition. To optimize health outcomes, the practitioner-patient relationship relies as much on the development of trust and respect; the understanding of, and sensitivity to, patients' values, perspectives, perceptions, and culture; and the display of empathy as it does on clinical observation and assessment.

Despite advances in communication theory and methods, historical barriers to effective communication in healthcare – constraints on time and staffing, environmental distractions, and shifting patient perceptions among them – steadfastly remain. Clinician education has traditionally favored clinical skills relative to a focus on so-called soft skills, such as communication, leaving many healthcare professionals feeling ill-equipped to successfully address the wide array of patient and collegial interactions they encounter, often for the first time, on the job. In addition, research is exploring the ways that rapid evolution of the healthcare industry and emerging technologies affect healthcare professionals' current and future ability to respond to their patients' and colleagues' communication needs, particularly among professionals who lag behind adoption of new technologies (De Leeuw et al., 2020). In the short term, as healthcare organizations endeavor to fulfill The Joint Commission (TJC, 2010) standards regarding patient-centered care, healthcare professionals are called upon to successfully incorporate patient-oriented communication techniques into practice.

FUNDAMENTALS OF COMMUNICATION

Commonality lies at the root of communication. The very term derives from the Latin noun *communis*, which means “common,” and is related to the Latin verb *communicare*, meaning “to make common” or “to share.” Humans have participated in that sharing since long before ancient Rome attached a word to it, however. The phenomenon of communication has been fundamental to human life – and human survival – since the beginning of humanness itself.

Along the continuum of human existence, from prehistoric people's use of pictographs to the 21st century's manipulations of complicated computer code, we humans gained an evolutionary edge through our capacity to attach common meaning, both proximate and conceptualized, to our reality in ways that other species cannot. Researchers have long theorized that, from the start, our ability to mutually understand and exchange information – not only about our

immediate surroundings but also, importantly, about abstractions beyond our direct experience – set us apart (Dance & Larson, 1976). Our values, beliefs, and emotions, alongside our perception of such wide-ranging concepts as freedom, fairness, art, or healthcare, rely on our human aptitude for ascribing common meaning to both the tangible and the abstract. Our cognitive powers, along with our collective capacity to think symbolically and to share that thinking with others of our species, are a uniquely human characteristic (Miyagawa et al., 2018). Evidence suggests that it is enabled by a distinctive area of our brains, namely, the human ventrolateral frontal cortex, associated with language and other cognitive processes (Snow, 2016).

In other words, communication is part of our nature; it is a significant portion of what makes us human.

Definition of communication

As central as communication is to human nature, it was not until the 20th century that scholars began to industriously theorize about the nature of communication. In little more than the past 100 years, communication science, as a distinct academic discipline, has explored the characteristics of language and other facets of communication, as well as developed models explaining the process by which it occurs. Yet definitions of communication remain as diverse as the theories that describe it, and theorists wrangle over factors, such as culture and intent, that may influence the meaning of the term (Trenholm, 2017).

Even as the science evolves, long-standing research has identified observable characteristics of communication (Dance, 1970). Communication, for example, is an inevitable behavior among people. Influential work in communication theory asserts that “no matter how one may try, one cannot not communicate” (Watzlawick et al., 1967, p. 30). We communicate even when we do not realize we are doing so.

Language, of course, often comes to mind when one considers the what of communication, but language is not unique to humans. Animals and certain plant species have their own means of communication. Human language distinguishes itself by its use of symbols. Our capacity to conceptualize, to think beyond our temporal being, allows us to assign meaning, not only to objects but also to actions and emotions, about all of which we conventionally share understanding (Onjefu & Olalekan, 2016). Across geography and culture, we use language to signify our collective knowledge of physical things (form) – book, chair, or stethoscope, for instance. We also use symbolic language to commonly recognize the manner in which we interact with those things (such as read, sit, or listen) and how we feel about them (for example, bored, comfortable, or grateful). No matter how you feel about it (emotion), you are able to read and understand (action) this course (object) because you share with your fellow humans a long-established, mutual understanding of the symbols – in this case, the words – it contains.

Language, then, conveys meaning, but words, spoken or written do not make up the whole of human language. Images and nonverbal actions carry meaning as well. Facial expressions; posture; affect; eye contact (or lack of it); tone, inflection, and pitch of voice; touch; physical gestures; social distance; and personal appearance, all have import. They each transmit a symbol or set of symbols – in other words, a message – that “says” something without need of speech. By way

of example, a smile or grimace, a nod of the head, a direct or muted gaze of the eyes, and a subdued or high-pitched tone of voice all send a message from one person for interpretation by another, as do the manner that one sits and the way in which one dresses. Even silence can transmit meaning (Bonvillain, 2020).

Language does not always connect us. We may speak different dialects, for example, or our perceptions of body language can differ by culture. Human communication universally allows us to form and sustain relationships. Communication prompts interaction between people or groups of people by transmitting meaning in context, including dialect and culture. The words language and communication are often used interchangeably, but the terms differ in the same way the concepts of what and how diverge. Language is the means behind the meaning; in other words, verbal and nonverbal language are modes of capturing meaning (the what). Communication is the process by which that meaning is shared among people (the how).

Moreover, the communication process is neither stagnant nor one-way. For transmission of meaning to occur between humans, whether that meaning is expressed dynamically as information, thoughts, ideas, or feelings, it takes (at least) two – that is, two or more people. Human communication exists when messages are sent and subsequently received by people.

Of course, communication is not always an effective transmission of meaning. It may be misinterpreted or misunderstood, and its quality varies as much as the volume of messages sent and received in the course of human life. Multiple factors influence communication, from the channel or medium used to transmit information or other messages to the context – environmental, social, and cultural, to name a few – in which communication occurs. Scholars have extensively explored the impact of channel and context on communication, including within the dynamics of the healthcare climate and settings, but for purposes of this writing, a working definition of communication harnesses its principal characteristics.

On the basis of its component parts, human communication, as summarized in Table 1, is a dynamic, bidirectional process in which people form relationships by interacting through symbols to create, interpret, and exchange the meaning of thoughts, ideas, information, and emotions (Sillars & Vangelisti, 2018; Wood, 2018).

Table 1: Characteristics of Communication

Communication is ...	Meaning that ...
Ongoing	Communication is an enduring human behavior with no fixed beginning or end.
Two-way	Communication occurs when messages are sent and received.
Social	Communication allows people to create and sustain relationships.
Symbolic	Communication relies on the uniquely human capacity to generate meaning from symbols, including verbal and nonverbal language.

Note. Adapted from “Communication in Our Lives” by J. T. Wood, 2018, 6th ed., Wadsworth. Reprinted with permission. “Communication: Basic Properties and Their Relevance to Relationship Research” by A. L. Sillars and A. L. Vangelisti, 2018, *The Cambridge handbook of personal relationships*, p. 243-255. Cambridge University Press. Reprinted with permission.

Forms of communication

Communication, as a process, takes several forms. Here, too, scholars differ in the specificity of communication’s forms, but a general discussion of the five principal types of communication clarifies the ways that people participate in the process.

Intrapersonal communication

Intrapersonal communication is self-talk. It is the two-way process of sending and receiving thoughts, ideas, information, and emotions within one person – a persistent personal dialogue that occurs primarily within our minds. In a social context, its influence on our self-identity and communication behaviors has been characterized for decades as communication in its most important form (Farley, 1992). Research indicates that self-talk serves important behavioral and self-regulating functions that either contribute to (positive self-talk) or detract

from (negative self-talk) life satisfaction, which is regarded as a measurement of mental health (Kyeong et al., 2020).

We participate in internal conversation when we react to internal stimuli and external phenomena. When we are tired, for example, we communicate to ourselves that we should rest or sleep. When we observe an event that is external to us – anything from the ping of our alarm clock to the blare of an emergency code, for instance – we respond with inner, instantaneous discourse about how we feel about it and what we will do in response.

We converse with ourselves about the things we experience as well as the people with whom we come in contact. We assess experiences or people and express feelings about them through an inner monologue. Who among us has not “silently” thought that an experience was, for

example, worthwhile or worthless, or that another person was, say, delightful or unpleasant?

Much of self-talk occurs at low levels of consciousness (Ricciolo, 1994, as cited in Wrench et al., 2020). You communicate to yourself the need to turn off the alarm clock, typically with little awareness of doing so. On the other hand, you are likely to be more cognizant of your feelings – happiness or frustration, for instance – about having to wake. Internal vocalization allows us to process thoughts and sentiments that rise to high levels of awareness, not only in response to immediate stimuli but also to think through and plan future actions or reflect on past interactions. It helps us rehearse, for example, what we will say to others and the manner in which we will say it.

As with any other form of communication, intrapersonal communication can be expressed verbally or nonverbally. We might talk to ourselves “out loud” with vocal expressions of happiness or frustration. We might use a gesture, such as a thumbs-up motion, to reinforce our satisfaction with ourselves, or we might admonish ourselves with a slap on the forehead. We might also distill what is on our minds in writing by way of keeping a journal or diary.

At its core, our intrapersonal communication enables us to define our idea of ourselves. Our self-concept, and consequently our self-esteem, draws on our ability to tell ourselves we are good or bad, satisfied or dissatisfied, competent or inept. Oles and colleagues (2020) suggest that intrapersonal communication in the form of self-talk regulates self-control and direction (“You didn’t do that well. Try again.”), but it also offers opportunities to engage in inner monologues (“Why didn’t I do that well the first time?”) as well as inner dialogues that may involve another person (“If my supervisor saw that I didn’t do that well the first time, she’d say I was lazy.”).

Healthcare professional consideration: Internal dialogue involves contemplation, or reflective thought. Reflective thinking is an intentional thought process widely lauded in education and practice as a standard for improving, not only self-awareness, but also critical-thinking skills (Barbagallo, 2021; Mikes-Lui et al., 2016). Reflecting on an interaction allows the person to improve their communications by evaluating how the interaction may have been more effective and what role they played in the outcome.

Interpersonal communication

Interpersonal communication is the exchange of thoughts, ideas, information, and feelings between two or more people. It is the behavior we use to create, maintain, and end relationships. It is how we connect with one another, and the more we interact with another person or people, the more interconnected and interpersonal our relationships become.

We communicate interpersonally using all modes of verbal and nonverbal interaction. A spoken conversation between two people is interpersonal communication, but so is writing an email or a birthday card. A smile, wink, or scowl; a pat on the back; and a squeeze of another’s hand count as interpersonal communication, too. Researchers have devoted copious amounts of study to the complexity of interpersonal communication – and with good reason: Interpersonal communication makes up the majority of human interaction (Trenholm, 2017). Noted theorist Julie T. Wood (2016), for example, describes several fundamental, widely accepted characteristics of the phenomena:

- *Omnipresent.* Interpersonal communication is ever present. Where relationships exist, communication also exists. Consciously or subconsciously, verbally or nonverbally, we cannot escape the sending and receiving of messages when we interact with other people. Anyone we personally encounter – a family member, friend, colleague, employer, or the person at the grocery store checkout counter – receives messages we transmit, whether in a conversation, an email, a smile, or myriad other ways.
- *Ongoing.* Interpersonal communication also is ever changing. As a process, it transforms over time. Our interpersonal communication with others has no clear beginning or end point; it is connected to the past, the present, and the future. One communication event precedes another, which precedes yet another, and so on. Similarly, a single communication event can lead to other events in the near and long term. Consider, for example, a colleague who approaches

you for advice. Suppose you have worked with this colleague for months or even years. Your communication, and consequently your relationship, with this colleague did not begin with the advice they have just sought. Rather, your previous interactions led to this communication moment, likely because earlier communication established trust or authority between the two of you. It is possible in this scenario that the whole of your communication (and again, your relationship) could end once you have offered your colleague guidance (they may leave your place of employment, for instance). Yet it is equally possible you will interact with them again – within a few moments, the next day, or at some other future point. Your communication with your colleague might change over time and be influenced by a variety of environmental, social, or other factors, but its start and finish cannot be definitively determined.

- *Selective.* Of course, not all of interpersonal communication is as familiar as, say, your interaction with a colleague, or, more to the point, a close friend or family member. Interpersonal communication is selective in that it spans a continuum from impersonal to intimate contact. Sometimes we encounter strangers, as in the case of a grocery store clerk, with whom we have little communication, let alone communication of a personal or private nature. Other times when we engage in small talk with others, our relationships are casual, involving equally casual, but not personal, communication. Most interpersonal communication involves these two modes. We acknowledge people impersonally as though they were objects (such as a homeless person), or we communicate superficially with them, acknowledging them within the context of social roles (as with a classmate, co-worker, or patient) but refraining from engagement on a personal level. We select the relatively few people whom we consider unique individuals and with whom we choose to communicate in deep and complex ways.
- *Transactional.* People participating in interpersonal communication each gain meaning from the interaction. Interpersonal communication is by nature transactional and reciprocal. Each person in an interaction simultaneously and recurrently sends and receives messages. Recall that those messages can be transmitted verbally or nonverbally. When you instruct a patient and the patient nods to signify their understanding, each of you has given and taken in messages in a circular manner: You present information, your patient acknowledges receiving the information, and the exchange comes back to you as you take in the meaning of your patient’s understanding. A variety of environmental, psychosocial, cultural, or other factors might influence that loop, however, which makes interpersonal communication fertile ground for misunderstanding. Some patients may nod acceptance of information when in actuality they do not understand what is being said, and some patients are frequently anxious or in pain and therefore distracted from an effective information exchange. Internal or external distractions, for example, can interfere with interpretation of the content of communication. The patient’s comprehension of instructions might be sidetracked by their self-talk revolving around health-related worries, or the arrival of another healthcare professional might interrupt, even momentarily, the patient’s ability to focus on the information being provided. Culture likewise can contribute to misunderstanding. The up-and-down motion of a nod of the head might suggest affirmation in one culture but signify the opposite in another culture or be a signal to simply proceed in still another. Yet the duality of interpersonal communication, according to Wood (2016), extends beyond the fact of two-person exchange to the sharing of responsibility by people within exchanges. In interpersonal communication, each party shares meaning with the other, but each party also shares responsibility for whether communication is successful. Nurses bear the responsibility to ensure the patient’s or caregiver’s understanding of critical instructions or consent.
- *Irreversible and unrepeatable.* After you have said or written something, or perhaps used a form of body language to communicate (rolling your eyes, for example), have you ever thought to yourself that you wished you could take it back? Interpersonal communication does not work that way. Inherently, all communication has an impact, and those effects cannot be erased.

As much as one cannot not communicate, as previously noted, one also cannot “unhear” or “unsee” messages and, consequently, cannot undo them. Explanations, apologies, or denials are consequential in their own right, but they do not purge the existence of what was communicated in the first place. Also, interpersonal communication cannot be repeated. Moment by moment, we exert influence through interpersonal communication and become influenced by it. The act of communicating changes us in some way or another. We can no more capture at any moment in time the precise effect on our thoughts and emotions of something we have communicated than we can time travel. Each act of communication in which we participate is unique.

Evidence-based practice! Empathy and authenticity are key components of effective communication. The content of communication needs to acknowledge individual experiences, but also the plethora of experiences that signify why effective communication counts, including good clinical outcomes, improved patient satisfaction, better clinical well-being, decreased litigation, and time savings (Lim & Dunn, 2017).

Group communication

Group communication involves interaction among three or more individuals, but not just any people. The five individuals with whom you stand in a cafeteria line, for example, indeed represent a group, but in this case, the group is little more than a collection of people standing in a cafeteria line. You and the other members of such a group share some common characteristics and goals: We might infer each of you is hungry or thirsty, for instance. You all stand in line for the purpose of paying for your food or beverage. While waiting, you might send messages on an interpersonal level, knowingly or otherwise, to others in the group – by tapping your foot, perhaps, or in some other nonverbal way demonstrating impatience, or by engaging in inconsequential small talk with the person immediately alongside you. If someone with whom you are well acquainted waits in line with you, such as a colleague, friend, or family member, your level of interpersonal communication with that person during your wait will be more intimate than that with a stranger in the group. However, in this scenario, you would not participate in group communication because (absent concerted effort by the group to work as one to, say, hurry the process) you have not communicated as a group.

Rather, group communication occurs when three or more people exchange thoughts, ideas, information, or emotions with the express purpose of achieving an identified objective or outcome. As a goal-oriented exercise, members who participate in group communication exchange ideas and information about a common problem or interdependent aim. Group communication differs from intra- and interpersonal communication in that it tends to be more formal and task-focused, and it is not necessarily voluntary; often one is assigned to participation and/or roles within group settings.

In addition to its emphasis on the achievement of goals, scholars have long defined group communication in light of the manner in which participants’ interactions affect group members (Jensen & Chilberg, 1991; Wilson & Hanna, 1990, as cited in Lumen Learning, n.d.). Group communication exists when assembled participants exert mutual influence over one another. In other words, group communication is a collaborative affair. People who communicate within groups do not do so independently; instead, they contribute to a communal exchange of information and ideas that affects each member of the group. Whether by motivation, inspiration, compromise, or manipulation, group members both influence others and are influenced by others in this information exchange (Lumen Learning, n.d.). Communication among interdisciplinary team members in clinical case conference discussions illustrates the concept of mutual influence in group communication. Research demonstrates the coexistence of competitiveness and collaboration in such discussions when, for example, physicians display a (historical) tendency toward dominating group exchanges at the same time nurses and allied health professionals alter the dynamic by questioning medical decision making (Liu et al., 2016).

Evidence-based practice! Use of Balint groups – involving facilitated groups of clinicians who regularly meet to present clinical cases to improve their understanding of clinician-patient relationships (American Balint Society, n.d.) – has been found to enhance both clinician-patient communication and clinicians’ confidence in their ability to understand their patients, particularly among triage practitioners during the SARS-CoV-2 pandemic (Yang et al., 2021). Participation in Balint group activities has been shown to improve clinicians’ self-efficacy and reduce burnout (Otten, 2017).

A third component of group communication involves group size. The number of participants in a group can affect the cohesiveness and quality of communication within the group. Too few members might result in gaps in perspectives or expertise, for example. Too many members, on the other hand, might disrupt the equal participation of group members. A group’s size also determines how many social ties – links, relationships, connections, edges – are needed to join members to each other and to the group (Forsyth, 2018). The mode of communication among group members – face-to-face or through assisted means, such as telephone or two-dimensional video conferencing – likewise can shape the effectiveness of exchange between participants. Communication via conference call, for example, lacks access by participants to body language and other nonverbal cues that might color the discussion, whereas participants’ acceptance of video conferencing technology may influence their satisfaction with the modality (Dobosh et al., 2019). The precise number of group members that constitutes an optimal collection of people for effective communication remains a matter of debate. Research focus groups, for instance, are typically limited to 8 to 10 members, whereas group meetings may still allow for each person to participate if the group size is 12 to 15 members. Techniques such as “round robin” or weighted voting can be used to elicit interaction.

However, a consensus view among communication scientists uses size to categorize group communication as either small-group or organizationally based. Small-group communication is typically associated with interpersonal communication behaviors; members of small groups tend to interact with one another as unique individuals. Organizational communication, on the other hand, relies more on the structure, hierarchy, and culture of an enterprise, which govern relationships and the exchange of information within groups (Krcmar et al., 2016). That is not to say that organizations are devoid of interpersonal communication. To the contrary, organizations are made up of individuals who, for the most part, participate in groups of varying sizes, and those individuals influence group dynamics, positively or negatively, through interpersonal communication. In an institutional context, small-group communication operates as a subset of organizational communication (Krcmar et al., 2016).

Regardless of group size, function, or aspiration, communication within groups shares common characteristics, as outlined in Appendix A.

Public and mass communication

The terms *public communication* and *mass communication* are often used interchangeably. The concepts do share similarities, but their differences are sufficiently significant to warrant unique definitions. Public communication is identified as sender-focused, meaning that the bulk of the messages involved in this form of communication originate with one person or group. Receivers consume these messages, but their side of the sender-receiver equation remains somewhat restrained. Public speaking, a familiar form of public communication, illustrates these limits to two-way interaction. By and large, a public speaker (sender) conveys thoughts, ideas, information, and emotion to a collection of people in an audience (receivers) on topics in which an interest is shared. The speaker is typically physically distanced from the audience. Because the receivers tend to be a heterogeneous group, the speaker may be equally detached from the onlookers in background, culture, expertise, or viewpoint. Even so, speakers endeavor to connect with their audiences. They characteristically evaluate the demographic makeup of participants (i.e., age, gender, ethnicity, etc.) as well as the audience’s attitudes, values, and beliefs beforehand. They work to

make their material understandable and relatable to a diverse group and attempt to bond with participants by establishing their credibility and gaining the audience's trust. For their part, audiences interact with speakers principally through nonverbal feedback, such as applause and attention or inattention reflected in body language.

In some instances, audience feedback takes the form of question-and-answer sessions or written commentary, but unlike interpersonal and group communication in which senders and receivers participate in feedback loops, the focus of the ideas and information imparted in public speaking remains on the speaker. Much of public speaking includes face-to-face contact, which allows speakers to "read" their audiences for clues in the manner in which their messages are received. Other forms of public communication stay faceless. Virtually any message freely conveyed in public spaces, from published opinions to government positions and safety announcements, counts as public communication. Such messages are shared with, and become part of, the community at large. As such, public communication fulfills an indispensable role in civil societies. It promotes discourse and debate on issues of general interest or import to citizens within the so-called public sphere, connecting the public at large to civil and other societal institutions (Fuchs, 2020). It can also inform the public about health, safety, or emergency issues.

Where public communication takes the form of one-to-many exchange, mass communication relies on many-to-many (versus one-to-one or one-to-many) properties. Mass communication also is sender-focused, but it lacks the measure of personal connection that public communication (or interpersonal or group communication, for that matter) affords. Mass communication differs from other forms of communication not only in the width of its reach, with audiences potentially numbering millions of people around the globe, but also in its reliance on print, audio, or digital technology to distribute messages. Radio; broadcast, cable, and streaming television; books, newspapers, and magazines; and websites, email, webinars, podcasts, blogs, and social media all fall under the category of mass communication. Each serves as a media channel, or as the means of information transmission; each would not exist without technology-driven distribution. (Incidentally, public communication transforms into mass communication when it is transmitted via media channels.)

A goal of any one of these channels might be to personalize an audience's experience with it – a television advertisement intended to "speak" to one's values or beliefs, for example, or a bulk email individualized with one's name – but such tactics amount to artifice. Mass communication has historically excluded a means for personal interaction among the people who use it. One might react to mass communication by calling a television station or book publisher to express a viewpoint, writing a letter or email to a newspaper, or posting a comment on a website, but direct, immediate, person-to-person contact has not been part of the mass communication matrix.

Digital, or online, modes of communication, notably social media channels, are changing communication dynamics, however. Interaction-

Communication models

Different forms of communication affect our lives in different ways. Communication scientists developed models that organize our varied experiences with the phenomenon and explain how the communication process essentially works, helping us better understand and control – and perhaps improve – our communication behaviors (Trenholm, 2017). A fundamental understanding of the complex process of human communication begins with a look at three main communication models: linear, interactive, and transactional. Each of these models employs the following key terms:

- **Sender** – The sender, also referred to as the encoder, is the person who conceptualizes a message and initiates delivery of the message.
- **Channel** – A channel is the medium used to transmit a message from a sender to a receiver. Channels can be physical in nature, including speech and nonverbal communication, or mechanical, such as print and electronic media.
- **Receiver** – Also known as the decoder, the receiver is the person who extracts meaning from a transmitted message.
- **Encoding and decoding** – Encoding is the process by which the

oriented social media channels, such as Facebook, Twitter, Snapchat, TikTok, and others, allow more immediate exchange of information and ideas, and technologies such as video conferencing encourage face-to-face interaction. The extent to which these and other Internet-enabled technologies affect interpersonal relations, public discourse, and mass dissemination of messages has warranted and will continue to warrant further exploration (Cappella, 2017; Rauchfleisch & Kovic, 2016).

Mass communication can help or hinder public awareness, education, and acceptance of best-practice healthcare information. Although the public generally trusts healthcare providers, patients receive health-related information from a variety of sources beyond the patient-provider relationship. Mass communication channels, in particular social media, serve as fertile sources of healthcare inaccuracies and misinformation that may carry crucial health consequences for patients (Love et al., 2020). Rumors, myth, and false information that emerged during the SARS-CoV-2 pandemic offer an example of the power of social media and other mass communication channels to disseminate information that impedes positive patient outcomes (Ali, 2020). Potentially less dire but nevertheless low-quality or harmful misinformation, such as false claims about the efficacy of "natural" or other remedies, that lack the accuracy and reliability of peer-reviewed, evidence-based treatments, are also readily found across the Internet.

Healthcare professional consideration: A growing body of research will continue to explore the impact of healthcare misinformation. In the meantime, healthcare professionals will be increasingly called upon to gain understanding of the impact of healthcare misinformation on their patients' lives, raise their awareness of digital and other mass communication environments where misinformation foment, and steer patients toward credible sources (Southwell et al., 2020).

Self-Assessment Quiz Question #1

Communication is best defined as:

- A one-way method of transmitting information from one person to another.
- An encounter between people that has a distinct beginning and end.
- An ongoing process that allows people to form and sustain relationships.
- A process unique to humans.

Self-Assessment Quiz Question #2

The majority of interaction between and among people occurs through:

- Interpersonal communication.
- Intrapersonal communication.
- Group communication.
- Mass communication.

symbols that form the basis of verbal and nonverbal communication are produced. Decoding is the process by which those symbols are translated into meaning.

- **Feedback** – In two-way communication, feedback is the response or reaction to a message. It occurs in a loop between senders and receivers.
- **Context** – Context in communication means the environment, atmosphere, or circumstances surrounding the communication. It includes elements such as time and place but also such factors as the values, attitudes, beliefs, and cultures of both senders and receivers.
- **Noise** – Anything that interferes with the delivery, receipt, or interpretation of a message or feedback relating to the message is considered noise. The source of noise can be internal (as in the case of intrapersonal communication) or external. External noise includes physical barriers that interrupt the sending and receiving of messages, such as the blare of an alarm or the clamor of a crowded room; physiological obstacles, such as deafness or blindness; and semantic barriers, as in words that mean different things to different people.

Linear model

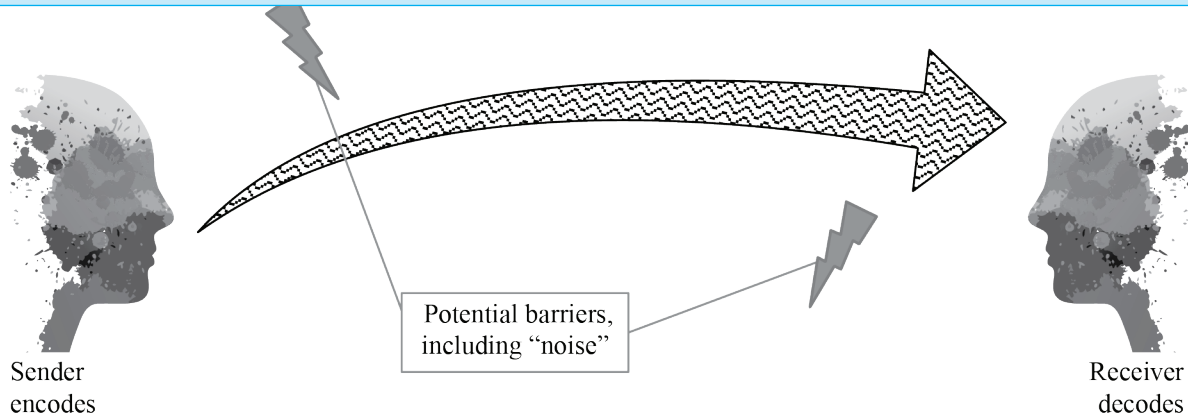
The ancient philosopher Aristotle is credited with perhaps the earliest communication model, which conceived communication as messages that travel along a straight line between a speaker and a hearer, but mathematics heralded the modern linear model of communication (Hilbert, 2021). This model is often called the Shannon-Weaver or transmission model. The linear model was developed in 1949 for Bell Telephone Laboratories as a means to map the communication process through telephone and radio channels. The linear model describes a direct, one-way, intentional transmission of a message from a sender to a receiver.

The linear model, depicted in Figure 1, demonstrates the point-A-to-point-B transmission process that we tend to think of when we casually consider communication encounters in our everyday lives. It factors in potential interruptions to the process by way of so-called noise. As we have seen, however, communication is a complex process that takes varied forms. Critics of the linear model point to its assumption that

communication encounters have a beginning and an end; in other words, in this model, no two messages can be sent or received simultaneously. As a sender-focused representation of communication, it neither allows for feedback nor addresses how receivers extrapolate meaning from messages.

Although the linear model does not suitably explain the back and forth associated with face-to-face communication in interpersonal and group forms of communication, it does describe mechanical communication, such as computers that “talk” to one another. It likewise illustrates the mechanisms of mass communication in the human realm, in which one-way, sender-driven messaging does not expect to elicit direct response by receivers or, for that matter, the means to immediately know how sent messages are interpreted by audiences. Technology-enabled communication among people, however, can exhibit properties of the linear model, such as voicemails, texts, emails, or social media posts that senders cannot be certain are received or understood.

Figure 1: Linear Model of Communication



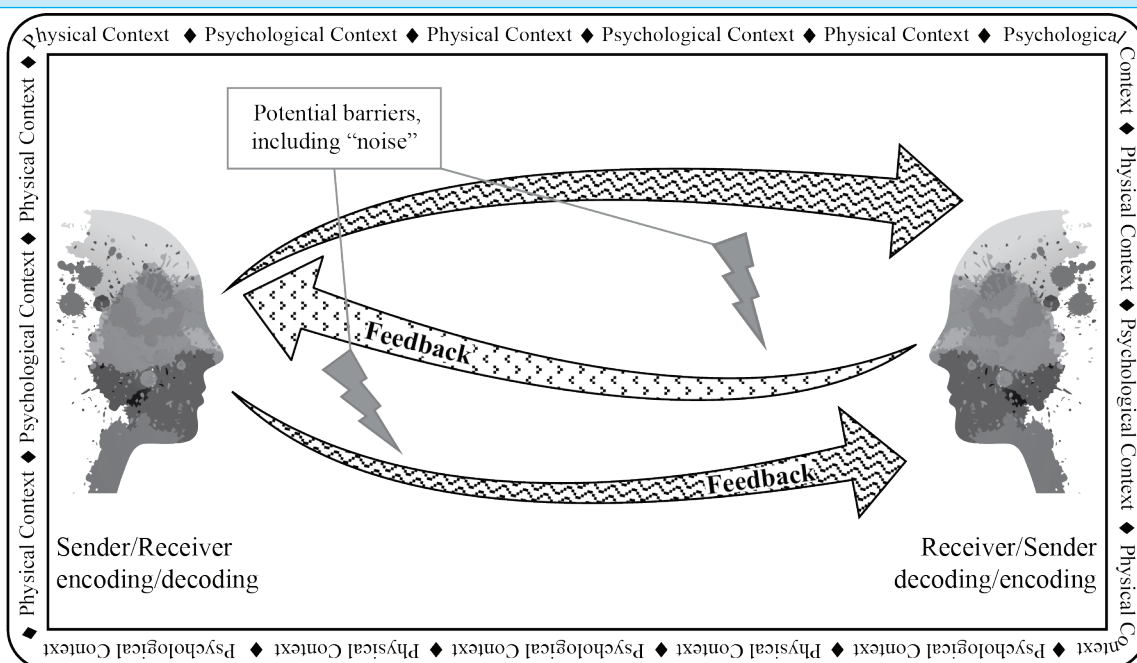
Note. Based on University of Minnesota Libraries Publishing, 2016, “Communication in the Real World: An Introduction to Communication Studies” (<http://open.lib.umn.edu/communication/chapter/1-2-the-communication-process/>). Reprinted with permission.

Interactive model

Figure 2 illustrates the interactive model of communication, which takes into account a two-way process of creating messages and generating feedback between senders and receivers. Developed in 1955, the interactive model recognizes that people actively participate in the

exchange of messages; that is, receivers respond to the messages of senders and senders, in turn, react to those responses. In other words, communication involves senders and receivers by way of feedback, and this feedback, both verbal and nonverbal, need not be intentional (Wood, 2018).

Figure 2: Interactive Model of Communication



Note. Based on University of Minnesota Libraries Publishing, 2016, “Communication in the Real World: An Introduction to Communication Studies” (<http://open.lib.umn.edu/communication/chapter/1-2-the-communication-process/>). Reprinted with permission.

As with the linear model, the interactive model of communication recognizes the concepts of channels through which messages are transmitted and noise as a potential barrier to communication, but it also incorporates the notion of context in communication encounters. People generate, or encode, messages and decipher, or decode, them within the context of their personal experiences. Those experiences include the physical environment in which communication occurs (e.g., a quiet room versus a raucous one) that could enhance or interfere with the encoding and/or decoding process, as well as psychological factors (e.g., self-esteem, stress, happiness, fear, or anxiety), which similarly influence the quality of encoded and decoded messages (Wood, 2018).

The interactive model expands the linear model by emphasizing not just how messages are received but rather how, through context and feedback, they are understood. The cause-and-effect nature of the interactive model, however – receivers respond to senders, who respond to receivers, and so on – does not account for simultaneous feedback, nor does it acknowledge that communication in relationships changes over time. It does not reflect the concept of feedback that is based on what is decoded by the receiver. For example, the receiver is responding to the message as they perceived or decoded it, and this may not have been the intended message.

In the interactive model, communication between people alternates from one to the other. Consider, for example, an encounter in which you ask a colleague for instructions on completing a task. You, as the sender in this unique encounter, ask for information. Your desire for information is decoded by your colleague, who then becomes a sender, encoding a response and passing the instructions back to you. You might offer feedback by way of thanks or a follow-up question, but you must wait for the instructions before you can react. Technology-aided communication provides another illustration of this alternating pattern of sending and receiving information and ideas. When you send an email or text message, for instance, you necessarily wait for a response before you are able to react.

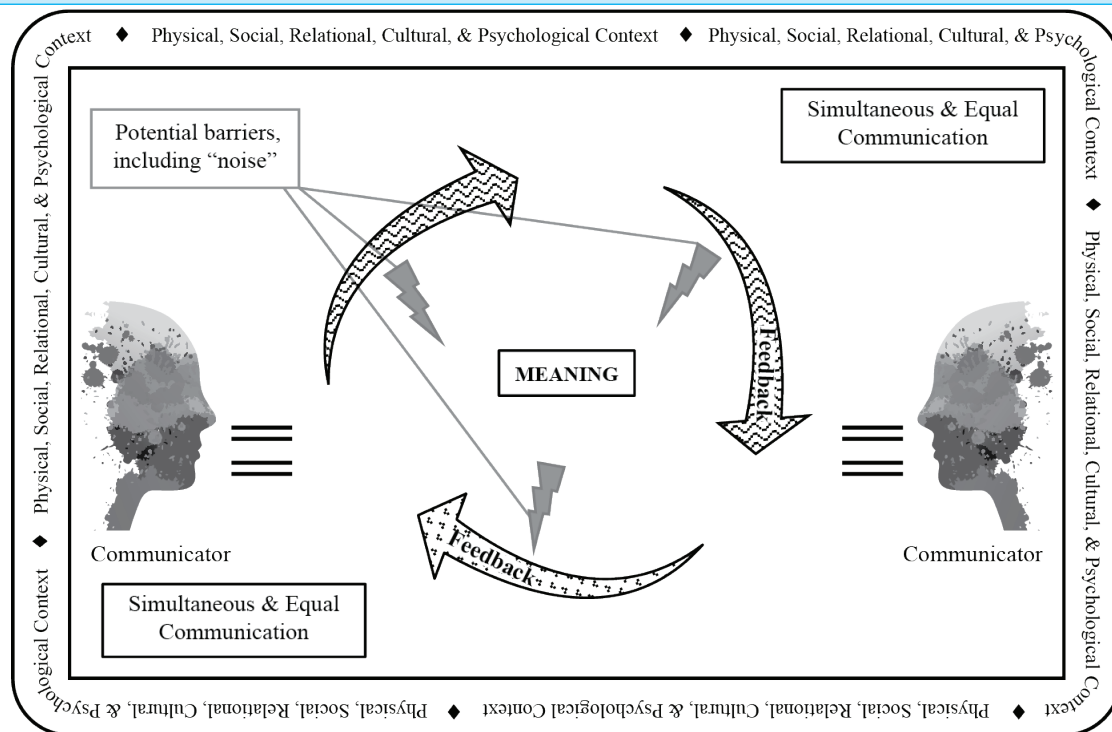
As described by the interactive model, the communication between you and your colleague also does not contemplate forms of communication other than questions and answers, such as nonverbal communication, that could be present at the same time. Your colleague might smile in response to your request, indicating their pleasure in helping you, or they might imply annoyance by rolling their eyes at your request. Then, too, the model fails to weigh the impact of your previous encounters with your colleague. Through your previously established relationship, you might have come to understand your colleague’s eye roll as an expression of playfulness rather than exasperation.

Transactional model

The transactional model views communication as an ever-changing process in which senders and receivers assume multiple roles that vary over time (Wood, 2018). The model demonstrates equality in communication, meaning that people participate equally and instantaneously, in verbal and nonverbal exchanges. People act as both senders and receivers of messages at any point in a communication encounter, and they can accomplish each action at the same time (e.g., you can furrow your brow to indicate confusion at the same time you voice the feeling). Consequently, the model replaces the notion of senders and receivers with the all-encompassing label communicators, as shown in Figure 3.

Healthcare professional consideration: According to the transactional model, we do not communicate solely to exchange information. Rather, we use communication to shape how we perceive ourselves and the ways in which we relate to others. The model describes the mechanism by which we form and nurture relationships through interpersonal communication. Nurses also use interactions with patients to assess neurological status, orientation, anxiety, and to simply casually invite the patient to express concerns or questions.

Figure 3: Transactional Model of Communication



Note. Based on University of Minnesota Libraries Publishing, 2016, “Communication in the Real World: An Introduction to Communication Studies” (<http://open.lib.umn.edu/communication/chapter/1-2-the-communication-process/>). Reprinted with permission.

As with other models of communication, noise is an ever-present factor in the transactional paradigm. Context, too, is taken into account in this model, although to a more detailed degree. In addition to the physical and psychological fields of experience or context supported by the interactive model, the transactional model involves factors that naturally

occur beyond a unique communication encounter. Specifically, three contextual dynamics influence communication:

- Social context – Social norms shape communication. People learn common rules that guide their exchanges with others – saying thank you, for example, or refraining from interrupting when another person is talking – through observation and trial-and-error

experience. Social conventions facilitate shared meaning and understanding in communication. Intentionally or unintentionally avoiding them leads to misunderstanding and, often, feelings of awkwardness.

- Relational context – The type of relationships we have with others and the length of time in which we have participated in those relationships also influence how we communicate. People are more apt to forgo social norms when they have developed tight bonds with other people, as in, say, a family relationship, as opposed to the manner in which they conduct themselves with strangers or in casual meetings with others.
- Cultural context – Miscommunication can occur as a result of, or be compounded by, cultural differences. Nationality and ethnicity, for example, contribute to our identity; mold our values, attitudes, and beliefs; and affect how we interchange and understand messages. Norms governing communication vary by and within cultures. Individuals encode and decode the meaning of messages according to their personal backgrounds, values, beliefs, and self-perception.

Implications for practice

All manner of communication is present in clinical practice. As a healthcare professional, you participate in intrapersonal communication when you reflect on the manner in which you responded to a patient or colleague and in group communication when you join a learning activity, engage a patient's family in discussion, or serve on a clinical standards committee. Lectures you attend involve public communication and mass communication offers you information about the latest clinical study in your specialty. Your text to a colleague instructing him to perform a task followed the linear model of communication; it became interactive when he responded he had already done so and you, in turn, expressed your thanks. Had you worked with your colleague for some time, the interaction was likely informed by the relationship you had established. The smile his response elicited in you would have fallen under the transactional model of communication.

The bulk of communication in healthcare settings, however, is interpersonal in form. Among the family of communication classifications, distinct types, such as intrapersonal and group communication, frequently include, or progress to, their interpersonal cousin. Communication science has long understood that self-talk informs and influences interpersonal behavior (Farley, 1992), and evidence supports a link between intrapersonal adaptability and interpersonal relationship outcomes (Wilde & Dozois, 2019). Interpersonal communication occurs within group interaction, and internal dialogue that takes place within the backdrop of small-group communication affects interpersonal connection or the lack thereof. For example, Moreland and colleagues (2015, as cited in Maginnis, 2018) found that clinicians' sense of self is predictive of their interpersonal relationships within nurse groups (such as unit or professional role), accounting for feelings of either powerlessness or the willingness to address conflict with their peers.

Healthcare professional consideration: By definition, exchanges between healthcare professionals and patients are interpersonal. Conceptualized in the transactional communication model, provider-patient interactions are active, immediate, and characterized by shifting roles within communication encounters. Practitioners, for instance, assume a symmetric, or equal, role when they exchange information and ideas with patients about achieving mutually agreed-upon health goals, such as strategies for overcoming obesity or lowering hypertension. Those same practitioners take on an authoritative role when their clinical expertise is sought (Arnold & Underman Boggs, 2016).

Communication scholars have recognized the complexity of interpersonal communication within healthcare settings, where provider-patient exchanges form lasting impressions that influence patients' health-related behaviors and quality outcomes. Challenges to engaging in effective interpersonal communication exist in all human relationships, but those challenges take on vital importance when communication between healthcare professionals and patients can affect patient outcomes or have life-or-death consequences (Chan et al., 2018;

Self-Assessment Quiz Question #3

The three primary models of communication are:

- Sender, channel, and receiver.
- Message, medium, and feedback.
- Intrapersonal, interpersonal, and group.
- Linear, interactive, and transactional.

Self-Assessment Quiz Question #4

In communication science, anything that interferes with the delivery, receipt, or interpretation of a message is referred to as:

- Feedback.
- Transmission error.
- Noise.
- Decoding error.

Ruben, 2016). The nursing profession, for example, has recognized the intricacy of message sending and receiving in nursing practice with its adoption of therapeutic communication, a subset of interpersonal communication specific to the promotion of patients' health and well-being, and the associated patient-centered care paradigm. Other clinicians likewise apply principles of therapeutic communication. Nurses are often seen in a paternalistic role by patients when, for example, nurses dictate care, such as when a patient will bathe, sleep, and participate in care regimens. In response, patients often comply and accept information provided by the nurse without completely understanding the message.

Tenets of therapeutic communication

Therapeutic interactions between healthcare professionals and patients are purpose driven (Nokuthula Sibiyi, 2018). Arnold and Underman Boggs (2016) define therapeutic communication as an ongoing, purposeful, cooperative process undertaken by healthcare professionals and patients to identify and achieve patients' health-related objectives. Translated into daily practice, therapeutic communication involves not only the exchange of information about health-related goals between practitioner and patient, but also the practitioner's purposeful effort to encourage the patient's expression of thoughts, ideas, and emotions as a means to advance the patient's well-being. Components of therapeutic communication are summarized in Appendix B.

Healthcare professional consideration: Therapeutic communication forms the basis of practitioner-patient interpersonal relationships (Kornhaber et al., 2016) and is rooted in time-honored frameworks for interpersonal relations in clinical practice. Maslow's (1943) basic needs model helps practitioners prioritize interventions, but it is fundamentally an interpersonal communication theory. Put simply, people need to communicate their various levels of needs. Healthcare professionals often turn to Erikson's psychosocial development theory to aid in recognizing, fashioning, and communicating developmentally and age-appropriate interventions (Arnold & Underman Boggs, 2016; Orenstein & Lewis, 2020).

The literature most often cites Peplau's theory of interpersonal relations (1997) in the context of therapeutic communication in nursing. Peplau's seminal work, considered a precursor to contemporary patient-centered care models (Ortiz, 2018), saw the clinician-patient relationship as the product of a professional, planned interpersonal process in which practitioners and patients share common goals and equal responsibility for self-awareness. Effective interventions, she maintained, culminate from the practitioner's recognition of their own behaviors and the behavior of patients throughout evolving phases of the clinician-patient relationship. Accordingly, practitioners assume a variety of roles in patient encounters, from stranger to resource person, teacher, leader, surrogate, and counselor, each of which serves to not only create relationships with patients, but to build, strengthen, and enrich them. Through these progressive therapeutic exchanges, practitioners identify, understand, and meet patients' needs so that, ultimately, their assistance with patients' health concerns is no longer required (Adams, 2017).

As with any form of interpersonal communication, therapeutic communication occurs in verbal and nonverbal forms and within intrapersonal, psychosocial, cultural, and environmental contexts. Nursing licensure requires proficiency in therapeutic communication (National Council of State Boards of Nursing [NCSBN], 2019), including the need for healthcare professionals to recognize nonverbal cues in assessing patients' health status, in addition to the manner in which practitioners' own voiceless behaviors – for example, eye contact, mirroring patients' facial expressions to reflect understanding and empathy, and touch – influence patients' comprehension and acceptance of their health-related needs. Likewise, healthcare professionals participating in effective therapeutic communication take into account factors that influence or interfere with the communication process and the accomplishment of patients' health goals. Noise is prevalent in encounters with patients who, for example, may be distracted by pain or worry or who feel apprehension or loss of privacy in healthcare settings (Arnold & Underman Boggs, 2016). Healthcare professionals also face a range of distractions, from the diversion of their own intrapersonal communication (a preoccupation with a personal concern, for instance) to alarms emitted by medical equipment or interruptions by cell phones, other patients, and colleagues.

Nursing consideration: Therapeutic communication requires self-reflection among healthcare professionals. Awareness of such factors as one's values, beliefs, biases, and cultural differences helps clinicians avoid inadvertent speech or behaviors that negatively influence patients' perception of the therapeutic relationship. Professional mindfulness promotes the empathy and objectivity that encourages healthcare professionals to value patients as individuals with unique needs and preferences, a hallmark of patient-centered care (Arnold & Underman Boggs, 2016; Nokuthula Sibiyi, 2018).

Therapeutic communication in small groups is most often associated with inpatient and outpatient counseling in psychotherapy, although group communication is used for therapeutic purposes in other healthcare environments, such as long-term care settings (Arnold & Underman Boggs, 2016).

Communication as core competency

Effective communication is a requisite skill in clinical practice, particularly in a contemporary healthcare climate that has made patient-centered care the new paradigm for improvements in the healthcare system as a whole. The New England Journal of Medicine (2017) describes patient-centered care as a healthcare delivery model in which patients are treated as partners with their healthcare providers and those providers interact with patients in ways that take into account not just the patients' clinical perspective, but their emotional, mental, spiritual, social, and other unique viewpoints as well. Because communication forms the basis of interpersonal relationships, this partnership exists only when healthcare professionals and patients mutually engage in therapeutic interaction. Patient-centered care encourages the active participation of patients in their own healthcare and it relies on the creation of understood meaning between providers and patients to optimally achieve patients' unique health goals.

Research has identified an inextricable link between care quality and communication aptitude that substantiates communication as a critical competency for healthcare professionals. Associating poor communication with 70% of errors in healthcare settings, the NAM (2000; formerly the IOM), a driving force behind widespread changes to healthcare delivery in the United States, declared effective exchanges between clinicians and patients to be a prerequisite for patient-centered care. In a subsequent report (NAM, 2001), the organization included among its recommendations for redesigning a patient-centric healthcare system such rules as basing patient care on continuous healing relationships, customizing care to patients' needs and values, recognizing patients as the source of control in therapeutic relationships, and freely and openly sharing knowledge and information. Additional analysis by the organization (NAM, 2003) specified requirements for communication competency in health professions education.

TJC (2017), the accrediting body for healthcare organizations, likewise has implicated poor communication or miscommunication in sentinel healthcare events, particularly during handoff communication. Accordingly, it mandates effective patient- and family-centered

communication practices in hospitals, including the provision of quality and safety information, respect for patients' personal and cultural values and preferences, identification of patients' verbal and written information needs, and adherence to guidelines for managing patient-provider communication (TJC, 2010).

Patient-focused exchanges between practitioners and patients are so relevant to the work of clinicians that for some practitioners, such as nurses, professional organizations have firmly embedded communication in their education and performance standards. Again, the NCSBN (2019) requires mastery of therapeutic communication concepts as a condition for registered nurse licensure, and the American Association of Colleges of Nursing (2008, 2011) emphasizes proficiency in interpersonal and interprofessional communication as essential elements of nursing curricula. In expanding the NAM's recommendations to better prepare nurses to participate in system-wide improvements to healthcare quality and patient safety, the Quality and Safety Education for Nurses (QSEN) Institute guides nursing education by establishing core competencies in patient-centered care and interprofessional collaboration (QSEN, n.d.), both of which rely on the development of effective communication skills. Time pressures, heavy workloads, and extensive technology demands have created work stress that can constrain effective communication with patients, particularly during pandemic crises. Exceptional effort is often needed to effectively communicate with patients.

Ineffective communication: correlations and consequences

Research grounds the premise that providing optimal care to patients requires healthcare professionals to sharpen their communication competency. The consequences of miscommunication and other failures in message transmission within interpersonal exchanges involving clinicians are well documented. Pervasive across healthcare settings, inadequate communication can lead to substandard care or missed opportunities and, ultimately, negative clinical outcomes. For example:

- *Patient recall and adherence* – In any given clinical encounter, patients decode an assortment of messages transmitted by their healthcare providers. Sometimes the messages they receive contain an extensive, even overwhelming, amount of information; sometimes those messages bear unwelcome news. A variety of issues can influence the manner in which patients process information during and after exchanges with healthcare professionals. Patients' language, education level, literacy, age, and degree of anxiety offer examples of factors that can interfere with patients' understanding and recall of their health status and treatment options.

Evidence-based practice! Research demonstrates that patients recall as little as one-fifth of the medical information they have discussed with a clinician; those with chronic disease, for example, forget as much as 40% to 80% of the content of their discussions in healthcare encounters (Richard et al., 2016).

Furthermore, patients' impression of the competence of their healthcare providers forms the basis of their trust in the provider-patient relationship and, consequently, their confidence in the health information they receive (Howe et al., 2019). Patients bring expectations for both information and empathy to clinical encounters (Howick et al., 2017). As much as any reassurance healthcare practitioners express verbally, their displays of empathy, signaled by such nonverbal communication as eye contact, leaning forward to address patients directly, or therapeutic touch, can impact patients' trust, recall, and adherence to treatment plans. Healthcare professionals' lack of eye contact with patients or reassuring smiles, for example, can adversely affect patients' recall of the information discussed in care settings (Hillen et al., 2016).

- *Patient satisfaction* – A growing body of evidence ties patient experience to positive clinical outcomes (Agency for Healthcare Research and Quality [AHRQ], 2020a). Patient experience is generally gauged by patient satisfaction, commonly known as patients' impressions of the care they experience. Driven by quality improvement standards and reimbursement requirements, healthcare organizations have employed patient satisfaction surveys, such as

the Hospital Consumer Assessment of Healthcare Providers and Systems Survey (Centers for Medicare and Medicaid Services [CMS], 2020) and the Consumer Assessment of Healthcare Providers and Systems (AHRQ, 2020a), as leading measures of service quality. Likewise, many healthcare organizations rely on patient-experience data collected by independent consulting firms through targeted surveys that provide performance benchmarks and real-time feedback.

Although such tools have proven successful in quantifying patient satisfaction, they do not entirely capture the complexity of patients' experience in healthcare settings (Street & Mazor, 2017). Patient satisfaction is indivisibly linked to the interpersonal relationships created and maintained between patients and their healthcare practitioners. Influenced as these relationships are by environmental, demographic, socioeconomic, cultural, and other factors, the degree of satisfaction expressed by patients significantly varies (Berkowitz, 2016; Pelletier et al., 2019). Even so, patients' impressions of their relationships with their healthcare providers have been shown to be strong predictors of patient satisfaction (Bible et al., 2018). Patient-centered communication likewise correlates with patient satisfaction (Bossou et al., 2021). Evaluation of patient satisfaction levels should include a time-related analysis of workload and staffing issues.

Evidence-based practice! Quality of care is often regarded as a high-ranking predictor of patients' assessment of a healthcare organization's overall quality (Karaca, 2019) because a clinician's skill in explaining, listening to, and empathizing with patients directly affects patients' experiences in the healthcare environment (Burgener, 2017).

- *Patient safety* – In the years since the NAM's (formerly IOM) landmark report revealed the extent of the connection between inadequate communication and medical errors, healthcare organizations have sought to minimize communication failures. Particular attention has been paid to gaps in practitioners' knowledge of communication breakdowns and the implementation

of structured training programs and standardized tools. Yet ineffective communication continues to impact patient safety across healthcare settings. TJC has identified poor communication or miscommunication as a leading cause of sentinel events (Burgener, 2017); in particular, the organization has pointed to inadequate communication during patient care handoff between clinicians as a contributing factor to adverse events (TJC, 2017). Other research suggests medical errors are underreported, owing in part to nonreporting of near misses (Scott & Henneman, 2017).

Self-Assessment Quiz Question #5

Healthcare professionals and patients engage in therapeutic communication to:

- Identify and achieve patients' health-related objectives.
- Conclude clinician-patient interaction.
- Allow the clinician to make all healthcare decisions.
- Allow clinicians to exceed professional boundaries.

Self-Assessment Quiz Question #6

Patients' impressions of their relationships with healthcare providers have been shown to be a strong predictor of:

- Miscommunication.
- Patient satisfaction.
- Professional standards.
- Contextual dynamics.

Self-Assessment Quiz Question #7

Patients' feelings of lack of privacy and control in healthcare settings are examples of which type of communication barrier?

- Environmental.
- Socioeconomic.
- Global.
- Administrative.

PRACTITIONER-PATIENT COMMUNICATION

Unquestionably, the dynamics of patient-clinician communication influence patient satisfaction, safety, and outcomes. That influence can be positive or negative, overt or subtle. Effective communication holds the power to secure patients' health and well-being.

Communication is a complex process: however, effective communication is even more so. The two-way makeup of communication dictates that a definition of quality exchanges between patients and healthcare professionals cannot rest with

Impediments to effective practitioner-patient communication

Barriers to quality communication in clinical practice come in a variety of forms – some are obvious, whereas others are more enigmatic. Either way, obstacles to effective communication exist at all levels of healthcare and in its varied settings, and they influence how information, ideas, and emotions are perceived by both parties in communication encounters. Communication scientists call the sum of all factors that affect the perception of meaning between people metacommunication. A full assessment of obstacles to quality practitioner-patient communication takes metacommunication into account, including nonverbal cues that supplement or contradict verbal messages.

Environmental distractions

Noise, in its literal sense, can interfere with patients' abilities to successfully decode the messages they receive in clinical encounters. The din common to certain healthcare settings, such as the emergency department and intensive care units, and the sounds emitted from customary medical machinery – electrocardiograph (ECG) beeps, chirping alarms, or the swish of suctioning equipment, for example – can divert patients' attention or inhibit their ability to hear. Sounds emitted by other people can likewise interfere with patients' ability to receive and comprehend information. A patient may be distracted by sounds of pain or distress in fellow patients or by exchanges in

those professionals alone. Rather, deciphering the meaning of effective communication relies equally on practitioners' and patients' interpretation of what it is and is not. To arrive at a consensus meaning of effective communication, it is helpful for healthcare professionals to recognize and understand instances in which it does not exist – in other words, to explore occurrences that impede quality communication from both practitioners' and patients' perspectives.

close proximity between practitioners and patients or family members, practitioners and practitioners, or patients and their family members. Machine- and human-generated noise also can elicit fear and anxiety in patients. For instance, a patient may be less likely to acknowledge or accept the reassurances of a healthcare professional about their health status while preoccupied with the flat-line tone of another patient's ECG. Although healthcare personnel are accustomed to tuning out sounds of floor cleaners, overhead pages, and food and supply carts, patients are more aware of these distractions. Patients have often had interrupted sleep and may be irritated by environmental noise.

Physical noise is less of an obstacle to communication from the viewpoint of clinicians, who are well acclimated to the frequency and intensity of sounds in healthcare settings. In the context of communication theory, however, the concept of noise moves beyond tangible sounds to encompass any internal or external barrier that impedes the encoding and decoding of messages and feedback. Fear and anxiety in patients, for example, can be present in clinical encounters in the absence of physical noise. Patients' worry over their health status and concern about being embarrassed or judged by healthcare professionals fall under the category of intrapersonal noise that can hinder their ability to receive and comprehend the intended messages of their healthcare providers. Feelings of powerlessness similarly

stem from intrapersonal communication and extend to interpersonal exchanges. Patients' receptiveness to messages can be influenced by their feelings of lack of privacy and control in healthcare settings, as when they cannot command who is or is not present in their clinical encounters or control when a clinician disrupts communication to respond to a page or cell-phone alert or attend to another patient with pressing needs. Moreover, patients may perceive an imbalance in power in their relationships with clinicians when they lack understanding of their condition and feel practitioners speak in ways or of topics that are beyond their comprehension (Ringdal et al., 2017). Patients may be embarrassed to question the meaning of medical terms used by healthcare professionals.

Patients increasingly desire to fully participate in their care and the support of healthcare professionals contributes to the development of meaningful patient-provider partnerships. However, communication barriers persist when patients – particularly among those who possess low health literacy or who are members of vulnerable populations – are uncertain or uncomfortable with their role in encounters with providers. Patients' self-efficacy affects the quality of their relationships with providers; but adopting an active role in the relationship by, for example, asking questions, is challenging for some patients. Other factors, ranging from patients' feeling overloaded by information or having insufficient time to process information during a clinical encounter, to the disruption of conversation caused by clinician use of electronic health record systems, to a hectic healthcare environment that causes some patients to refrain from open and timely communication out of concern that their needs will interrupt busy healthcare professionals, can likewise present obstacles to effective communication and the formation of the partnership touted by patient-centered care models (Gordon et al., 2020).

Healthcare professional consideration: For their part, some nurses cite organization-related factors – for example, the complexity and fragmentation of healthcare systems – as impediments to effective communication with patients (Arnold & Underman Boggs, 2016). Nurses report that environmental factors peculiar to healthcare settings, including heavy workloads that reduce time spent with patients, cause fatigue and contribute to stress and impede nurse-patient communication (Arnold & Underman Boggs, 2016; Norouzinia et al., 2016). The scheduling of 12-hour shifts and overtime demands contribute to the work stress that can create limited communication time with patients.

The SARS-CoV-2 pandemic highlighted another environmental barrier to healthcare communication: the use of personal protective equipment (PPE) and its impact on patient-provider interaction. Masks, respirators, face shields, goggles, and protective clothing — mandated for all healthcare workers to prevent the spread of the highly contagious virus — were found to adversely affect some, though not all, clinicians in their efforts to communicate with patients and colleagues. Such communication breaks carried the potential to jeopardize the effectiveness of interventions and patient safety (Hines et al., 2020; Marler & Ditton, 2020). At the time of this writing, researchers speculated that mask wearing by providers and patients during the pandemic impeded not only verbal communication by reducing the volume or changing the tone of voice in a mask-wearer, but also nonverbal communication cues by compromising the ability to view mouth and lip movement and facial expressions (White et al., 2021). Marler and Ditton (2020) theorized that patients with cognitive, hearing, and other communication impairments, including elderly patients, may have been particularly susceptible to physiologic and psychological stress resulting from their inability to rely on auditory stimuli or inferences from facial expressions in mask- or respirator-wearing clinicians. Additionally, PPE use during the pandemic made clinicians indistinguishable from one another from the patient perspective, negating patients' perception of consistency in their healthcare providers and disrupting the development of patient-provider rapport central to therapeutic communication (Marler and Ditton, 2020). Patients who have impaired hearing are often reluctant to admit that they did not hear all of the conversation or believe that they heard something other than what was said.

Worldwide, healthcare professionals used a variety of means to overcome PPE-induced barriers to communication with patients, including simple measures such as employing white boards/blackboards and sticky notes (Bagnasco et al., 2020). Patients hospitalized for treatment of SARS-CoV-2, as well as those confined in long-term care facilities or to their homes following isolation measures or community lock down, were at risk for complicated feelings of fragility, loneliness, and disempowerment that was exacerbated by lack of family contact. In the acute care setting, safety protocols deprived patients who were ill or dying of the support of family members at their bedsides (White et al., 2021). Clinicians embraced communication technologies, such as smart phones and touch-screen tablets, to virtually connect patients with their families and friends and to keep families and friends informed of their loved ones' conditions (Schwerdtle et al., 2020). Healthcare professionals likewise widely employed telehealth video conferencing technologies to communicate with patients for a variety of interventions ranging from outpatient care during stay-at-home orders and isolation or quarantine (Elkbuli, et al., 2020; Wosik et al., 2020) to screening to limit exposure to the virus in emergency departments (Chou et al., 2020).

Health literacy and medical jargon

Health literacy is an important driver of clinical outcomes. Research recognizes low levels of health literacy as a contributing factor in suboptimal or even poor outcomes. On the other hand, a higher level of health literacy, and the patient engagement it spurs, is thought to be indispensable to patients' successful navigation of an increasingly complex healthcare environment (McKenna et al., 2017). Asking patients if they would like a further explanation of instructions or checking for comprehension may offer patients an opportunity to clarify unknown terms.

In a fundamental sense, health literacy is a by-product of the communication process. Patients acquire and process the information they need to make healthcare decisions based on their ability to encode and decode information that is often complicated and scattered. Of course, health literacy involves speaking, reading, and writing about health-related topics, as in discussing one's health with a practitioner, reading care instructions or locating information on healthcare services, and completing forms. At its most basic level, however, it also requires numerical aptitude (to correctly measure medication, for example, or follow nutrition labels) and the grasp of such calculation-related concepts as probability and risk. The sheer volume and complexity of healthcare information can overwhelm even the most adept-appearing patient.

Wide-ranging factors, from socioeconomic status and culture to individual feelings of stigma or confidence, influence patients' health literacy and their communication with healthcare practitioners. Health literacy can act as a facilitator to effective patient-provider communication when patients feel empowered to contribute to their own healthcare; it serves as a barrier when patients feel they are not able to adequately describe their health status or feel insufficiently respected or listened to by clinicians. Patients who feel armed with information that they comprehend and can place in the context of their life circumstances gain the confidence to proactively engage in healthcare decision making and action, potentially impeding or preventing negative health outcomes (McKenna et al., 2017). Patients whose health literacy levels fail to inspire such feelings of control can succumb to wariness of healthcare settings and professionals to the extent that their uncertainty impedes the development of effective patient-partnership relationships. Underlying mistrust of practitioners has been found to be more pronounced in patients with lower levels of health literacy (White et al., 2016).

Healthcare professional consideration: To improve health literacy, best practices recommend healthcare professionals use plain language. Transmitted in both verbal and written form, plain language is considered a message(s) that is readily decoded by receivers. In other words, information conveyed in plain language is understood by people at the moment they hear or read it (U.S. Department of Health and Human Services [HHS], n.d.).

The benefits of the use of plain language are straightforward: In exchanges between patients and their practitioners, both parties immediately and simultaneously share common meaning of the terms used. On the other hand, use of medical terminology or jargon interferes with patients' comprehension of facets of their care. Barring any physiological impediments, patients generally understand an instruction spoken or written as "take this medication every morning," as opposed to "take this medication q.a.m.," the latter of which contains a term beyond the knowledge of the typical layperson. While healthcare professionals can unwittingly lapse into medical jargon for a variety of reasons, not the least of which is the fast pace and pressure associated with their jobs, the use of jargon has been shown to reduce patient participation in their care (DeCelle, 2020).

To improve patients' understanding of discharge instructions, many hospitals have created discharge lounges. In this setting, patients are brought from their rooms to a lounge area where family and patients sit in a relaxed environment and discuss discharge information on medications, home care, and follow-up plans. This system has been shown to minimize environmental noise and distractions to improve effective communication as well as free up patient rooms while follow-up appointments are made and the family prepares to pick up the patient.

Linguistics, social identity, and culture

Communication is impaired when practitioners and patients do not speak the same language, literally and figuratively. Multiple factors influence the manner in which messages are given and received in healthcare settings, not the least among them being the dialect, age, gender, race, sexual orientation, religious affiliation, and socioeconomic status of patients and their practitioners, and the cultural norms to which they both adhere.

The literature is rife with evidence of the need for healthcare professionals to develop therapeutic relationships with patients of diverse backgrounds. Safe, quality care relies on practitioners' respect for patients' values, experiences, and customs. For instance, the ethical standards of nursing (ANA, 2015b) demand that nurses recognize and value the individuality of each patient in every professional interaction, regardless of the patient's health issues, personal characteristics, beliefs, or social or economic status and unobstructed by the nurse's own characteristics, status, or bias. An encyclopedic accounting of the diversity of patients' traits and the influence of those traits on practitioner-patient communication cannot be accomplished here, but the following themes describe factors that commonly impinge on the effectiveness of practitioner-patient communication:

- **Linguistics** – Healthcare professionals assume unacceptable risk to patient safety when they try to communicate with patients whose first language is not shared with their own, in other words, when English (in the United States) is not a patient's (or the practitioner's, for that matter) first language. All practitioner-patient communication can be vulnerable to miscommunication, but exchanges between clinicians and patients using different dialects are far more susceptible to misinterpretation and error; and use of family members, children, or other ad hoc interpreters can lead to miscommunication and heightened risk of adverse events (Showstack, 2019). In any country or setting, research has identified language barriers as significant obstacles to the provision of adequate, appropriate, effective, and timely care to patients with limited proficiency in the language of their healthcare providers (Ali & Watson, 2017). In the United States, patients with limited proficiency in English tend to have longer lengths of hospital stays and higher readmission rates than their English-speaking counterparts, regardless of their socioeconomic status (Squires, 2018).

US law, such as the Civil Rights Act of 1964 and the Americans With Disabilities Act, and federal regulations and executive orders compel healthcare organizations and professionals to overcome language barriers for non-English-speaking and physiologically challenged individuals by providing language services, such as qualified interpreters (Schwei et al., 2016; Squires, 2018). TJC (2020) standards also require the identification of patients' preferred language and the provision of language services for patients with different dialects and sensory impairment.

Nursing consideration: Practitioners report that their challenges with low health literacy in patients are primarily because of language differences and they recognize that patients who have limited proficiency in English may not receive the same quality of care as English-speaking patients. While use of translators can be beneficial to ensuring quality care among patient populations with language barriers, further research is required to develop best practices for working with translators to assess patients' health literacy (Wittenberg et al., 2018).

Social identity – Adults encode and decode messages differently than children do. Men and women interact with others in discrete ways; men and women of diverse racial, ethnic, religious, or socioeconomic backgrounds communicate differently still. Gaps between generations can contribute to gaps in shared understanding of messages. Any one of a multitude of characteristics with which people socially identify can become a barrier to quality communication, even when senders and receivers share some of those characteristics.

Recall that most patient-provider interactions follow the transactional model of communication, by which we shape our perceptions of ourselves and the ways in which we relate to other people – all in the context of our personal experiences. We form attachments to people based on our respective fields of experience, including the social norms to which we have been exposed and the type and length of our relationships. Social norms and the level of familiarity in relationships can be powerful drivers of intrapersonal and interpersonal communication. Generally speaking, for example, we understand that conversing with a middle-aged adult as if they were a toddler would defy a social convention or that an exaggeratedly friendly exchange with a person whom we just met would be a social faux pas.

In addition to our deference to convention, communication accommodation theory (CAT) suggests people consciously or unconsciously adjust their mode of communication – the tone or pitch of their voice, the speed of their speech, the words they choose, or the gestures they use, for instance – to either promote understanding and build rapport with others or to highlight differences (Arnold & Underman Boggs, 2016). CAT explains our tendency to address children differently than adults, adopt the rhythm of another person's speech, or, to the contrary, verbally or nonverbally turn away from exchanges with others. Although additional research is warranted, convergence, a subset of CAT that explains the ways in which people adapt their communication to reduce social and other differences, may demonstrate efficacy in patient-provider encounters, particularly with communication with patients of advanced age (Momand & Dubrowski, 2020).

- **Culture** – As a body of knowledge, beliefs, values, and behaviors, culture shapes our identity and the ways in which we communicate intrapersonally, interpersonally, in groups, and through media. Ubiquitous in clinical encounters, culture guides both patients' and practitioners' attitudes toward every aspect of health and care, from concepts of wellness to viewpoints on death. An increasingly diverse population in the United States means healthcare professionals are progressively more likely to engage in intercultural exchanges with patients. Complicated and at times confounding, intercultural exchanges can be further muddled by multiple cultural identities. A patient or practitioner, for example, can be simultaneously guided by the norms of American culture; an ethnic culture; a generational culture; and lesbian, gay, bisexual, and transgender culture. The use of titles (Ms., Miss, Reverend, Dr., or rank) is generally culture-based and the use of first names is also a patient's preference in some cultures. Transgender patients should be asked how they would prefer to be addressed to promote sensitive communication.

The healthcare environment has its own culture. Clinicians are comfortable within this culture; they know how the healthcare system functions, the protocols it follows, and the tasks accomplished by its members. To lay patients, however, healthcare settings are foreign environments. Navigating the strange land of healthcare settings adds to the apprehension or stress patients so often feel as they try to unravel the mysteries of medical jargon, diagnoses, medications, treatments, and procedures – and all while illness renders them at their most vulnerable

(Ruben, 2016). Lack of congruence between the culturally steered viewpoints of patients and their practitioners, let alone differences in language, interferes with the encoding and decoding of messages in patient-provider encounters, which can hamper the development of therapeutic relationships and provider decision making. Lack of cultural competence and unconscious bias among healthcare providers have been implicated in disparities found in patient care activities across healthcare settings (Perez-Stable & El-Toukhy, 2018). TJC recognizes that bias in clinical decision leads to patient safety concerns (TJC, 2016). Table 2 provides further examples of culturally based factors that influence patient care.

Healthcare professional consideration: Culture acts as a barrier to effective communication and quality outcomes when practitioners fail to recognize, accept, appreciate, and examine differences in patients' values, beliefs, and preferences. The cultural competence required of healthcare professionals by such organizations as TJC (2010) and HHS (n.d.) arises from the recognition that cultural differences strongly influence patient-provider communication and decision making, which in turn affect patient satisfaction and clinical outcomes.

Clinician-family communication

Communication among family members, patients, and practitioners profoundly influences health-related decision making. Families can facilitate positive outcomes for their loved ones by acting as patients' counselors, advocates, and caretakers, but their involvement in healthcare events might also impede patients' understanding of their health concerns and ability to make informed decisions about their care. Sometimes families cause aggravation for patients and clinicians alike (Arnold & Underman Boggs, 2016).

Families add a layer of complexity to healthcare communication. All of the barriers to effective communication that pertain to patients apply to families as well. Communication between families and clinicians can be constrained by the influence of the healthcare environment and the diversity of members' health literacy, language, social identity, and culture. The diversity of families is likewise demonstrated by their varied composition. Families are made up of childless dyads, single-parent households, stepfamily or blended households, extended family members, and same-sex partners and their children, among others. Moreover, families are composed of individuals, each with their own values and preferences about health and healthcare. Reactions among family members to the patient experience, particularly during emergent situations or other crises, can widely vary (Arnold & Underman Boggs, 2016).

The same assorted values and viewpoints that clinicians bring to interactions with patients also occur – positively or negatively – in their exchanges with families. For example, critical care nurses report that their attitudes toward the involvement of family in patient care decisions and activities are formed by such factors as their own values and beliefs concerning family participation, their concerns about patient safety and trust in family members' capabilities as caregivers, their interpretation of family dynamics in the context of a patient's care, and the culture of their workplace or unit (Hetland et al., 2018). Physical space allowed for performing patient care may restrict the presence of family or the care may require privacy that will limit family presence. Restriction should be explained to the patient and family and the most liberal visitation policies should be adopted to promote patient satisfaction and safety.

Table 2: Examples of Cultural Influences on Patient-Provider Interaction

Influence	Description
Health beliefs	In some cultures, people believe that talking about a possible poor health outcome will cause that outcome to occur.
Health customs	In some cultures, family members play a large role in healthcare decision making.
Ethnic customs	Differing roles of women and men in society may determine who makes decisions about accepting and following through with medical treatments.
Religious beliefs	Religious faith and spiritual beliefs may affect healthcare-seeking behavior and people's willingness to accept specific treatments or behavior changes.
Dietary customs	Disease-related dietary advice will be difficult to follow if it does not conform to the foods or cooking methods used by the patient.
Interpersonal customs	Eye contact or physical touch will be expected in some cultures and inappropriate or offensive in others. The presence of unaccompanied male nurses in female's rooms may be prohibited in some cultures/religions.

Note. From Agency for Healthcare Research and Quality, 2020b, "Health Literacy Universal Precautions Toolkit 2nd Edition" (<https://www.ahrq.gov/health-literacy/improve/precautions/tool10.html>). Reprinted with permission

Improving the effectiveness of practitioner-patient communication

The healthcare industry's shift toward patient-centered care as a pathway to improved care quality has renewed interest in communication theory and its particular application in healthcare settings. Linear transmission of information between practitioners and patients, in which patients receive information without opportunity for feedback and clinicians assume a dominant role in patient-practitioner interaction, has given way to participatory, transactional modes of building and sustaining therapeutic relationships. Contemporary and emerging care models seek not only to better provide and explain healthcare information, but also to understand and incorporate how patients make sense of and apply that information to healthcare decisions in the context of their unique personal experiences (Ruben, 2016).

Shared decision making

Shared decision making is an outgrowth of the construct of patient-focused care. Its premise centers on transactional communication that develops a partnership between clinicians, patients, and families. In shared decision making, practitioners form collaborative relationships with patients in which healthcare decisions meld practitioner expertise and evidence-based care with patient values, preferences, and life context. It emphasizes conscious effort on the part of clinicians to

understand and appreciate the breadth of patients' circumstances and involve patients in choosing care options based on their unique needs and perspectives of the importance of those options in their lives (Kunnean et al., 2016).

Research has demonstrated a positive relationship between shared decision making and patients' reports of satisfaction with healthcare encounters, but the state of the science lacks empirical evidence of a direct link between jointly achieved patient-provider decisions and clinical outcomes (Muller et al., 2018; Truglio-Londrigan & Slyer, 2018). Additionally, uncertainty exists among clinicians about the defining characteristics of shared decision making and its appropriate use (Kon et al., 2016). Despite this lack of clarity, the ethics of promoting patient autonomy and self-determination has justified interest in and adoption of shared decision-making principles (Muller et al., 2018), and professional organizations have outlined approaches that both adhere to ethical standards and promote effective communication skills. An example of a basic conceptual framework for shared decision making involving a treatment decision and suggested ways to participate in the shared decision-making process are provided in Appendices C and D, respectively.

Communication and the building of relationships with patients form the foundation of shared decision making. Healthcare professionals promote shared decision making by actively seeking trusting and respectful partnerships with patients that engender collaboration and power-sharing. Patients who feel the trust and respect of clinicians are more apt to approach their relationships with clinicians openly and freely share information. Shared decision making can improve patient compliance that is critical to recovery.

Healthcare professional consideration: At times in shared decision-making relationships, healthcare professionals can be challenged to strike a balance between their patients’ needs, desires, and preferences and evidence-based practice. When patients’ values or beliefs conflict with clinical guidelines, practitioners should consider principles of ethical practice, which involve the concepts of patient autonomy and beneficence. In such situations, however, healthcare professionals should also look to their communication skills to encourage deliberation, negotiation, and consensus with patients on healthcare decisions (Truglio-Londrigan & Slyer, 2018).

Communication tools and techniques

Targeted communication tools have demonstrated efficacy in overcoming barriers to effective patient-practitioner communication, promoting patient satisfaction, and improving clinical outcomes.

Professional healthcare organizations recommend the use of health literacy universal precaution in clinical encounters and in the development of printed patient education materials. The precautions, described by the AHRQ (2020c), are intended to treat all patients, regardless of their education or level of proficiency in health-related matters, as if they are at risk of not understanding information about their health. Health literacy skills can vary not only between individuals but within individuals, and they can change over time (McKenna et al., 2017) or be influenced by illness, fatigue, and fear (Liang & Brach, 2017).

Guidelines for the precautions emphasize clear, concise, jargon-free communication (see Appendix E) and employ the use of the teach-back method of ensuring comprehension.

The teach-back method was developed for use chiefly in primary care, but its implementation is also supported in other clinical specialties (Almkuist, 2017). The method involves an iterative, sender-receiver feedback loop in which practitioners convey information in plain language and test patients’ comprehension by asking them to repeat the information in their own words. If patients do not adequately transmit their understanding back to practitioners, the looped feedback process continues until the practitioner is assured the information is understood. AHRQ (2020b). The Institute for Healthcare Improvement recommends use of teach-back activity to meet the standards of health literacy universal precautions (Yen & Leasure, 2019). Despite low levels of health literacy in the American population and the efficacy of the teach-back method, however, more than two-thirds of surveyed adults reported they had not received teach-back instruction in healthcare encounters in a one-year period, a gap that potentially risks patient dissatisfaction and adverse outcomes (Liang & Brach, 2017).

Motivational interviewing is a technique that originated in primary care drug and alcohol addiction counseling as a means to guide behavior change. Its use has migrated to other healthcare specialties with positive results (Gesinde & Harry, 2018; Rehman et al., 2017). The counseling- style approach of motivational interviewing acknowledges that patient-centered care does not follow a one-size-fits-all pattern.

The technique has been successfully applied to a range of instances, from improving medication adherence to reducing vaccine hesitancy, that call for facilitating changes in patient behavior in ways that lead to improved outcomes (Oh & Lee, 2016; Gagneur, 2020; Gisebde & Harry, 2018). It aims to support patients’ decision making by fostering a culture of partnership between healthcare professionals and patients, encouraging engagement in the relationship, and reinforcing patients’ motivation for change (Gagneur, 2020). The approach likewise seeks to adapt to patient preferences and culture (Gisebde & Harry, 2018; Oh & Lee, 2016). For example, determining care options that suit patients’ preferences and boost patient adherence can involve tradeoffs between clinicians’ preferred course of action and other clinically sound choices that yield or nearly yield the same result. A clinician might prefer that their patient, a single, working parent of young children who is overweight, reach a mutually established goal for body mass index (BMI) within 6 months. However, in consideration of limits on the patient’s available time to prepare calorie-conscious meals, the clinician and patient may determine 9 months to be a realistic and acceptable goal – one that raises the prospect the patient will adhere to a structured weight-loss plan.

Motivational interviewing has been found beneficial in instances in which patients express ambivalence about a necessary behavior change (Oh & Lee, 2016) and it is frequently used in combination with shared decision-making tactics. The four overlapping stages of motivational interviewing are summarized in Table 3.

As healthcare organizations increasingly underscore the importance of effective patient-provider communication, researchers are exploring the effect of communication interventions in a variety of patient populations and their potential application across healthcare specialties. The BATHE (a mnemonic for Background, Affect, Trouble, Handling, and Empathy) technique in primary care settings, for example, facilitates rapport between patients and clinicians using a brief five-step question-and-answer tool, summarized in Appendix F (Cayley, 2018). Typically employed as a mental health screening tool, the BATHE technique has shown some efficacy in engendering feelings of empowerment in patients with chronic conditions, such as diabetes (Akturan et al., 2017), and has shown positive effects on patient satisfaction with inpatient experiences (Pace et al., 2017).

The CRASH Course in Cultural Competency Skills training program helps clinicians adjust their interpersonal communication skills to accommodate the values, preferences, and behaviors of an ever-more-diverse patient population. (The CRASH mnemonic stands for the following: consider Culture, show Respect, Assess/Affirm differences, demonstrate Sensitivity/Self-awareness, and show Humility.) CRASH seeks to build practitioners’ confidence in providing holistic care by competently addressing the health concerns of racially and ethnically diverse patients. It integrates patients’ culture into clinical decision making (McGregor et al., 2019). Principal elements of the protocol are outlined in Appendix G.

Communication interventions on a narrow scale also have demonstrated improvements in patient-clinician therapeutic exchanges. When employing nursing’s Commit to Sit initiative, for example, nurses take time to briefly sit, rather than stand, at the bedside while exchanging information about care plans with patients. As a demonstration of nurses’ empathy and skill in interpersonal relations, the Commit to Sit protocol has shown markedly improved patient satisfaction scores (George et al., 2018; Lidgett, 2016).

Table 3: Stages of Motivational Interviewing

Stage	Description
Engaging	Building and maintaining a trusting clinician-patient partnership.
Focusing	Supporting the patient in establishing a direction for change.
Evoking	Exploring and reinforcing the patient’s motivation(s) for change
Planning	Designing a realistic and specific plan of action.

Note. Adapted from “Practical Guidance on the Use of Motivational Interviewing to Support Behavior Change” by L. Johnston, C. Hilton, and F. Dempsey, 2021, in S. Belo Ravara, E. Dagli, P. Katsaounou, K. E. Lewis, & Pisinger, Eds., “Supporting Tobacco Cessation [ERS Monograph],” European Respiratory Society, pp. 56-75 (<https://doi.org/10.1183/2312508X.10002320>). Reprinted with permission.

Therapeutic communication skills

No matter the communication strategy you use in interchanges with patients, your ability to fulfill your professional responsibilities relies as much on your mastery of therapeutic communication skills as it does your clinical expertise. Competency in therapeutic communication skills underlies the achievement of a patient's health-related goals (Arnold & Underman Boggs, 2016).

Therapeutic communication skills can be taken for granted or blurred by environmental factors and other barriers. The hectic pace of your workplace, for example, might trigger lapses in your demonstration of empathy or prompt you to exhibit nonverbal cues (a heavy sigh, a deeply inhaled breath, or tightly crossed arms, for instance) that patients interpret as disapproval. Self-talk might overpower your objectivity and confidence to, for example, present bad news to a patient, impelling you to provide false reassurances instead. You may think a brisk demeanor shows your professional efficiency; your patient might interpret the meaning of your behavior as unsociable. Diligence in patient sensitivity and effective communication techniques will help to ensure the best patient outcomes.

Skilled therapeutic communication, however, is distinct from social communication (Arnold & Underman Boggs, 2016). Although practitioners might engage in social banter with patients as a means to alleviate anxiety, perhaps, or to diffuse conflict, therapeutic communication techniques are purposely directed toward advancing patients' health outcomes. Appendix H provides a refresher on patient-focused therapeutic communication skills.

Self-Assessment Quiz Question #8

Healthcare professionals assume unacceptable risk to patient safety when they:

- Accommodate all patients' preferences in decision making.
- Communicate with patients when there is a language barrier.
- Ask open-ended questions in clinical encounters.
- Reduce internal and external distractions.

Self-Assessment Quiz Question #9

Which type of barrier to effective communication potentially occurs when practitioners lack awareness of differences between their values and preferences and those of their patients?

- Linguistic.
- Relational.
- Environmental.
- Cultural.

Self-Assessment Quiz Question #10

Which tool is used in health literacy universal precautions to ensure patients' understanding of health-related information?

- Language services.
- BATHE interviewing.
- Shared decision making.
- Teach-back method.

Technology-assisted communication

Existing and emerging information and communication technologies (ICT) intend to facilitate communication between healthcare professionals and patients, as well as between other practitioners. ICT is used to simplify and expedite communication for purposes ranging from patient diagnoses and care management to patient education, counseling, and support. It takes various forms, from email and mobile texts to automated decision support, e-health portals, personal digital assistants, and telehealth systems. Next generation ICT applications aim to improve healthcare services and delivery through 5G network upgrades that reliably connect anyone, anywhere, at any time through any device or service; the so-called Internet of Things that seamlessly integrates smart devices; and artificial intelligence and machine learning, among others (Maria et al., 2020; Tuli et al., 2020).

ICT, including the use of electronic health systems for documentation, has dramatically transformed the work of healthcare professionals. In daily practice, the ability of health information technologies to improve communication and, ultimately, patient outcomes, is dependent on healthcare professionals' adoption of new technologies and development of technical competence. Healthcare professionals' attitudes toward technology can be influenced by such factors as age, education level, years of service, and prior use of computers or other digitally based technology (Maria et al., 2020). Practitioners who lag behind in the adoption of and demonstrated competence in ICT may not only be hindered in their ability to adhere to professional practice standards, but they may also experience feelings of stress, frustration, and incompetence that further impede or delay their acceptance of technological innovations (De Leeuw et al., 2020). Extensive technology can also result in nurses focusing more on the screens and monitors than the patient. Research continues to explore the effects of ICT on clinical practice and the efficacy of technology-assisted practitioner-patient interpersonal communication.

CASE STUDY

Mr. Miller is a physically active 67-year-old who, before his retirement 2 years ago, had achieved a master's degree and worked in an executive capacity in his profession. He arrived at his primary care practice with reports of mild chest discomfort, slight dyspnea, and fatigue. He has a previous history of smoking for more than 20 years, a current history of hyperlipidemia controlled by atorvastatin 10 mg daily for 10 years, and mild hypertension managed by diet and exercise. His BMI falls within the normal range.

A physical examination, chest x-ray, and baseline ECG were unremarkable, but his blood pressure was 148/90 mmHG. His physician ordered laboratory tests. During the blood draw, the nurse noted Mr. Miller seemed quiet and distracted. He directed his gaze toward the floor and did not ask questions other than when he could expect the results of the laboratory findings.

Four days later, in the midst of overbooked cases and as Mr. Miller is attending his grandson's soccer game, the nurse calls his cell phone. Reading from Mr. Miller's health record, she relays that his physician noted an elevated hs-CRP (high-sensitivity C-reactive protein) value necessitating an exercise stress test. The nurse also instructs Mr. Miller to increase his atorvastatin to 20 mg daily. Responding to Mr. Miller's question about the meaning of the laboratory results, the nurse perfunctorily states, "It is a possible signal of heart disease, so the doctor wants you to have a stress test. We will put in the order

and you will receive a call with the date and time of the test and other instructions." Mr. Miller responds with a simple, "Okay." To the nurse, Mr. Miller sounds subdued, even downcast. At the conclusion of the call, she thinks about ways in which she could better approach conversation with Mr. Miller during his follow-up visit in a week's time. For his part, Mr. Miller becomes preoccupied with worry about his heart health and self-restricts his usual physical activity.

Questions

- Which elements of metacommunication should the nurse consider in future interactions with Mr. Miller?
- Which techniques should the nurse apply to improve the effectiveness of communication with Mr. Miller?

Responses

- Upon reflection, the nurse senses Mr. Miller may have felt intimidated or in some way defeated by the prospect of a cardiovascular issue. In reviewing her interaction with Mr. Miller, she recognizes that several barriers may have influenced his feelings about his laboratory results and upcoming test, his ability to express his concerns, and her own behavior. For example, she challenges her assumption that, based on his education, work experience, and demeanor, Mr. Miller has a high level of health literacy. She contemplates environmental obstacles – a busy workday that left her feeling pressed for time and the distracting

noise of the outdoor event Mr. Miller was attending at the time of their telephone call – that potentially interfered with both the encoding of her message to Mr. Miller and his decoding of the information he received. She further considers whether Mr. Miller’s social identity could be linked to his perception of success and control in his life, a viewpoint he may now feel is threatened by the possibility of poor heart health.

2. The nurse resolves to prepare for her conversation with Mr. Miller during his follow-up visit. She makes a mental note to relax and take time to review his medical record and the results of his stress test before their meeting. Additionally, to lessen any potential anxiety for Mr. Miller, she will ensure the practice’s portable ECG is absent from the examination room to which he is assigned. She plans to be consciously present during the exchange and explore the degree to which Mr. Miller understands cardiovascular disease and his feelings about his current health. She will probe whether anything in his field of experience – the premature death of a family member, perhaps – might account for the fatalistic feelings she suspects he possesses. She also reminds herself to avoid the use of medical terminology and answer his questions in plain language, adjusting the length and tenor of her answers to match his during the course of their conversation.

Drawing on her knowledge of therapeutic communication principles, the nurse warmly greets Mr. Miller at the scheduled appointment time with a smile, eye contact, and an upbeat attitude. She sits across from him, tilting away the computer screen displaying his health record. She initiates a series of questions, waiting until Mr. Miller has completed his answers, issuing verbal and nonverbal prompts, when necessary, to elicit further information, restating his responses to ensure mutual

understanding, and displaying empathy for his concerns. For example, the nurse may use the following questions to probe his thoughts:

- “I sense you have been concerned about the stress test and the results. Can you tell me about that?” “It sounds like this has caused you a great deal of worry. How have you been handling that?”
- “Let me see if I understand. Your concerns come from the fact that heart disease contributed to your father’s death, your brother died prematurely, and you are worried about your wife becoming a widow? Those are all valid concerns and I can understand why this situation makes you feel nervous, but let’s take a minute to talk about family risk factors and ways to reduce your anxiety.”
- “What do you understand about heart disease, the risk factors involved with it, and the available treatments for it?”

Following the physician consult, the nurse returns to explain the next test Mr. Miller will undergo, a coronary angiogram. She sits alongside Mr. Miller and together they review a patient education pamphlet about the procedure, including how he should prepare for the test and what he can expect during and after the procedure. The nurse prompts Mr. Miller to demonstrate his understanding, asking, “I want to be sure we both have this right. Can you repeat what you should do before the angiogram?”

At the close of the session, the nurse inquires how Mr. Miller feels about the procedure and the information he has been given. She reiterates strategies Mr. Miller can use to reduce his anxiety, reinforcing the degree of control he holds over his own health. Mr. Miller responds that he feels much more confident and optimistic about his overall health and treatment plan.

Conclusion

Communication forms the bedrock of healthcare practice. It underlies the patient-centered, therapeutic relationships healthcare professionals use to promote and support patients’ health and well-being. When interpersonal communication between healthcare professionals and patients is effective, improved patient satisfaction, adherence, safety, and clinical outcomes result.

Demonstrated competency in communication is not a nice-to-have skill for healthcare professionals; it is must-have know-how in clinical practice. Practitioners must be proficient in interpersonal communication to meet standards established by healthcare organizations, but also, crucially, to ensure every patient receives the quality care to which they are entitled in every clinical encounter.

As much as communication is ever present in clinical encounters, it is ever changing, which presents particular challenges in a healthcare environment in flux as well. It also is often fraught with obstacles to the

shared meaning between practitioners and patients that is so integral to the provision of safe, quality care.

Evidence-based techniques help to guide healthcare professionals toward effective communication with patients. No one communication strategy will suit all practitioners or perform equally well with all patients, however, nor will mastery of interpersonal skills overcome all barriers to effective communication all of the time. Rapport can be established and broken, and even the most highly skilled communicators will not communicate well in every situation. Even so, knowledge of communication theory, models, and techniques, along with their application in healthcare practice, provides practitioners the foundation needed to meet the central challenge of effective communication, that is, to build better relationships with patients and, ultimately, improve the quality of their care.

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Appendix A

Characteristics of Group Communication	
Group communication is ...	Meaning that ...
Interdependent	People who communicate in groups depend on others within the group to preserve the group's existence. Without reliance on others, group communication does not occur.
Cooperative	Group members recognize their need for others to accomplish things they cannot achieve on their own.
Purposeful	Interaction between group members serves a common objective. Although individual members might have unique goals, communication within the group centers on a collective purpose.
Shared	Shared expectations guide accepted behavior in group communication. Established norms (e.g., agreeing to meeting times, due dates, or the silencing of cell phones during meetings) steer a group's interaction.
Cohesive	Members of groups experience a sense of solidarity or feeling part of something larger than themselves.

Note. Adapted from "Introduction to communication," n.d., Lumen Learning (<https://courses.lumenlearning.com/introductiontocommunication/chapter/227/>). Reprinted with permission.

Appendix B

Features of Therapeutic Communication	
Element	Description
Purpose	<ul style="list-style-type: none"> An intentional objective centered on patients' health and well-being. Therapeutic communication differs from general social exchanges because it is purpose driven. Its focus remains on recognizing p health needs and improving health outcomes.
Mutuality	<ul style="list-style-type: none"> Shared responsibility for health-focused dialogue. Practitioners and patients participate equally and simultaneously, through verbal and nonverbal means, throughout every communication encounter.
Empathy	<ul style="list-style-type: none"> The ability to form an emotional link with another person within that person's frame of reference or personal experience. Empathy allows nurses to envision themselves in their patients' situations or "walk in their shoes," and knowingly accept and value their patients' realities.
Authenticity	<ul style="list-style-type: none"> A genuine interest in a person and their circumstances. When practitioners are sincere in their approach to patients, they communicate their appreciation for patients' individuality, thus making patients feel valued and important.
Presence	<ul style="list-style-type: none"> Fixed, conscious attention on the practitioner-patient communication process. Being present in therapeutic communication involves consciously reducing or eliminating internal or external distractions to maintain patients' needs and preferences.
Neutrality	<ul style="list-style-type: none"> Intentional omission of one's values, beliefs, biases, and prejudices in communication encounters. Nurses participating in therapeutic communication have an ethical and professional responsibility to nonjudgmentally respect the patient's beliefs and behaviors even when the patient's values, culture, or conduct conflict with the nurse's personal feelings.
Consistency	<ul style="list-style-type: none"> Dependable, accurate information exchanged in the communication process. Practitioners build trust with patients when they meet patients' expectations of predictability, truth, accuracy, and competence throughout communication encounters.
Validation	<ul style="list-style-type: none"> Mutual understanding between communication participants. Supportive messaging by practitioners validates patients' concerns and ensures both parties develop the same understanding of those concerns.

Appendix C

Stages of Shared Decision Making	
Stage	Description
Information exchange	The practitioner and the patient/family share information needed to make a treatment decision. The practitioner furnishes information about treatment options and the risks and benefits of each alternative. The patient/family discloses their goals, values, and preferences relating to the choice(s) to be made.
Deliberation	The practitioner and the patient/family jointly consider which of the available treatment options best suits the patient, given the patient's needs and preferences. Both the patient/family and the practitioner participate in asking questions, voicing opinions, offering perspective on preferences, and correcting misperceptions or erroneous information.
Treatment decision	The practitioner and patient mutually agree on the choice of treatment options and begin the implementation of the selected course of action.

Note. Adapted from "Shared Decision Making in Intensive Care Units: An American College of Critical Care Medicine and American Thoracic Society Policy Statement," by A. A. Kon, J. E. Davidson, W. Morrison, M. Daand D. B. White, 2016, *Critical Care Medicine*, 44 (1), 188-201. Reprinted with permission..

Appendix D

Examples of Effective Practitioner Communication in Clinical Encounters Involving Shared Decision Making

- Seek to gain trust by expressing commitment to the patient/family.
- Involve interprofessional colleagues to support the patient/family.
- Show empathy for the patient's/family's emotions and explore their concerns or fears.
- Use two-way conversation to draw out the patient's/family's goals, values, and preferences and the patient's level of comfort in making healthcare decisions.
- Explain the importance of family involvement in treatment decisions and assess the patient's/family's preferences on the role each plays in the decision-making process.
- Emphasize that choices exist and use plain language to explain the patient's illness and treatment choices, as well as the risks and benefits of each treatment option.
- Ask open-ended questions to determine the patient's/family's understanding of the patient's health status and the available treatment options.
- Explain the rationale underlying treatment recommendations.

Appendix E

Health Literacy Universal Precautions – Communication Strategies for Patient Visits

Action	Description
Greet patients warmly	Receive everyone with a welcoming smile and maintain a friendly attitude throughout the visit.
Make eye contact	Make appropriate eye contact throughout the interaction (after considering patients' culture, customs, and beliefs).
Listen carefully	Try not to interrupt patients when they are talking. Pay attention and be responsive to the issues they raise and questions they ask.
Use plain, nonmedical language	Do not use medical words. Use common words that you would use to explain medical information to your friends or family, such as <i>stomach</i> or <i>belly</i> instead of <i>abdomen</i> .
Use the patient's words	Take note of the words the patient uses to describe their illness and use them in your conversation.
Slow down	Speak clearly and at a moderate pace.
Limit and repeat content	Prioritize what needs to be discussed; limit information to three to five key points and repeat them.
Be specific and concrete	Do not use vague and subjective terms that can be interpreted in different ways.
Show graphics	Draw pictures, use illustrations, or demonstrate with 3-D models. All pictures and models should be simple and designed to demonstrate only the important concepts without detailed anatomy.
Demonstrate how it is done	Whether doing exercises or taking medicine, a demonstration of how to do something may be clearer than a verbal explanation.
Invite patient participation	Encourage patients to ask questions, be involved in the conversation during visits, and be proactive in their health care.
Encourage questions	Create an inviting, shame-free atmosphere that encourages patients to ask questions. Use open-ended questions, such as "Do you have any questions?" several times during the visit. Sit at the same level as the patient and look at them, as opposed to a chart or computer screen, when talking and listening.
Apply teach-back	Confirm patients understand what they need to know and do by asking them to teach back important information, such as directions.

Note. From Brega, A. G., Barnard, J., Mabachi, N. M., Weiss, B. D., DeWalt, D. A., Brach, C., ... West, D. R. (2015, January). *AHRQ health literacy universal precautions toolkit* (2nd ed.) (AHRQ Publication No. 15-0023-EF, prepared by Colorado Health Outcomes Program, University of Colorado Anschutz Medical Campus under Contract No. HHS290200710008, TO#10). Rockville, MD: Agency for Healthcare Research and Quality.

Appendix F

The BATHE Interviewing Technique

B	Background	Elicit a brief description of the patient's circumstances. <i>Ask: What's going on?</i>
A	Affect	Probe how the patient feels about the circumstances. <i>Ask: Do you feel angry, frustrated, or frightened?</i>
T	Trouble	Determine what troubles the patient most about the circumstances. <i>Ask: What concerns you about this?</i>
H	Handling	Inquire how the patient is handling the circumstances and make suggestions. <i>Ask: How are you dealing with that? I can offer you some options.</i>
E	Empathy	Express your understanding of the situation and offer your support. <i>Say: Sounds like this is difficult for you. Let's get you the help you need.</i>

Note. Adapted from "Effects of a brief psychosocial intervention on inpatient satisfaction: An RCT," by E. J. Pace, N. J. Somerville, C. Enyioha, J. P. Allen, L. C. Lemon, and C. W. Allen, 2017, *Family Medicine*, 49(9), 675-678. "Four evidenced-based communication strategies to enhance patient care," by W. E. Cayley, Jr., (2018), *Family Practice Management*, 25(5), 13-17. Reprinted with permission.

Appendix G

Primary Components of the CRASH Course in Cultural Competency Skills		
C	Culture	The importance of shared values, perceptions, and connections in the experience of health, healthcare, and the interaction between patient and professional.
R	Respect	Understanding that demonstrations of respect are more important than gestures of affection or shallow intimacy, and finding ways to learn how to demonstrate respect in various cultural contexts.
A	Assess	Understanding that there are tremendous “within-group differences,” ask about cultural identity, health preferences, beliefs, and understanding of health conditions. Assess language competency, acculturation level, and health literacy to meet the individual’s needs.
A	Affirm	Recognizing each individual as the world’s expert on their own experience, being ready to listen and to affirm that experience. Reframing cultural differences by identifying the positive values behind behaviors we perceive as “different.”
S	Sensitivity	Developing an awareness of specific issues within each culture that might cause offense or lead to a breakdown in trust and communication between patient and professional.
S	Self-awareness	Becoming aware of our own cultural norms, values, and “hot-button” issues that lead us to misjudge or miscommunicate with others.
H	Humility	Recognizing that none of us ever fully attains “cultural competence,” but instead making a commitment to a lifetime of learning, of peeling back layers of the onion of our own perceptions and biases, being quick to apologize and accept responsibility for cultural missteps, and embracing the adventure of learning from other’s firsthand accounts of their own experience.

Note. From “A CRASH Course in Cultural Competence,” by G. Rust, K. Kondwani, R. Martinez, R. Dansie, W. Wong, Y. Fry-Johnson, M. Woody Ridell, E. J. Daniles, J. Herbert-Carter, L. Aponte, & H. Strothers, 2006, *Ethnicity & Disease*, 16(2), S3-29-S3-36. Published by ISHIB. Reprinted with permission. All rights reserved.

Appendix H

Therapeutic Communication Skills (Page 1 of 2)	
Skills	Description
Report:	Approach every patient as an individual and with genuine interest. Displaying authenticity fosters patients’ feelings of importance and value.
Probing:	Ask open-ended questions that encourage patients to use their own words to describe their health needs and concerns. Use focused questions to gather brief, specific information on such factors as symptoms, health history, pain level, and patients’ efforts to resolve their health problems.
Observation:	Look and listen for themes, communication patterns, and nonverbal communication cues. Scrutinize what patients say, the manner in which they say it, and what they do not say. Validate your interpretation of their verbal and nonverbal messages with targeted follow-up questions.
Active (empathetic) listening:	Be attentive and conscious of the nonverbal messages you send to patients. Sit (if possible) facing patients and make eye contact (if culturally appropriate) as you mutually explore the meaning of the messages they send. Consider patients’ values, beliefs, preferences, and priorities as you demonstrate interest and elicit information using active listening response techniques, including the following:
○ Minimal cues	Apply short verbal and nonverbal prompts to encourage patients to share their experiences in their own way. Use phrases such as, “Yes, please go on”; smile, lean forward, and nod your head to prompt continued conversation.
○ Clarification	When uncertain of a patient’s meaning, use a neutral tone of voice to ask for elaboration. For instance, say, “I want to be sure I understand. Can you give me an example?”
○ Restatement	Focus patients’ communication and ensure mutual understanding by reiterating the words they have used. Repeat patients’ statements in the form of a question, such as, “To make sure I’ve got this right, you said ...”
○ Paraphrasing	Translate into your own words the substance of patients’ statements to ensure your interpretation of the content of messages is thorough and accurate.
○ Reflection	Recognize the emotional implications of patients’ messages with statements intended to connect their feelings with the content of their messages, previous experiences, and future outcomes. Say, for example, “I sense you’re feeling angry about your diagnosis,” and “It sounds like this experience reminds you of a bad experience in the past.” Ask, “Can you share with me what you hoped for or expected?”
○ Summarization	Link patients’ knowledge to their feelings and ensure understanding with a few statements that sum up the entirety or portions of exchanges. Use summarization to move on from one topic to another.
○ Silence	Intentionally use pauses to give yourself and patients time to think and process emotions. Short breaks in conversation can also illuminate important points for reflection.
Responses:	To meet patients’ needs for knowledge, empathy, and support, use verbal and nonverbal responses to their messages, such as the following:
○ Matching responses	Align the manner of the messages you send with those of patients. A quick, light comment by a patient, for example, should elicit a similar reaction versus a lengthy or intense response.

Therapeutic Communication Skills (Page 2 of 2)

○ Concrete language	Use simple, unambiguous words that take into account patients' language skill, culture, and level of health literacy. Do not use medical jargon.
○ Feedback	Offer and accept feedback to facilitate patient education. Provide feedback immediately after observing a behavior, be specific in the content of your feedback, and convey empathy and support of patients' learning and comprehension.
○ Touch	Use touch – the holding of a hand, for example, or gentle massage – to convey caring, nurturing, and comfort. Always consider cultural implications that contraindicate the use of touch.
○ Humor	Use humor and laughter as a healing tool. Humor should be strategic (used only when assessed to be appropriate to the situation) and focused on patients' circumstances rather than their characteristics. It can be particularly effective in lessening the discomfort of conversations about health topics that are taboo or otherwise beyond social or cultural norms.

Note. Adapted from "Interpersonal relationships: Professional communication skills for nurses," by E. C. Arnold, and K. Underman Boggs, 2016, 7th ed., Elsevier. Reprinted with permission.

Resources

- Academy of Communication in Healthcare <https://www.achonline.org/>
- Agency for Healthcare Research and Quality – Health Literacy Universal Precautions Toolkit <https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html>
- Agency for Healthcare Research and Quality – Informed Consent/Informed Choice <https://www.ahrq.gov/professionals/systems/hospital/informedchoice/index.html>
- Agency for Healthcare Research and Quality – Patient and Family Engagement <https://www.ahrq.gov/professionals/quality-patient-safety/patient-family-engagement/index.html>
- Agency for Healthcare Research and Quality – SHARE Approach (for shared decision making) <https://www.ahrq.gov/evidencenow/tools/share-approach.html>
- Agency for Healthcare Research and Quality – TeamSTEPS (for effective teamwork) <https://www.ahrq.gov/teamsteps/index.html>
- Centers for Disease Control and Prevention – Health Literacy <https://www.cdc.gov/healthliteracy/index.html>
- Ethnomed <https://ethnomed.org/>
- Health Information Translations <https://www.healthinfotranslations.org/>
- Health Resources and Services Administration – Culture, Language and Health Literacy <https://www.hrsa.gov/about/organization/bureaus/ohc/health-literacy/culture-language-and-health-literacy>
- Institute for Healthcare Communication <http://healthcarecomm.org/>
- International Association for Communication in Healthcare <https://each.international/>
- International Research Centre for Communication in Healthcare <https://charterforcompassion.org/healthcare-partners/international-research-centre-for-communication-in-healthcare>
- The Joint Commission – Effective Communication and Cultural Competence: LGBT Community <https://www.jointcommission.org/lgbt/>
- The Joint Commission – Patient-Centered Communication <https://www.jointcommission.org/standards/r3-report/r3-report-issue-1---patient-centered-communication/>
- The Joint Commission – Roadmap for Hospitals <https://www.jointcommission.org/assets/1/6/ARoadmapforHospitalsfinalversion727.pdf>
- National Center for Cultural Competence <https://nccc.georgetown.edu/>
- National Institute of Minority Health and Health Disparities <https://www.nlm.nih.gov/programs/edu-training/language-access/health-information/>
- National Institutes of Health – Clear Communication <https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication>
- National Network of Libraries of Medicine – Health Literacy <https://nmlm.gov/initiatives/topics/health-literacy>
- National Patient Safety Foundation <https://npsf.digitellinc.com/npsf/>
- U.S. Department of Health and Human Services – National Action Plan to Improve Health Literacy https://health.gov/communication/hlactionplan/pdf/Health_Literacy_Action_Plan.pdf
- U.S. Department of Health and Human Services – Office of Minority Health <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=1&lvlid=6>

COMMUNICATION IN HEALTH CARE, 2ND EDITION

Self-Assessment Answers and Rationales

1. The correct answer is C.

Rationale: On the basis of its component parts, communication is a dynamic, bidirectional process in which people form relationships by interacting through symbols to create, interpret, and exchange the meaning of thoughts, ideas, information, and emotions.

2. The correct answer is A.

Rationale: Interpersonal communication is the exchange of thoughts, ideas, information, and feelings between two or more people. It is the behavior we use to create, maintain, and end relationships. Interpersonal communication makes up the majority of human interaction.

3. The correct answer is D.

Rationale: Communication scientists developed models that organize our varied experiences with different forms of communication and explain how the communication process works. The complex process of human communication is categorized into three main communication models: linear, interactive, and transactional.

4. The correct answer is C.

Rationale: In communication theory, anything that interferes with the delivery, receipt, or interpretation of a message or feedback relating to the message is considered noise. The source of noise can be internal (as in the case of intrapersonal communication) or external. External noise includes physical barriers that interrupt the sending and receiving of messages, such as the blare of an alarm or the clamor of a crowded room; physiological obstacles, such as deafness or blindness; and semantic barriers, as in words that mean different things to different people.

5. The correct answer is A.

Rationale: The bulk of communication in healthcare settings is interpersonal in form. Therapeutic communication is a subset of interpersonal communication specific to the promotion of patients' health and well-being. It is defined as an ongoing, purposeful, cooperative process undertaken by healthcare professionals and patients to identify and achieve patients' health-related objectives.

6. The correct answer is B.

Rationale: Patient satisfaction is indivisibly linked to the interpersonal relationships created and maintained between patients and their healthcare practitioners. Although the degree of satisfaction expressed by patients significantly varies, patients' impressions of their relationships with their healthcare providers have been shown to be strong predictors of patient satisfaction.

7. The correct answer is A.

Rationale: Environmental noise can interfere with patients' abilities to successfully decode the messages they receive in clinical encounters. In communication theory, the concept of noise moves beyond tangible sounds to encompass any internal or external barrier that impedes the encoding and decoding of messages and feedback. Patients' receptiveness to messages can be influenced by their feelings of lack of privacy and control in healthcare settings, such as when they cannot command who is or is not present in their clinical encounters or control when a practitioner disrupts communication to attend to another patient with pressing needs.

8. The correct answer is B.

Rationale: APractitioners assume unacceptable risk to patient safety when they try to communicate with patients whose first language is not shared with their own. All practitioner-patient communication can be vulnerable to miscommunication, but exchanges between healthcare professionals and patients using different dialects are far more susceptible to misinterpretation and error.

9. The correct answer is D.

Rationale: Culture serves as a barrier to effective communication and quality outcomes when practitioners fail to recognize, accept, appreciate, and examine differences in patients' values, beliefs, and preferences. Cultural differences strongly influence patient-provider communication and decision making, which in turn affect patient satisfaction and clinical outcomes.

10. The correct answer is D.

Rationale: The teach-back communication tool involves an iterative, sender-receiver feedback loop in which practitioners convey information in plain language and test patients' comprehension by asking them to repeat the information in their own words. If patients do not adequately transmit their understanding back to practitioners, the looped feedback process continues until the practitioner is assured the information is understood. The Agency for Healthcare Research and Quality and the Institute for Healthcare Improvement recommend use of teach-back activity to meet the standards of health literacy universal precautions.

Emerging Infectious Diseases

6 Contact Hours

Release Date: March 3, 2021

Expiration Date: March 3, 2024

Faculty

Bradley Gillespie, PharmD, is a clinical pharmacist and has practiced in an industrial setting for the past 25+ years. His initial role was as a Clinical Pharmacology and Biopharmaceutics reviewer at FDA, followed by 20 years of leading Early Development programs in the pharma/biotech/nutritional industries. In addition to his industrial focus, he remains a registered pharmacist and enjoys mentoring drug development scientists and health professionals. He also leads workshops and develops continuing education programs for pharmacy, nursing, and other medical professionals.

Bradley Gillespie has disclosed that he has no significant financial or other conflicts of interest pertaining to this course.

Content Reviewer: Dianne L. Haas, PhD, RN, currently serves as full-time faculty as the FNP program coordinator and is a tenured professional with over 45 years of experience in healthcare, serving in clinical, administrative, public health, educational, research, and

consulting roles. Her passion, experience, and education provide her with a strong background in the provision of high-quality client consulting and advisement services. Relevant to this review, she has been a member of several Pharmacy and Therapeutics and Infection Control Committees in both Pediatric and Adult hospitals and has administered hospital-based infection control programs. She was a first lieutenant with the National Disaster Medical System, National Nurse Response Team, USDHHS, from 2001-2006. This body is charged with responding to national health crises such as pandemics. She is a current member of the Michigan Medical Care Advisory Council, whose members serve as policy advisors to the state's Medicaid Director and program staff, who are currently responding to the coronavirus pandemic.

Dianne L. Haas has disclosed that she has no significant financial or other conflicts of interest pertaining to this course.

Course overview

Nurses in many practice settings are likely to encounter patients that are using dietary supplements – some appropriately – whereas in other instances, not. This course is designed to provide an overview of these products that will empower nurses to guide their usage safely and effectively. Dietary supplements of many types are widely used by Americans. As a result, it is likely that nurses, in a variety of settings, will encounter patients who use these products.

This educational program is designed to provide an overview of the following:

- The regulation of nutritional supplements.
 - Main categories of nutritional supplements, their potential activity, and safety concerns.
 - Resources available to provide additional information.
-

Learning objectives

Upon completion of the course, the learner should be able to do the following:

- ♦ Provide two historic examples of a global pandemic.
- ♦ Describe a potential consequence of antimicrobial resistance.
- ♦ Explain how R0 can change over the course of an epidemic.
- ♦ Detail a scenario that could permit an outbreak of a previously eradicated ID in the United States.
- ♦ Identify one reason why some people refuse to vaccinate themselves and/or their children.

- ♦ Understand the relationship between a pandemic and the human need to assign blame.
 - ♦ Name three components of hygiene efforts useful to counter the spread of ID.
 - ♦ Acknowledge the role of public health agencies in the management of contagious ID.
 - ♦ Identify two elements needed to support effective contact tracing efforts.
 - ♦ Explain two practices that nurses can teach their patients that are effective in reducing the spread of contagious diseases.
-

How to receive credit

- Read the entire course online or in print which requires a 6-hour commitment of time.
- Complete the self-assessment quiz questions which are at the end of the course or integrated throughout the course. These questions are NOT GRADED. The correct answer is shown after you answer the question. If the incorrect answer is selected, the rationale for the correct answer is provided. These questions help to affirm what you have learned from the course.
- Depending on your state requirements you will be asked to complete either:

- An affirmation that you have completed the educational activity.
 - A mandatory test (a passing score of 70 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
 - If requested, provide required personal information and payment information.
 - Complete the MANDATORY Course Evaluation.
 - Print your Certificate of Completion.
-

CE Broker reporting

Elite, provider # 50-4007, reports course completion results within 1 business day to CE Broker. If you are licensed in Arkansas, District of Columbia, Florida, Georgia, New Mexico, South Carolina, or West

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Elite is accredited as a provider of nursing continuing professional development by the American Nurses Credentialing Center's Commission on Accreditation.

Individual state nursing approvals

In addition to states that accept ANCC, Elite is an approved provider of continuing education in nursing by: Alabama, Provider #ABNP1418 (valid through February 5, 2025); California Board of Registered Nursing, Provider #CEP17480 (valid through January 31, 2024); California Board of Vocational Nursing and Psychiatric Technicians (LVN Provider # V15058, PT Provider #15020) valid through

December 31, 2021; District of Columbia Board of Nursing, Provider # 50-4007; Florida Board of Nursing, Provider #50-4007; Georgia Board of Nursing, Provider #50-4007; and Kentucky Board of Nursing, Provider #7-0076 (valid through December 31, 2023). This CE program satisfies the Massachusetts Board's regulatory requirements as defined in 244 CMR 5.00: Continuing Education.

Activity director

Shirley Aycock, DNP, RN, Executive Director of Quality and Accreditation

Disclosures

Resolution of conflict of interest

In accordance with the ANCC Standards for Commercial Support for continuing education, Elite implemented mechanisms prior to the planning and implementation of the continuing education activity, to identify and resolve conflicts of interest for all individuals in a position to control content of the course activity.

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Course verification

All individuals involved have disclosed that they have no significant financial or other conflicts of interest pertaining to this course. Likewise, and in compliance with California Assembly Bill No. 241,

every reasonable effort has been made to ensure that the content in this course is balanced and unbiased.

INTRODUCTION

The world's struggle with the novel coronavirus has brought the term *Emerging Infectious Disease* into everyday use in scientific and clinical vernacular. While the use of this terminology has only recently become more common, the phenomenon of EID has likely plagued humans for many centuries. Over the past several years, though, the occurrence of EID seems to have greatly accelerated, becoming an existential threat to humankind. The changes leading to an increased incidence of EID are likely multi-faceted, with linkages to modifications in land use, enhanced intercontinental travel, climate change, and antimicrobial resistance. Whatever the reason, EID pose significant challenges for

public health and science. While the impact of some EID may be blunted by immunization programs, antimicrobial therapeutics, and active immunity, it can be anticipated that, in many cases, EID will overwhelm global public health systems.

While the COVID-19 pandemic was the most important global EID at the time that this program was developed, the focus of this educational program is EID agnostic. Nonetheless, because of the massive scale of the current crisis, thousands of examples related to COVID-19 are available that work well to illustrate the general concepts of EID.

Infectious disease

Microorganisms, such as parasites, bacteria, viruses, and fungi, live inside, on, and around animal and human bodies. While many are harmless and, in some cases, even helpful, others are pathogenic and can cause ID. Some ID are not easily transmissible between animals and people, while others can be quite contagious. In some cases, infectious microorganisms are spread by insects or other animals (vectors), while at other times, transmission is via environmental exposure or by consumption of contaminated food or water. Manifestations of ID are variable, depending on a variety of factors, perhaps most importantly, the organism causing the infection. Despite symptomatic diversity, ID are often associated with fever and fatigue. Additional symptoms may include diarrhea, arthralgia, and coughing. While mild infections may respond well to rest and home remedies, others may be life-threatening and require urgent medical attention. Many historically devastating ID, such as measles, can be prevented by timely immunizations. In addition, many other ID can be prevented by employing thorough sanitation practices, such as handwashing and cloth face masks. While anyone exposed to a virulent pathogen can contract an ID (Mayo Clinic, 2019), there are risk factors that may increase the odds of illness through immunosuppression resulting from the following (Mayo Clinic, 2019):

- The use of medications or therapies such as chemotherapy, chronic use of corticosteroids, or post-transplant anti-rejection medications.

- Human Immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS).
- Cancer or disorders impacting the immune system.
- Other medical conditions, such as malnutrition and advanced age.

Some ID are associated with long-term risks of contracting cancer and other disease states. For example, the human papillomavirus has been linked to an increased risk of cervical cancer; *Helicobacter pylori* is a known cause of peptic ulcer and stomach cancer; while both hepatitis B and C are associated with liver carcinoma. Furthermore, a number of pathogens can cause disease and then go dormant, only to reappear later in life. An example of this is varicella zoster virus (VZV), which can initially cause chicken pox, and then present itself decades later as shingles (Mayo Clinic, 2019).

In order for an infection to occur, a pathogen must enter the body, replicate to a critical mass, and then cause a reaction (Centers for Disease Control and Prevention [CDC], 2017). In order for this to occur, three elements are required:

1. A source where the infectious agent can exist, for example, human skin or household surfaces.
2. Susceptible person, that is, a person with an accessible entry point.
3. Transmission route – a way that the pathogen can access the susceptible person (CDC, 2017).

It is critical to note that pathogens do not move themselves; rather, they depend on help from people or the environment (CDC, 2017). There are a few general ways that infectious agents can be transmitted, such as the following:

- Contact (touching). As an example, a person's hands become infected by contact with a high-touch area and then spread, if proper hygiene (handwashing) is not performed before coming into contact with a susceptible person.
- Sprays and splashes are often associated with coughs and sneezes from an infected person. In this case, droplets are created carrying germs that are able to travel short distances (thought to be approximately 6 feet) before deposition on a susceptible person's eyes, nose, or mouth. Pertussis and meningitis are known to be transmitted in this way (CDC, 2017).

Nursing consideration: Nurses need to teach their patients how to properly cover their mouth and nose while sneezing. Patients should either cough or sneeze into their shirt sleeve at the elbow or use a tissue. If a tissue is used, it should be disposed of immediately after use. No matter the technique, individuals should be taught to wash their hands with soap and water (or hand sanitizer, as appropriate) as soon as possible after coughing or sneezing.

- Inhalation of aerosolized pathogenic material. Unlike sprays and splashes from coughs and sneezes, when aerosolized, infectious agents can survive and be carried long distances (relative to the range of particles carried by coughs and sneezes) by air currents to reach a susceptible person. If conditions allow, aerosolization can result when infected patients cough, talk, or sneeze. As examples, tuberculosis and measles are known to be transmitted this way. Additionally, aerosolization can be caused by some types of medical equipment or can be contained within dust emanating from construction. Such examples include aspergillus and some mycobacteria (CDC, 2017).

Evidence-based practice! Traditional hypotheses about the transmission of airborne ID have largely focused on the roles of coughing and sneezing – dramatic examples of expiration sometimes resulting in visible droplets, as well as copious amounts of particles too small to be visualized. Nevertheless, it has been acknowledged that normal speech is also capable of generating invisible particles that are still able to ferry a variety of contagious respiratory pathogens. Asadi and colleagues conducted a series of experiments designed to link the amplitude (loudness) of speech with the rate of particle emission. Results obtained from this work showed that the number of particles increased from an average of one particle per second at low amplitudes to 50 at high speech amplitudes. Of significant importance were the individuals that they identified as “speech superemitters,” who consistently released particles in an order of magnitude greater than their peers. This phenomenon could not be completely explained by either specific speech structures or amplitude. Asadi and colleagues suggested that there must be unknown physiologic factors that vary considerably between individuals. In conclusion, they hypothesized that these findings may help explain the existence of “superspreaders,” who are disproportionately responsible for airborne ID outbreaks (Asadi et al., 2019).

- Injuries such as those incurred by accidental needlesticks may lead to certain infections such as HIV and hepatitis B or C (CDC, 2017).
- Animal to person transmission can occur if a human is bitten or scratched by an infected animal, to include pets. In addition, disease can be transmitted via animal waste (cat litter boxes have been associated with toxoplasmosis infection).
- Mother to child – in some cases, pregnant women may pass certain pathogens through the placenta or breast milk. Also, vaginal germs can infect a baby during birth.
- A variety of infectious agents rely on insect vectors such as mosquitos, fleas, lice, or ticks. Examples include the malaria parasite carried by mosquitos and Lyme disease carried by deer ticks.

- Food or water contamination can facilitate the transmission of disease-carrying agents between people. A common example of this is *Escherichia coli* (*E. coli*), a bacterium sometimes present in undercooked ground meat or unpasteurized fruit juice (Mayo Clinic, 2019).

Emerging infections disease

The term “emerging infections” was defined in a 1992 report published by the Institute of Medicine as “new, reemerging, or drug-resistant infections whose incidence in humans has increased within the past two decades or whose incidence threatens to increase in the near future” (Watkins, 2018, p. 86). In addition to providing this definition, the report identified the following six factors contributing to EID (Watkins, 2018):

1. Changes in human demographics and behavior.
2. Technology advances and modifications of industry practice.
3. Changes in land-use patterns and economic development.
4. Significant changes in the amount and speed of international travel and commerce.
5. Microbial evolution (including resistance to antimicrobial agents).
6. A disruption in public health capacity.

Furthermore, such infections are often linked to agents that, while previously identified, have come to be associated with novel disease states (Baylor College of Medicine [BCM], 2020).

A majority of EID discovered to date are of animal origin, with that trend projected to continue. Another commonality is the type of pathogen: most are viral. EID are often costly, both in terms of human life and economically. As a result of the devastation wrought by EID, the World Health Organization (WHO) has prioritized a number of pathogens as requiring urgent research and development in an effort to curb severe outbreaks. While some of these diseases have already been manifested, others have a high likelihood of causing future outbreaks (Watkins, 2018).

In 2007, WHO warned that the emergence of ID is occurring at a rate never seen in previous history. Since the 1970s, at least 40 novel ID have been discovered, to include: severe acute respiratory syndrome (SARS), Middle East Respiratory Syndrome (MERS), Ebola, chikungunya, avian flu, swine flu, Zika, and, recently, a new coronavirus associated with COVID-19. Although many of these diseases resulted from the factors described previously by Watkins, the potential also exists for diseases to emerge as a result of intentional introduction of pathogens to human, animal, or plant populations as bioterrorism agents. Examples of such pathogens include anthrax, smallpox, and tularemia (BCM, 2020).

Endemic

When a disease is typically present in a community at baseline exposure frequencies, it is termed endemic. It is critical to note that, although incidences of disease may exist in the background, this is not to say that this is always at a desired level. If adequate interventions are not taken and the incidence is not so high as to exhaust all susceptible people, the disease will continue to spread indefinitely. In this scenario, the baseline level of disease may come to be expected in that population. The rarity of a disease in a population may govern its treatment. For example, a single case of a relatively rare ID, such as rabies, may warrant an epidemiologic investigation in an effort to control further spread. In other cases of more common pathologies (for example, malaria, in some parts of the world), investigations may be triggered when the frequency of disease occurs outside the norm. While the term endemic is used to describe the constant and usual presence of a disease, at least two other terms are sometimes used to further describe endemic conditions. *Sporadic* diseases are those that occur with infrequency and irregularity. *Hyperendemic* diseases occur persistently and with sometimes relatively high levels of incidence (CDC, n.d.).

Epidemic

If an unexpected increase in the incidence of a disease in a specific geographic area occurs, this may signal the beginning of an epidemic, which is defined as a rise in cases beyond baseline levels in a defined geographic area. Epidemics can occur because of a variety of causes, to include the following:

- When an infectious agent rapidly becomes more common in an area where it already existed (endemicity).

- A pathogen spreads through a region that was previously naïve to that agent.
- When human susceptibility somehow changes, allowing people to become sickened by agents that they previously tolerated.

(Joy, 2020)

The term epidemic has been present for some time, with possibly the first reference occurring in Homer's *Odyssey*, where it appeared to be used similarly to how the word endemic is now used (Joy, 2020). The first occurrence of the word epidemic being used in a way similar to its contemporary meaning was in 430 BCE by Hippocrates in his writings, *Epidemics*, which is a collection of clinical observations that would go on to form the underpinnings of modern medicine (Martin & Martin-Grauel, 2006).

Pandemic

The word pandemic stems from a construct formed from the Greek words *pan*, meaning all, linked to *demos*, which refers to the population, thus forming the contraction *pan-demos*, referring to all of the people (Shiel, n.d.).

When a novel infectious agent emerges, the majority of people lack immunity to counter the resultant ID. If conditions permit, this susceptibility may result in a rapid spread of disease between people,

History

Although not well documented, history suggests that communicable diseases have been present for thousands of years – at least as far back as the so-called hunter-gather days of possibly two million years ago. A major change in the way people lived occurred approximately 10,000 years ago, as a shift to more agrarian lifestyles took hold. During this era, communities were created. These increases in population density facilitated the occurrence of transmissible disease, to include malaria, tuberculosis, leprosy, influenza, and smallpox. The civilization of humans was coupled with the building of larger cities, increased trade, and war between other peoples. These interactions fueled the likelihood of pandemics (History.com, 2020). Some key examples of ID have emerged over time.

Great plague of Athens, 430 BCE

The first written account of a pandemic was rooted in 430 BCE Athens, in conjunction with the Peloponnesian War. Thucydides, an exiled Athenian general, was responsible for documenting the disease from a firsthand perspective. The malady was suspected, but not confirmed, to be typhoid fever, manifesting as fever, thirst, bloody throat and tongue, red skin, and lesions. It significantly weakened the Athenian army and likely contributed to their defeat at the hands of the Spartans. Although the Spartans had laid siege to Athens, the disease managed to spread beyond the walls of the city, ultimately impacting Libya, Ethiopia, and Egypt. Thucydides estimated that as much as two-thirds of the affected population ultimately died as a result of the disease. It was apparent that overcrowding in Athens, associated with inadequate housing and sanitation allowed the disease to rapidly spread and contributed to its lethality. Thucydides, himself, fell victim to the plague, but was able to recover. Perhaps, it was because of his own experience that he was able to understand fear and self-interest as it related to the disease, how it drove individual motivations and the subsequent fate of Greece. Through this lens, he recognized the practical and moral weaknesses that the disease was able to exploit. In addition to observations of inadequate infrastructure, Thucydides also criticized personal principles, noting that morally weak individuals, when they become afraid, regressed to lawlessness and sacrilege: "For the violence of the calamity was such that men, not knowing where to turn, grew reckless of all law, human and divine" (Kelaidis, 2020).

Antonine plague, 165 CE

This early manifestation of smallpox apparently was initiated within a population of Huns, who infected the Germans, who shared it with the attacking Roman army. Upon return to Rome, troops quickly spread it throughout the Roman Empire. Infected people suffered fever, chills, dyspepsia, and diarrhea that evolved from red to black in a week's time. Victims reportedly developed black pocks over their entire bodies, both inside and out. In those that survived, these sores then scabbed over, leaving disfiguring scars. In many cases, the suffering continued for 2 to 3 weeks. Of the approximately 75 million people residing in the

sometimes covering major swaths of the population. The spread of a viral pandemic can be characterized by the following six distinct phases (Lockett, 2020):

- Phase 1 – viruses are transmitted within animal populations. Since they have not been shown to enter humans, these pathogens are not considered a threat.
 - Phase 2 – a new virus appears in animals that is shown to be transmissible to humans. As a result, this presentation may signal the potential risk of an epidemic or pandemic.
 - Phase 3 – Initial clusters of human disease crop up as a result of animal-to-human transmission. Nonetheless, at this point, the rate of transmission is too low to result in significant community outbreaks. Although humans are considered to be at risk, the occurrence of a pandemic is unlikely.
 - Phase 4 – The rate of human-to-human transmission accelerates to the point that community outbreaks are documented. This escalation marks the presence of a high risk of pandemic development.
 - Phase 5 – When there is transmission of the virus to at least two countries, a global pandemic is considered to now be inevitable.
 - Phase 6 – If a virus has spread to at least three countries, a global pandemic is officially present.
- (Lockett, 2020)

Roman Empire, it is reported that 10% died. So shaken by this insult to their people, the town of Hierapolis erected a statue to the god, Apollo Alexikakos, the Averter of Evil, to protect their people from the disease as it spread throughout the Empire (Watts, 2020). The Antonine plague persisted until about 180 CE, even claiming the life of Emperor Marcus Aurelius (History.com, 2020).

Leprosy

Leprosy, sometimes called Hansen's disease, is caused by infection with the bacterium *Mycobacterium leprae*. Leprosy, if diagnosed and treated early, is a curable disease, allowing the afflicted to work and lead a normal life. If untreated, it can impact nerves, skin, eyes, and nasal mucosa, resulting in paralysis and blindness. Historically, leprosy was feared as both highly contagious and devastating (CDC, 2017a).

In medieval times, the disabling consequences of leprosy were apparent throughout England, afflicting both rich and poor, in rural areas as well as in cities. By 1050, leprosy was considered to be a regular consequence of life. In its most extreme form, it could cause the loss of fingers and toes. It is crucial to note the complicated reaction that people had to the disease. Because some saw it as punishment for sinful behavior, being afflicted could result in various moral judgements or ostracization. Alternatively, others saw it as akin to the suffering endured by Christ. In this light, leprosy was considered to be purgatory on earth, providing a direct conduit to heaven upon death. Sufferers of leprosy, in some circles, were considered to be closer to God than others (HistoricEngland.org, 2020).

Black Death, 1350 CE

The term Black Death was given to a deadly plague associated with the bacterium *Yersinia pestis*, which ran rampant in Europe during the 14th Century. It is thought that it originated in Asia, arriving in Europe in late 1348. Up until recently, it was understood that *Y. pestis* was transmitted to humans through bites from rats. Nonetheless, forensic archaeology work conducted in 2014 generated evidence concluding that the infection relied on airborne routes of transmission (coughs and sneezes), with the reasoning that this was the only mechanism that could have been responsible for such a rapid spread. Initial evidence of contracting the plague included lumps in the groin or armpit regions. In due course, black spots appeared on the body. Many of the afflicted died within 3 days of exhibiting symptoms, with few people recovering. At the time, existing medical knowledge was no match for the plague, which killed six of every 10 Londoners by the spring of 1349. Remnants of the Black Death recurred six more times by the end of the century (Trueman, 2015).

It appears likely that people's ignorance of contagious diseases at the time contributed greatly to the plague's ability to infect and kill so many people. Perhaps if they were more knowledgeable, they might have avoided close contact with others, especially when ill, and may have made better efforts to cover their mouth and nose when sneezing

or coughing. Instead, the lack of information resulted in people trying most anything to escape the disease. One extreme example was the case of the so-called *flagellants*. Adherents to this philosophy whipped themselves in hopes that God might forgive them of their sins, and thus spare them of the Black Death (Trueman, 2015).

The Columbian exchange, 1492

The Columbian exchange was a term used to describe massive transfers between the Old and New world. This process, marked by the arrival of Christopher Columbus to America in 1492, continues to this day. While many people may think of this colonization as mainly impacting plants, animals, and culture, all manners of life were sent in both directions across the Atlantic and, subsequently, to all corners of the world. One historian, Alfred Crosby, noted that European colonization of the New World depended not so much on guns, steel, and brutality, but more on the lifeforms that accompanied the early colonists. Some of the most critical were microbes that decimated the native peoples. For example, it is estimated that European small pox ultimately killed one-half of the indigenous American population, with the initial outbreak recorded in 1520-1521. In addition to the fatal efficacy of the virus, those that survived were weakened, and thus more susceptible to the diseases that followed, to include measles, bubonic plague, influenza, and typhus (History of Science in Latin America and the Caribbean [HOSLAC], n.d.).

Fiji Measles Epidemic, 1875

In October 1874, the chief of Fiji made an official state visit to Australia. Unfortunately, cases of measles had just started occurring in Sydney. The entire Fijian delegation caught the disease. The Australians provided attentive care, with most recovering by the time they returned home in January 1875. Nonetheless, the virus was not eradicated. Within a week, residents of the island began to be struck down by a disease that they could not understand. Despite the assurances of British administrators, some Fijians grew suspicious, believing that they were victims of sorcery. There was a widely held belief that the British had taken their chief to Australia with the intention of poisoning him. People became increasingly hostile and refused all conventional treatments for measles, leaving their immune systems alone to battle this serious illness. In the end, this measles outbreak was the worst disaster in the history of Fiji, resulting in the death of one-third of the island's population of 150,000. The British government scapegoated the ship's doctor and captain for not placing their passengers in quarantine upon their return to Fiji (Devestatingdisasters.com, n.d.).

Spanish Flu, 1918

The most severe pandemic to impact the world in the recent past was the influenza pandemic of 1918, sometimes called the Spanish Flu. It is thought that the virus infected approximately 500 million people globally, resulting in the death of over 50 million. In the United States (US), it is estimated that one-fourth of the total population was afflicted by the virus that killed approximately 675,000 Americans. In the US, the pandemic was thought to have decreased the average life expectancy by 12 years. At that time there was no vaccine available to prevent influenza. Instead, people were encouraged to exercise good sanitation, isolate, and quarantine as appropriate and strictly limit their social interactions (National Archives, 2020).

Zika Virus, 1952

Zika virus is a flavivirus transmitted by infected mosquitos. Initially identified in Ugandan monkeys in 1947, the first known transmission to humans occurred in 1952. Since that time, outbreaks of Zika have been noted in Africa, the Americas, and the Pacific. During the 1960s to 1980s, outbreaks were rare and sporadic, typically associated with mild illness. Larger outbreaks occurred in countries and territories of the Pacific beginning in 2013. In 2015, a major outbreak was reported in Brazil. During this outbreak, Zika was associated with Guillain-Barré syndrome and the incidence of microcephaly of children born to infected mothers. Outbreaks accelerated after this time. To date, infections have been reported in 86 countries and territories. Symptoms usually occur within 3 to 14 days of infection. In most individuals, the disease is mild and asymptomatic. In those that exhibit symptoms, the most common signs are mild and include fever, rash, conjunctivitis, muscle and joint pain, malaise, and headache, usually lasting 2 to 7 days.

Ebola Virus Disease (EVD), 1976

EVD can result from infection with a variety of viruses within the genus ebolavirus. The first observation of Ebola was near the Ebola River, in what is now the Democratic Republic of Congo. Since that time, viral outbreaks have occurred sporadically in a number of African countries. Although not with certainty, it is thought that the most likely source of Ebola was either bats or nonhuman primates. The initial spread to humans was likely through direct contact with infected blood, body fluids, or tissues of animals. The virus then could easily spread to other people through contact with body fluids of other people who are sick with or have died from EVD. Viral entry is typically through broken skin, mucous membranes, or by sexual contact. The appearance of symptoms can occur anytime between 2 to 21 days after exposure to the virus. Usually, initial symptoms include fever, aches and pains, and fatigue, progressing to diarrhea and vomiting as the patient becomes sicker. Those that survive Ebola infections may experience lingering symptoms such as tiredness, muscle aches, eye and vision problems, and stomach pain (CDC, 2019).

HIV/AIDS, 1981

Although the virus causing AIDS had likely been present for some time, it was first characterized in 1981. AIDS is not, in itself, fatal. Rather, left untreated, it destroys a person's immune system (largely t-cells), leaving them vulnerable to a variety of diseases that the body could normally fight off. After infection by HIV, people generally experience fever, headache, and enlarged lymph nodes. After a time, these symptoms may subside, leaving those afflicted infectious to others. While AIDS was initially seen primarily in gay American communities, it is thought that it originally stemmed from a west African chimpanzee virus in the 1920s, moving through Haiti in the 1960s and arriving in New York and San Francisco in the 1970s. Although a variety of therapeutics have been developed that effectively slow the progression of disease, no cure or vaccine has been found. To date, over 35 million people worldwide have died of AIDS since its discovery in 1981 (History.com, 2020).

Severe Acute Respiratory Syndrome (SARS), 2003

SARS is a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus (SARS-CoV). Initial reports of SARS occurred in Asia in early 2003. The sickness spread to more than 25 countries in the Americas, Europe, and Asia before the pandemic could be contained (CDC, 2013). Generally, SARS is initially associated with flu-like symptoms, to include fever, chills, muscle aches, headache, and occasionally diarrhea. Approximately a week later, most people suffering from SARS will have a fever of at least 100.5°F, dry cough, and shortness of breath (Mayo Clinic, 2019). At this time, there are no known actively transmitted cases of SARS anywhere in the world. In 2004, human infection linked to laboratory-acquired infections in China were reported (CDC, 2013).

Severe Acute Respiratory Syndrome Coronavirus 2 (COVID-19), 2019

The term coronavirus is used to describe a family of viruses that have the potential to cause illness, ranging from the common cold to deadly diseases such as SARS. In 2019, a novel coronavirus identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) first appeared in China. Infection with SARS-CoV-2 results in the disease COVID-19. Although some people with COVID-19 will remain asymptomatic throughout the course of disease, others may experience serious and even fatal outcomes. The most common signs and symptoms associated with COVID-19 appear within 2 to 14 days of exposure and may include fever, cough, and fatigue. In many cases, infected individuals may experience a loss of taste and/or smell. Other symptoms include a shortness of breath, arthralgia, chills, sore throat, rhinitis, headache, chest pain, and conjunctivitis. The severity of symptoms runs the gamut, ranging from very mild to severe. It appears that older individuals may be at a heightened risk of severe COVID-19. Additionally, it is evident that certain comorbidities, including heart disease, diabetes, obesity, pulmonary disease, and immunodeficiency put individuals in a higher risk category. In March 2020, WHO declared that the COVID-19 outbreak was a pandemic (Mayo Clinic, 2020).

While the world is awaiting the broad availability of a vaccine to prevent COVID-19, there are well-acknowledged steps that can be taken to reduce the risk of infection. Key concepts include avoiding close contact with other people; frequent handwashing; prodigious

use of face coverings; covering of mouth and nose when coughing or sneezing; avoidance of touching eyes, mouth, and nose; frequent cleaning and disinfecting of high-touch surfaces; and staying home when sick (Mayo Clinic, 2020).

History of EID: A summary

From the 430 BCE Plague of Athens to our present struggle with COVID-19, it is uncanny, despite the passage of nearly 2,500 years and great advances in medicine, how many aspects remain the same:

- Vaccines and therapeutics are often not available in time to stop a fast-spreading pandemic.
- Failure to maintain adequate distance from people allows microbial transmission.
- Contagion is often linked to poor sanitation.
- Stigma and misinformation are able to enhance the spread of disease.

Efforts to manage EID

The concept of *emerging infectious diseases* has been discussed in a variety of scientific publications since at least the early 1960s. It required a major outbreak of genital herpes, followed by the emergence of HIV/AIDS in the 1970s and early 1980s, to raise awareness and concern of EID, making the term widespread. A number of subsequent landmark events and publications aroused interest in the subject, deepening the funding channels, permitting increased levels of research and publication of seminal articles. This is not to say that previous to this, clinicians were ignorant to the potential harms of EID. As an example, in 1888, the Institut Pasteur (IP) opened in Paris as one of the original centers dedicated to supporting research to prevent, diagnose, and control outbreaks of EID. A number of laboratories were established to study the epidemiology of pathologies such as malaria and sleeping sickness. Such efforts led to the development of early vaccines intended to counter smallpox, rabies, and the plague. Meanwhile, the mission of the IP expanded, forming a close alliance with WHO and establishing centers in nine African countries. Currently, the IP remains a major player, entwined in almost every EID outbreak (Ndow, 2019).

In response to the heavy toll that yellow fever was inflicting on the US Military, the Yellow Fever Commission was formed in 1900 to evaluate the cause and transmission of yellow fever. This effort was initially led in Cuba by Major Walter Reed. In its initial year of existence, the commission confirmed that yellow fever was communicated via mosquito bites. This was proven by deliberately infecting 30 men with mosquito bites. The commission then initiated control programs in Cuba revolving around enhanced sanitation, fumigation with insecticides, and endeavoring to eliminate standing water to prevent breeding. Their efforts were rewarded with a dramatic decrease in the incidence of yellow fever. These control programs were implemented just in time to preserve the Panama Canal project. Early in the project, it was estimated that approximately 85% of canal workers required hospitalization as a result of contracting malaria or yellow fever, resulting in the death of tens of thousands. President Theodore Roosevelt funded an effort to keep the construction progressing. A total of 4,000 workers traveled to Panama and spent a year working to prevent mosquitos from laying their eggs. To this end, they employed fumigation and spread oil on standing water. These efforts were effective, with the last victim of yellow fever in the Panama Canal zone succumbing to disease in 1906. By the end of World War II, most parts of the world had adopted dichlorodiphenyltrichloroethane (DDT) as its weapon of choice to eradicate mosquitos, and thus control yellow fever. Shortly thereafter, a vaccine for yellow fever was developed that ultimately provided

Current status of EID

As of October 24, 2020, the CDC (2020c) reported a total of 12 US-based ID related outbreaks:

- Salmonella infections from pet bearded dragons (October 2020).
- Salmonella infections from wood ear mushrooms (September 2020).
- Salmonella infections from pet hedgehogs (September 2020).
- Salmonella infections from peaches (August 2020).
- Salmonella infections from onions (August 2020).
- Salmonella infections from backyard poultry (May 2020).
- COVID-19 (January 2020).
- Multidrug-resistant *Campylobacter* infections from pet store puppies (December 2019).

lifetime immunity for 99% of people who were immunized. In the past 30 years, limited clusters of yellow fever have emerged in Africa and South America (National Public Radio [NPR], 2019).

The Medical Research Council (MRC) laboratory in Gambia was formed in 1947 when a World War II British Army hospital was handed over to the United Kingdom (UK) based MRC. This institution is, and always has been, funded by the UK government and is their largest investment in medical research based in a developing country. With a keen focus on ID threatening Gambia and the greater continent of Africa, its objective was to reduce the burden of death, both there and in all of the developing world. The laboratory made significant contributions toward the prevention of pathologies to include malaria, tuberculosis, and *Haemophilus influenzae*. To this day, it remains deeply engaged in research focused on ID, conducted at the bench as well as in clinical trials. Its reputation is excellent and it is thus able to attract international funding and the recruitment of superior investigators (Perform, 2020).

In the timeframe spanning the 1950s to 1970s, a number of African nations created and supported research centers throughout the continent designed to improve health and quality of life. Examples include the South African Medical Research Centre (SAMRC), Kenya Medical Research Institute (KEMRI), the National Research Centre (NRC) of Egypt, the National Institute for Medical Research (NIMR) in Tanzania, the Medical Research Council of Zimbabwe (MRCZ), and the Medical Research Council of Nigeria. Many of these organizations conducted research intended to characterize the transmission of EID in ways designed to better understand the evolution of antimicrobial resistance and best inform procedures to counter disease outbreaks (Ndow, 2019).

The National Center for Emerging and Zoonotic Infectious Diseases, a component of the US CDC, is tasked with protecting people from health threats, both global and domestic (CDC, 2017b). Some of their areas of interest include the following:

- Waterborne and foodborne disease.
- Hospital- and institution-based infections.
- Antimicrobial-resistant infections.
- Fatal diseases such as Ebola, anthrax, and COVID-19.
- Illnesses that tend to impact travelers, immigrants, and refugees.
- Diseases resulting from contact with animals.
- Diseases that spread by fleas, mosquitos, and ticks.

WHO endeavors to provide an integrated global alert and response system for epidemics and other public health emergencies by partnering with national health systems, resulting in a coordinated and effective response. WHO identifies their core functions as the following (WHO, 2020c):

- Supporting their member states in a way to implement national capacities for epidemic preparedness and response, to include laboratory capacity, early warning alerts, and response schemes.
- Support of training for epidemic (to include influenza) preparedness and response.
- Generate standardized schemes supporting readiness and response to known epidemic diseases, such as meningitis, plague, and yellow fever.
- Reinforce biosafety, biosecurity, and readiness for outbreaks of dangerous and emerging pathogenic outbreaks, such as SARS, COVID-19, and viral hemorrhagic fevers.
- Maintain global operational platforms to support outbreak response.

- Lung injury associated with vaping (August 2019).
- Drug-resistant *Brucella* infections from raw milk (February 2019).
- Measles (January 2019).
- Hepatitis A among people who are homeless and use drugs (March, 2017).

It is evident that while the US faces a variety of perils, the greatest current challenge is that of managing COVID-19. In addition, the CDC (2020a) reported an outbreak of Ebolavirus in the Democratic Republic of the Congo beginning in May 2018. WHO more broadly focuses across all global outbreaks and is currently monitoring a much more extensive portfolio of ID. As of October 24, 2020, the WHO (2020b) list of pandemic and epidemic diseases included the following:

- Chikungunya.
- Cholera.
- Crimean-Congo haemorrhagic fever.
- Ebola virus disease.
- Hendra virus infection.
- Influenza (pandemic, seasonal zoonotic).
- Lassa fever.
- Marburg virus disease.
- Meningitis.
- MERS-CoV.

- Monkeypox.
- Nipah virus infection.
- Novel coronavirus (2019-nCoV).
- Plague.
- Rift Valley fever.
- SARS.
- Smallpox.
- Tularaemia.
- Yellow fever.
- Zika virus disease

Drivers of EID

In the last 60 years, the emergence of ID has occurred at an increased rate. In many cases, outbreaks seem to appear without warning, complicating public and animal health as diseases spread across regions. In order to best manage this evolving threat, it is critical to understand the driving force of these phenomena. When the basis of disease is characterized, it may be possible to develop solid measures designed to prevent and mitigate their spread. As long as EID are able to run rampant across the world, health security and sustainable development will remain in jeopardy (Machalaba & Karesh, 2017).

Climate Change

Human's relentless drive to expand their global footprint is a major factor in driving the risk of EID. Population expansion linked to environmental impacts are acknowledged as linkages to some outbreaks of ID (Machalaba & Karesh, 2017).

When ID appear in new hosts and/or in new regions, the cause of climate change must be considered. With climate change now nearly universally acknowledged, the emergence of novel ID can be expected. Changes in climate drive shifts in habitats, putting wildlife, crops, and humans into contact with pathogens that they have never been exposed to, and are thus typically susceptible. One example was recorded in Costa Rica. In this case, humans hunted capuchin and spider monkeys to the point of extinction in some regions of the country. With no host, native lungworm parasites moved to howler monkeys that, because of changes in climate, occupied a broader habitat, beginning a new path of migration. Over time, by hitchhiking on a variety of hosts inhabiting increasing ranges, lungworms have moved as far north as the arctic, ultimately taking up residence in Canadian caribou and muskoxen. For over 100 years, scientists did not believe that parasites could jump so rapidly between species. This has recently been proven otherwise with pathogens shifting to new hosts relatively quickly, given the right circumstances. To make matters worse, in many cases, the new hosts, which have not yet developed resistance, are often extremely susceptible to illness and get much sicker than the previous host. In cases where resistance to the pathogen does develop, the acute disease simply becomes a chronic problem. This is illustrated by West Nile Virus. Although West Nile is no longer an acute issue for animals or people in North America, it is well established and is here to stay (University of Nebraska-Lincoln, 2015).

One potential approach to at least partially countering the impact of climate change on EID is to enhance the level of interaction between the public, veterinary health communities, and the biologists that study and classify evolving life forms. While the treatment of human cases of ID and development of vaccines to protect against them is

Case Study 1

Melissa is a 14-year-old girl who has been brought to her Advanced Practice Nurse (APN), Laura, because she has been complaining of a sore throat, fever, and body aches. Although she does not feel especially unwell, she is concerned because she has a history test later that week and does not want to miss it. Her mother suggests that Laura prescribe a course of azithromycin because she is confident that this will help Melissa get better more quickly. While Laura considered the idea of offering an antibiotic, she was aware of a recent surge of viral infections in the community presenting similarly to Melissa's. Based on this, Laura was leaning toward a diagnosis of viral pharyngitis. Based on her experience, there was not likely to be an effective treatment, so she suggested that her mother provide supportive care to address Melissa's symptoms. Melissa's mother was persistent though and had come to expect the provision of antibiotics whenever she or her family

needed, these fundamental approaches usually come too late. A more proactive approach would increase the study of pathogens carried by nonhuman reservoirs and predict which ones are likely to make the jump to humans and/or domesticated animals. If scientists could develop increased knowledge focused on the geographic distribution and behavior of nonhuman reservoirs of pathogens, better public health strategies could be developed to reduce the risk of spreading infections. While it is unlikely that pathogens can be eradicated from host species, human awareness of infected animals could lead to reduced contact and thus decrease the incidence of resultant ID (University of Nebraska-Lincoln, 2015).

Evidence-based practice! Parasites typically can exist within broader temperature ranges than their hosts. This is thought to occur because the smaller parasitic organisms can acclimate more readily because of higher metabolic rates. When there is a thermal mismatch, for example, a host organism is present in an environment at the higher edge of what they can tolerate, they may be more susceptible to parasitic infestation. Cohen tested the thermal mismatch hypothesis by measuring the temperature-dependent susceptibility of amphibian species to the fungal pathogen *Batrachochytrium dendrobatidis*. To this end, they assessed a total of 15,410 animals in 598 distinct populations. Their results showed that the greatest susceptibility of cold- and warm-adapted hosts occurred at relatively warm and cool temperatures, respectively. Investigators suggest that as climate change occurs, hosts find themselves out of their optimum environments, and thus more susceptible to parasitic infestation. These efforts help associate disease outbreaks with the extreme weather shifts common to climate change (Cohen et al., 2017).

Antimicrobial Resistance (AMR)

AMR asserts itself when bacteria, viruses, fungi, and parasites evolve to the point where they are no longer sensitive to medications previously able to counter them. AMR can then result in making infections more difficult to treat, thus permitting them to spread more easily. AMR happens naturally, typically as a result of genetic changes. AMR can occur in humans, animals, food, plants, and the environment. AMR pathogens can spread from person to person or between people and animals. Although there are a variety of causes of AMR, the largest drivers are the misuse and overuse of antimicrobial medications, poor sanitation, a lack of clean water, inadequate knowledge, and poor enforcement of guidelines designed to prevent it (WHO, 2020a).

pursued medical care for a variety of complaints, to include fever, sore throat, and even diarrhea. Laura, fairly confident that Melissa was suffering from a viral infection, strongly suspected that antibiotics would serve no purpose. Even worse, she was aware that indiscriminate antibiotic usage could contribute to antibiotic resistance. Instead, Laura took the time to help Melissa's mother understand the difference between bacterial and viral infections and the potential harm that can result from inappropriate antibiotic usage. Laura's patience and persistence appeared to be a good investment of time – before long, Melissa's mom was nodding in appreciation of Laura's words. After Laura ensured that they had no further questions, Melissa and her mother left for the pharmacy to stock up on ibuprofen and orange juice.

Self-Assessment Quiz Question #1

Regarding antimicrobial resistance (AMR), which of the following statements is *false*?

- Antimicrobial resistance can render antibiotics ineffective against some previously susceptible microorganisms.
- In many cases, AMR facilitates the treatment of bacterial infections.
- AMR pathogens can sometimes spread between people.
- A major driver of AMR is the misuse of antibiotic products.

According to the U.S. Agency for International Development (USAID), AMR and zoonotic rooted diseases account for 95% of all EID recorded in the second half of the 20th century. Examples include tuberculosis, HIV, and malaria. It is estimated that 700,000 people die annually as

R₀

R₀ (pronounced R naught) is a mathematical construct that describes the contagiousness of an ID. A synonym for R₀ is reproduction number. Both terms characterize the reproduction of an infection, providing insights into how it spreads. R₀ indicates the average number of people who will contract an infection from a single contagious person. This scenario is qualified by the population being totally susceptible, i.e., not immune to it, either through previous infection, vaccination, or otherwise protected. These conditions would allow for uncontrolled spread of a virulent pathogen. As an example, if a certain disease carries an R₀ of 12, it can be expected that, in a vulnerable population, 12 additional people will ultimately be infected. R₀ values, then, demonstrate that every disease has the following three spreading scenarios (Ramirez, 2016):

- In cases where R₀ is less than one, each infection will result in less than one afflicted person. In this case, the incidence of disease will fade and eventually disappear.
- When R₀ equals one, each infected person will cause one additional person to become ill. In this situation, the disease will remain stable, but an outbreak or epidemic is not expected. This is aligned with endemic conditions.
- If R₀ is greater than one, each infection will result in more than one new infection. The disease will spread, potentially leading to epidemic conditions (Ramirez, 2016).

Fortunately, the conditions needed to support an ID with an R₀ greater than one are relatively uncommon because of advances in public health and medicine. Many deadly, contagious ID of the past have been largely contained (Ramirez, 2016).

To put things in perspective, the R₀ of the influenza virus of the 1918 Spanish Flu was estimated to range from 1.4 to 2.8, while the swine flu of 2009 was likely 1.4 to 1.6 (Ramirez, 2016).

In the midst of the coronavirus pandemic, one of the most commonly argued issues is that of its R₀. Both the media and public opinion remain focused on this epidemiological metric and its relationship to spreading potential. In some cases, R₀ has even been defined as the “fatal number”: the higher it goes, the greater the mortality. Early on in the COVID-19 pandemic, at the time it was declared by WHO, that

Reemergence of ID that had significantly declined in the past

Causes of the reemergence of so-called “old” ID are numerous. In some instances, pathogens may become more virulent through evolution over time, but in the majority of cases, it is a result of human behavior. An example of this is provided through examination of the changing interface between humans and the global environment. Over the course of the past century, populations have grown, people have migrated to cities, international travel has increased, and poverty, war, and destructive ecological changes have all occurred as a result of economic development and increases in land use (BCM, 2020).

As with the initial emergence of an ID, reemergence depends on at least the two following factors:

- The infectious agent must come into contact with a susceptible population.
- Ready transmission of the agent must exist, allowing rapid spread from persontoperson, causing disease (BCM, 2020).

a result of AMR variants of these three diseases. USAID projects that, unless something is done to curb the escalation of AMR frequency, drug-resistant infections are on course to kill 10 million people per year by 2050 (USAID, 2019).

Nursing consideration: Unfortunately, the inappropriate use of antibiotics in the treatment of viral disease is common. In fact, many patients have come to expect a prescription to be issued when they visit their clinician for treatment of an illness, even in cases of viral-based sicknesses. Nurses have a critical responsibility to explain the difference between viral and bacterial disease, and work to dissuade both these patients and their prescribers to avoid using antibiotics in these instances, in an effort to combat the development of antibiotic-resistant bacteria.

organization assigned an R₀ ranging from 1.4 to 2.5. This degree of infectivity is, however, controversial. As of February 2020, the literature contained references to R₀ ranging from 1.5 to 6.7, with average values reported of 3.28. If, indeed, this R₀ was accurate, the coronavirus would exceed the reproductive potential of SARS. The diversity in estimating R₀ is likely driven by discordant assumptions and modeling approaches. It is critical to understand that R₀ is not an intrinsic value of the pathogen, rather it is calculated based on at least the following three variables, all of which may vary between the studies designed to estimate R₀ (Viceconte & Petrosillo, 2020):

- Duration of contagiousness.
- Likelihood of infection per contact.
- Economic, social, and environmental factors of the recipient population.

These differences are compounded by the use of different modeling approaches used to estimate R₀. Further to this, it is generally assumed that there is no variation of secondary infections generated by a single infected case. This is known to be false because of the understanding of superspreader events in which a single individual may infect a large number of subjects. This phenomenon has been observed in cases of SARS, MERS, and the novel coronavirus. As a result, available models are not able to fully appreciate the large degree of heterogeneity in the transmission of and susceptibility to an infectious pathogen. Furthermore, R₀ is constantly modified over the course of an epidemic because of mitigation approaches that are designed to reduce R₀, specifically the duration of contagiousness, the likelihood of infection, and the rate of contact between infected and susceptible individuals (Viceconte & Petrosillo, 2020).

Despite its potential flaws, R₀ will continue to be used to describe contagions. In addition to difficulties in estimating this parameter, it is critical to note that R₀ is not related to an infection’s potential lethality. As an example, Ebola (R₀ ranging from 1.5 to 2.5) is far more deadly than the more contagious influenza in its regular form (R₀ ranging from 2 to 4). The most contagious pathogens, pertussis and the measles, with R₀ on the magnitude of 12 to 18, are well controlled by efficacious immunization strategies (Rodrigue, n.d.).

In addition, the disease must be self-sustaining to allow more and more people to become infected. It is acknowledged that a number of IDs are passed from animals to people. So, when humans move into new environments, it becomes more likely that they may come into contact with species of animals that are hosts to IDs. Increases in population density and mobility both facilitate the reemergence of disease that had been previously vanquished. Another critical factor in the reemergence of IDs is increased rates of AMR. As microorganisms evolve, they are sometimes able to develop a resistance to the drugs that were once effective against them. This resistance can allow once dormant diseases to flourish (BCM, 2020).

Lastly, a key contributor to reemergence is a decline in the use of immunizations (BCM, 2020). There is a growing population of people who refuse to vaccinate themselves and/or their children. In many cases, this is driven by controversial studies linking measles vaccinations and autism (BCM, 2020).

Measles (United States)

WHO states that the definition of measles elimination is “the absence of endemic measles virus transmission in a defined geographic area (e.g., region or country) for at least 12 months in the presence of a surveillance system that has been verified to be performing well” (Masresha et al., 2018, p. 1). In 2000, measles, according to the WHO definition, was no longer a presence in the US. According to the CDC, this means that because of substantial levels of immunizations, the risk of Americans contracting measles is low. Nonetheless, there is an expectation that measles will remain present in the US because of importation of the virus from other countries. The risk incurred by this reality is that these few cases of measles can spread among people who are not vaccinated, leading to outbreaks. The CDC fears that if such an outbreak is able to be sustained for a year or more, the US risks losing its measles elimination status. As a result, the US remains vigilant and prepared to respond to any incidence of measles (CDC, 2020a).

The achievement and maintenance of measles elimination required monumental effort, reliant on substantial investments in time and resources. To lose elimination status would lead to efforts to reestablish this status, consuming valuable resources that could be better deployed elsewhere. It is well acknowledged that the key to preventing this threat is to ensure adequate levels of vaccination in all communities. It is especially important that children adhere to measles, mumps, and rubella (MMR) vaccination schedules and that international travelers confirm their immunization status before departure (CDC, 2020a).

Measles outbreaks are defined as chains of transmission involving three or more cases that are linked in time and place. Such assessments are determined by local and state health department led investigations. Internationally imported cases of measles can be surmised in cases where at least part of the exposure period (usually 7 to 21 days before the onset of rash) occurred outside of the US and the rash began appearing within 21 days of reentry to the US with no known exposure to measles in the US during the exposure period (Patel, 2019).

During the first three-quarters of 2019, a total of 22 measles outbreaks in 17 states, encompassing a total of 1,163 individuals, were recorded in the US. An additional 86 cases were not associated with a defined outbreak. Not only was this the second highest number of outbreaks since the 2000 elimination of the measles, it was the largest number of cases in a single year since 1992. Of those infected, 89% were patients who had not been properly immunized or whose vaccination status was not known. Furthermore, a total of 119 patients (10%) developed serious enough illness to require hospitalization. Transmission continued for nearly 1 year in closely related New York State outbreaks. The majority of these outbreaks (934, 75%) were rooted in large, closely knit Orthodox Jewish communities. Fortunately, a vigorous response effectively halted the transmission of disease before the 1-year mark,

Case study 2

A 7-year-old boy, Roger, recently returned from Taiwan, was feeling a bit unwell. Nonetheless, he attended a matinee film. 9-year-old twin girls attended the same movie. It was ultimately determined, after a week's time, that Roger had contracted the measles, likely when visiting Taiwan. Before his diagnosis, Roger also infected his older sister Mary, just before she left to visit her grandparents in Iowa. 2 weeks after the chance theater meeting, the first of the twin girls developed a febrile rash, often associated with the measles.

Upon development of the first twin's rash, her mother took the girl to see their usual pediatrician, Dr. Steve. Despite the presence of a rash, because of the rarity of measles, Steve did not test the child for measles. Steve was puzzled by the presentation and consulted his colleague, Dr. Tanya. The idea of measles crossed Dr. Tanya's mind, but again, the uncommon occurrence of measles led her not to pursue the possibility. Steve concluded that the rash could be treated with 1% topical hydrocortisone cream and sent the twin home. Roger and both girls continued to attend school and participated in a variety of extracurricular activities. Within a week the second twin developed the same mysterious rash.

An attentive school nurse noticed a pattern of fever, rash, and cough in a number of children and grew suspicious. As part of her investigation, she reviewed the school's student immunization status records. Her

detective work showed that a total of six students were not properly vaccinated for measles. Despite taking all of these students, and another who was immunocompromised out of school, a total of five of the six unvaccinated students, including the twin girls, Roger, and his sister Mary, ultimately contracted the measles. One of the infected students was a member of a traveling soccer team. After diagnosis, all of the team members and parents were advised of the case of measles among the team. 2 weeks after this, one of the adult trainers (born in the 1960s) developed symptoms consistent with the measles. Although he notified his doctors that he had been exposed to measles, like the twin, he was not tested. The disease was more serious for the adult, requiring a brief hospitalization. Since his immunization status was unclear, blood was drawn in an attempt to assess immunity. Results indicated that he was not properly protected.

The trainer, a truck driver, had been driving about making deliveries while infectious. Additionally, he was married to a woman who was 39 weeks pregnant. Serologic testing showed that she had been properly vaccinated and was immune to measles. Unfortunately, the male trainer had attended several Lamaze classes with his wife while infectious. While no efforts were made to identify the contacts he had encountered while working, exhaustive tracing was undertaken to ensure that all of the people that he contacted at the Lamaze classes had been properly

1. Areas of low vaccination coverage and, in general, a variable acceptance of vaccinations.
2. High population density in the impacted communities coupled to relatively closed social behavior.
3. Repeat cases of measles importation by unvaccinated individuals traveling internationally.

Responses to the outbreaks were multipronged and included the administration of approximately 60,000 doses of MMR vaccine, specialized communication strategies, partnering with religious leaders, physicians, health centers, and advocacy groups (Patel, 2019).

Evidence-based practice! In an effort to better understand a measles outbreak involving 649 confirmed cases in a New York Orthodox Jewish community, Yang modeled the transmission dynamics of the outbreak in an effort to identify root causes. To this end, he used a model based on age to estimate important epidemiological factors, including initial susceptibilities, the reproductive number (R0), contributors to spread of measles, and the proportions of infection attributable to each age group. Lastly, an effort was made to assess the impact of vaccination campaigns on modulating the outbreak. Findings from this work indicated that the delayed vaccination of children aged 1 to 4 years enabled the spread and enhanced infectious transmission. Approximately one-half of infants were susceptible at age 1 year and suffered many infections. Data obtained suggested that the vaccinations that did occur were effective: in the total absence of vaccinations, the number of infections may have been as much as 10-fold greater than experienced. These estimates are supported by an observed effective R0 ranging from 1 to 1.5 (compared to 12 to 18 in a totally susceptible population). Yang concluded that vaccination campaigns are critical to temper measles outbreaks and that enhanced public health education is needed to reduce unneeded exposure of children to measles and other infectious agents (Yang, 2020).

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vaccinated. Meanwhile, the public health department had been notified and the man was ordered into quarantine. Unfortunately, he was still in isolation when his wife went into labor, and he missed the birth of his first son.

Including Roger, the twins, Mary, the soccer trainer, and the other two students, at least seven people contracted measles in this outbreak.

Self-Assessment Quiz Question #2

Although CDC has stated that the chances of getting measles in the US are low, occurrences of measles can happen. Which of the following is the most likely scenario that might allow a measles outbreak, such as that described in this case study, to occur?

- Comprehensive vaccination programs and travel to developed countries.
- Incomplete vaccination efforts and travel to developing countries.
- Genetic mutations conferring susceptibility to measles infection.
- High vaccine acceptance rates.

Self-Assessment Quiz Question #3

If a measles outbreak in the US is sustained for a period of at least 1 year, what is one potential outcome?

- Enough people will be infected to create a new level of immunity, halting spread of the outbreak.
- The chances of contracting pertussis will increase.
- The US risks losing its measles elimination status.
- It can be expected that such outbreaks will be more common in rural than urban settings.

Self-Assessment Quiz Question #4

Although there are many factors that can lead to the reemergence of an ID thought to be eradicated, overall, which of the following situations was most likely to contribute to the measles outbreak described in the case study?

- Antimicrobial resistance.
- Decreases in population density.
- Reduced mobility.
- A growing population of people who refuse to vaccinate themselves and/or their children.

Pertussis (Japan)

Beginning in the early 1900s, the microorganism *Bordetella pertussis*, which caused the disease pertussis (whooping cough), was studied in rodents. As a result of this early work, a number of toxins and so-called protective antigens were discovered. Unfortunately, while providing some protection from the disease, significant adverse events were implicated with the use of these early vaccine products. Research continued, resulting in the development of safer products (Cherry, 2019).

By 1974, Japan had assembled a successful vaccination effort to protect children from pertussis. In that year, it is estimated that almost 80% of children were vaccinated, and only 393 cases with no deaths were reported (CDC, 2018). As far back as the 1940s, though, reports have been published suggesting that some vaccines may lead to severe neurological disease. Critical to the pertussis vaccine was a 1974 article by Kulenkampff et al. (1974). This publication described observations of 36 children over the course of 11 years that were thought to suffer neurological complications after immunization for pertussis. They rationalized their findings by noting that the complications were all

clustered around the 24-hour interval after inoculation. In summary, they suggested that the pertussis vaccine should be avoided in patients with a history of fits (sudden appearance of a symptom; Farlex Partner Medical Dictionary, n.d.), a family history of fits, or those with previous reactions to vaccinations, recent infection, or with presumed neurological deficit (Kulenkampff et al., 1974). Additional studies conducted in Sweden, Wales, and England found high incidences of encephalopathy thought to be linked to vaccines. In addition to rumors regarding the safety of the pertussis vaccine, it was believed in Japan that the pertussis vaccine was no longer needed. By 1976, only 10% of newborns were vaccinated for pertussis (CDC, 2018).

In 1979, a pertussis epidemic took hold in Japan, resulting in more than 13,000 cases. Mortality attributed to this outbreak was estimated to be 41 deaths. In the meantime, efforts were in play to develop a novel, safer vaccine. In 1981, the Japanese government reinitiated an immunization program using the new product. As a result of this campaign, the number of pertussis cases began dropping to pre-1974 levels (CDC, 2018).

Vaccine hesitancy – Anti-vaxxers

WHO defines vaccine hesitancy as a “delay in acceptance or refusal of vaccines despite availability of vaccination services.” Vaccine hesitancy is a global phenomenon, reported in more than 90% of countries. As an example, immunization for measles has dropped to less than 95% in multiple regions. This is critical, because this is the immunization threshold set by WHO to maintain herd immunity (The Lancet, 2019).

Nursing consideration: Unfortunately, the fear of autism’s linkage to vaccination is still prevalent in our communities. Effective nurses and APN should familiarize themselves with this controversy, allowing them to help allay the fears of their patient’s caregiver or parents.

In an effort to support healthcare professionals’ efforts to increase vaccine uptake, WHO has developed a series of training modules designed to aid in facilitating difficult conversations with those that are vaccine hesitant. It may be useful to consider the statement by Dr. Michael Gannon, president of the Australian Medical Association, who noted that pediatric patients are 10,000 times more likely to suffer neurological injury as a result of measles than by vaccination (The Lancet, 2019).

The threat of vaccine hesitancy is real, and is threatening to reverse many of the great accomplishments to date in the battle against ID. In an effort to reverse the current anti-vaxing trend, all health professionals, public health officials, governments, and the industry must collaborate to dispel the myths and misinformation regarding vaccinations (The Lancet, 2019).

Case Study 3

Jennifer appears to be a happy, well-developed girl, aged 2 years. Her family recently relocated and is taking her for her initial visit to a Pediatric Nurse Practitioner (PNP), Mike, for her 2-year-old well-child examination. After visiting a bit with Jennifer's mother, Mike learns that Jennifer has had a few ear infections and her mother believes that she may be developing another. Jennifer was born at 36 weeks gestation, the product of an in vitro procedure. She was breastfed for 1 year and appears to have met all of her development milestones. Jennifer's mom feeds her a balanced diet of organic fruits and vegetables and provides plenty of oat milk in a sippy cup. The entire family is vegetarian. She has no siblings and her parents, both aged 43 years, exercise regularly and are healthy. Everything went pretty much according to Mike's plans, until he reached the topic of immunizations. Jennifer's mom stated that she had received no immunizations. When Mike politely asked the reason for the decision to forego the usual brace of vaccinations, her mother shared her maternal concerns. She explained that her sister's

baby was diagnosed with autism at age 2. She went on to say that he was a perfectly healthy baby until he received his 1-year vaccines. She got emotional at that point and said that it has been very difficult for the family, and she is certainly not going to make the mistake that her sister made. Furthermore, she believed that it would be better for Jennifer to develop natural antibodies the way they did in the old days, like with measles and chicken pox.

Self-Assessment Quiz Question #5

What is the most likely reason that Jennifer's mom is unwilling to vaccinate her daughter?

- She is not very interested in the well-being of Jennifer.
- She is convinced that ID are a product of conspiracy theories.
- She believes that immunizations can do more harm than good.
- She believes that vaccine-preventable diseases no longer exist.

Human response to EID

Certainly, many EID are serious, some with potentially fatal consequences. Despite these obvious outcomes, the total impact on humankind is likely more complex.

Psychosocial impact of EID

The evolving COVID-19 pandemic, seemingly changing on a daily basis, lends itself to the dissemination of misinformation and confusion, resulting in a dazed population, unclear on what to fear, who to trust, and how to best live their lives. These feelings are not new; a long history of major ID outbreaks has provided examples of societal response. In 1990, Philip Strong, against the backdrop of HIV/AIDS, authored *Epidemic Psychology: A Model*. In this critical book, Strong explained how epidemics are able to create threats to the human race by pitting all of society against one another (Strong, 1990). Large outbreaks of novel ID often result in enormous threats to public health and global economies, planting fear, stigma, and a variety of calls to counteract the disease (Loveday, 2020).

Pandemic-associated distress encompasses closely related ideas. For example, fear of the emerging infection may lead to suspicions that those around us may infect us. Early on in an epidemic, if there is an uncertainty of how exactly the disease is transmitted, additional anxieties can develop as individuals consider the possibilities: is it through human contact, the environment, food, breathing, coughing, or sneezing? These ambiguities can breed fear, which may lead to irrational behavior. Typically, the next step is the stigmatization of those infected with the disease, resulting in stereotyping of the main carrier groups. While these phenomena plant the seeds of fear, in many cases, incessant media commentary typically provides the conditions for fear to grow. Media headlines often discuss superspreader events and describe the so-called patient zero, both of which help to characterize scapegoats. While much of this is sensational and raises the visibility of those reporting it, the media often lacks useful information that individuals might use to protect themselves from infection (Loveday, 2020).

Effect on routine healthcare

In the case of the COVID-19 pandemic, while hospitals were often flooded with patients seeking care, general practitioners often reported a lack of patients, with a number of elective procedures postponed indefinitely. In addition to the fear factor, millions of people lost health insurance and the ability to pay for critical preventive care. Many experts predict that the COVID-19 pandemic will be followed by a second, less obvious pandemic, fueled by poor diet, diminished exercise, avoidance of maintenance medications, and mental health flare ups. Potentially more serious are reported anecdotes of decreased incidence of heart attack and stroke, with some suggesting that this is a sign of people avoiding hospitals even in the most extreme situations. As a corollary observation, reduction in healthcare access is a well-acknowledged cause of morbidity and mortality subsequent to natural disasters. The reduction in healthcare usage has been associated with layoffs and, potentially, facility closures. At such time that society

The public is often faced with unrelenting amounts of information, with much of it intended to place blame on how an EID could have been allowed to occur. The opinions offered often conflict with one another. In some cases, explanations offered result in unsubstantiated moral judgements, which again, are not usually productive (Loveday, 2020).

To counter a pandemic, there must be a call to action, ranging from local to international responses. To be effective, many of the countermeasures taken will infringe on rights and freedoms, while disrupting normal trade, travel, and personal activities. While such reactions may result in tamping down the EID in the short term, long-term social unrest and distrust often results. In the initial phases of the coronavirus outbreak in China, seemingly draconian measures appeared to be effective at curbing the spread of infection. Nonetheless, the sometimes forceful removal and quarantine of citizens suspected of harboring the virus created harsh optics that could be difficult to see and accept in return for a hope of eradicating the disease. WHO and similar public health organizations have, in some cases, been able to develop balanced public health messages designed to counter the panic-causing misinformation often associated with EID (Loveday, 2020).

Despite these efforts, it appears that the model suggested 30 years ago by Strong still describes the human response to novel EID: initial overreaction, followed by the emergence of news and images confirming society's worst fears. It is incumbent on health professionals to best understand all available information and help their patients to best normalize the threat so that they can make proper decisions. A sense of proportion is required that allows individuals to take infection threats seriously while toning down fear, stigma, and scapegoating.

begins to return to normal, these deficiencies may result in healthcare shortages (Barnett, 2020).

The incidence of measles infections has risen on a global basis of 556% between 2016 and 2019. The fundamental cause of this increase is a failure to immunize. While a hesitancy to vaccinate is likely driving some of the acceleration, access barriers are also contributing to inadequate levels of immunization. Some experts share a concern that the COVID-19 pandemic is likely to make matters worse. Evidence showed a significant decline in routine childhood vaccinations in the first 8 months of the pandemic. It appears that under-resourced public health departments, overwhelmed with a response to COVID-19, have largely not identified locations where immunization coverage is lacking. This lack of oversight allows the development of pockets of potentially susceptible individuals. Meanwhile, the practice of social distancing reduces travel and social interaction, all while wearing facial coverings and taking other precautions that give the measles virus

fewer opportunities to spread. This results in the creation of “artificial scenarios,” suggesting safer than actual conditions. As a result, when the COVID-19 pandemic eases and restrictions are removed, it seems reasonable to expect an acceleration in the incidence of measles (Belluz, 2020).

Nursing consideration: Nurses should be especially diligent in their efforts to ensure that their patients remain up to date with their vaccinations. In the case where patients have fallen behind on their scheduled immunizations, nurses can suggest adherence to CDC endorsed catch-up vaccine schedules. The CDC pediatric catch-up vaccination schedule can be found online at <https://www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html>

Mental health issues

It has been reported that an escalation of mental health and substance abuse problems has been occurring during the COVID-19 pandemic. What may not have been expected is the scale of these issues. It appears possible, if not likely, that mental health and substance abuse may reach their own epidemic proportions. The combination of high unemployment, housing instability, and social isolation work in unison to result in a reported one-third of Americans experiencing new or worsened mental health symptoms. Alcohol sales since the beginning of the pandemic have risen by 250%. Likely most alarming is the number of individuals needing treatment that are delaying, avoiding, or are unable to access proper care. While telehealth may help some, it has been suggested that those most needing assistance have the fewest resources and are thus unable to take advantage of these technologies. Staffing shortages caused by pandemic health conditions may also

hinder mental health professional efforts. The reality of the situation is that if mental health needs are not adequately addressed in times of a pandemic, the result will be an increased number of drug overdoses, suicides, homelessness, and untreated mental illness. Sadly, it is anticipated that these consequences are most likely to impact the same populations of people most at risk of contracting an EID: people of color, older people, and those of lower socioeconomic classes (Kozak, 2020).

Nursing consideration: Nurses can certainly make a difference by checking in with their patients to proactively screen for medical concerns. Nurses can communicate to their patients that they are never too busy to help and, despite changes to practice during a pandemic, they remain present to serve as a main conduit to healthcare.

Pandemic fatigue

While individuals may be more willing to take the precautions required early in a pandemic to prevent the spread of infection, it is evident that, at some point, many will become tired of following these guidelines. This phenomenon can be called pandemic fatigue. Pandemic fatigue occurs at the point that people get frustrated with their situation and want to return to the life they enjoyed before the pandemic. As a

result, some may give up on protective measures. Unfortunately, if the pathogen is still present in the community, these lax practices provide an opening for it to infect more people. It can be hypothesized then, that pandemic fatigue can be a contributor to the spread of an EID (Akins, 2020).

Human attribution for EID

Many individuals may decide that the optimum approach is to seek and follow the best scientifically-supported approaches to avoiding, managing, and treating an EID. Pragmatically, this logic-based method may be a good way for some to cope with the out-of-control feelings

associated with pandemic disease. Others may employ different tactics, such as denial of the problem or focusing more on assigning blame to the perceived cause of the pandemic.

Blame

According to the Stanford Encyclopedia of Philosophy, blame is a negative response pointed at someone, or their behavior. As an example, in the case where one party wrongs another, the victim reacts with a verbal rebuke. Of course, blame could also be focused on someone for their attitudes or characteristics. Since blame can be directed at a plethora of offenses, the act of blaming can also vary greatly, including a broad range of inward and outward responses to beliefs, desires, emotions, and expectations. Blame is a very common part of the human moral experience. While praise may be the counterweight to blame, the latter response remains a more significant component of moral philosophy (Tognazzini & Coates, 2018).

Uniacke (2020) takes a more contemporary approach to blame, acknowledging that accidents happen and, on some occasions, life does not proceed according to plan, noting that in some cases, the default reaction is to find someone else to blame for their problems. In truth, most of the things that happen in life result from manifold contributing factors and can be caused by a mixture of actions – some of our own making and some contributed by others. As a real-world example, consider a cyclist hitting a rough patch in the road and falling. If the incident was deconstructed, it may become evident that while the poorly maintained road contributed to the accident, perhaps if the cyclist was not going so fast and was looking where they were going, they could have avoided the hazard. Many mistakes will be made, some with minimal penalties, with others resulting in catastrophic consequences. It is critical that when things do go wrong, individuals acknowledge their errors and learn to do better going forward. In the absence of this process, humanity is doomed to never being able to improve itself (Uniacke, 2020).

Blame, as it relates to pandemics

So, blame is a destructive emotion, yet often a go-to part of the human toolkit. It seems likely that when it comes to pandemics, such

as the coronavirus, it is critical for many to be able to assign blame. Specifically, they are likely to attribute blame in line with the classic definition provided by Tognazzini & Coates (2018), which states blame is a negative response pointed at someone or at their behavior. Unfortunately, there are ample examples to prove that hypothesis.

A recent article in Breitbart News stated that the coronavirus originated in Wuhan, China, and that the Chinese government was not forthcoming in describing the seriousness of the outbreak. Furthermore, they claim that WHO was well aware of the virus but withheld the information, while simultaneously praising China for their transparency on the matter. According to this account, then Vice President Pence stated that “China is to blame for the coronavirus,” and then went on to state that China prohibited US personnel from entering China to investigate until mid-February, even though the initial cases of COVID-19 occurred in November 2019 (Bleau, 2020).

It appears evident that some are listening, with a few responders becoming self-styled vigilantes. Early in the pandemic, a Singaporean law student was attacked by a group of strangers. When walking in London one night, the victim passed a group of people. As he heard the word “coronavirus,” he turned and one of the men in the group shouted at him, and then punched him in the face, leaving him with a black eye. One of the men shouted, “I don’t want your coronavirus in my country,” before striking him a second time in the face, resulting in facial fractures. The group then fled before the police arrived. The Metropolitan Police investigated the beating as a racially aggravated assault. In response to his ordeal, the victim posted to Facebook: “Racism is not stupidity – racism is hate. Racists constantly find excuses to expound their hatred – and in this current backdrop of the coronavirus, they’ve found yet another excuse” (Iau, 2020).

Evidence-based practice! Cho et al. (2020) conducted a nationwide (US) sample of 842 adults in an effort to characterize factors associated with a stigmatization of Asians during the COVID-19 pandemic as well as to discover factors that can prevent or mitigate stigmatization. Data obtained from this effort were able to assign racial prejudice, biased media, and maladaptive coping techniques as causes of stigmatization. Of these features, racial prejudices, stereotypes, and emotions toward Asian Americans were the strongest predictor of stigmatization. People who felt relatively powerless to deal with COVID-19, while estimating its high perceived harm, were more likely to stigmatize Asian Americans. Investigators concluded that in order to reduce stigmatization, racial stereotypes, emotions, maladaptive coping, and biased media need to be countered through the provision of education and enhanced public resources to better understand the causes of COVID-19 (Cho et al., 2020).

Oddly enough, all of the blame is not just directed at the Asians, as explained in a publication by Jean (2020). She states that a number of reports are appearing that blame Jews for the recent COVID-19 pandemic. According to these accounts, Jews intentionally invented the coronavirus to spread it globally, and then used it as a way to profit or achieve global control, adding that historically, economic downturns have always led to increases in antisemitic acts. The imagery and language employed in this tactic are similar to the medieval “blood libels,” where Jewish people were blamed for spreading disease through the poisoning of wells in order to control economies. The current conspiracy theories were most frequently reported in the US, France, and Germany (Jean, 2020).

Many individuals blame the government for the ravages of COVID-19. Harvey suggests that partial re-openings of the US economy may be a direct cause of the COVID-19 resurgence, with most of the blame being assigned to state and local governments for their decisions to reopen. While acknowledging that much of the rhetoric presented by governors and mayors has not been helpful, he asks, what choice did they have in the matter? Since the federal government failed to address their local problems, reopening was the only approach that could possibly repair budgets that were decimated by shutdowns. He argued that the federal government should have aggressively attacked the economic problems early in the pandemic. Perhaps if individuals were not so concerned for

Case study 4 – Phase 1

Henry, an APN for a large family practice group in a Midwest college town, has noted an uptick in the number of COVID-19 cases in his community. He has studied current CDC practice guidelines and feels that he is doing a good job of protecting his patients and himself from infection. Unfortunately, none of his careful planning prepared him to manage a verbal outburst from his patient Julia. Julia had been experiencing symptoms of fever, cough, general fatigue, and an inability to smell or taste. Based on the presence of the novel coronavirus in the community and her symptoms, Henry suggested that she be tested for COVID-19. At first Julia resisted, stating, “I take good care of myself; only dirty people get the corona.” Nonetheless, Henry persisted and, eventually, she agreed to be tested. Henry was not surprised when the test came back positive. This afternoon, he had to call her on the telephone to discuss the results and provide directions for her care.

Henry began the call by asking how Julia was feeling that day. She noted that she remained tired and was coughing a bit more and was still unable to taste or smell. Henry then told her that he had received her test results, and that, unfortunately, she had tested positive for COVID-19. Before he could even begin to describe what she needed to do for self-care and to protect those around her, Julia interrupted and started into a rant, making random comments about the China virus and how it was not her fault that the Chinese were unable to control the spread of the virus. Henry continued listening, thinking that she would wear herself out and he could continue. Eventually, she did slow down a bit and Henry was able to explain the need to isolate herself, treat her fever with ibuprofen, and call if her symptoms should worsen. Nonetheless, Henry was not happy with the interaction and felt that he was unable to provide proper care.

the survival of their businesses, they might not have been so eager to reopen (Harvey, 2020).

There seems to be plenty of blame available for consideration relating to the root causes of the current COVID-19 pandemic. One not so obvious assessment was offered by Kessel, who bluntly stated in a September 2020 article that “the pandemic is your fault.” Most people who are doing what they are told, wearing a mask, social distancing, and washing their hands frequently may scoff at this thesis. Our ability to easily assign blame may help us to shrug off this notion with contempt. A large majority of Americans place blame for the global spread of the coronavirus squarely on the Chinese government for not rapidly containing the contagion. Others blame politicians for prioritizing their political future over the health of those that they govern. Alternatively, it is easy enough to blame people holding large unmasked parties or bar goers. There is ample blame to go around. Pinning the blame for the virus on one’s self, though, can be difficult. Nonetheless, some experts say that everyone plays a role in creating conditions favorable for explosive EID. The causative factors are not always evident, though. These ID experts posit that food choices, the clothes that are worn, the decision to own electronic devices, bearing children, and the amount of travel, for example, are all choices that apply pressure to the natural world. According to this view, it is nearly impossible to make choices that do not stress the natural world. In short, the more that humans interrupt native ecosystems, the better the odds that mankind will contract the diverse and potentially deadly viruses that wild animals carry (Kessel, 2020).

It is understood that the pathogens causing EID have been present for millennia. Humans have colonized every corner of the earth, bringing populations into contact with the last remaining wildlife-borne viruses that have not yet infected people. According to this thinking, no person caused COVID-19, rather, it was a group effort, involving everyone in the developing world. Human appetite for consumption has changed the planet to such an extent that people now subjugate every ecosystem on earth. Nonetheless, humans typically fault one country or another for their problems, blaming people who choose to eat one species of animals over another. Others cite acts of God, blaming nature for their dilemma. In Kessel’s view, people need to collectively accept the blame for COVID-19 and many other global problems, understand what is happening, and then take decisive action to change it (Kessel, 2020).

Self-Assessment Quiz Question #6

It is well acknowledged that humans often need to assign fault for predicaments. Which of the following statements about blame is *true*?

- Blame is uncommon, its philosophical counter, “praise,” is used much more often in American society.
- In many cases, blame cannot be affixed to a single element; usually actions occur as a result of a combination of events.
- Stereotyping usually plays no role in developing stigmatism in the COVID-19 pandemic.
- Causative factors for the COVID-19 pandemic are evident and fully established.

Self-Assessment Quiz Question #7

Think about the way that Henry managed his conversation with Julia. Could he have done anything differently?

- Henry approached the situation poorly. He should have immediately interrupted Julia and provided a factual representation of how the virus spread to and within the US.
- Henry approached the situation poorly. He should have chastised Julia for not taking proper precautions to protect herself from the virus.
- Henry approached the situation adequately but should have reassured her that the government had done everything possible to protect her and her infection was an unfortunate case of bad luck.
- Henry did the best he could when dealing with a difficult patient. He listened and did not interrupt her, waiting until he was able to communicate what he had to say.

Politicization of pandemics

In addition to the risk of stigma arising from the occurrence of pandemics, the occurrence of such global disasters also leaves the door open to ambitious politicians who can use it to their partisan advantage. Again, the case in point is COVID-19. The Director General of WHO, Dr. Tedros Adhanom Ghebreyesus, recently stated that, indeed, the coronavirus is being politicized to the extent that there is no overall global leadership, creating a greater threat to humanity than the virus itself. In his words, global solidarity to counter a pandemic is vacant, and COVID-19 has made it worse. Although Dr. Ghebreyesus did not name who he thought was politicizing the pandemic, the US Government has criticized WHO and threatened to stop funding the global health organization. These global fractures demonstrates that, although the whole world is suffering from COVID-19, there is great disparity in the impact of and response to the pandemic among regions and countries (Voice of America [VOA], 2020).

As politicians continue their discussions over public bailouts, the prioritization of employer liabilities, and the correct way to conduct death counts, COVID-19 marches on with more infections, more death, increased unemployment claims, and general dread. As politicians remain engaged in tribal battle, action to obtain meaningful change often bears the brunt of it. The individual skirmishes have resulted in a piecemeal approach to managing COVID-19 across the US, to include reviving its economy. The easing of lockdowns in some regions has not resulted in the promised large-scale reductions in unemployment. Instead, such changes are often associated with increased incidence of viral infection (Marcellus, 2020). According to a Brookings Institute report, a coherent reopening strategy is much more important than individual state reopening timelines. This report goes on to state that, in order to keep people safe, it is necessary that Americans come to trust their government leaders, and that they receive a consistent message. These discrepancies and associated behaviors can be measured by examining surveys. A recent survey instrument found that 52% of

Real solutions to managing EID

After better understanding the realities associated with an actual pandemic, the urgency to prevent, mitigate, and respond to emerging ID seems evident. While human nature may gravitate toward the assignment of blame for emerging ID and politicians are often quick to seize the occurrence of pandemics as a tool, it is generally more useful to focus on what can be done to avoid it--failing that, to blunt its impact.

How to best control/manage EID

Better hygiene

For any infection to become problematic, the pathogen needs to enter the body, multiply in numbers, and then interfere with typical body function. Developing a good understanding of how infections are transmitted can go a long way toward avoiding sickness. The way that organisms move from host to host is not fully worked out and new knowledge is continually emerging. In broad strokes, what is known is that the majority of pathogenic microorganisms enter the body through orifices, such as the mouth, nose, eyes, ears, anus, or genital passage. In some cases, they are able to transit the skin through animal or insect bites. No matter the access point, infections can be stopped by preventing the entry of pathogens to the body. Although these guidance statements were written with generalized infections in mind, these approaches are also applicable to mitigating the spread of emerging diseases that have established a toehold in a community. One of the best and primary defense strategies is based on solid personal hygiene. In many cases, the spreading of infection can be stopped by adhering to a few critical habits and guidelines described below (Harvard Health Publishing, 2016):

- Handwashing. Hands should be thoroughly washed with soap and water for at least 20 seconds, rinsed, and then dried after using the bathroom, before preparing or eating food, and after completion of dirty tasks. Handwashing should also follow nose blowing, coughing, sneezing, and caring for a pet or sick person. So far as technique, it is important that hands are thoroughly wetted and

people identifying as Democrats compared to 37% of Republicans practice social distancing and avoid even small gatherings. Further to this, differences can be observed by reviewing state policies governing lockdowns, which also reflect a political divide (Graham & Pinto, 2020).

Anthony Fauci, MD, Director of the U.S. National Institute of Allergy and Infectious Diseases, described the politicization of the coronavirus pandemic as unfortunate. As background, he stated that over the past 40 years or so, he has experienced a variety of infectious outbreaks, but never one with such divisiveness as that associated with COVID-19. Rather than politicize the situation, he claimed that it is critical that the government functions only in the context of good public health. Instead, in the US, the government's response to the pandemic has been widely criticized, downplaying the impact on the country and presenting dubious claims (Lavers, 2020).

While the US is not the only country guilty of politicizing COVID-19, some countries are taking steps to avoid it. In March 2020, it was reported that Otumbo Osei Tutu (the Asantehene [ruler] of Ghana) requested a 1-month moratorium on political activities so that Ghana could focus all of its attention on countering the coronavirus. It was his expectation that the media cool its political discourse and dedicate its coverage to methods designed to contain the viral spread. To this end, he suspended all major traditional activities at the Manhyia palace. The Information Minister was impressed with Tutu's efforts and encouraged other traditional rulers and institutions to follow the example set at the palace. Tutu's Deputy Chief of Staff of International Relations then advised all Ghanaians to adhere to directives discouraging social gatherings. The Ghanaian Representative to the United Nations, Nana Apenteng, stated that it is critical that the government projects a unified front against the coronavirus to avoid the collapse of Ghana's healthcare system (GhanaWeb, 2020).

In 2017, the CDC issued a document, National Pandemic Influenza Plans. Predating the COVID-19 pandemic by at least 2 years, it describes, in general terms, a coordinated national approach to managing a pandemic. In summary, it states that the US government has long been aware of the hazards of an influenza pandemic (CDC, 2017c). Ignoring high-level government platitudes, there are a few things that can be done to help better understand EID, preventing, and managing pandemics.

lathered with soap, rubbed into the palms, back of hands, and wrists. The fingertips, between the fingers, and under fingernails must also not be neglected. Lastly, it is important to rinse under running water and dry hands and wrists completely (Harvard Health Publishing, 2016). In the absence of soap and water, hand sanitizer (containing at least 60% alcohol) is an acceptable substitute.

Evidence-based practice! It is well accepted and supported by data that proper handwashing is critical to curbing the spread of ID in a clinical setting. Zivich and colleagues (2018) noted that the impact of handwashing on reducing the incidence of ID in nonclinical workplaces was not well established. In order to resolve this lack of information, they led a systematic review of the scientific literature to characterize the impact of handwashing on ID prevention in office-based workspaces. To this end, they evaluated a total of 11 studies published between 1960 and 2016. These publications were able to demonstrate that hand hygiene, at various levels of rigor, was able to reduce self-reported symptoms of illness. More specifically, these analyses suggested that proper hand hygiene is more effective against gastrointestinal illness than respiratory disorders. Nonetheless, they note that complete consensus on this observation was not present. Overall, investigators concluded that even minimal hand hygiene efforts were effective at reducing the incidence of employee illness through reduced infections (Zivich et al., 2018).

Nursing consideration: It is well established that we live our lives surrounded by germs. While some are harmless and even helpful, our world is also sprinkled with dangerous species. Fortunately, rudimentary sanitary practices are able to combat many of these organisms. Nurses must ensure that their patients are aware of these facts and are well educated about the necessity of proper handwashing and sanitation. These practices are essential companions to all forms of healthcare.

- In order to stop the spread of airborne microorganisms, it is important to properly cover the mouth when coughing or sneezing. Ideally, the mouth and nose should be covered with a tissue, which is then disposed of. If a tissue is not available, the next best approach is to cough or sneeze into the elbow rather than into the hand.
- All skin injuries (cuts) should be promptly washed and bandaged. In the case of serious lacerations, prompt medical assessment and treatment are often warranted.
- Healing wounds, blemishes, and pimples should be left alone: picking at them may open the skin, providing a microbial access point.
- Sharing of glasses, dishes, or other eating utensils should be avoided.
- Napkins, tissues, or handkerchiefs used by other people should be avoided.

(Harvard Health Publishing, 2016)

In most cases, foodborne infections are not especially serious. Nonetheless, on occasion, ID breakouts have been linked to issues with contaminated food – some resulting in serious medical conditions. In the majority of cases, these types of infections can be avoided by proper preparation and storage of foods (Harvard Health Publishing, 2016). A few guiding principles include the following (Harvard Health Publishing, 2016):

- Carefully rinse all foods under running water before cooking or serving.
- Thoroughly wash hands with soap and water both before and after handling raw meats or fish.
- Retain separation between raw and cooked foods, avoiding the sharing of utensils used for raw and cooked meats without properly washing between uses.
- Cook and reheat hot foods to an appropriate temperature using an internal thermometer.
- Thaw frozen foods only in the refrigerator or microwave oven.

Nursing consideration: The incidence of foodborne bacteria, both susceptible and resistant to treatment with antibiotics, is widespread. Fortunately, these pathogens can generally be killed using proper cooking methods. Nurses should educate their patients on these potential risks and encourage them to handle and cook their foods properly to avoid illness from foodborne pathogens.

Public health measures

In 1920, Charles-Edward Amory Winslow, an American bacteriologist and public health expert, wrote that “[public health is] the science and art of preventing disease, prolonging life, and promoting health through organized efforts and informed choices of society, organizations, public and private, communities, and individuals” (Winslow, 1920). Specifically, public health is directed to the study of population analyses designed to improve well-being and quality of life by preventing and treating disease and other health conditions. Public health can be broken into fields of study that include epidemiology, psychology, environmental health, behavioral health, as well as occupational health and safety. Since the study of public health requires the analyses of large datasets (based on populations of interest), the proper use of statistics is critical. Multiple datapoints (samples from a larger population) are collected and, when analyzed, can be used to make inferences about the greater population. In general, as the science of data and statistical analyses has matured, advances in the field of public health have been appreciated. Scientists interested in promoting public health learned as early as the 1820s that they could best help large populations of people by using data and statistics to structure

information in a way that readers could easily absorb and understand (Oregon Health & Science University [OHSU], n.d.).

Further to the proper sharing of information, significant medical discoveries in the 1850s contributed to public health. In 1854, statistics, maps, and mortality data were employed to determine the source of a cholera outbreak in London. Using these findings, the public water supply was repaired to control the outbreak. On the basis of this experience was born the modern field of epidemiology. In addition, shortly after this time, the science of bacteriology emerged. By the 1880s, a number of highly pathogenic bacteria were identified. These discoveries formed the foundations required to determine how these diseases spread and facilitated the development of vaccines to prevent epidemics. By the 1890s, bacteriology laboratories began to appear in many cities. These facilities were purpose-built to allow the identification of a variety of diseases such as diphtheria, tuberculosis, typhoid, and cholera. They were able to examine a variety of media, to include foodstuffs, to best maintain the health of their communities. Whenever a potential communicable disease was identified, samples were collected and sent to the city’s bacteriology laboratory for evaluation. If a culture was positive, the source of infection could be isolated by quarantine in order to protect the community. In addition, bacteriologists detailed causes of death in the community, to include the presence of communicable disease (OHSU, n.d.).

While historically public health was focused on the practice of collecting outbreak data to control the spread of ID, current infection control approaches rely on surveillance for early detection of infections in an effort to prevent disease. WHO supports an infection prevention campaign called “Clean Care is Safer Care.” The objective of this program is to ensure that infection control is fully appreciated as a critical contributor to patient safety and well-being (Decision Support in Medicine, 2017).

A number of factors and tools are required to support public health; examples include the following (Decision Support in Medicine, 2017):

- Surveillance.
- Data analysis.
- Public reporting of communicable disease data.
- Investigation of ID outbreaks.
- Education to both healthcare professionals and the public.
- Development of effective guidelines.

Increased vaccination rates

Vaccine products are able to protect the body from ID by eliciting immune responses resulting in the formation of antibodies to counter the pathogen. In many cases, vaccines are able to offer a cost-effective, safe, and efficacious tool intended to prevent illness, accompanying disability, and potential death resulting from ID. Over many years, vaccines have saved millions of lives and significantly decreased the incidence of a variety of sometimes deadly diseases. Nonetheless, there remains a need for novel vaccines to counter existing and emerging pathogens. As a result, abundant research is being conducted by government and commercial organizations (National Institute of Allergies and Infectious Diseases [NIAID], 2020).

In an effort to partially solve the problems of EID, global efforts are underway to develop efficacious vaccine products. In the US, the Advisory Committee on Immunization Practices (ACIP) was formed to generate recommendations for the optimum use of vaccines to the director of CDC and the Secretary of HHS. ACIP is classified as a federal advisory committee that makes their decision making and documents available to the public. They use an evidence-to-recommendation approach, based on burden of disease; safety and efficacy of the vaccine product; acceptability to patients, clinicians, and immunization programs; as well as issues related to implementation of immunization programs (Lee et al., 2020).

Despite significant efforts by ACIP to provide recommendations designed to guide the use of vaccines, such policy making for rapidly emerging ID present unique challenges. For example, the burden of disease may be unevenly distributed, inflicting greater impact on older individuals and those of color. Furthermore, the risk of exposure and morbidity/mortality can vary greatly across populations. Differences in vaccine characteristics among candidates may dictate that certain products are preferable in some populations compared to other products.

Lastly, the timing of availability and supply chain limitations relative to demand often result in even greater complexities (Lee et al., 2020).

Typically, ACIP begins developing policy after many years of research. As a result, the target disease is often well characterized, to include transmission patterns, risk factors, and its immunologic properties. In the case of novel, rapidly emerging ID much of this critical information is unknown. Nonetheless, a need to make consistent, evidence-based recommendations is required. There is precedent for such policy making, though. ACIP played a critical role in developing guidance for use of a vaccine to counter the 2009 Swine Flu pandemic. In anticipation of the need for such guidance, ACIP convened an emergency meeting in July of that year to finalize their recommendations. These adoptions were widely implemented, facilitating the equitable distribution of a vaccine product and ensuring consistent communication (Lee et al., 2020).

In April 2020, ACIP formed a COVID-19 working group to begin the development of evidence-based approaches to a COVID-19 vaccination policy. The overarching goals were to evaluate all available evidence and provide recommendations for the safe and effective use of COVID-19 vaccine products, the chances of reducing disease transmission, morbidity, and mortality of COVID-19 disease. Furthermore, they examined the potential of vaccines to minimize societal disruption and to maintain proper healthcare capacity. Lastly, ACIP endeavored to adopt approaches designed to ensure equity in the allocations and distribution of any vaccine products. In July 2020, ACIP reconvened to discuss emerging information describing known epidemiology and pathology of disease as well as immunologic responses to disease, vaccine candidates, and considerations for their recommendations. Despite the many unknowns, rapidly emerging bases of evidence, and the need to work under conditions of high uncertainty, ACIP developed multiple principles designed to guide decision making. Safety was deemed to be of paramount importance, understanding that safety profiles may vary greatly across populations. It was determined that, in order to allow for the evolution of recommendations, real time monitoring of safety and efficacy would be required. ACIP also realized that it would be critical that their guidance would support an efficient and equitable distribution of any vaccine products (Lee et al., 2020).

Also, in June 2020, the U.S. Food & Drug Administration published their guidance on the development and ultimate regulatory licensure of COVID-19 vaccines. Recognizing the challenges of developing such a product in a limited time frame, FDA guidance recommended that a product should provide a minimum of 50% efficacy compared to placebo in the prevention of COVID-19 infection and disease (Lee et al., 2020).

Nursing consideration: Nurses and nurse practitioners, through comprehensive educational efforts, are in an ideal position to help break down some of the psychological barriers that may prevent proper vaccination practices. Nurses should make an effort to insert practical immunization information into their patient education repertoire.

Strategic testing

Definitive testing of people suspected of being infected with an ID provides critical data aiding in understanding the contours of a pandemic. It is important because it is impossible to know with certainty the true number of afflicted individuals, only the infection status of those that have been tested using an accurate instrument. As a result, in most pandemics, the true number of infected patients is typically higher than official counts. Test data can be misleading because jurisdictions may use differing approaches for reporting information. For example, some countries report the total number of tests performed, while others report the number of people tested (some people may be tested more than once). Test coverage by region is also inconsistent. In Iceland, a relatively extensive tester, more than 10% of the population has been tested for COVID-19. On the other side of the spectrum, Indonesia has tested far fewer of its residents: 0.01%. Typically, increased rates of testing provide more robust and reliable data. Statistical theory states that the larger the sample, the closer the resultant estimate will be to reality (that is to say the only way to know the true infection rate would be to test everyone). The other reason that

increased testing is generally more accurate is that a high capacity for testing indicates that there is no need for rationing (testing only the highest risk individuals; Hassel, 2020).

The required testing capacity to provide an accurate assessment of disease spread varies over the course of an outbreak. At the beginning, when the number of infected is low, a much smaller number of tests are required to accurately assess disease spread. As the frequency of disease expands, test capacity must rapidly grow to meet the demand. As a result, the metric “number of tests/confirmed cases” is a reasonable tool that indicates if adequate testing is occurring. If the ratio is decreasing, that indicates that the amount of testing is becoming less adequate. As an example, as of April 2020, Vietnam conducted 400 tests for each confirmed case of coronavirus infection, while in the US approximately five tests were conducted for each case (Hassel, 2020).

It is evident that both testing coverage and the number of tests conducted for every confirmed case provide useful information to understand the spread of an ID. A jurisdiction that is conducting a small number of tests relative to the number of confirmed cases is not testing enough. While this approach may capture the most severe cases, it is likely overlooking asymptomatic people or those with mild symptoms. Unfortunately, these unidentified individuals may be contagious and able to propagate the ID (Hassel, 2020).

By late October 2020, the US had documented its 5 highest days of positive COVID-19 test results, with signs that these figures would continue to rise. CDC stated the need to develop a strategy to better identify individuals who are asymptomatic, yet contagious. These patients are not rare; according to recent CDC estimates, they comprise 40% of coronavirus positive cases. Dr. Thomas Tsai of the Harvard Global Health Institute noted that the time to develop a comprehensive national test strategy passed months previous. At this point, he stressed that the emphasis should be on developing an approach to identify asymptomatic COVID-19 patients (Vera & Maxouris, 2020).

Contact tracing

Contact tracing and case investigation are key tools in pandemic management. These activities involve close work with patients diagnosed with an ID. The main thrust of the work is to identify and provide support to the patient’s contacts who may have been infected through exposure to the diagnosed patient. The objective is to separate those that are potentially infected before they can spread the disease to susceptible people. This process is a core disease control measure that has been used effectively for a number of decades. It is important to note that a proper response to an outbreak is multipronged: contact tracing is just one of the required tools (CDC, 2020b).

Case investigation is the process of determining who has received confirmed test results and probable cases of an ID. Contact tracing is the next step, where individuals who have come into contact with that person are identified, monitored, and offered support. If all infected and potentially exposed individuals can be identified and self-isolated, experience has shown that the chain of transmission can be broken, preventing further spread of the disease in a community. These methods are not novel, rather they have been effectively employed to curb the spread of a variety of ID, including tuberculosis, sexually transmitted infections, and HIV/AIDS. These approaches are well known by public health agencies and are designed to be easily adapted to a variety of ID (CDC, 2020b).

Aspects of the ID must be taken into consideration when designing effective case investigation and contact tracing operations (CDC, 2020b). Points for consideration include the following:

- If the ID can spread asymptotically, contact tracing efforts must be more rapid than in cases where symptoms precede contagiousness.
- Procedural recommendations must be flexible to allow modifications as additional data emerges.
- Remote communications, i.e., by telephone, should be the primary contact approach.
- Prioritization, when needed, should be based on vulnerability.
- If capacity exists, patients with probable, as well as confirmed cases should be investigated.

- Extensive community engagement is critical to support acceptance of contact tracing efforts.
- In addition to identifying at-risk individuals, significant social support is also required to best facilitate safe self-isolation and testing.
- Jurisdictions must develop plans to rapidly organize contact tracing workforces at time of need.
- While digital contact tracing tools may supplement conventional efforts, they cannot replace the need for a large human contact tracing work force.

(CDC, 2020b)

Evidence-based practice! In the case of COVID-19, combinations of public health directives such as stay-at-home orders, public mask wearing, case investigations, contact tracing, and quarantine have been employed in an effort to blunt the spread of disease. Kanu (2020) closely examined data obtained in Delaware to characterize the impact of these interventions. Delaware reported its first case in March 2020. They began case investigations immediately and issued a stay-at-home order on March 24. A mask mandate took effect on April 28 and contact tracing efforts began on May 12. In Kanu's assessment, disease incidence, hospitalization, and mortality were examined over the period spanning March to June. Results demonstrated that the incidence of COVID-19, hospitalizations, and mortality decreased by 82%, 88%, and 100%, respectively from late April to June, aligned with the mask mandate and contact tracing. The investigator concluded that when combined, available mitigation strategies can reduce the incidence of COVID-19 and associated mortality. Furthermore, he stated that it is doubtful that, if employed alone, any one single approach was likely to be effective (Kanu, 2020).

Self-Assessment Quiz Question #8

Since Julia had tested positive for COVID-19, Henry needed to report the case to the County Health Department. Which of the following are core public health objectives designed to curb the spread of ID?

- Identify people that infected individuals have come into contact with.
- Isolate all known contacts that have been potentially infected.
- Provide support for suspected contacts.
- All of the above.

Self-Assessment Quiz Question #9

Ideally, the County Health Department would employ a comprehensive contact tracing program to investigate each identified case of COVID-19 within their jurisdiction. Regarding an effective contact tracing program, which of the following elements is *false*?

- Time is of the essence; effective tracing should be rapid in cases of diseases that can spread asymptotically.
- Procedures must be rigid to ensure consistent data collection.
- Community engagement can facilitate effective contact tracing efforts.
- If capacity permits, possible contacts as well as certain contacts should be investigated.

Herd immunity

If the point can be reached where a high percentage of a population is immune to an ID (either through vaccination or the development of immunity via previous exposure to the pathogen), it becomes difficult for the ID to spread. This obstacle is a result of there being a limited number of susceptible individuals. As an example, if a person with measles is surrounded by others who are immune to the virus, the disease cannot be easily transmitted, and then dissipates as the infected person recovers. This is called herd or community immunity. This mode of protection is beneficial since it provides a defense for vulnerable people, such as newborns, the elderly, or individuals too ill to be vaccinated. It is critical to note that herd immunity is not a panacea for all vaccine-preventable diseases. An example is tetanus; while tetanus is classified as an ID, it is not contagious, rather it enters the body as environmental bacterial. Regardless of the level of tetanus vaccination in a community, nonimmunized people remain fully susceptible to the disease. The extent of protection in a community required for herd immunity varies by pathogen. While it may ultimately be effective, herd immunity does not provide absolute safety from infection (Immunisation Coalition, n.d.).

If COVID-19 is ever stopped, it will likely be as a result of the attainment of herd immunity. As with any infection, there are three ways to achieve that endpoint: a large percentage of the population gets infected; most people receive an effective vaccine for the coronavirus; or a combination of both. There are at least three scenarios that may lead to herd immunity for COVID-19 (D'Souza & Dowdy, 2020):

1. Worst case. This could occur if no mitigation strategies were employed, such as social distancing, wearing of face masks, or proper sanitation to slow the spread of disease. The virus is adequately virulent to impact millions of people in just a few months, conferring extensive immunity. As a result, this situation would likely overwhelm health systems and result in substantial mortality.
2. Perhaps ideally, mitigation strategies are employed to maintain or reduce current levels of infection until an efficacious vaccine is widely available.
3. Most likely, realities will dictate that a compromise posture is employed where the rates of infections rise and fall and mitigation approaches are loosened as infection rates decrease and tightened as needed to counter increases in disease until an efficacious vaccine is widely available (D'Souza & Dowdy, 2020).

Preparing for EID

The avian influenza (H5N1) virus made its first known transmission from poultry to humans in 1997, resulting in the death of six of 18 infected Hong Kong citizens. This experience spurred the US government and WHO to increase their preparedness for a pandemic. Since that time, the world has experienced instances of novel influenza A viruses, including avian and swine flu. While not nearly at the level

of the COVID-19 pandemic, these experiences made it evident that a pandemic could place enormous demands on public health systems and essential community service industries (CDC, 2017d). Although major planning efforts are focused on influenza pandemics, the key concepts are applicable to most any EID.

HHS: 2005 pandemic influenza Plan

As described previously, pandemics caused by EID are not novel. Governments have had time to prepare and, to their credit, efforts have been made to prepare for pandemic emergencies.

While on vacation in the summer of 2005, President George W. Bush began reading a book chronicling the 1918 flu pandemic “The Great Influenza.” When he returned to Washington, he gave the book to his National Security Advisor, stating, “This happens every 100 years. We need a national strategy.” From this was born a plan to best manage a pandemic. This guide described global warning systems, funding for rapid vaccine development technology, and a national stockpile containing therapeutic drug products, masks, and ventilators. In order to design the strategy, the government conducted cabinet-level exercises (Mosk, 2020).

A total of \$7 billion was allocated for setting up the plan. Cabinet secretaries urged their staff to participate and a website (www.pandemicflu.gov) was launched, which is still in use. Unfortunately, this high level of engagement was not sustained and, as a result, large parts of the plan were not completed and, in some cases, elements were abandoned in favor of new, emerging crises. With the passing of time, it became difficult to justify the necessary funding and staffing levels. Nonetheless, comments made by President Bush 15 years ago still hold true, and elements of this original work remain and form the basis for the US pandemic response (Mosk, 2020).

In 2005, HHS published its Pandemic Influenza Plan, a 396-page guidebook designed to prevent, control, and mitigate the impacts of high-risk influenza viruses. It was noted that certain strains of influenza had pandemic potential and would require the extensive use of vaccines, diagnostics, and antiviral therapeutics, as well as a variety of preparedness and response efforts (CDC, 2017e).

Progress has been made since this initial publication, necessitating the need for an update. In a 2017 update, progress was reviewed, illustrating both successes as well as gaps in preparedness. Significant achievements include expanded surveillance, increased laboratory capacity, new vaccines, and antiviral resistance monitoring capabilities. Furthermore, extensive coverage is dedicated to mitigation measures that communities and individuals can take to slow the spread of a novel virus starting at the earliest stages of a pandemic (CDC, 2017e).

The intention with the 2017 update was to reflect a comprehensive, system approach to enhancing preparedness and response across various sectors and disciplines. The challenge of creating and maintaining such an extensive plan is to cover most eventualities, while retaining the flexibility to adjust as conditions warrant. The objective of the plan was to allow HHS to quickly respond to a pandemic, while at the same time strengthening their response to seasonal influenza (CDC, 2017e).

WHO: global influenza strategy 2019–2030

WHO published the *Global Influenza Strategy for 2019–2030* in order to build and enhance global and national preparedness for a pandemic. It was specifically designed to counter the threat of zoonotic influenza while improving the prevention and control of seasonal influenza worldwide. The strategy was intended to unify the global goals and priorities of all member countries (WHO, 2019).

In spite of all of the progress that has been made, WHO acknowledged that critical gaps and challenges remain. They identified the two most urgent needs, which formed the foundation of this long-range planning document (WHO, 2019):

- Current prevention and control tool limitations – there is an urgent need for better mechanisms to prevent, control, and treat influenza.

- Robust national capacities for influenza preparedness and response are essential. It was recognized that influenza programs are able to enhance the core capacities across all areas of public health (WHO, 2019).

Dr. Tedros Adhanom Ghebreyesus, Director General of WHO, summarized the threat by stating (WHO, 2019):

“The threat of pandemic influenza is ever-present. The ongoing risk of a new influenza virus transmitting from animals to humans and potentially causing a pandemic is real. The question is not if we will have another pandemic, but when. We must be vigilant and prepared – the cost of a major influenza outbreak will far outweigh the price of prevention.”

Role of nurses incombating emerging ID

Nurses practicing in settings related to public health have clear roles and responsibilities intended to eliminate the health inequalities present in our society. These responsibilities focus on the critical importance of awareness of self and others, forming the foundation of human relationships. There is a requirement that these health professionals acknowledge that all cultures and populations are not known or understood. Many of the same roles and responsibilities assigned to public health nurses apply to most other nurses practicing in a variety of specialties and settings. All nurses must recognize and understand the impact on health and outcomes of social determinants, to include environment, socioeconomic status, access to care, and availability of transportation and food, as well as many other factors. Poverty, general inequity, and other social determinants clearly contribute to global health issues and their contribution to morbidity and mortality (Edmonson et al., 2017).

Nurses are in an ideal position to carefully evaluate individuals, communities, and the greater population for susceptibilities, advocate for equality and justice, and involve themselves in their communities in order to best address local, national, and even worldwide health problems (Edmonson et al., 2017).

Evidence-based practice! Lam and colleagues (2018) conducted a systematic review of the scientific nursing literature in order to explore nurse preparedness to function in an epidemic event. It is appreciated that nurses are often tasked with providing a frontline response to an outbreak of an ID. With this critical role, it is important that their preparedness for epidemic events is well characterized. In order to conduct this evaluation, Lam and colleagues identified eligible, qualitative published studies, then extracted and synthesized the findings. A total of seven studies describing nurses’ experiences and perceptions of epidemic events were selected for evaluation. Upon examination of the resultant data, a total of three interlocking themes were identified: personal resources (individual nurses), workplace resources (healthcare institutions), and situational influences. It was determined that, in order to provide an effective response, additional efforts are needed to enhance and reinforce interplay between these themes. Investigators concluded that these interactions are critical, and that additional research is needed to fully understand and appreciate the dynamic (Lam et al., 2018).

Nursing consideration: It is critical that, in order to enhance nurse preparedness and response to an epidemic event, appropriate training and education is provided for nurses focused on the topic of ID. Furthermore, nursing management needs to ensure that institutional assistance is available to provide support for nurses in the event that an epidemic event occurs (Lam et al., 2018).

Situational management: reactions and overreactions to emerging infections

An EID that reaches the state of pandemic may contribute to a secondary epidemic – one of fear. At the onset, when most people do not know anyone afflicted, they may view the disease in the abstract, minimizing the risk, easily feeling immune. Nonetheless, as the disease spreads and increases in prevalence, anxieties often surge, overwhelming a person’s ability to think rationally. This state may result in an overreaction to the situation. So, depending on the phase of an epidemic, outbreaks can present two dueling challenges: both underreaction and overreaction (Klitzman, 2020).

Past epidemics, such as Ebola, HIV/AIDS, and SARS, have provided insights into how humans typically process and manage such situations. Often, individuals will experience both forms of reaction, initially adopting an under-reactive posture and then, based on limited information and accompanying fear, overcompensating, moving them into an over-reactive state. In order to slow down this rapidly swinging pendulum, responses should ideally be rational and evidence-based, not panic-based (Klitzman, 2020).

According to an April 2020 survey conducted by the Pew Research Center (PRC), President Trump’s initial management of the coronavirus outbreak was widely criticized, with 65% of Americans stating that he was too slow to take major steps to address threats to the US despite the reporting of disease in other countries (PRC, 2020). Although it is impossible to know President Trump’s logic behind his actions, based on the perception of a majority of Americans, this can be classified as an underreaction.

Although not an EID-related event, the Three Mile Island nuclear event, which has never been positively associated with any chronic negative health outcomes, terrified many Americans. The result was often a generalized fear of nuclear power. In this case, people were intently focused on that one incident, not aware of the large number of other nuclear plants that were operating safely. This oversight kept people from realizing that the probability of an accident at any given nuclear facility was very small. Nonetheless, the resultant overreaction was great, with some experts suggesting that this fear kept nuclear power from reaching its potential in the US, instead relying on the dirty and unhealthy combustion of fossil fuels (Oster, 2020).

While some responses to EID will certainly promote safety and save lives, others will impact livelihoods to an extent exceeding their benefit. It is impossible to rationally assess this tradeoff using partial information. What is needed is full-picture data, not anecdotal stories that often fill media reports (Oster, 2020).

Optimistically, the coronavirus pandemic and the wreckage that it leaves behind might motivate societies to learn how to better calibrate between overreactions and underreactions. Proper preparation and evidence-based responses could save valuable time in the case of future epidemics, resulting in better outcomes (Klitzman, 2020).

Case study 4 – phase 2

Three days later, Henry was disturbed to see Julia’s telephone number appear on the caller ID. He was not looking forward to spending more time listening to her unproductive ramblings. Nonetheless, he took a deep breath and answered the telephone. While she was still worked up and speaking at a rapid rate, he quickly realized that she had changed her approach to dealing with her diagnosis. She was calling to inform him that she had come to terms with her diagnosis and wanted advice on good practices that she could share with her niece to better protect her from contracting the infection.

Conclusion

The COVID-19 global pandemic has forced all people, especially nurses, to learn about, manage, and prepare for EID. While many of

Nurses can manage human response to EID

According to a 2019 Gallup poll, for the 18th consecutive year, Americans rate nurses as the most ethical and honest among professions. More specifically, 85% of Americans surveyed stated that nurses’ ethical standards and honesty are high or very high. To put this in perspective, automobile salespersons, the profession held in lowest esteem, received the same rating from 9% of people surveyed. According to Gallup, nurses have consistently outrated all other professions by a wide margin. For perspective, medical doctors were similarly rated by 65% of individuals (Reinhart, 2020).

Nurses can leverage the high levels of trust that they have earned to act as the voice of reason in unsettled times. Through calm and rational acts, they can help patients sift through the layers of misinformation and provide evidence-based approaches to safely managing a pandemic emergency. In many cases, nurses are the front line in healthcare. Prevention is key, and nurses are ideally situated to convey these critical messages.

At a foundational level, nurses can provide their patients with information describing clear basic hygienic practices. It is critical that such educational topics are evidence-based and not highly controversial. Points for consideration include the following:

- The novel coronavirus, as well as many other pathogenic viruses, is largely thought to spread from person-to-person to those who are in close contact with one another; ideally individuals should try to maintain separation of at least 6 feet to avoid respiratory droplets generated by coughs and sneezes. Virus may also spread by airborne particles generated from talking or screaming. Whichever the source, particles can land in the mouth or nose of people, or in some cases be inhaled into the lungs. As a result, it is critical to wear face coverings and to cover the mouth and nose with a tissue or the interior portion of the arm when coughing or sneezing. Used tissues should be immediately discarded and hands should be thoroughly washed with soap and water or alcohol-based hand sanitizer (containing at least 60% alcohol; HHS, 2020).
- In addition to social distancing and facial covering, handwashing and effective personal hygiene practices are critical to maintaining good health. Individuals should get in the habit of frequently washing their hands. Lastly, it is important to avoid touching eyes, nose, and mouth to avoid self-infection from contaminated hands (HHS, 2020).

Nurses are well positioned to lead the charge against EID by teaching their patients how to not just survive, but to thrive in a far from sterile world, through a collection of low-cost, high-impact practices. If properly executed, nurses can maintain balance in an often-misinformed world, promote proper immunizations, demonstrate sanitation techniques, and contribute to the generation of timely public health guidance.

Self-Assessment Quiz Question #10

- Which of the following suggestions should Henry share with Julia?
- All people should maintain a distance of at least 6 feet from other individuals.
 - Everyone should wear face coverings, especially when proper distance between people cannot be maintained.
 - People should wash their hands frequently with soap and water.
 - All of the above.

these ideas are novel for most people, the scourges of ID and resultant pandemics have occurred for millennia. Despite epic advances in

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EMERGING INFECTIOUS DISEASES

Self-Assessment Answers and Rationales

1. The correct answer is B.

Rationale: Antimicrobial Resistance (AMR) is a growing problem that may make previously susceptible bacteria immune to treatment with formerly effective antibiotic therapy regimens.

2. The correct answer is B.

Rationale: Regardless of the level of immunization in a community, the presence of even a small number of unvaccinated individuals creates a level of susceptibility, even to diseases considered eliminated, such as measles in the US. Nonetheless, in order to infect a susceptible person, the virus needs a way to enter the community. In many cases, it is through an unprotected person traveling to a region where that ID is endemic.

3. The correct answer is C.

Rationale: The US expended significant effort and resources to achieve the coveted measles elimination status, as defined by WHO. According to WHO criteria, in order to maintain this status, no measles outbreaks can be sustained for a period greater than 1 year in duration.

4. The correct answer is D.

Rationale: A major driver to the reemergence of some preventable ID is a reduction in the use of immunizations. One reason for this is a growing population of people who refuse to vaccinate themselves and/or their children. In many cases, this is driven by controversial studies linking measles vaccinations and autism.

5. The correct answer is C.

Rationale: Jennifer's mom appears to prescribe to the circulating belief that vaccines can result in the affliction of autism.

6. The correct answer is B.

Rationale: Blame is often a simplification where a person suffering an insult attributes blame to one specific causative element. In reality, actions typically occur when a number of elements combine to create a situation that allows the insult to occur.

7. The correct answer is D.

Rationale: While the interaction was far from ideal, in some cases, clinicians need to work with whatever personalities their patients have. In this case, while he was unable to provide the full level of care that he wanted to, he practiced patience and was thus able to at least deliver the minimum amount of information indicated by the situation.

8. The correct answer is D.

Rationale: Although public health professionals have many responsibilities, in the case of managing an outbreak of ID, their key roles are to identify and provide support to all individuals who may have been infected through exposure to the diagnosed patient. Another objective is to separate those that are potentially infected before they can spread the disease to susceptible people.

9. The correct answer is B.

Rationale: Contact tracing procedures should be flexible to allow modifications as new information emerges. For example, it may become apparent over time that whatever approach initially worked may become unwieldy as case numbers increase.

10. The correct answer is D.

Rationale: In addition to social distancing and facial covering, handwashing and good person hygiene practices are critical to maintaining good health in the face of an epidemic ID. Henry should be pleased that, possibly through his attention to Julia, despite her difficult demeanor, she came to trust him, relying on his advice to counter the spread of COVID-19.

Nursing Management of Sepsis

7 Contact Hours

Release Date: March 12, 2020

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Activity director

June D. Thompson, DrPH, MSN, RN, FAEN, Lead Nurse Planner

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Course verification

All individuals involved have disclosed that they have no significant financial or other conflicts of interest pertaining to this course. Likewise, and in compliance with California Assembly Bill No. 241,

every reasonable effort has been made to ensure that the content in this course is balanced and unbiased.

Learning outcome

This course is intended to educate nurses about the management of sepsis and provide vital information that nurses can utilize to help identify and care for patients with sepsis.

Learning objectives

After completing this course, the learner will be able to:

- ◆ Define sepsis and septic shock.
- ◆ Describe the pathophysiology of sepsis.
- ◆ Discuss the signs and symptoms of sepsis.
- ◆ Identify the patients at risk of sepsis.
- ◆ Become familiar with recommendations and guidelines for sepsis management.
- ◆ Discuss the challenges associated with sepsis in the older adult.
- ◆ Describe sepsis in pregnant women, neonates and children, IV drug users, and immunosuppressed individuals.
- ◆ Discuss ways the nurse can help identify and prevent sepsis.
- ◆ Describe how the nurse can help to prevent healthcare associated infections (HAI).
- ◆ Describe post-sepsis syndrome.
- ◆ Identify resources for additional information on sepsis.

Course overview

The following course will provide nurses with an overview of the progression and treatment of sepsis, as well as an overview of screening

tools available to recognize early signs and symptoms that will improve patient outcomes and reduce mortality associated with sepsis.

INTRODUCTION

Sepsis is a life-threatening condition that occurs when the body's systemic inflammatory response causes injury to tissues and organs (Singer et al., 2016). It is a dysregulated immune response to infection that results in organ dysfunction and is the leading cause of death from infection if not recognized early and treated quickly. Any patient may develop sepsis; it is an overwhelming systemic response by the body to an infectious source (Singer et al., 2016).

Septic shock is defined as sepsis with the presence of circulatory, cellular, and metabolic dysfunction associated with a higher risk of mortality than from sepsis alone (Singer et al., 2016). If sepsis is not recognized and treated promptly, it can quickly progress to septic shock AND multiple organ failure which greatly increases the likelihood of a negative outcome. Early identification and prompt treatment of patients with sepsis are key to improving patient outcomes, decreasing length of hospital stays, and decreasing costs associated with sepsis and septic shock. Nurses play an integral role in helping to identify patients who have a suspected or confirmed infection and may develop sepsis. Through education and awareness of the signs and symptoms of sepsis, nurses can decrease morbidity and mortality related to sepsis and improve patient outcomes.

EBP alert! The importance of education and sepsis awareness is critical to improving sepsis outcomes. In 2018, an educational intervention program known as the ABISS-Edusepsis study revealed that education about the importance of infection control, timing and appropriate administration of empirical antibiotics, and the de-escalation of antibiotic treatment lead to:

- Improved overall use of antibiotics in sepsis and lowered time from sepsis to onset of treatment.
- Increased the proportion of patients receiving appropriate empirical treatment.
- Improved safety by increasing the percentage of patients receiving appropriate de-escalation (Ferrer et al., 2018).

DEFINITION OF SEPSIS AND SEPTIC SHOCK

The current definition for sepsis was introduced in 2016 by a task force comprised of 19 experts from the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine (Singer et al., 2016). This definition of sepsis (formerly known as severe sepsis) states that sepsis is a life-threatening organ dysfunction caused by a dysregulated immune response to infection (Singer et al., 2016). Clinically speaking, organ dysfunction is represented by a Sequential Organ Failure Assessment (SOFA) score of two points or more and is associated with an in-hospital mortality of >10% (Singer et al., 2016). The SOFA tool is used to assess organ failure and to help predict mortality in those with sepsis and other conditions that may lead to multiple organ dysfunction syndrome (MODS). The patient's baseline score should be zero unless the patient has known organ dysfunction before the onset of infection (Singer et al., 2016).

The critical concept when defining sepsis is that it is not a regulated response. In sepsis, the dysregulated response of the immune system to an infectious source leads to hypotension, hypoperfusion, peripheral

vasodilation, increased metabolic demands, and myocardial depression. Sepsis can quickly progress from tissue damage to organ failure and even death.

The terms *sepsis* and *severe sepsis* historically were often used interchangeably, leading to confusion. As sepsis is already severe, the task force felt using the term *severe* was redundant (Singer et al., 2016). The host response to infection is critical to the progression of sepsis and is now included in the definition.

Septic shock is defined as sepsis with the presence of circulatory, cellular, and metabolic dysfunction associated with a higher risk of mortality than sepsis alone (Singer et al., 2016). Clinically speaking, patients with septic shock require a vasopressor to maintain an arterial blood pressure of >65mmHg and a serum lactate > 2mmol/L (Singer et al., 2016). The task force wanted to include that definition of septic shock to emphasize the increased rate of mortality, as patients who progress to septic shock have a mortality rate higher than 40% (Singer et al., 2016).

Incidence and prevalence

Data on sepsis demonstrates a major concern:

- It is estimated that there are 30 million cases of sepsis worldwide per year, potentially leading to 6 million deaths (World Health Organization [WHO], 2019).
- Sepsis is the third leading cause of death in the U.S. after heart disease and cancer (Sepsis.org, n.d.a).
- Adults older than 65 years of age make up 60% to 85% of those diagnosed with sepsis (Neviere, 2017a).

- Patients who receive a diagnosis of sepsis are hospitalized 75% longer than those with other diagnoses, and readmission rates are high in patients with sepsis (O'Brien, 2015).
- Almost 270,000 Americans die from sepsis every year (Center for Disease Control and Prevention [CDC], 2016a).
- As many as 1.7 million adults in the U.S. develop sepsis annually (CDC, 2016a).
- Sepsis is the cause of death for 1 in 3 patients who die in the hospital (CDC, 2016a).
- Hospital readmission rates for those diagnosed with sepsis are two to three times higher than people diagnosed with heart failure, COPD, and pulmonary disease (Mayr et al., 2017).

Associated costs

The care and treatment of patients with sepsis is skyrocketing, and it is ranked as the most costly type of hospital stay (O'Brien, 2015). It is estimated that sepsis costs in U.S. hospitals have reached \$20 billion annually, or over \$65 million per day (Sepsis Alliance, n.d., a).

The cost of a patient with sepsis not present on hospital admission ranges from nearly \$40,000 (without organ dysfunction) to nearly \$69,000 in patients with more severe sepsis (Paoli, Reynolds, Sinha, Gitlin, & Crouser, 2018). The cost associated with treating someone

with sepsis is greater than those associated with congestive heart failure and acute myocardial infarction (Hajj, Blaine, Salavaci & Jacoby, 2018). Other costs to consider include ongoing disability, cost of a caregiver, inability to work, etc. The treatment, length of stay, and personal financial impacts of sepsis have significant financial implications on health care costs. Sepsis is not only a prominent health issue, but it also places a significant financial burden on the healthcare system and on patients and families who are affected.

HISTORICAL DEVELOPMENTS RELATED TO SEPSIS

The existence of sepsis was noted as early as 460-370 BC, when Hippocrates named the term. Many historically significant and critical discoveries in patient care have been made over time in an effort to find the etiology of infection, as well as to reduce infection rates and decrease mortality rates from sepsis. The effort to discover why patients were dying was the impetus behind the discovery of techniques such as hand washing and pasteurization/sterilization that are still in use today. The following is a timeline of historical developments related to the term *sepsis*:

1. **Hippocrates (460-370 BC):** First coined the term "sepsis"; it was a term derived from the Greek word "sipsi" which translates to "make rotten".
2. **Ibn Sina (979-1037 BC):** Was the first to note an association between fever and blood putrefication.
3. **Ignaz Semmelweis (1818-1865):** Is credited with a more modern approach to sepsis. He was an obstetrician who noticed high mortality rates in his pregnant patients who died after giving birth, a term historically known as "childbirth fever". He believed the cause of this fever and subsequent death to be related to "decomposed animal matter that entered the blood stream". He was able to reduce mortality rates in his patients from 18% to 2% by introducing the concept of hand washing with a lime solution before examinations.
4. **Louis Pasteur (1822-1895):** Realized that single cell organisms, which he named bacteria or microbes, could be causing "blood putrefication" and that by heating this bacteria in fluids, bacteria could be killed. This process became known as "pasteurization".

5. **Joseph Lister (1827-1912):** Was a surgeon who concluded that there was a correlation between the findings of Semmelweis, Pasteur and the high number of his own patients who underwent amputations and subsequently suffered a 50% mortality rate. He proposed an antiseptic method for the skin and instrument disinfection which greatly reduced post-amputation mortality.
6. **Robert Koch (1843- 1910):** Improved on the antiseptic method by introducing steam sterilization in 1887.
7. **William Osler (1849-1919):** Observed that patients "seem to die from the body's response to infection, rather than the infection itself". Osler was among the first to observe the role of the host in sepsis.
8. **Hugo Schottmuller (1867-1936):** Is credited with linking the importance of the source of infection as a cause of sepsis. Schotmuller stated that "sepsis is present if a focus has developed from which pathogenic bacteria, consistently or periodically, invade the blood stream in such a way that this causes subjective and objective symptoms" (German Sepsis Society, nd).

The aforementioned discovery of bacteria being a cause of infection, and subsequent discoveries of hand washing and sterilization techniques, were obviously of critical importance to the progression of medical care. However, even with the advent of antibiotics after WWII, patients still died from sepsis. It was this phenomenon that led researchers to believe that there was a significant host response to infection that was a major contributing factor to the development of sepsis, since the pathogen causing the infection had been eliminated.

REVIEW OF THE IMMUNE SYSTEM RESPONSE

When the body comes into contact with an infectious pathogen, the immune system is activated. There are two types of immunity that our bodies use to help fight a foreign invader, or antigen. The first line of

defense is known as innate immunity and the second line of defense is known as acquired or adaptive immunity.

Innate immunity

Innate immunity is also known as natural immunity. It is the immunity we are born with and does not require previous exposure to an antigen to work effectively. Innate immunity includes phagocytic cells, natural killer cells, and polymorphonuclear neutrophils (PMNs); the complement system; and cytokines and chemokines.

The following definitions provide a brief overview and function of these terms:

- **Phagocytic cells:** Ingest and destroy microbial components. Phagocytic cells include neutrophils present in blood and tissues, monocytes in blood, and macrophages in tissues.
- **Natural killer cells:** Are responsible for destroying tumor cells and cells infected with viruses.
- **Leukocytes:** Include neutrophils, eosinophils, basophils, monocytes, and macrophages. Leukocytes are the cells present in the inflammatory response. Their function is to ingest foreign materials and cellular debris, and destroy infectious agents.
- **Polymorphonuclear neutrophils (PMNs):** Are the main cellular participants in the acute inflammatory process. Neutrophils are the first responders to the site of injury or infection. They are stored in the bone marrow, circulate via blood, and accumulate at the site of injury or infection. Neutrophils are phagocytic cells that engulf and destroy bacteria.
- **Complement system:** Is a protein cascade that helps clear pathogens from the host.
- **Cytokines:** Are small proteins that are chemical mediators that recruit immune cells to the site of infection or injury. Cytokines are key in the proinflammation and antiinflammation response of the body and play a pivotal role in the development of sepsis.
- **Chemokines:** Are small molecules that direct the movement of leukocytes. Inflammatory chemokines are produced in response to bacterial toxins and inflammatory cytokines (Delves, 2017; Neviere, 2017b).

Our innate immune response is known as the first line of defense against an invading organism and is an immediate response by our bodies. Upon the initial invasion of the harmful organism, blood vessels dilate and the injured tissue or site of the infectious agent is flooded with fluid, coagulation factors, cytokines, chemokines, platelets, and inflammatory cells which include white blood cells (also known as leukocytes), such as neutrophils, monocytes, macrophages, eosinophils, and basophils. The increase of blood flow to the injured area is responsible for the heat and redness associated with the acute inflammatory response. Increased vascular permeability is responsible for localized edema.

White blood cells (such as macrophages in the tissues, neutrophils in the blood and tissues, monocytes in the bloodstream, and natural killer cells) recognize the invader and bind to it.

There are three different ways this recognition and binding may occur:

- 1. Pattern recognition receptors (PRRs):** PRRs are located on the surface of immune cells and may recognize the invader by the molecular pattern of the pathogen. PRRs are responsible for alerting the immune cells of the body that there is an invading organism. PRRs are like watchmen who are on the lookout for an approaching enemy. They recognize the enemy and call the troops (the immune cells) to fight the invaders. Following are the three families of PRRs:
 - Toll-like receptors (TLRs).
 - Nucleotide-oligomerization domain (NOD).
 - Retinoic acid-inducible gene (RIG-1).

PRRs can also recognize danger signals or patterns associated with a given invader that are released during the inflammation process.

- 2. The triggering receptor:** On myeloid cells (monocytes, macrophages, and granulocytes, collectively) can recognize and bind to microbial components.

Acquired immunity

Acquired immunity (also known as adaptive immunity) relies on previous exposure to an invader. Acquired immunity includes white blood cells, such as lymphocytes, T cells and B cells. They make up between 20% and 40% of the white blood count and are important in fighting off infection (Foxy, 2016). The acquired immune system is activated if the innate response has not entirely rid the body of infection—both types of immunity work simultaneously to rid the body

Complement system

The complement system is an important defense mechanism in fighting off infections and is activated during the immune response. Proteins are released that trigger an inflammatory cascade that helps with the destruction of microorganisms and eventual removal of harmful

Coagulation cascade

During the normal immune system response, inflammatory cytokines (specifically IL-1 and TNF α), in response to injury or invasion, trigger the release of tissue factors. This begins the coagulation cascade. This leads to the production of thrombin and fibrin and eventually to the formation of clots that help keep invading organisms localized. Bradykinin, a peptide, is a key component of the coagulation cascade that also causes increased vascular permeability and vasodilation. It is responsible for the inflammatory-mediated pain response that occurs during the process of acute inflammation and contributes to hypotension secondary to vasodilation.

The following key points further describe the process:

- Two types of immunity respond to an invader: innate immunity that we are born with and acquired or adaptive immunity that develops after exposure to an invader.
- Upon invasion from an organism, blood vessels dilate and the site of invasion is flooded with coagulation factors, cytokines, chemokines, platelets, and inflammatory cells (white blood cells, such as neutrophils, macrophages, monocytes, eosinophils, and basophils).

- 3. TLRs:** Recognize carbohydrate and lipid molecules on the surface of pathogens known as PAMPs (pathogen-associated molecular patterns) and also patterns associated with injury from necrotic cells and mitochondria known as DAMPs (damage-associated molecular patterns) (McConnell & Coopersmith, 2016). This recognition leads to the release of cytokine and chemokine signaling molecules (McConnell & Coopersmith, 2016) (Neviere, 2017b).

In general, when the immune cells are recruited to local tissues and bind to infectious agents for phagocytosis, the binding process activates inflammatory cytokines (Neviere, 2017b). More specifically, immune cells bind to the invader (via Toll-like receptors [TLRs], C-type leptin receptors, NOD-like receptors, and RIG-1-like receptors), which then leads to the production of proinflammatory cytokines known as tumor necrosis factor (TNF- α), interleukin 1 (IL-1), and IL-6 (Gyawali, Ramakrishna, & Dharmoon, 2019). Proinflammatory cytokines cause the activation of the complement system, increase in the prevalence of leukocytes, endothelial adhesion molecules, chemokine and tissue factor production (Gyawali et al., 2019).

Cytokines help to regulate the inflammatory response, including the coagulation cascade, and trigger more inflammatory immune cells (leukocytes) to go to the location of infection. Chemokines, molecules that direct the movement of the immune cells to the site of injury or invasion, help out in a process known as chemotaxis.

Normally, anti-inflammatory cytokines are activated in the immune response. Their purpose is to regulate and suppress the immune system to prevent an exaggerated inflammatory response (Neviere, 2017b). There is a definitive endpoint in the normal immune system response when the invader is phagocytosed and neutralized and debris is cleared. In sepsis, this endpoint is not realized, and the response spreads.

of infection. The acquired immune system has a specific plan to fight off the invading organism through experience with previous exposure.

If the infection remains localized and the invading organism has been entirely neutralized through innate and acquired immune function, tissue is repaired, healing is complete, homeostasis resumes, and the body is rid of infection.

immune complexes (Shaffer, 2019). These proteins act as a link between the innate and adaptive immune responses. The complement system is important in the recognition and clearance of harmful pathogens (Shaffer, 2019).

- White blood cells—such as neutrophils, macrophages, and monocytes—recognize the invader and bind to it, causing the release of inflammatory cytokines. Elevated white blood counts indicate the presence of organisms that may lead to infection and, ultimately, sepsis.
- Inflammatory cytokines recruit more inflammatory cells to the site, known as leukocytes.
- The innate and acquired immune systems work to neutralize the invader; the complement system is considered to be the bridge between the innate and acquired immune responses.
- Proinflammatory cytokines, known as IL-1 and TNF α , also trigger the coagulation cascade to help form clots and keep the infection localized.
- Anti-inflammatory cytokines, along with the regulatory proteins of the complement system, normally keep the inflammatory process in check.
- Homeostasis resumes when the invader is neutralized, debris is removed, and tissue repair and healing are complete.

Self-Assessment Quiz Question #1

Betty is a 66-year-old woman with a history of degenerative joint disease and diabetes. She has had several years of increasing hip pain and difficulty ambulating. Recently, she underwent surgery to replace the right hip joint. Prior to surgery, screening blood work was completed. Laboratory results were unremarkable and she was cleared for surgery. The joint replacement was subsequently completed and the surgery went well.

If Betty's blood were drawn in the first few hours following surgery, what would be the most likely laboratory findings if she was showing an early response that may progress to sepsis?

- Leukocytosis (elevated WBC).
- Elevated hematocrit.
- Leukopenia (low WBC).
- Elevated hemoglobin.

PATHOPHYSIOLOGY OF SEPSIS

The pathophysiology behind sepsis is complicated and still being widely researched. It is a complex manifestation of an abnormal response by the body's inflammatory response to an infection. The development of sepsis is thought to depend on a variety of factors, including comorbidities (coexisting or preexisting conditions), the pathogen causing the disease, the virulence or harmfulness of the pathogen, and possibly a genetic predisposition (Neviere, 2017b). Sepsis often begins with an infection acquired before hospitalization.

Typically, when a person gets an infection, the body responds by initiating an inflammatory response to the infectious agent. There is a balancing of localized proinflammatory and anti-inflammatory mediators, known as cytokines, that results in the destruction of the infectious agent and subsequent tissue healing and repair when the immune response remains localized (Neviere, 2017b). If, however, the immune response does not stay localized to the site of infection and the response becomes generalized, sepsis can result (Neviere, 2017b).

It is still not known why the immune system response remains localized in some instances and becomes generalized in other instances. It may be because of many factors, including what type of organism is invading and the toxic products it releases, the release of a large amount of proinflammatory cytokines, or genetic predisposition (Neviere, 2017b). It is believed that the development of sepsis is mostly related to the

dysregulation of the innate immune response rather than dysregulation of the acquired immune response. However, evidence of immune suppression in postmortem ICU patients with sepsis has been shown in the depletion of CD4 and CD8 lymphocytes (specific T cells of the adaptive immune response), suggesting there may be a role in the adaptive immune response in sepsis as well (Gyawali et al., 2019).

The proinflammatory response involves mediators directed at ridding the body of invading pathogens. Proinflammatory cytokines and chemokines that further the inflammatory response are believed to contribute to vasodilation, tissue damage, and multiple organ failure (Hotchkiss et al., 2016). Anti-inflammatory response involves mediators crucial for limiting local and systemic tissue injury. Phagocytosis of pathogens by immune cells may cause oxidative stress leading to injury and organ dysfunction (Kumar, 2018). In late stages of sepsis, this response by the body is believed to increase susceptibility to secondary infections due to immunosuppression or immunoparalysis (Kumar, 2018). It is a complex back-and-forth response in which proinflammatory and anti-inflammatory mediators attempt to clear the body of infection and aid in tissue recovery. However, when the host response is dysregulated, organ damage and susceptibility to secondary infections can occur.

Proinflammatory mediators

Proinflammatory mediators include cytokines, such as tumor necrosis factor alpha (TNF α) and interleukin-1 (IL-1). Both TNF α and IL-1 can cause hypotension, leukocytosis, stimulation of other proinflammatory cytokines, and activation of the coagulation cascade (Neviere, 2017b). Proinflammatory mediators lead to the recruitment of more

macrophages and polymorphonuclear neutrophils (PMNs) which are present to rid the body of the invading organism. PMNs respond to the site of injury and release mediators that cause the signs of local inflammation (warmth, swelling, and redness).

Anti-inflammatory mediators

Anti-inflammatory mediators are cytokines that inhibit the production of TNF α , IL-1, and IL-6. The main anti-inflammatory cytokines include IL-4, IL-10 and IL-13. These anti-inflammatory cytokines inhibit proinflammatory cytokine production and suppress the immune system (Neviere, 2017b). A period of immune suppression has been seen to follow the initial proinflammatory state of sepsis (Gyawali et al., 2019). This finding has revealed the complex nature of sepsis and the fact that it is not simply an issue with a hyper-response of the pro-inflammatory

immune response, but a dysregulation of both the proinflammatory and the anti-inflammatory responses.

Nursing consideration: Nurses should be aware that patients at particular risk of sepsis are 65 years or older, have weakened immune systems, have had a recent health care interaction, or have a chronic disease requiring frequent medical care.

Complement cascade

The complement system is made up of proteins that are activated in the immune response and play an important role in helping the body fight infection. Trauma, widespread infection, and hemorrhagic shock can trigger the complement cascade, which is an innate fluid defense system that helps clear damage-associated molecular patterns (DAMPs) and pathogen-associated molecular patterns (PAMPs) (Karasu, Nilsson, Kohl, Lambris & Huber-Lang, 2019). The complement system can be excessively activated or inhibited, which can lead to a dysregulated host response and cellular and organ dysfunction, as seen in sepsis (Karasu et al., 2019). During sepsis, a component of the complement cascade (C3a) concentrations is elevated (Helling & Pindur, 2015). Hyper-activated or depleted complement and coagulation cascade can cause an imbalanced immune response, altered clearance of tissue debris, dysregulated coagulation, perfusion inadequacy, and barrier dysfunction leading to eventual organ dysfunction (Karasu et al., 2019).

Key points:

- The exact pathology of sepsis is still being researched.
- Sepsis is a dysregulation of proinflammatory and anti-inflammatory mediators (cytokines) released in response to an infectious agent.
- Proinflammatory cytokines are believed to be the cause of collateral tissue damage in sepsis; anti-inflammatory cytokines are believed to contribute to the susceptibility to secondary infections.
- When the inflammatory response does not stay localized, but becomes generalized, sepsis results.
- Toxicity of the invading agent, genetic predisposition, comorbidities, and the release of a large number of proinflammatory mediators may be causative factors in the development of sepsis.
- The complement system, in concert with proinflammatory cytokines, can contribute to the widespread inflammatory response and subsequent organ failure and circulatory insufficiency that occur in sepsis.

Self-Assessment Quiz Question #2

A nurse educator is giving a presentation to a group of young students who have just started their clinical rotation on a medical-surgical unit. She instructs the students on signs and symptoms of sepsis and also teaches them about the importance of recognizing infection and treating infection early and with the appropriate antimicrobial. She begins the educational presentation with a brief statement about the development of sepsis.

Which of the following statements best fits what is known about the pathophysiology of the development of sepsis?

- Sepsis develops as a result of a hyper-response of proinflammatory mediators to infection.
- Sepsis is a localized response that occurs in response to a large release of cytokines.
- Sepsis is a dysregulated host response of both pro-inflammatory mediators (cytokines) and anti-inflammatory mediators.
- Sepsis is normally caused by an infection but can be attributed to noninfectious etiologies as well.

EFFECTS OF SEPSIS ON THE BODY

All of the organs of the body are susceptible to damage from sepsis. Sepsis causes cellular injury that may be caused by tissue ischemia (lack of oxygen to tissues), cytopathic injury (injury to cells by proinflammatory mediators), and altered apoptosis (programmed cell death) (Neviere, 2017b). Apoptosis is the mechanism in which the body gets rid of dysfunctional cells; it is a normal and necessary function of the body. Pro-inflammatory cells may delay apoptosis in activated immune cells, such as neutrophils and macrophages, and may speed up apoptosis in other cells, such as gut endothelium, leading to disruption of normal functions and contributing to the injury found in sepsis (Al-Khafaji, 2016).

The activation of the complement system causes release of complement peptides (C3 and C5a); C5a peptide stimulates proinflammatory cytokines and chemokines that further the inflammatory response

(Hotchkiss et al., 2016). This is believed to contribute to vasodilation, tissue damage, and multiple organ failure (Hotchkiss et al., 2016).

Complement activation (as well as microorganisms and damage-associated molecular patterns [DAMPs]) can trigger the coagulation cascade (Hotchkiss et al., 2016). The coagulation cascade leads to microcirculatory defects from thrombus and fibrin deposits, causing endothelial injury and eventual dysfunction. Endothelial dysfunction causes increased capillary permeability and vasodilation, which ultimately leads to poor tissue perfusion and ultimately shock (Hotchkiss et al., 2016). Vasodilation and subsequent hypotension and hypoperfusion occur in the patient with sepsis, causing poor oxygen delivery and damage to organs in the body.

Coagulation dysfunction and disseminated intravascular coagulation

Interleukin-1 (IL-1) and tumor necrosis factor (TNF α) are pro-inflammatory cytokines which are released in response to inflammation. IL-1 and TNF α trigger tissue factor, which is the first step in the pathway of coagulation. Tissue factor leads to the production of an inflammatory substance known as thrombin that causes fibrin clots to form. Small blood clots may develop during sepsis and impair circulation, especially in the microvascular system, which includes the capillaries. When the blood clots form in the small vessels, oxygenation to organs is reduced, leading to organ dysfunction. In patients with sepsis, fibrinolysis (the breakdown of fibrin and clots) is impaired, leading to further disruption of a normalized response.

Disseminated intravascular coagulation (DIC) occurs in approximately 35% of patients with sepsis (Sepsis Alliance, 2017a). DIC is a condition where small clots form in the microvascular system, leaving the body

depleted of clotting factors that, in turn, can lead to bleeding out in other areas (Sepsis Alliance, 2017a).

Symptoms of disseminated intravascular coagulation (DIC) include:

- Skin mottling or bruising.
- Blood clots.
- Drop in blood pressure.
- Bleeding from multiple sites (Sepsis Alliance, 2017a).

Treatment of DIC related to sepsis includes treatment of the underlying cause of infection and administration of anticoagulants and blood products as necessary (Sepsis Alliance, 2017a). In some cases, amputation of an infected limb may be necessary if circulation impairment has led to tissue death. About 50% of those with DIC die (Sepsis Alliance, 2017a).

Lungs

The lungs are highly susceptible to damage when a patient is septic. The endothelial injury that occurs during sepsis leads to increased capillary permeability and vasodilation within the lung tissue that causes interstitial and alveolar pulmonary edema. Neutrophils become entrapped in the microcirculation of the lungs, causing further injury. The patient is unable to oxygenate properly and hypoxemia ensues. (Neviere, 2017b). This effect can lead to acute respiratory distress syndrome (ARDS).

ARDS is acute onset hypoxemia that can be caused by sepsis, trauma, aspiration, and toxins (O'Sullivan & Kerrigan, 2015). Sepsis is the leading cause of ARDS and is associated with high mortality (Kim & Hong, 2016). Intubation and mechanical ventilation may be required in patient with ARDS (Greco et al., 2017). Severe lung damage which can occur in patients with sepsis and ARDs is thought to be related to leukocyte and platelet recruitment, intravascular coagulation, damage to the endothelium, decrease in surfactant, and oxidative stress (Greco et al., 2017).

Kidneys

Kidney failure can occur during sepsis, requiring the patient to receive dialysis. It is unknown exactly how the kidneys fail in the cascade of sepsis. Hypoperfusion may contribute to the development of kidney failure, as well as dysfunction of the microvascular circulation.

Acute tubular necrosis (the death of tubular epithelial cells that make up the renal tubules of the kidney) can occur from hypoxemia and hypoperfusion. It may also occur from systemic hypovolemia, direct renal vasoconstriction, release of cytokines, or activation of neutrophils by endotoxin (Neviere, 2017b). Clinical signs of kidney failure include oliguria and increased creatinine levels.

Gastrointestinal tract

Sepsis causes circulatory abnormalities that may affect the normal barrier function of the gut, leading to translocation of bacteria and endotoxin into the systemic circulation, contributing to sepsis (Neviere, 2017b). Clinical symptoms of gastrointestinal involvement include

absent bowel sounds indicating paralytic ileus, seen in patients with septic shock. Paralytic ileus is thought to be caused by excess production of nitrous oxide (Al-Khafaji, 2016).

Liver

The liver plays an important part in helping to clear the body of infectious agents. During sepsis, the liver can be damaged by

overwhelming inflammatory responses or drug toxicity (Strnad, Tacke, Koch, & Trautwein, 2017). Hypoxic hepatitis due to ischemia and shock

may also occur (Strnad et al., 2017). In patients with cirrhosis, acute or chronic liver failure is associated with a high risk of death from sepsis (Strnad et al., 2017). Liver dysfunction can also prevent the clearing of

endotoxin and bacterial products, eventually allowing spillover of these products into systemic circulation (Neviere, 2017b). Clinical evidence of liver failure is seen in elevated bilirubin levels.

Central nervous system (CNS)

Confusion and changes in mental status may be evidence of central nervous system involvement, possibly as a result of hypoperfusion to the brain. Clinical symptoms of CNS involvement can be seen as mental status changes, such as confusion, restlessness, or agitation.

The Glasgow Coma Scale is the tool used to measure mental status in unconscious patients. Any decrease in the Glasgow Coma rating may be an early indication of impending sepsis (German Sepsis Society, n.d.).

Metabolic changes

Metabolic changes, such as hyperlactatemia and hyperglycemia, are evident in sepsis. Hyperlactatemia may be associated with tissue hypoperfusion associated with organ dysfunction (Lee & An, 2016). Lactate is overproduced in cases of tissue hypoxia as a result of anaerobic glycolysis and it is cleared primarily in the liver (60%) and the kidneys (30%) (Lee & An, 2016). In patients with liver and kidney dysfunction, lactate clearance may be worse.

Hyperglycemia in sepsis is a result of muscle glycolysis, lipolysis, and gluconeogenesis and glycolysis in the liver. Although glycemic control is important in patients with sepsis, it is equally important that the patient not become hypoglycemic. Historically, patients with intensive insulin therapy have been shown to have a high incidence of hypoglycemia (Rhodes et al., 2017). It is now recommended that glucose levels be kept under 180 mg/dL and that hypoglycemia should be avoided (Rhodes et al., 2017).

EBP alert! A large international randomized trial, known as the NICE Sugar Study, demonstrated an increase in mortality in critically ill patients who underwent intensive insulin therapy. The updated Surviving Sepsis Campaign guidelines for glucose control in sepsis are based on the results of the NICE sugar trial and aim to keep blood glucose under 180 mg/dL and avoid hypoglycemia (Rhodes et al., 2017). Intensive glycemic control in the ICU targeting glucose <110 mg/dL (<6.1 mmol/L) is no longer recommended. The ideal target glucose remains unclear, however, guidelines suggest glycemic target of 140-180 mg/dL (7.8-10 mmol/L). Since hypoglycemia is associated with increased mortality in sepsis patients, careful monitoring is suggested.

MULTIPLE ORGAN DYSFUNCTION SYNDROME

Multiple organ dysfunction syndrome (MODS) is present when there is more than one failing organ in the body. MODS is progressive organ dysfunction in which the patient cannot maintain homeostasis without medical intervention. It may be caused by an infectious etiology as in sepsis or septic shock, or it may be of noninfectious etiology as in the case of systemic inflammatory response syndrome (SIRS) from pancreatitis (Neviere, 2017b). Multiple organ dysfunction syndrome can be primary or secondary in nature. Primary MODS is organ dysfunction related to the injury directly, and secondary MODS results from the host's response to an injury elsewhere. In septic shock, the dysregulation of the immune response results in platelet-endothelial adhesion and platelet-leukocyte aggregates, which contribute to microthrombi formation in small vessels. This causes cytokines and chemokines to be released, which leads to more cellular involvement and causes microvascular dysfunction, leading to organ damage and failure (Greco, Lupia, Bosco, Vizio & Montrucchio, 2017).

As sepsis progresses and is left unchecked, different organs begin to fail. The number of organs that fail correlates to the risk of mortality.

Key points:

- Sepsis can cause endothelial injury in the lungs, which leads to pulmonary edema and poor oxygenation and, eventually, acute respiratory distress syndrome.
- Sepsis can lead to ileus in the gastrointestinal tract and can cause translocation of bacteria and leaking of endotoxin into the blood.
- Sepsis can lead to kidney failure requiring hemodialysis.
- Sepsis can cause liver failure, allowing more endotoxins and bacteria into systemic circulation.
- Mental status changes can be seen in the patient with sepsis as evidenced by confusion, restlessness, or agitation.
- Sepsis can cause metabolic changes, such as hyperlactatemia and hyperglycemia.
- Sepsis can progress to multiple organ dysfunction syndrome in which organs begin to fail, ultimately leading to death.

SEPTIC SHOCK

Shock is a result of circulatory failure that is life-threatening (Gaeski & Mikkelsen, 2016). It is a state of cellular and tissue hypoxia caused by reduced oxygen delivery, increased oxygen consumption, or inadequate oxygen utilization that can be attributed to various causes, including the following:

- **Cardiogenic:** Occurs after myocardial infarction.
- **Neurogenic:** Occurs after severe brain or spinal cord injury.
- **Anaphylactic:** Related to a severe allergic reaction.
- **Endocrine:** Occurs as a result of severe endocrine dysfunction.
- **Hypovolemic shock:** Occurs as a result of low intravascular volume and can be hemorrhagic or nonhemorrhagic shock.
- **Drug-induced shock.**

- **Septic shock:** That occurs in the presence of sepsis (Gaeski & Mikkelsen, 2016).

Septic shock is defined as sepsis with the presence of circulatory, cellular, and metabolic dysfunction associated with a higher risk of mortality than sepsis alone (Singer et al., 2016). Clinically, septic shock is present when the patient has a vasopressor requirement to maintain a mean arterial pressure of 65 mmHg or greater and serum lactate level greater than 2 mmol/L (> 18 mg/dL) in the absence of hypovolemia (Singer et al., 2016). Patients who are hypotensive despite vasopressors and volume resuscitation and have a high lactate level are considered to be in septic shock and have a 40% chance of dying (Singer et al., 2016).

RECOGNIZING SEPSIS

Early recognition of sepsis is critical. It can be recognized by a comprehensive evaluation of the patient. The clinician should be aware of general variables—such as vital signs, blood glucose levels, and mental status—and should obtain specific laboratory results that may indicate worsening infection or sepsis with organ involvement. Abnormalities in laboratory values associated with the coagulation cascade—such as prolonged PTT/PT and high platelet counts—can be

found in the early onset of sepsis. Low platelet counts are found later in patients with disseminated intravascular coagulation. Creatinine levels, bilirubin levels, serum glucose levels, and white blood cell counts may all be abnormal in patients with sepsis (Neviere, 2017a). Lactate, procalcitonin, and c-reactive protein levels are also routinely monitored in patients with suspected or confirmed sepsis.

Lactate

Serum lactate is not a direct reflection of tissue perfusion; however increases in serum lactate can be indicative of tissue hypoxia, accelerated aerobic glycolysis (the breakdown of glucose or other sugars for energy, resulting in the formation of lactic acid or pyruvic acid) (Levy, Evans, & Rhodes, 2018). Accelerated aerobic glycolysis is when this process occurs via adrenergic stimulation (stress response).

Procalcitonin

Procalcitonin (PCT) is the precursor of calcitonin produced by cells in the thyroid gland and is cleaved into calcitonin; it is undetectable in a healthy person. In bacterial sepsis, procalcitonin is unable to cleave into calcitonin and is instead released into the bloodstream. Elevated procalcitonin is seen in bacterial infection, as opposed to lower levels with viral infections (Chakraborty, 2015). Not all patients with a bacterial infection, however, will show increased levels of PCT. PCT levels >1.2 ng/ml indicate a need for immediate antibiotic therapy for bacterial infections.

Procalcitonin has been researched as a potential biomarker for the diagnosis of sepsis. PCT levels rise in the presence of a bacterial cause of sepsis. A higher level of PCT has been associated with increased morbidity and mortality (Liu, Su, Han, Yan, & Xie, 2015). One of the benefits of obtaining a PCT level is that PCT levels rise quickly in the blood in the presence of a bacterial infection. If sepsis is suspected, an elevated PCT level from a bacterial infection can be a very useful diagnostic tool to help confirm diagnosis.

There are, however, limitations in the use of PCT as a biomarker for sepsis. A high PCT level can also be seen in other conditions,

Some fluctuations in lactate levels are normal, and in the healthy person, the body clears the lactate in a timely fashion. In patients who are septic, higher lactate levels have been associated with an increase in acute hospital mortality than those with lower lactate levels (Lee & An, 2016). Lactate levels may be useful in diagnosing sepsis, as higher levels may indicate tissue hypoxia associated with sepsis.

such as SIRS from a noninfectious source, localized bacterial infection, autoimmune disease, pancreatitis, severe trauma, and burns (Chakraborty, 2015). Another downside to using PCT level as a prognostic indicator of sepsis is that it is not sensitive to viral, fungal, or parasitic causes of sepsis. It is still a useful tool, however, and the Surviving Sepsis Campaign (SSC) recommends the use of PCT level when deciding to discontinue the use of antibiotic therapy (Rhodes et al., 2017). A PCT value of less than 0.5 ng/ml in a patient with SIRS without the evidence of infection and negative cultures can be a useful tool to support the decision to discontinue antibiotics (Rojas-Mereno & Hariharan, 2016).

EBP alert! In a study completed in 2019 of 165 patients with sepsis, PCT (procalcitonin) was found to have a sensitivity of 89.7% compared to lactic acid, which had a 64.9% sensitivity; PCT values were found to have a higher predictive value than lactic acid (De Oro, Gauthreaux, Lamoureux & Scott, 2019).

C-reactive protein

In the acute phase of sepsis, c-reactive protein (CRP) is secreted by the liver during inflammation and levels of CRP are elevated (Pradhan et al., 2016). CRP levels can help diagnose an inflammatory condition or

an infection, and may help to diagnose sepsis in the presence of other symptoms and lab values.

Diagnostic criteria for sepsis

Nurses should be alert to the following diagnostic criteria for sepsis in their patients and report identified symptoms to the patient's physician or nurse practitioner:

General variables:

- Fever $> 38.3^{\circ}\text{C}$ (100.9°F).
- Core temperature $< 36^{\circ}\text{C}$ (96.8°F).
- Heart rate > 90 bpm or 2 standard deviations (SD) above normal value for age.
- Tachypnea.
- Altered mental status.
- Edema or positive fluid balance > 20 ml/kg over 24 hours.
- Hyperglycemia (> 140 mg/dL in a non-diabetic patient).

Inflammatory variables:

- Leukocytosis (blood cell count $> 12,000$).
- Leukopenia (white blood cell $< 4,000$).
- Normal white blood cell count with $> 10\%$ immature forms.
- Plasma c-reactive protein > 2 SD above normal value.
- Procalcitonin level > 2 SD above normal value.

Hemodynamic variables:

- Hypotension < 90 mmHg, MAP, 70 mmHg, or a systolic blood pressure drop > 40 mmHg in adults or less than 2 SD below normal for age.

Organ dysfunction variables:

- Arterial hypoxemia ($\text{PaO}_2/\text{FiO}_2 < 300$).
- Acute oliguria (< 0.5 mL/kg/hr for at least 2 hours despite fluid resuscitation).
- Creatinine increase (> 0.5 mg/dL or 44.2 mmol/L).
- Coagulation abnormalities (PTT > 60 seconds, INR > 1.5).

- Ileus (absent bowel sounds).
- Thrombocytopenia (platelet count $< 100,000$).
- Hyperbilirubinemia (plasma bilirubin > 4 mg/dL or 70 mmol/L).

Tissue performance variables:

- Hyperlactatemia (> 1 mmol/L).
- Decreased capillary refill or mottling (Dellinger et al., 2013).

Nursing consideration: The first step in sepsis screening is to look for signs and symptoms of infection or worsening infection. Nurses are often the first to evaluate a patient's vital signs, symptoms, and laboratory results and should suspect sepsis in a patient with known or suspected infection who presents with abnormal clinical findings. Early identification of sepsis can save a patient's life. Beginning with a quick SOFA score or Quick SOFA criteria may help to determine if a comprehensive assessment or physician alert is needed:

- Respiratory rate ≥ 22 /min.
- Altered mentation.
- Systolic blood pressure ≤ 100 mm Hg.

EBP alert! Identifying sepsis and initiating treatment in the first critical hour has shown to dramatically lower the risk of patient mortality. If any doubt in identifying criteria exists, contact the patient's provider and continue to assess and monitor symptoms.

Self-Assessment Quiz Question #3

Betty, who has diabetes and degenerative joint disease, is recovering from hip surgery and is now 10 days postop. She recently noticed that she feels increasingly sluggish, and her swelling, which was subsiding, is now getting worse, along with an increase in pain, redness, and purulent drainage at the incision site. She calls the nurse at the surgeon's office to express her concerns and is told to come in immediately for evaluation. Upon evaluation, the nurse finds her vital signs and blood glucose levels to be the following:

- Temperature: 36.1°C (97°F).
- Heart rate: 84 bpm.
- Blood pressure: 138/70.
- Respiratory rate: 26 rpm with a pulse oximetry reading of 91% without oxygen supplementation.
- Blood glucose level: 148 mg/dL.

What abnormal findings should alert the nurse that the patient may be developing sepsis?

- Elevated blood glucose level of 148 mg/dL.
- Elevated blood pressure.
- Low body temperature.
- Respiratory rate of 26 rpm with a low oxygen saturation level.

Endocrine dysfunction in septic shock

The endocrine system consists of glands throughout the body that produce hormones and regulate body processes. During septic shock, the endocrine system is disrupted; this disruption may contribute to the deleterious effects of shock. For example, vasopressin levels may be low, there may be reduced adrenal response to ACTH, and there may be high leptin levels, which may contribute to multi organ failure (Gheorghită, Barbu, Gheorghiu & Căruntu, 2015). Cytokine-induced insulin resistance contributes to hyperglycemia in the patient with sepsis and septic shock (Gheorghită et al, 2015).

Key points:

- Septic shock is clinically present when a patient requires vasopressors to maintain a mean arterial pressure of 65 mm/Hg and a serum lactate level of greater than 2 mmo/L in the absence of hypovolemia.
- Disruption of the endocrine system may contribute to the deleterious effects of sepsis and septic shock.

SIGNS AND SYMPTOMS OF INFECTION

Sepsis always begins with an infection somewhere in the body. Nurses play a pivotal role in preventing the development of sepsis. This is best accomplished by early recognition of signs and symptoms of infection, especially for at-risk populations, such as the elderly, immunosuppressed patients, and those with a history of a chronic illness requiring frequent medical care. Early recognition of the risks can reduce the incidence and the development of sepsis, and prevent the sepsis cascade from progressing into septic shock. Nurses are often the first to encounter a patient in a health care or outpatient setting and often spend the most time with patients. As such, the nurse should be familiar with the signs and symptoms of infection. Early identification of a worsening infection, particularly in patients who may be at greater risk for developing sepsis, is critical to preventing progression of the infection.

The following are general signs and symptoms of infection that should be recognized and monitored, especially in cancer patients since they are at increased risk of sepsis:

- Fever.
- Change in cough or new cough.
- Nasal congestion.
- Diarrhea.
- Muscle aches.
- Chills and sweats.
- Sore throat.
- Burning or painful urination.
- Vomiting.
- Pain in the abdomen or rectum.
- Redness, soreness, swelling of wounds or surgical sites.
- Changes in skin, urination, mental status.
- Stiff neck.
- New onset of pain (Preventcancerinfections.org, n.d.).

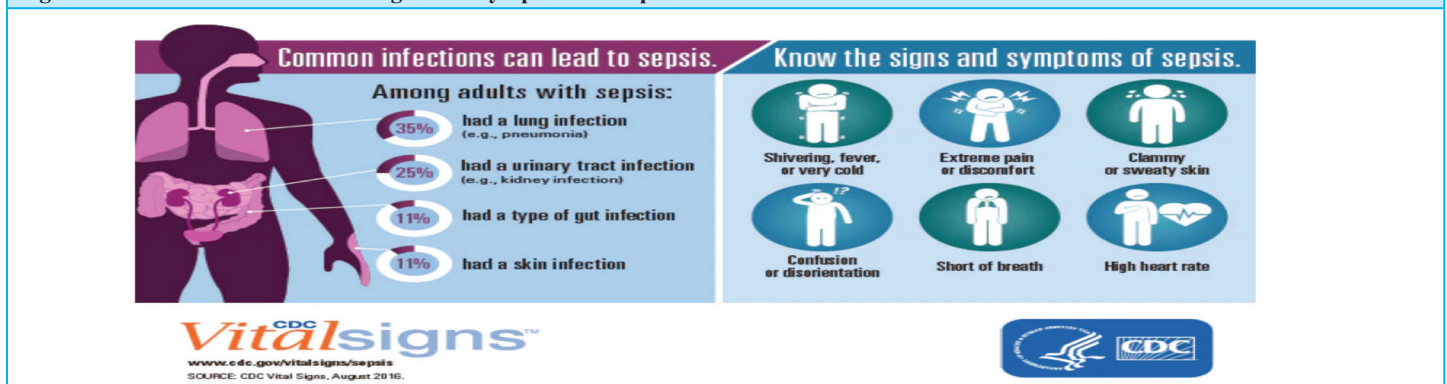
Nursing consideration: Although some populations are considered at risk, sepsis can result from any infection, even in a previously healthy person. Nurses should screen all patients and always think of the possibility of sepsis.

Signs and symptoms of sepsis

Nurses should be aware of signs and symptoms of sepsis in every patient who has an infection or suspected infection. Treating sepsis promptly can make a significant difference in the course of sepsis and prevent the patient's condition from deteriorating and leading to septic shock, MODS, and possible death. If a patient has a known or suspected

infection (especially infection of the lung, urinary tract, abdomen, or skin) and presents with shivering, extreme pain or discomfort, clammy or sweaty skin, altered mental status, shortness of breath, and high heart rate, the nurse should suspect sepsis (see Figure 1).

Figure 1: Common Infections and Signs and Symptoms of Sepsis



Physical exam

Any high-risk patient presenting with an infection should be evaluated for signs of sepsis, which may include fever, chills, sweating, tachypnea, and confusion (Al-Khafaji, 2016). Systemic tissue perfusion should be evaluated as well. In the beginning stages of sepsis, cardiac output might be normal, or even increased, with warm skin and extremities as the blood vessels dilate (Al-Khafaji, 2016). As sepsis

worsens, stroke volume and cardiac output decrease, leading to cool extremities and skin, and delayed capillary refill (Al-Khafaji, 2016). Blood sugar levels and temperature may vary extremely in children, pregnant women, and the very frail or elderly patients, so continued monitoring is essential.

SCREENING TOOLS FOR SEPSIS

Sequential (sepsis-related) organ failure (SOFA) screening tool

Values for organ-specific dysfunction are used to help diagnose multiple organ dysfunction syndrome (MODS) and predict associated mortality. The sequential (sepsis-related) organ failure assessment score (SOFA) was first developed as a tool for sepsis-related organ failure, but it is also used to evaluate mortality with other conditions that may lead to MODS. The SOFA score is promoted by the SCCM and the European Society of Intensive Care Medicine to help predict those with the greatest risk of death from sepsis (Kelley, 2017).

SOFA score measurements:

- **Respiratory system:** The ratio of arterial oxygen tension to fraction of inspired oxygen (PaO₂/FiO₂). A lower PaO₂/FiO₂ measurement correlates to a higher SOFA score.
- **Cardiovascular system:** The amount of vasoactive medication necessary to prevent hypotension. The higher the medication dosage, the higher the SOFA score.
- **Hepatic system:** The bilirubin level is measured. A higher bilirubin level correlates to a higher SOFA score.

- **Coagulation system:** Platelet concentration is measured. A lower platelet level corresponds with a higher SOFA score.
- **Neurologic system:** The Glasgow Coma Scale score is used to evaluate the neurologic system. The lower the Glasgow Coma Scale score, the higher the SOFA score.
- **Renal system:** The serum creatinine or urine output is measured. An increased creatinine level correlates to a higher SOFA score. Decreased urine output correlates to a higher SOFA score.

A patient with a SOFA score greater than or equal to 2 is considered to be in a life-threatening situation with a mortality rate of greater than or equal to 10% (Singer et al., 2016). A patient with a SOFA score greater than or equal to 2 and who requires vasopressor therapy and has an elevated lactate level > 2 mmol/L despite fluid resuscitation has a mortality rate of 40% (Singer et al., 2016). The patient's baseline SOFA score should be 0 unless the patient has known organ dysfunction before the onset of infection (Singer et al., 2016). The SOFA score should be evaluated hourly in patients at risk and any positive findings or score changes should be immediately reported to the patient's care provider.

Quick SOFA screening tool

A screening tool called the quick SOFA (qSOFA) was developed to be used at the bedside to quickly identify patients who may have infection. A positive qSOFA in a patient who otherwise was not believed to have infection should be a red flag to the clinician to suspect infection. This tool does not require the use of blood draws or other predictive measures and it may be used at the bedside as often as necessary.

The qSOFA criteria include presence of the following:

- Respiratory rate greater than or equal to 22 breaths per minute.
- Altered mentation: Changes in the Glasgow Coma Scale may be used here.
- Systolic blood pressure less than 100 mmHg (Singer et al., 2016).

Key points:

- The SOFA scoring system helps to predict mortality for patients with sepsis and other conditions that lead to multiple organ dysfunction syndrome.
- The SOFA scoring system takes into account abnormalities in the respiratory system, cardiovascular system, hepatic system, coagulation system, neurologic system, and renal system.

- The qSOFA scoring system is used as a quick screening tool that can be used frequently at the bedside and does not require invasive testing.
- The qSOFA takes into account the patient's respiratory rate, cognitive status, and blood pressure.

Nursing consideration: Nurses should utilize the qSOFA screening tool at regular intervals to evaluate patients. They should report a positive qSOFA score promptly in any patient. The qSOFA tool can be useful in identifying patients with an unknown infection or identifying those patients with suspected infection. Since treatment for sepsis must be initiated within the first hour, after verbally reporting the patient's condition to the provider, the nurse should confirm IV patency, prepare oxygen, and document symptoms. Continue to assess urine, surgical or trauma wounds, and respiratory function for signs of infection.

Self-Assessment Quiz Question #4

Betty has been admitted to the hospital with suspected post-surgical infection. The floor nurse makes her first rounds of the evening and goes into the patient's room. Upon introducing herself to the Betty, she finds that she is confused and unable to tell her the correct date or year. This is concerning to the nurse since she was told by the day shift nurse that Betty was alert and oriented to person, place and time. Upon review of Betty's vital signs, the nurse finds that Betty's blood pressure is 90/58, showing a significant drop from previous readings since admission. Betty's nurse is concerned, but isn't sure if perhaps Betty gets confused at night time, which is somewhat common in the population she cares for on her floor. Betty's nurse discusses her concern with another nurse colleague who has recently completed a continuing education course about sepsis and is fluent with using the qSOFA screening tool. The nurse colleague immediately asks about another parameter that Betty's nurse should consider in suspected sepsis.

Using the qSOFA scoring system, what other parameter should the nurse consider?

- a. Bilirubin level.
- b. Platelet concentration.
- c. Respiratory rate.
- d. Serum creatinine level.

Surviving Sepsis Campaign recommendations for screening and management

The Surviving Sepsis Campaign (SSC) was formed in 2002 in an effort to raise awareness and decrease mortality from sepsis. The focus of the

SSC is to educate clinicians and to provide a set of recommended care guidelines to improve diagnosis and care for the patient with sepsis.

The SSC recommends the following screening and management tools for sepsis:

Step 1: Screening and management of infection:

- **Identify infection:** Look for signs and symptoms of infection.
- **Manage infection:** Obtain blood and other cultures as indicated. Administer antibiotics while simultaneously reviewing laboratory results to screen for infection-related organ dysfunction.

Step 2: Screening for organ dysfunction and management of sepsis

Identify organ dysfunction: Organ dysfunction should be identified using lactate levels > 2 mmol/L and the quick Sepsis-Related Organ Failure Assessment (qSOFA). Organ dysfunction may also be present if the patient has:

- Significantly decreased urine output.

Surviving sepsis campaign bundle recommendations

In 2018, the SSC updated their recommendation of sepsis treatment to a one-hour bundle to replace the original three and six hour bundles recommended in 2016. The goal of the one-hour bundle focuses on prompt treatment and fluid resuscitation for better outcome. However, this new recommendation has been met with much controversy, with critics stating that the one-hour bundle recommendation lacks scientific evidence and should not be implemented. Other concerns regarding the implementation of a one-hour bundle approach to sepsis management are that too many will be treated if there is the slightest suspicion of sepsis (due to fear of legal repercussions or lack of reimbursement), and this quick-to-start treatment approach will contribute to the problem of antibiotic resistance over time (Berg & Gerlach, 2018). As of this writing, the Society for Critical Care, the Infectious Disease Society of America, the American College of Emergency Physicians, and the European Society of Emergency Medicine have all expressed concerns over the recommendation (Freund, et al., 2019). The Society for Critical Care Medicine and the American College of Emergency Physicians have even advised against implementation of the one-hour bundle (Pulm CCM, 2019).

Note: The one-hour bundle is included for informational purposes, and may change after further evaluation and more scientific

Surviving sepsis campaign bundle recommendations (three and six hour)

Three-hour bundle

To be completed within three hours of presentation:

1. Measure lactate level.
2. Obtain blood cultures prior to administration of antibiotics.
3. Administer broad spectrum antibiotics.
4. Administer 30 ml/kg crystalloid for hypotension or lactate ≥ 4 mmol/L.

Six-hour bundle

To be completed within six hours of presentation:

5. Administer vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥ 65 mm Hg.
6. In the event of persistent hypotension after initial fluid administration (mean arterial pressure (MAP) < 65 mm Hg) or if

- Abrupt change in mental status.
- Decrease in platelet count.
- Difficulty breathing.
- Abnormal heart function.
- Abdominal pain.

Step 3: Identification and management of initial hypotension:

- Identify patients with infection and hypotension: Patients with infection and hypotension (< 100 mmHg) or a lactate level > 4 mmol/L should be provided an infusion of crystalloids at a dose of 30 mL/kg.
- Management of hypotension: The clinician should reassess volume responsiveness or tissue perfusion after infusion begins (SSC, 2016).

research becomes available. The three-hour and six-hour bundle recommendations (see below) are also included since some institutions may still use them. Please check with your institution to stay updated on current policy and guidelines. Prompt recognition and treatment remains critical in the care of patients with sepsis.

One-hour bundle

To be completed within one hour of recognition of sepsis/septic shock:

- Measure lactate level. Re-measure lactate level if it is elevated (> 2 mmol/L).
- Obtain blood cultures before administration of antibiotics.
- Administer broad-spectrum antibiotics.
- Begin rapid administration of 30 ml/kg crystalloid for hypotension or lactate ≥ 4 mmol/L.
- Apply vasopressors if hypotensive during or after fluid resuscitation to maintain a mean arterial pressure greater than or equal to 65 mm Hg (Levy et al., 2018).

Time of presentation is defined as the time of triage in the emergency department or, if presenting from another care venue, from the earliest chart annotation consistent with all elements of sepsis or septic shock ascertained through chart review.

initial lactate was ≥ 4 mmol/L, re-assess volume status and tissue perfusion and document findings.

7. Re-measure lactate if initial lactate elevated:
 - Document reassessment of volume status and tissue perfusion with either.
 - Repeat focused exam (after initial fluid resuscitation) including vital signs, cardiopulmonary, capillary refill, pulse, and skin findings.

Or, re-measure using two of the following:

- Measure central venous pressure (CVP).
- Measure ScvO₂.
- Bedside cardiovascular ultrasound:
 - Dynamic assessment of fluid responsiveness with passive leg raise or fluid challenge.

CAUSATIVE AGENTS

The causative agents behind sepsis are numerous and include bacterial, fungal, and viral agents and parasites. However, bacterial agents that induce infection are the most common culprit (Neviere, 2017a). In almost half of all reported cases of sepsis, a pathogen is not identified (Gupta et al., 2016). Respiratory infections (such as pneumonia), intra-abdominal infections, urinary tract infections, and primary bloodstream infections can lead to sepsis and septic shock (Healthline, 2018). Pneumonia is the most frequent cause of sepsis and septic shock (American Thoracic Society, 2018).

Examples of gram-negative bacteria include: *Escherichia coli*, *Salmonella*, *Shigella*, *Pseudomonas*, *Acinetobacter*, *Neisseria*, *Haemophilus influenzae*, and *Vibrio cholerae*. Gram-positive bacteria

include *Staphylococcus*, *Streptococcus*, and *Enterococcus* (Polat, Ugan, Cardirci, & Halicj, 2017). The most common organisms that lead to the development of sepsis in the community are *Staphylococcus aureus*, *Streptococcus pneumoniae*, and *Enterobacteriaceae* (*Escherichia coli* is the most common of this species) (Polat et al., 2017).

Nurses may have the opportunity to review the culture reports on patients long before the clinician and are, therefore, in a position to recognize the findings that need immediate reporting. Starting the correct antibiotic in a timely window may be instrumental in avoiding septic shock.

Self-Assessment Quiz Question #5

A patient presents to the emergency room via ambulance. Medics were called to the patient's home after her daughter came to visit and found that she had significant shortness of breath that had been worsening since waking in the morning. The medics tell the triage nurse that the patient is alert and oriented to person, place and time. She told the medics that she has been "under the weather" for a few days and complained of a productive cough with yellow-greenish thick sputum and worsening dyspnea. She has NKA and her only daily medication is Synthroid for hypothyroidism. The medics report her vital signs on arrival to her home as follows:

- HR: 102.
- BP: 100/64.
- RR: 26/min.
- Temperature: 101.6.
- Blood glucose: 204 mg/dL.
- SpO₂: 86% on room air.

The medics began giving oxygen and fluids. Upon arrival at the emergency room a short time later, her vital signs are as follows:

- HR: 106.
- BP: 94/56.
- RR: 26/min.
- Temperature: 101.7.
- Blood glucose: 200 mg/dL.
- SpO₂: 90-92% on 4 L O₂ nasal cannula.

The emergency room staff suspects sepsis and knows that early and prompt recognition is important for survival.

Which of the following does not need to be completed right away?

- Ensure airway and oxygenation.
- Measure lactate levels.
- Perform diagnostic imaging to determine source of infection.
- Secure venous access.

Staphylococcus aureus infections

Staphylococcus aureus (also referred to as "staph") is an organism found on skin that can be dangerous if it gets into the blood stream. *Staph* is either susceptible to methicillin (MSSA) or not susceptible to methicillin (MRSA). More than 119,000 staph infections were reported in 2017, with nearly 20,000 deaths (CDC, 2019a). One in ten staph infections in 2016 occurred in those who injected drugs (CDC, 2019a). According to the CDC, those at risk for developing staph infections include:

- Those persons in the community who have:
 - Uncovered or draining wounds, especially in high-contact sports or crowded areas.

- Habits of sharing personal items such as towels or razors.
- A history of recently staying at a healthcare facility.
- A history of injected drug use.
- In hospitals or long-term facilities:
 - Anyone staying in the hospital or those who have had surgery.
 - Those who have had exposure to patients infected or carrying staph.
 - Those with medical devices (i.e. IVs, central lines, catheters, or G-tubes).
 - Those undergoing outpatient procedures (CDC, 2019b).

Viral infections

Viral infections include influenza, parainfluenza, meningitis, pneumonia, respiratory syncytial virus, HIV, herpes, Epstein-Barr virus, Cytomegalovirus, and Adenovirus (Pomerantz & Weiss, 2016; Sepsis Alliance, n.d.b). Viral infections can cause sepsis directly or ultimately lead to the development of a bacterial infection (e.g., a person starts

with influenza that leads to the development of a bacterial pneumonia). Sepsis from a viral infection can occur in patients with compromised immune function who are highly susceptible to opportunistic pathogens, although these patients may not show an increase in procalcitonin.

Fungal infections

Invasive fungal infections, usually caused by *Candida albicans*, are seen with more frequency in critically ill patients, accounting for 10% to 15% of all health care-associated infections (Delaloye & Calandra, 2014). Fungal infections are responsible for 5% of all sepsis and septic shock cases and are the fourth most common organism found in positive blood cultures in the United States (Delaloye & Calandra, 2014). *Candida* is a normally found in the skin, vagina, and GI tract and does not typically cause a problem for people with an intact and healthy immune system.

The risk of developing an infection from a fungus like *Candida* increases with the following factors:

- Advanced patient age.
- Broad-spectrum antibiotic use.

- Length of hospital stay.
- Central vascular catheter placement.
- Diabetes mellitus.
- Parenteral nutrition.
- Mechanical ventilation.
- Renal insufficiency or hemodialysis.
- Antifungal prophylaxis.
- Surgery.
- Pancreatitis.
- Treatment with corticosteroids and chemotherapy (Delaloye & Calandra, 2014).

Parasitic infections

Parasitic causes of sepsis are rare, especially in North America, but they occur in other parts of the world. In the case of sepsis caused by malaria, for example, a parasite infects a mosquito and the mosquito, in turn, infects a person.

Key points:

- Sepsis can be caused by bacterial, viral, fungal, or parasitic organisms.

- Pneumonia is the most common infection that leads to sepsis and septic shock.
- Respiratory infections, such as pneumonia, are the most frequent cause of sepsis and septic shock, followed by intra-abdominal infections, urinary tract infections, and bloodstream infections.
- The incidence of sepsis caused by multi-resistant bacteria and fungal infections has risen in recent years.

Self-Assessment Quiz Question #6

A resident of a long-term care facility was recently admitted to the hospital with symptoms consistent with methicillin-resistant *Staphylococcus aureus* (MRSA) infection and subsequently developed sepsis as a result. The charge nurse is concerned because there are two other patients who may possibly have MRSA infections on the same floor.

Which of the following statements is FALSE in regards to pathogens associated with sepsis?

- In almost half of all cases of sepsis, a pathogen is not identified.
- Parasitic infections are a common cause of sepsis, and the incidence of parasitic infection is higher than fungal and viral infections combined.
- Respiratory infections, particularly pneumonia, are the most frequent cause of sepsis and septic shock.
- The incidence of fungal infections and multi-resistant bacterial infections that lead to sepsis is on the rise.

Sites of infection

Pneumonia

The most common site for infection that leads to sepsis and septic shock is the respiratory tract following a respiratory infection, such as pneumonia. Organisms responsible for various types of pneumonia include the following:

- Community acquired:** *Streptococcus pneumoniae*, *Haemophilus influenzae*, methicillin-resistant *Staphylococcus aureus* (MRSA), *Legionella pneumophila*, *Mycoplasma pneumoniae*.
- Early hospital acquired (patient has been hospitalized < 5 days):** *S. pneumoniae*, *H. influenzae*, *L. pneumophila*, *M. pneumoniae*; nonresistant gram-negative rods.
- Late hospital acquired (patient has been hospitalized >5 days):** *Pseudomonas aeruginosa*, *Klebsiella spp.*, *Acinetobacter spp.*, methicillin-resistant *Staphylococcus aureus* (LaRosa, 2010).

Other common sites of infection include:

- Abdomen:** Appendicitis, peritonitis, cholecystitis (gall bladder infection). Organisms responsible for infection include enteric gram-negative rods and anaerobes.
- Genitourinary tract:** Kidney or urinary tract infection. An indwelling catheter increases risk of infection. Organisms responsible for infection include gram-negative rods and *Enterococcus spp.*
- Skin:** Infectious organisms can enter anywhere there is a break in the skin—wounds and IV sites, surgical sites, skin ulcerations. Wounds such as stasis ulcers, burns, and trauma from auto accidents and gunshot wounds present a particular risk for infection.

- Postsurgical wounds:** Infectious organisms can enter the wound during surgery if a sterile field is compromised or if the surgery takes place over several hours so the wound is exposed. Postsurgical sites can also become infected if exposed to infectious organisms.
- Nervous system:** Inflammation and infection of brain and spinal cord (encephalitis, meningitis). Pneumococcal meningitis is the common form of meningitis.
- Bones:** Osteomyelitis, or infection in the bone, may originate in the blood in IV drug users, may begin as a pelvic infection or UTI, and may be seen in surgical or trauma patients and those with an overlying skin infection (Friedrich, 2016). Patients at risk for developing pseudomonas bone infection include those with a puncture wound to the foot, diabetics, those who have peripheral vascular disease, and those who are IV drug users (Friedrich, 2016).
- Heart:** *Pseudomonas aeruginosa* may cause infective endocarditis, an infection in the right or left heart valves. IV drug users and those with prosthetic heart valves may be highly susceptible to development of endocarditis. General symptoms include fever and malaise. Left-sided heart failure symptoms include those consistent with congestive heart failure (Friedrich, 2016).

Nursing consideration: Nurses should closely monitor any patient who has a suspected or known infection of the lungs, particularly pneumonia. The respiratory tract is the most common site of infection that leads to sepsis. Nurses should report any signs and symptoms that may indicate sepsis immediately so prompt treatment can begin.

POPULATIONS AT RISK FOR DEVELOPING SEPSIS

Though it is true that sepsis can occur after something as seemingly benign as a cut or scrape, which anyone can have, it is most likely to affect those populations considered at risk.

The following are populations at particular risk:

- Patients admitted to the ICU.
- Those with bacteremia.
- Those previously admitted to the hospital, especially those with an infection.
- Those with a nosocomial infection.
- Patients who are immunocompromised.
- Infants and children under 10 years of age.
- Persons over age 65.
- Those with a chronic illness.
- Those undergoing treatment for cancer.
- Those who have diabetes, kidney disease, liver disease, or HIV/AIDS.
- Those who have suffered a severe burn or a physical trauma (Neviere, 2017a; Sepsis Alliance, n.d.a).

Sepsis can occur after an infection of common sites in patients who have a surgical procedure/incision, an indwelling catheter, an intravenous catheter, or who are mechanically ventilated. There may also be a genetic component to the likelihood of developing sepsis (Neviere, 2017a).

Key points:

- Populations at risk for sepsis include patients who are over age 65, have chronic diseases, are admitted to the ICU, are immunocompromised, or are burn or trauma victims.
- Infection can occur in surgical patients, those with indwelling catheters, and those who are mechanically ventilated.
- There may be a genetic predisposition to sepsis.

Nursing consideration: Nurses should always be aware of the signs and symptoms of sepsis in every patient with documented or suspected infection. Nurses should be particularly vigilant in screening for sepsis in those patients who are highly susceptible to the development of sepsis, including patients who are immunocompromised, have a chronic disease, are very young or elderly, or have undergone an invasive procedure.

Sepsis and cancer

Patients who have been diagnosed and are being treated for cancer are at an increased risk for developing sepsis for many reasons, such as:

- Compromised immune system due to chemotherapy.
- Frequent hospital stays with more exposure to healthcare associated infections.
- Surgery.
- Weakness as a result of malnutrition, which can increase the risk of infection (Sepsis Alliance, 2017b).

Patients with neutropenia are at particular risk for developing an infection that may lead to sepsis. It is important to teach all patients who are undergoing treatment for cancer how to protect themselves from infection. The CDC recommends the following to patients for prevention of infection:

- Wash hands often and ask those around you to wash their hands.
- Avoid crowds and people you know are sick.

- Get flu and other vaccinations as recommended by your medical provider.
- Bathe or shower everyday unless contraindicated.
- Use an unscented lotion to keep skin from getting dry/cracked.
- Use a soft toothbrush.
- Cook food thoroughly to kill any germs.
- Wash fruits and vegetables.
- Protect skin from animal waste.
- Wash hands immediately after touching an animal or handling its waste.
- Use gloves when gardening (CDC, nd).

EBP alert! A study focused on sepsis in an oncology population found that the respiratory system was the most common site for infection (37.5%), followed by the urinary system (26.7%), as opposed to the cancer-free population of the study that showed the urinary system was the most common site of infection (40.9%). This study also reported that patients with cancer have higher mortality rates than their cancer-free counterparts, despite aggressive treatment (Abou Dagher et al., 2017).

Sepsis and pregnancy

Pregnant women and those in the postpartum or puerperal phase (six weeks after delivery) can develop sepsis and septic shock. In this population, sepsis can develop quickly in an otherwise healthy-appearing patient and have serious and life-threatening consequences.

Incidence

Maternal sepsis (sepsis that develops during pregnancy, during or after giving birth, or after an abortion) is common in developing countries where women do not have access to quality medical care or may live in unsanitary conditions or with limited nutrition, as compared to women in developed countries (Bonet et al., 2018; Sepsis Alliance, 2017c). Worldwide, sepsis is responsible for 11% of maternal deaths and may cause hemorrhage and thromboembolism that lead to death as well (Ali & Lamont, 2018). While maternal and postpartum sepsis is considered to be rare in the more developed countries, incidence and maternal deaths from sepsis are rising, and attention to this specific population should be considered in the discussion of the adult patient with sepsis.

Conditions such as hypertension, diabetes, and obesity contribute to maternal morbidity and mortality and there is an increasing number of pregnant women who have these chronic conditions (Agrawal, 2015). In addition, those with advanced maternal age and those carrying multiples are at risk for developing complications:

- **Increasing maternal age:** Pregnancy in women over age 40 is much more common than it was in the past, carrying with it an increase in the incidence of gestational diabetes, gestational hypertension, and cesarean delivery (Kahveci, Melekoglu, Evruke & Cetin, 2018). Women who have a first-time pregnancy after age 35 are at risk for gestational hypertension, cesarean delivery, and delivery complications, including prolonged labor and excessive bleeding (NICHD, nd).
- **Multiple gestations:** Multiple gestations, which carry increased maternal risk, are on the rise with the availability of reproductive technologies. Multiple gestations require more invasive and diagnostic procedures than single pregnancies and are associated with complications associated with delivery, such as increased bleeding and C-section deliveries. Women carrying multiples are more at risk for pyelonephritis, urinary tract infection, viral and fungal infections, and infection after vaginal deliveries than those women carrying singletons (Dotters-Katz, Patel, Grotgut & Heine, 2015).
- **Obesity:** Pregnant women who are obese or morbidly obese are at an increased risk for obesity-related complications, such as increased hypertensive disorders, type 2 diabetes, caesarean section, and cardiopulmonary complications.

EBP alert! A Nationwide Inpatient Sample study found that among women with multiple gestations, 38.4 per 1000 women had a complication related to infection, compared to 12.8 per 1000 women with singletons (Dotters-Katz et al., 2015). Significant morbidity in this patient population was seen in those with intestinal infections, pyelonephritis, influenza, and pneumonia (Dotters-Katz et al., 2015).

Etiology

Causes of infection that may lead to maternal sepsis and postpartum sepsis include the following:

- Infections related to pregnancy:
 - Chorioamnionitis.

- Endometriosis (with or without retained products of conception).
- Wound infection post c-section.
- Perineal infection.
- Lactational mastitis.
- Infections exacerbated by pregnancy:
 - UTI/pyelonephritis.
 - Pneumonia.
 - Rubella.
 - Listeria.
 - Influenza.
 - Varicella.
 - Toxoplasmosis.
 - Herpes.
 - Parvovirus.
 - Cytomegalovirus.
- Incidental infections:
 - Lower respiratory tract infection.
 - Tuberculosis.
 - Sexually transmitted disease (Turner, 2015).

As with the general population, comorbidities in pregnant women increase the risk for the development of sepsis. Risk factors include the following:

- Diabetes.
- Mastitis.
- Viral or bacterial infection.
- Obesity.
- Cesarean section.
- Prolonged/obstructed labor.
- Premature ruptured membranes.
- Cerclage (cervical stitch).
- Placental abruption.
- Emergency surgery.
- Miscarriage or induced abortion.
- Limited prenatal care (Sepsis Alliance, 2019b).

According to the World Health Organization (WHO), maternal and neonatal sepsis is a top contributor of death and morbidity for pregnant and recently pregnant woman as well as newborns (WHO, 2017). Sepsis is associated with up to 100,000 maternal deaths annually as a primary or contributing cause, and neonatal sepsis kills approximately 1 million babies globally per year (WHO, 2017). In low-income countries, access to clean water, proper sanitation, prenatal care, care during delivery, timely and appropriate medication, and infection control are all necessary to prevent infection and sepsis (WHO, 2017). The use of prenatal vitamins, including folic acid supplements, are rarely available to women in developing countries.

Key points:

- Maternal sepsis is more common in developing countries than in developed countries, but incidence and mortality is rising in developed countries because of such factors as increased maternal age, multiple gestation, and maternal obesity.
- Urinary tract infections are responsible for one-third of sepsis cases in pregnant women, and genital tract infections are responsible for one-third of sepsis case in the postpartum period.
- Women who have comorbidities are more likely to develop sepsis than women with a single condition.

Self-Assessment Quiz Question #7

Mary is a 34-year-old woman who is pregnant with twins as a result of in vitro fertilization. Previous to pregnancy, she was an active and healthy adult with no preexisting health conditions.

Which statement is FALSE regarding Mary's risk for developing sepsis?

- Mary is not at increased risk for developing sepsis because she was a healthy adult before pregnancy and had no preexisting medical conditions.
- Mary is more at risk for developing an infection post vaginal delivery than those carrying a single child undergoing vaginal birth.
- Mary is at risk for developing sepsis as a result of more invasive and diagnostic procedures that may be needed during a multiple pregnancy.
- Mary is at a greater risk for sepsis secondary to pyelonephritis and/or urinary tract infection than those with singletons.

Neonatal sepsis

Neonatal sepsis (defined as birth to 90 days of age) is considered early onset if it develops within 24 hours of birth and late onset if it occurs more than 24 hours after birth (Sepsis Alliance, 2019a). Group B *Streptococcus* (GBS) is the most common cause of neonatal early-onset sepsis and can also cause late-onset sepsis in young infants (Puopolo, Lynfield, & Cummings, 2019). The incidence of early onset GBS has declined, occurring at a rate of 0.23 cases per 1000 live births in 2015, with nearly 95% of cases diagnosed <48 hours after birth (Nanduri et al., 2019). Globally, there were 200,000 cases of early-onset GBS reported in 2015 (Kuzniewicz, et al., 2017). Late-onset GBS occurs from ages seven days to 89 days and occurs at a rate of 0.31 per 1000 live births, occurring nearly twice as much in preterm births than term infants (Nanduri et al., 2019). Babies are more at risk if the mother has group B *Streptococcus* while pregnant, the baby is premature, or there is rupture of membranes more than 24 hours before delivery (Sepsis Alliance, 2019a). Universal antenatal testing of pregnant women is recommended at 36-37 weeks using vaginal-rectal cultures, or before 37 weeks in women who have premature rupture of membranes (PROM) or who are in preterm labor (ACOG, 2019). The administration of intrapartum antibiotics before delivery is recommended to help prevent early-onset GBS in neonates for women who test positive for GBS, and for women with GBS at any point in pregnancy, a history of having a previous infant with GBS, and those in preterm labor or PROM <37 weeks (ACOG, 2019).

Newborns with early-onset GBS may have:

- Tachycardia.
- Tachypnea.
- Lethargy.
- Cardiorespiratory failure.
- Persistent pulmonary hypertension.
- Perinatal encephalopathy (Puopolo et al., 2019).

Late-onset GBS symptoms include:

- Fever (>38 C).
- Lethargy.
- Poor feeding.
- Irritability.
- Tachypnea.
- Grunting.
- Apnea (Puopolo et al., 2019).

In cases of late-onset meningitis, symptoms can include vomiting, temperature instability, and signs of CNS issues, such as bulging fontanelle or seizures. Late-onset GBS can occur in infants whose mothers had a negative or a positive GBS screen, and intrapartum antibiotic prophylaxis doesn't protect against late-onset GBS (Puopolo et al., 2019). Antibiotic therapy may include penicillin G or ampicillin (ACOG, 2019).

Pediatric sepsis

Epidemiology

There are approximately 75,000 children in the U.S. who are hospitalized with sepsis each year, with a mortality rate of 9% (Novosad et al., 2016). Cases of pediatric sepsis may be caused by various infections, including common childhood viral illnesses, flu, and bacterial causes. *Staphylococcus aureus* and *Streptococcus pneumoniae* are the most common sources of infection for those children hospitalized with sepsis, followed by other infections including *Klebsiella* (children >12 months) and *Enterococcus* (children under one year) (Novosad et al., 2016). Children who are older may be at risk for sepsis with exposure to illness via daycare and school, and as a result of *Staphylococcus* infection in cuts or wounds that are not properly cleaned (Sepsis Alliance, 2019a).

Children who have significant underlying illness and are immunocompromised are particularly vulnerable to infection and subsequent sepsis with a rapid progression. Pediatric sepsis cases account for >8% of all critically ill children and are linked to significant morbidity and mortality (Weiss et al., 2015). Immunocompromised children are at particular risk of rapidly declining condition and mortality, with mortality reaching 40-50% (Jacobs et al., 2019; Weiss et al., 2015).

Signs and symptoms in children

As with all cases of suspected sepsis, children should be screened for signs and symptoms of sepsis. In addition, parents should be educated on when to seek medical attention to ensure prompt medical intervention.

Signs and symptoms in children may include the following:

- High fever (>100.4 F).
- General illness/malaise following a previous injury (scrape or cut).
- Dyspnea.
- Tachycardia.
- Decreased urine output or oliguria (Sepsis Alliance, 2019a).

EBP alert! A recent study compared the qSOFA tool to the previously used SIRS tool in patients who entered the emergency department with suspected infection. The qSOFA tool was found to have greater prognostic accuracy than the formerly used SIRS tool had (Freund et al., 2017).

According to the Sepsis Alliance, any child with the following signs should be evaluated promptly:

- Is abnormally cold to the touch.
- Has a mottled, bluish, or pale skin.
- Has a rash that does not fade when you press it.
- Has a seizure.
- Is lethargic or difficult to rouse.

A child under 5 years of age should be evaluated promptly when the following signs are present:

- The child is not eating.
- The child is vomiting repeatedly.
- The child has not urinated in 12 hours (Sepsis Alliance, 2019a).

For babies, the most common source of infection that may lead to sepsis includes:

- Respiratory syncytial virus (RSV).
- Cytomegalovirus (CMV).
- *Escherichia coli*.
- *Candida*.
- Herpes simplex virus.
- *Listeria monocytogenes* (Sepsis Alliance, 2019a).

Signs and Symptoms in babies

Signs and symptoms to watch for in babies include:

- Changes in body temperature.
- Breathing difficulty.

- Diarrhea.
- Reduced movement.
- Seizures.
- Bradycardia.
- Swollen abdomen.
- Vomiting.
- Jaundice (Sepsis Alliance, 2019a).

EBP alert! APACHE II vs. APACHE III

APACHE (Acute Physiology, Age, and Chronic Health Evaluation) is a collection of data points used for all critically ill patients admitted to the ICU. APACHE II and APACHE III are both strong predictors of mortality for patients with a sepsis diagnosis (Sadaka, et al., 2017). Common variables between APACHE II and APACHE III include: mean arterial blood pressure, respiratory rate, arterial oxygen pressure, oxygen gradient between alveoli and artery (PA-aO₂), and serum creatinine concentration (Sadaka et al., 2017). Sadaka et al., (2017) found that APACHE III is more complicated with more variables, and is more time consuming as a result. APACHE II is as effective in predicting mortality in hospitalized patients with sepsis and is easier to use with wide availability (Sadaka et al., 2017).

Prevention

As with all cases of sepsis, prevention of infection is crucial. Vaccinations against childhood disease and influenza are critical. Proper cleansing of wounds, cuts and scrapes should be performed to avoid a potential infection. Hand washing is a simple, yet effective infection prevention technique when performed properly.

Nursing consideration: School nurses play a critical role in pediatric sepsis prevention because they may be among the first to see children who have an existing infection or have cuts and scrapes obtained on the playground that need to be cleaned properly. School nurses are responsible for knowing if vaccinations are kept up to date, and can help discern which child may need medical treatment for illness or infection. School nurses should educate children and staff on the importance of hand hygiene to help reduce the risk of infection.

Prognosis

Children who survive sepsis may have long term physical and/or mental health consequences. In the 28 days following discharge from the hospital, 34% of children have a change in cognitive skills, while 47% will be readmitted at least once (Sepsis Alliance, 2019a). In addition, children may suffer long term effects, such as post-traumatic stress disorder from the experience of being critically ill.

Sepsis and the IV drug user

People who inject intravenous drugs are at risk for developing bacterial and fungal infections. IV drug users are at risk due to pathogens on the injection site or hands, contaminated drugs, contaminated needles, poor personal hygiene, or skin wounds (CDC, 2019c). Injecting drugs puts the user at risk for developing viral hepatitis, HIV, abscesses, bacterial and fungal infections, cellulitis, empyema, endocarditis, osteomyelitis, and septic arthritis (CDC, 2019c). The incidence of infections caused by *Staphylococcus aureus*, *Streptococcus*, and *Candida* are increasing among intravenous drug users (CDC, 2019c). Recent statistics on infection in IV drug users include:

- IV drug users are 16 more times likely to develop MRSA than those who do not use IV drugs (Jackson et al., 2018).
- Endocarditis rates in North Carolina increased 12-fold by those who inject drugs (Schranz, Fleischauer, Chu, Wu & Rosen, 2019).
- Rates of invasive streptococcus infection were present in one in five IV drug users in New Mexico in 2017 (Valenciano et al., 2019).

- An analysis of a hospital in Miami-Dade County reported drug-related infection treatment cost \$11.4 million in one year (Tookes, Diaz, Li, Khalid, & Doblecki-Lewis, 2015).

Nurses should be aware of the risk for infection in their patients who are known intravenous drug users and assess for infection. The CDC (2019b) recommends that nurses:

- Consider infection in those who are known IV drug users; infection symptoms can be similar to withdrawal symptoms (i.e., fever, myalgia, malaise, etc.).
- Consider wound botulism in patients with cranial nerve weakness, descending paralysis, or those who do not respond to naloxone.

It is important to educate patients on how they may be susceptible to infection as an IV drug user. The patient should be taught safe injection practices, such as good hygiene, wound care, cleaning the injection site, and using clean needles/not sharing needles, and the risk of botulism-contaminated drugs (CDC, 2019b).

Sepsis and the burn patient

Infection is a serious and common complication associated with patients suffering burns (Nunez Lopez, Cambiaso-Daniel, Branski, Norbury & Herndon, 2017). Sepsis is the leading cause of death for adult and pediatric burn patients (Nunez Lopez et al., 2017). Most frequently, pneumonia, cellulitis, and urinary tract infection were reported as complications in a certified burn center (Norbury, Herndon, Tanksley, Jeschke & Finnerty, 2016). Burn injuries leave the patient susceptible to infection, as does the immune response to the burn, as a result of immunosuppression and apoptosis leading to low lymphocyte count (Girardot, Rimmelé, Venet & Monneret, 2017).

Management of sepsis for burn patients includes the same recommendations from the SSC:

- Blood cultures obtained.
- Fluid resuscitation.
- Prompt antibiotic administration.
- Source control when feasible (Rhodes et al., 2016; Nunez Lopez et al., 2017).

Infected wounds from burns are the cause of sepsis in most burn patients with *Pseudomonas aeruginosa* and methicillin-resistant *Staphylococcus aureus*, and are among the most commonly found organisms responsible for infection in burn patients (Norbury et al., 2016). Others include vancomycin-resistant *Enterococcus*, *Acinetobacter*, non-*albicans* *Candida* spp., and *Aspergillus* (Norbury et al., 2016). Fungi colonization is increasing in incidence as a result of topical antimicrobials and broad spectrum antibiotic use, resulting in an increase in invasive fungal infections in burn patients (Norbury et al., 2016). Burn patients are also at risk for other types of infections, such

as HAIs from use of urinary catheters, intravenous and intra-arterial catheters, and *Clostridium difficile* infection. It is recommended that in burn patients:

- Cultures of the burn wound taken early should be low or negative; positive cultures or high counts of bacteria suggest an early contamination of the wound.
- If infection of a burn wound is suspected, wound culture and a histologic analysis should be completed to confirm suspicion.
- Routine culturing may aid in empiric antibiotic selection if the patient becomes ill.
- An increase in colony counts may be cause for a different topical antimicrobial.
- Wound cultures that show particularly virulent organisms or resistant organisms may be a precursor to an invasive burn wound infection.
- Operative wound colony counts greater than 10⁶ may indicate graft failure and infection.
- The risk for nosocomial infections may be lessened by knowing burn wound culture results and taking appropriate infection control actions.
- Regular catheter changes (every five to six days for central lines) can decrease the chance of infection, which occurs at elevated rates in burn ICUs (Norbury et al., 2016).

Burns associated with an explosion event are at greatest risk for early infections. It is crucial to take special care in infection control practices with this at-risk and vulnerable population.

Sepsis in the older adult

People over age 65 account for almost 60% of sepsis cases (Stepko, 2018). Pneumonia is the most frequent cause of sepsis in older patients, followed by urinary tract infections (Surviving Sepsis Campaign, n.d.). This population is also more likely to have gastrointestinal infections, skin tears or pressure sores, tooth/gum infections, and health care-associated infections.

There are numerous reasons that the older adult is more at risk than the younger adult for developing infection and sepsis, including these:

- Immune system changes and immunodeficiency.
- Nutritional deficits.
- Comorbidities.
- Exposure to health care-associated infections and community-acquired infections.
- Altered clinical presentation.

Malnourished older patients should be further assessed for oral infections, dehydration, and areas of skin breakdown.

Immune system changes in the older adult

The ability of the body to fight invaders declines as the body ages. The immune system in the older adult has less ability to recognize and kill foreign invaders, leading to the development of more infections, malignancy, and autoimmune disorders (Azar & Ballas, 2017). The age-related changes in the immune system that result in the development of infections, malignancy, and autoimmune disorders are termed *immunosenescence*.

Innate immune system changes

As discussed before, the innate immune system is comprised of macrophages, neutrophils, pattern recognition receptors (PRRs), and natural killer cells. The natural killer cells, which are responsible for killing tumor cells and viruses, have been found to be less active in older adults. In older adults, macrophage activity and function are decreased, possibly leading to longer presence of bacteria in the body and delayed wound healing (Azar & Ballas, 2017). Neutrophil phagocytic ability in older adults is also decreased (Azar & Ballas, 2017). All of these factors lead to increased risk of infection and cancer, and may result in the development of sepsis in older adults.

Adaptive immune system changes

The adaptive immune system includes T cells and B cells and is responsible for immune response to previous invaders. T cells are produced in the bone marrow and travel to the thymus gland to reach maturity. As aging occurs, there is less activity in the thymus gland, and the functional components of the thymus gland are replaced with fatty tissue, thereby resulting in fewer T cells (Azar & Ballas, 2017).

B cells respond to invaders through exposure to infections or vaccinations by producing antibodies. The number of B cell precursors and the number of B cells declines with advancing age, as do specific antibodies produced from previous infections or vaccinations (Azar & Ballas, 2017). The decline in the adaptive immune system is responsible for the decreased effectiveness of vaccines in older adults.

Decreased effectiveness of vaccinations

Immune system changes in the older adult make vaccinations less effective, presenting a challenge to protect the health of a very vulnerable population. In patients > 65 years of age, a number of strategies have been used to combat this difficulty, such as increased dosage of a vaccine, increased vaccine boosters, and use of different vaccine formulations. Vaccinations remain crucial to the older adult to help ward off infections and viruses that may have serious health effects. It is recommended that the adult > 65 years of age receive vaccinations to protect against influenza, pneumococcal infections, diphtheria, pertussis, tetanus, and varicella zoster virus (shingles) (Azar & Ballas, 2017). Testing for Hepatitis B and C should also be considered, even if symptoms are not evident.

Nursing consideration: Nurses are likely to administer vaccines and are in a position to educate the public on the importance of being properly vaccinated to protect against infections that may lead to sepsis. Older adults who have repeated contact with small children or infants should be advised to revaccinate for diphtheria, pertussis, and tetanus.

Immunodeficiency

A deficient immune response by the older adult may be, in part, due to the decreased response of the immune system as the body ages. The clinician should be aware that there may be an underlying immunodeficiency that is not simply a normal consequence of aging. If there is an increase in the length, severity, or frequency of infections, or infections caused by unusual or opportunistic pathogens, an immunodeficiency should be suspected (Azar & Ballas, 2017).

Causes of immunodeficiency include the following:

- Malabsorption syndromes.
- Malignancy and related immunosuppressant therapies.
- Metabolic disease (diabetes, liver disease, uremia).
- Prescription drugs that may immunosuppress as a side effect.
- Malnutrition (Azar & Ballas, 2017).

Nutritional deficiencies in older adults

Nutritional deficiencies in older adults contribute to the decreased effectiveness of the immune system and lead to susceptibility of developing infections and illness. Nutritional deficiencies exist for a variety of reasons. Older adults may not have the income necessary to buy healthy and nutritionally dense foods, since high carbohydrate foods are generally cheaper. Additionally, they may not be able to prepare nutritionally dense foods for themselves because of physical or cognitive limitations. Many older adults live and eat by themselves, resulting in reduced caloric intake (Ritchie & Yukawa, 2017). Appetite also tends to decrease with age, and elderly adults may simply not feel hungry. Problems with teeth, gums, or dentures and swallowing difficulties may also impair a person's nutrition.

Physical limitations, such as dysphagia (difficulty or discomfort swallowing), may affect those who have suffered a stroke or have such diseases as Parkinson's, Zenker's diverticula, and amyotrophic lateral sclerosis (ALS), thus reducing nutritional intake (Ritchie & Yukawa, 2017). Older adults may have difficulty or pain with chewing because of poor dentition. Or they may have tremors or other conditions, such as arthritis, that may make it difficult to feed themselves.

Other conditions that may affect the intake of adequate nutrition include the following:

- Malignancy.
- Depression.
- Alzheimer's disease.
- Gastrointestinal disorders (gastroesophageal reflux, celiac disease, inflammatory bowel, peptic ulcer disease, ischemic bowel, pancreatic insufficiency).
- Drug or alcohol dependence.
- Medication side effects (Ritchie & Yukawa, 2017).

Vitamin deficiency

Older adults are highly susceptible to vitamin deficiencies from either poor nutritional intake or poor absorption of vitamins, which are a consequence of aging. Vitamin B12 deficiency is rather common in adults > 65 years of age, possibly affecting the nervous system (Ritchie & Yukawa, 2017).

Nursing consideration: Nurses should identify anyone at risk for falls and should ensure proper fall precautions are in place. This can protect the patient from being injured and developing a subsequent infection that may progress to sepsis.

Vitamin D is often deficient in older adults as well, resulting from such causes as poor intake and lack of sun exposure, and skin changes with aging that lead to decreased absorption of vitamin D. (Ritchie & Yukawa, 2017). Vitamin D is necessary for the absorption of calcium. A deficiency in vitamin D can lead to skeletal as well as non-skeletal complications (Kheiri et al., 2018).

Calcium deficiency is also prevalent in older populations as a result of malabsorption by the gastrointestinal tract as a person ages (Ritchie & Yukawa, 2017). Adults between the ages of 70 and 90 absorb one-third the amount of calcium that younger adults absorb (Ritchie & Yukawa, 2017). Calcium deficiency is associated with reduced bone mass and osteoporosis, which can lead to osteoporotic fractures.

EBP alert! Osteoporosis affects more than 10 million people in the United States. Within that population, there are nearly 2 million fractures each year (National Osteoporosis Foundation, 2015).

Comorbidities

Older adults are more likely to suffer comorbidities than are younger adults. They may have preexisting conditions that put them at risk for infection, such as diabetes, cancer, kidney dysfunction, liver disease, and lung disease—among others. Older people are also more likely than younger adults to need invasive devices that have the potential of becoming infected, such as in-dwelling catheters, peripheral catheters, joint replacements, and pacemakers. These comorbidities may lead directly or indirectly to infection and increase the risk of morbidity and mortality of sepsis. In fact, chronic diseases—such as heart disease, lung disease, and diabetes—affect a person's immune system more than their chronological age does (Mody, 2017).

Healthcare associated infections and community associated infections (HAIs and CAIs)

Older adults are also more likely than younger adults to be hospitalized, live in long-term care centers, or participate in senior day care programs, where they are highly susceptible to infection. They are also more likely to develop antibiotic-resistant infections in these care centers than in other sites.

Older adults are susceptible to immune suppression and malnutrition related to immobility, social isolation, and depression. Emotional states of agitated depression, confusion, Alzheimer's, dementia, or hopelessness can contribute to a lack of appetite or dehydration from a diminished sense of thirst. Concomitant factors that contribute to the risk of injuries and infections can also increase their risk of developing sepsis.

Self-Assessment Quiz Question #8

Margaret is an 86-year-old woman with a history of COPD, osteoporosis, and dementia. She is considered a fall risk at the local nursing home in which she resides. She sees a physician frequently and stays up to date on flu and pneumonia vaccinations. She has a diminished appetite lately and is being given supplemental nutritional drinks to ensure her calorie intake is sufficient. Her caregivers know that she is at risk for developing complications should she develop an infection.

Which of the following statements about the older patient is FALSE in regard to infection and risk of developing sepsis?

- Older patients are more likely to have nutritional deficiencies, such as low calcium and vitamin D, than younger patients, that may lead to increased risk of falls and fractures, thereby increasing the risk for infection.
- The patient over age 65 is more likely to be current with vaccinations, and is therefore at low risk for developing certain infections.
- The older patient is more at risk than the younger patient for developing sepsis as a result of comorbidities.
- Normal changes in immune function can leave the older patient more susceptible to infection than the younger patient.

Altered clinical presentation of symptoms of infection

Older adults may present atypically for infection, causing the practitioner to potentially miss diagnosing an infection early and treating it promptly, thus leading to a greater potential to develop sepsis. Additionally, older adults may have confusion or alterations in mental status as their baseline, making it difficult to identify mental status changes associated with infection or sepsis. Changes in the sensorium or memory of older persons may affect their ability to report a reliable history of previous infections or antibiotic use. In older adults, fever, sweating, and chills may be absent or not as pronounced as they would be in the younger patient (Mody, 2017). Older adults often have a lower baseline core temperature, in general, than younger adults.

In frail older patients, fever may be considered as one or more of the following readings:

- Single oral temperature $> 37.8^{\circ}\text{C}$ ($> 100^{\circ}\text{F}$).

- Persistent oral or tympanic membrane temperature $\geq 37.2^{\circ}\text{C}$ (99.0°F).
- Rectal temperature $\geq 37.5^{\circ}\text{C}$ (99.5°F).
- Rise in temperature of $\geq 1.1^{\circ}\text{C}$ ($\geq 2^{\circ}\text{F}$) above baseline temperature (Mody, 2017).

It is important for the clinician to get a thorough clinical picture of the patient's baseline status to notice a change that may be subtle and easily overlooked.

Nursing consideration: Older adults often present atypically with infection and sepsis. The nurse must be astute in evaluating changes in the patient and take into consideration changes from the patient's baseline presentation whenever possible. Involving a family member or caregiver in the evaluation of the elderly may help to achieve a comprehensive evaluation.

Bacteremia in the older adult

Older patients are more likely to develop bacteremia from gastrointestinal and genitourinary sources than younger patients, with gram-negative bacteria as the infectious agent (Mody, 2017). Mortality rates increase with age for nosocomial gram-negative bacteremia (Mody, 2017). The increase in mortality for older adults may be related to higher frequency of invasive catheters, depressed immune response, comorbidities, and a higher incidence of end organ damage, such as renal insufficiency or acute respiratory distress syndrome (Mody, 2017).

Infective endocarditis in the older adult

Infective endocarditis is a relatively rare but serious infection in the endocardium of the heart that affects older adults five times more than it affects younger populations (Ursi et al., 2019). In older adults, streptococci and staphylococci are the main causative organisms. Infective endocarditis is also more difficult to diagnose in older patients, leaving them at a higher risk for undetected infection that may lead to sepsis.

Pneumonia in the older adult

Pneumonia is a cause for concern with the aging population. Adults older than age 65 are more likely to be hospitalized and die from pneumonia than younger populations (CDC, 2019d). *Streptococcus pneumoniae* is the most frequent causative organism in older populations, but gram-negative organisms—such as *Haemophilus influenzae*, *Legionella pneumophila*, *Moraxella catarrhalis*, and *Klebsiella* spp—are more frequently seen in older adults with chronic obstructive pulmonary disease (COPD) who reside in long-term care facilities than those who reside elsewhere (Mody, 2017). Lack of vaccinations, immobility, immunosuppression, and chronic respiratory illnesses increase the risk of developing pneumonia and subsequent sepsis.

Prosthetic device infections

Many older adults are likely to have prosthetic devices as they age, including joint replacements, pacemakers, heart valves, and vascular grafts (Mody, 2017). Prosthetic joint replacements offer a particular challenge for treatment, as they are found to have microbial biofilms that reduce the effectiveness of antibiotics and may also have reduced blood flow secondary to scarring from surgery (Mody, 2017). Typically, removal of the prosthesis and re-implantation is recommended, which could be difficult to withstand for the older patient with existing comorbidities (Mody, 2017).

Urinary tract infections in the older adult

Older adults are particularly prone to the development of urinary tract infections (UTIs). Gram-negative bacilli—such as *Escherichia coli*, *Enterobacter*, *Klebsiella*, and *Proteus*—are the most common causative organisms. However, there is an increased incidence of more resistant organisms also being isolated, such as *Pseudomonas aeruginosa* and gram-positive organisms, such as *Enterococci*, *Staphylococci*, and *Streptococcus* (Mody, 2017). Elderly patients with indwelling catheters are at risk for infection and urosepsis.

Key points:

- Older adults are at risk for developing sepsis for many reasons, including immune system changes, nutritional deficiencies, increased risk for HAIs and CAIs, comorbidities, and chronic health issues.

- Older adults may present atypically with infection, allowing the infection to go undiagnosed and, therefore, untreated, potentially leading to sepsis.

- Older adults are more likely to have prosthetic devices and subsequent infections of devices, infective endocarditis, pneumonia, and urinary tract infections than younger populations are.

RECOMMENDATIONS ON THE CARE OF PATIENTS WITH SEPSIS

The Surviving Sepsis Campaign (SSC) originally published guidelines for the treatment of sepsis in 2004, with updates in 2008, 2012 and 2018. All clinicians should be aware of these recommendations, using the latest research in an effort to combat the cascade of events that start with infection and increase quickly in the progression of sepsis.

The newest changes are moving away from previous early goal-directed therapy in which there were specific goals for central venous pressure (CVP), mean arterial pressure (MAP), and central venous oxygenation (Howell & Davis, 2017). The new guidelines recommend the use of frequent clinical reassessment and dynamic fluid responsiveness measures instead, such as arterial pulse pressure variation or stroke volume induced by mechanical ventilation or passive leg raise test (DeBacker & Dorman, 2017; Howell & Davis, 2017).

Treatment recommendations

Treatment for sepsis should start immediately upon recognition. The term *time zero* refers to the time when it is documented that a patient has signs and symptoms of sepsis. This may be in the emergency room upon triage, or it may be when signs and symptoms are documented on the floor. The clinician should promptly obtain appropriate blood work and blood cultures, and assess oxygenation, perfusion, fluid resuscitation, and antimicrobial therapy.

Support oxygenation

The first priority in any patient is to stabilize breathing and maintain oxygenation. The clinician should address hypoxemia by stabilizing the airway and supplementing with oxygen. Oxygenation should be monitored with pulse oximetry; intubation and mechanical ventilation may be required (Schmidt & Mandel, 2017). Sepsis causes increased work of breathing. The airway may need to be secured for patients who have a decreased level of consciousness (Schmidt & Mandel, 2017). Chest X-rays and arterial blood gases should be obtained in the initial stages of treatment to determine the presence of acute respiratory dysfunction syndrome (ARDS), which can be present in the patient with sepsis or septic shock (Schmidt & Mandel, 2017).

Guidelines for specific mechanical ventilation settings—such as tidal volume, the use of PEEP, and plateau pressures—can be found in the new Surviving Sepsis Campaign International guidelines linked here: <http://www.survivingsepsis.org/Guidelines/Pages/default.aspx>.

Assess perfusion

Hypotension is the most common sign for sepsis and septic shock, but it might not be evident in the beginning stages of sepsis and might not accompany hypoperfusion (Schmidt & Mandel, 2017). Blood pressure should be monitored early and reassessed frequently. During the early stages of sepsis, skin may be warm and flushed, but as the blood is redirected to core organs, the skin may become mottled and cool. Other signs of hypoperfusion include tachycardia, obtundation, restlessness, oliguria, and anuria (Schmidt & Mandel, 2017).

Hypoperfusion can be indicated in patients who show signs of hypotension, high lactate levels, evidence of acute organ dysfunction, and even tachycardia (Rhodes et al., 2017). Evaluation of lactate levels is part of the three-hour SSC bundle recommendation. Lactate levels can be important in assessing hypoperfusion even in the absence of hypotension (Schmidt & Mandel, 2017). Serum lactate level >2 mmol/L may indicate sepsis. Increased serum lactate level may represent tissue hypoperfusion associated with organ dysfunction in critically ill patients.

Nursing consideration: Nurses should be aware that patients with preexisting conditions may present differently. For example, older patients, diabetic patients, and patients on beta blockers might not exhibit tachycardia as blood pressure decreases. Younger patients may have a severe and prolonged tachycardia without hypotension that may appear later and suddenly (Schmidt & Mandel, 2017).

This allows the approach to be more patient centered in monitoring fluid responsiveness, rather than keeping to strict and static protocols that may not be beneficial to all patients. Infection source control and administering early antimicrobial therapy continue to be the standards of practice (DeBacker & Dorman, 2017). Timeliness has recently been identified as a factor in treatment of sepsis, indicating that the first hour for diagnosis and treatment is critical for decreasing mortality.

Nursing consideration: The SSC 2018 update may change due to concerns over lack of scientific evidence. All clinicians, including nurses, should check <http://www.survivingsepsis.org/Bundles/Pages> for the latest bundle recommendations, as new evidence becomes available.

Patients presenting with signs and symptoms of sepsis or septic shock will need immediate intravenous fluids and intravenous antimicrobial therapy at a minimum. In addition to IV fluids, patients may need blood products; frequent medication administration, including vasopressors; or blood draws, which may require reliable central venous access at some point during their treatment (Schmidt & Mandel, 2017). Central venous pressure and oxygenation (ScvO₂) can be measured from central venous access. Peripheral IV access must be obtained in the first stages of treatment.

Provide fluid resuscitation

The SSC guidelines for 2017 recommend that patients with hypoperfusion resulting from sepsis should receive at least 30 ml/kg of IV crystalloid fluid promptly and that the patient be reassessed through such variables as heart rate, blood pressure, respiratory rate, temperature, arterial oxygenation saturation, and urine output (Rhodes et al., 2017). Fluids should be administered as necessary based on the hemodynamic status of the patient.

The SSC guidelines also recommend that albumin be added in addition to crystalloids for patients requiring large amounts of crystalloids for fluid resuscitation (Rhodes et al., 2017). Hydroxyethyl starches are no longer recommended for volume replacement in patients with sepsis or septic shock (Rhodes et al., 2017). It is important that the patient be reassessed frequently. Fluid replacement should be taken into account of the patient's response and clinical presentation, including the presence of cardiogenic pulmonary edema. Administration of an early fluid challenge may not be appropriate for every patient with sepsis (known as a "fluid non-responder"), and care should be taken to avoid fluid overload (Berg & Gerlach, 2018). Fluid overload may be a greater risk for children, the frail elderly, or those with compromised cardiac, kidney, or lung function. Oxygen saturation, hematocrit, electrolytes, BUN, and creatinine should be monitored closely.

EBP alert! Hydroxyethyl starches (HES) are synthetic colloid starches that have been used in the past for fluid resuscitation. HES are no longer recommended for volume replacement. HES have been found to increase the risk of acute kidney injury and potentially mortality (Semler & Rice, 2016).

Provide antimicrobial therapy

Antimicrobial therapy should begin quickly and, ideally, directly after appropriate cultures have been drawn. Empiric broad-spectrum therapy should begin within one hour after recognition of sepsis or septic shock (Rhodes et al., 2017). The use of empiric broad-spectrum antibiotics that have one or more antimicrobials has been suggested to ensure that all likely pathogens be covered, including bacterial, viral, or fungal causes (Rhodes et al., 2017). If the pathogen is identified, the antimicrobial therapy should be changed to target that particular pathogen.

Nursing consideration: The nurse is often responsible for ensuring that microbiologic cultures (blood cultures, sputum, wound, and urine cultures) are obtained once ordered. It is imperative that the nurse prioritize the obtaining of these cultures before initiating antimicrobial treatment so that rapid treatment can begin. The cultures should be taken in less than 45 minutes (Rhodes et al., 2017).

Typically, antibiotic administration is continued for seven to 10 days, depending on patient response. Assessment of antibiotic allergies should be evaluated. Antibiotic therapy can be a broad-spectrum or combination therapy until a source of infection is realized. Antibiotic therapy for sepsis can include the following:

- Vancomycin.
- Ceftriaxone.
- Meropenem.
- Ceftazidime.
- Cefotaxime.
- Cefepime.
- Piperacillin and tazobactam.
- Ampicillin and sulbactam.
- Imipenem/cilastatin.
- Levofloxacin.
- Clindamycin.

EBP alert! A large-scale study explored the effect of an educational program targeted to physicians and nurses regarding sepsis care with appropriate antimicrobial management (Ferrer et al., 2018). The study found that an improved use of antibiotics in those with sepsis lowered the time to antibiotic treatment and increased the number of patients receiving appropriate treatment and appropriate de-escalation of treatment (Ferrer et al., 2018).

Identify and control the source of infection

Source control is arguably one of the most important interventions in controlling the progression of sepsis. This includes prompt administration of antibiotics and a thorough evaluation of the patient to pinpoint the source of infection.

Following are questions to consider:

- Does the patient have any invasive devices that may be the source of infection (urinary catheters, prosthetic devices, intravascular devices)?
- Has the patient undergone a recent trauma or surgery?
- Does the patient live in a setting which may have an increased risk of nosocomial or community-acquired infection, such as a long-term care facility?
- Does the patient have a productive cough that may indicate pneumonia?

Source control can include the debridement of a wound, drainage of an abscess, and the prompt removal of intravascular devices or indwelling urinary catheters. Chest x-ray and repeated auscultation may help to identify pneumonias. Source control is particularly effective for the following conditions:

- Gastrointestinal perforation.
- Intraabdominal abscesses.
- Ischemic bowel.
- Cholangitis.
- Cholecystitis.
- Pyelonephritis.
- Necrotizing soft tissue infection.
- Implanted device infections (Rhodes et al., 2017).

Imaging scans useful for pinpointing the source of infection include the following:

- **X-rays:** Chest x-rays are useful for evaluating a lung infection, such as pneumonia.
- **Computerized tomography (CT):** CT scans are useful in visualizing infections in the appendix, bowel, pancreas, or kidney.
- **Ultrasound:** Ultrasounds are useful for diagnosing infection in the gall bladder or ovaries.
- **Magnetic resonance imaging (MRI):** MRIs are helpful in visualizing infection in soft tissue, such as abscesses in the spine (MayoClinic.org, nd).

Self-Assessment Quiz Question #9

A patient comes into the emergency room with symptoms of pneumonia.

Which imaging test would the physician most likely order?

- a. MRI.
- b. Chest X-ray.
- c. Ultrasound.
- d. CT scan.

Administer vasoactive medication if indicated

Vasopressors may be required to maintain the patient's blood pressure if fluid replacement alone is not sufficient to adequately restore perfusion, or if the patient develops cardiogenic pulmonary edema.

The following vasopressors are recommended:

- **Norepinephrine:** The first choice in vasoactive medication.
- **Vasopressin or epinephrine:** Can be added to norepinephrine to raise mean arterial pressure (MAP) to a target goal or adding vasopressin to decrease epinephrine dosage. A MAP target of 65 to 75 mm Hg is usually sufficient in patients with septic shock.
- **Dopamine:** Recommended as an alternative to norepinephrine only in patients with low risk for tachyarrhythmias or absolute or relative bradycardia.
- **Dobutamine:** Recommended for patients with persistent hypoperfusion despite fluids and vasopressors. Dobutamine is an inotropic agent that may, in low doses, cause a blood pressure drop initially as a result of systemic artery dilation caused by peripheral vascular resistance. However, as the dose increases, cardiac output increases enough to overcome the peripheral vascular resistance, and blood pressure is increased (Schmidt & Mandel, 2017) (Rhodes et al., 2017).

EBP alert! A recent study found that adjunctive vasopressin is the most cost-effective second-line vasopressor in terms of financial value for short and long-term care of patients with septic shock (Lam et al., 2020). Vasopressin is added to the first choice vasoactive medication (Norepinephrine) for patients who need additional support.

Administer glucocorticoid therapy if indicated

Glucocorticoids are recommended only if the patient's blood pressure does not respond to adequate fluid resuscitation and vasopressor medications (Rhodes et al, 2017; Schmidt & Mandel, 2017). It was once hypothesized that corticosteroid therapy would be beneficial in controlling the inflammation associated with sepsis; however, studies are still being conducted to evaluate the usefulness of corticoid therapy. The latest recommendations are only for those patients who experience hypotension in the presence of fluids and vasopressors (Rhodes et al., 2017).

Administer blood transfusions if indicated

Blood transfusions are reserved for those patients who have a hemoglobin level of < 7 g/dL unless it is suspected that the patient has myocardial ischemia, severe hypoxemia, or acute hemorrhagic shock (Rhodes et al., 2017; Schmidt & Mandel, 2017).

Administer insulin therapy if indicated

Blood glucose levels should be kept under 180 mg/dL (Rhodes et al., 2017). Insulin therapy should not be started unless there are two consecutive blood glucose levels > 180 mg/dL, and levels should be monitored every one to two hours until stabilized (Rhodes et al., 2017). The use of new devices attached to the patient to quickly measure blood glucose using cell phone apps can save valuable time in frequent assessments for a more immediate treatment response.

Provide renal replacement therapy if indicated

As sepsis progresses, the kidneys may become injured and the patient may require some form of renal replacement therapy. Renal replacement therapy may be continuous or intermittent, and can include hemofiltration, hemodialysis, and hemodiafiltration. The SSC guidelines (2017) recommend that renal replacement therapy (either continuous or intermittent) be used in patients with sepsis who have acute kidney injury. The guidelines further recommend that Continual

Renal Replacement Therapy (CRRT) be used to manage fluid balance in hemodynamically unstable patients with sepsis (Rhodes et al., 2017). Renal replacement therapy is not recommended for patients who demonstrate an increase in only creatinine or oliguria with no other indications for dialysis (Rhodes et al., 2017). Since vascular access for dialysis may present another opportunity for an acquired infection, the decision for dialysis should be made with care.

Provide venous thromboembolism prophylaxis

Patients who have sepsis or septic shock are at risk for developing blood clots; therefore, measures to prevent the formation of clots should be taken. Pharmacologic agents, such as low molecular weight heparin, may be useful, as well as mechanical types of prophylaxis, such as intermittent pneumatic compression or compression stockings (Rhodes et al., 2017).

Nursing consideration: The nurse is often responsible for ensuring the use of compression stockings or intermittent pneumatic compression. The nurse should be aware of the importance of preventing clots by making sure mechanical prophylactic measures are used continuously and are functioning properly, as well as performing scheduled skin inspections underneath the devices.

Provide stress ulcer prophylaxis if indicated

Any critically ill patient can develop stress ulcers while hospitalized. Stress ulcer prevention includes the administration of proton pump inhibitors or histamine receptor antagonists to the patient who has risk factors for gastrointestinal bleeding (Rhodes et al., 2017). Not all critically ill patients should receive stress ulcer prophylaxis, however, as there may be a risk of nosocomial infections in patients who are taking medication for acid suppression (Cook & Guyatt, 2018). Stress ulcer prophylaxis in patients with sepsis should be used only in patients at risk for gastrointestinal bleeding, such as patients on prolonged mechanical ventilation (> 48 hours) and patients suffering coagulopathy (Rhodes et al., 2017). A history of GI bleeding or severe reflux may warrant the need for prophylaxis, as well as observations for tarry stools or bloody vomitus.

Nursing consideration: Although the staff nurse does not prescribe antimicrobials or order the treatments used to manage sepsis, it is beneficial for the nurse to have a familiarity with therapies that may be prescribed to observe for side effects or symptom changes that may indicate a complication.

Support nutritional needs

Nutritional needs of patients with sepsis or septic shock should be met as early as possible. In critically ill patients with sepsis or septic shock, enteral feeding is recommended for patients who tolerate feedings (Rhodes et al., 2017). Parental nutrition is not recommended to meet caloric needs, as there is evidence that there is an increase in chance of infection with parental nutrition and no benefit over IV glucose in mortality (Rhodes et al., 2017). In patients unable to begin or tolerate enteral feedings within the first seven days, IV glucose is recommended,

along with advancing enteral feeds as tolerated (Rhodes et al., 2017). The SSC guidelines for 2017 suggest that gastric residual volumes should not be routinely monitored unless the patient is at high risk of aspiration or has a feeding intolerance (Rhodes et al., 2017). Post-pyloric feeding tubes and the use of pro-kinetic agents are suggested for those who are critically ill and have a feeding intolerance or are at risk for aspiration (Rhodes et al., 2017).

Set goals of care

Sepsis and septic shock are associated with significant mortality rates. Patients often become critically ill and may have an extended stay in an intensive care unit. It is important to discuss goals of care and prognosis with the patient and the patient's family (Rhodes et al., 2017). End-of-life and palliative care plans should be utilized when appropriate (Rhodes et al., 2017). As the primary caregiver in the hospital setting, the nurse is a supportive, educational, and empathetic resource to patients and their families in a time when it is needed the most. A hospice referral may be warranted to evaluate the use of palliative measures, as well as to support the family/significant others during this time.

Nursing consideration: Nurses often spend the most time with patients and their families during the course of the hospital stay. Nurses should be understanding of the fear that accompanies a diagnosis of sepsis and should communicate effectively with the patient and the patient's family to keep them informed as much as possible.

EBP alert! Blood cultures obtained before and within 120 minutes of antimicrobial therapy for patients with symptoms of sepsis (including SBP <90mmHg or a lactate level of 4mmol/L) showed a significant decrease in the sensitivity of the culture, even those drawn shortly after antimicrobial therapy (Cheng et al., 2019). This study, which included seven emergency departments in North America, highlighted the importance of obtaining blood cultures prior to the initiation of antibiotic therapy.

Self-Assessment Quiz Question #10

Corey is a 28-year-old active adult. He works full time as a computer analyst and spends his free time playing volleyball or football with friends. Recently, during a weekend volleyball game at his local community center, Corey fell and tore a piece of skin on his leg. Later that evening felt, unbeknownst to Corey, his wound had become infected and had begun to spread. Corey was exhausted and pain at the site of his injury. He went to bed early and reassured himself he would feel better in the morning after a night of rest.

The next day Corey noticed that the skin surrounding the wound had turned a dark red color and was swollen. He also felt very weak and began having chills and sweating. Corey assumed he must be coming down with the flu and called in sick to work. Later that evening Corey's girlfriend found him very lethargic, shivering, and breathing rapidly. His forehead was hot to the touch, and he complained of pain in his leg. He was disoriented and said things that made no sense. His girlfriend drove him straight to the local ER for evaluation.

Upon arriving at the ER, the nurse gathered information about Corey's condition. She noted that Corey was complaining of leg pain. His girlfriend relayed the story of the injury he sustained playing volleyball the day before. The nurse also noted that he was disoriented, was breathing rapidly, and looked pale. Upon further evaluation, his vital signs were found to be BP 100/50, pulse 140, respiratory rate of 26 rpm with an oxygen saturation level of 89%, and temperature 39.4°C (103°F). The nurse examined his wound, which was very red and swollen. She immediately recognized that he had signs an infection was likely progressing to sepsis.

What should the nurse's first action be?

- Administer vasoactive medications to bring blood pressure up as quickly as possible.
- Notify physician and obtain cultures (blood and wound) as per sepsis protocol and immediately notify the sepsis response team.
- Administer oxygen and start intravenous fluids.
- Begin broad-spectrum antibiotic therapy.

WHAT NURSES CAN DO TO HELP FIGHT SEPSIS

Nurse-led protocols

Nurses are at the forefront of care and spend a substantial amount of time with patients. This allows nurses to know their patients and may help them to pick up on subtle nuance and changes in their patient's condition. Sepsis screening by nurses can easily be integrated into practice given the frequency of nurse-patient interaction (Kleinpell, 2017).

Various studies have shown the success of nurse-led sepsis protocols. A study conducted in Norway found that after implementation of a sepsis-specific triage, flow chart alert and treatment system for inpatients, there was an increased 30-day survival, fewer patients with sepsis that progressed to severe sepsis, and shorter length of stays in the ICU post-intervention group (Torsvik et al., 2016). Specifically, the intervention included a bundle that had a flow chart for sepsis identification, treatment and physician response time, a SIRS and organ failure triage used on the floor to re-evaluate for sepsis, if indicated, and direct phone call to an ICU doctor if a ward doctor was unavailable (Torsvik et al., 2016). Also included in the interventional bundle was an educational element requiring all physicians, nurses, and nursing students to take a four-hour training course that covered the pathophysiology, early signs, and treatment of sepsis (Torsvik et al., 2016). Prompt intravenous fluid and appropriate antibiotic treatment were emphasized, and senior nurses were given extra training sessions on the interpretation of blood gas analysis and the use of the triage tool (Torsvik et al., 2016). The positive outcomes of the study (increased survival, decreased morbidity, and shorter LOS) highlight the importance of education, training, and implementation of a protocol for improved outcomes in patients with suspected infection.

Another study included a nurse-directed emergency department Code Sepsis and an inpatient "power hour" that allowed nurses to initiate

Emergency department nurses and triage nurses

As many as 85% of patients are seen in the emergency room with a 12% mortality rate (Rothman et al., 2017). Historically, sepsis was treated in the intensive care unit, but it is now known that early identification and timely and aggressive intervention are required to improve patient outcomes, and treatment should be initiated in the emergency room. The oftentimes quick progression of sepsis requires proper identification, and the triage nurse will be the first to assess the patient's level of urgency. After the patient is properly triaged, the emergency room nurse begins caring for the patient following the hospital protocol regarding sepsis treatment. Next, when the patient is admitted, clear communication with the nurse receiving the patient is mandatory to ensure the continuum of care is followed. The emergency room nurse should give a clear, concise, and thoughtful report to the next nurse

Inpatient nurses

Patients admitted to the intensive care unit directly from the emergency department with suspected infection have better outcomes and lower associated costs than patients admitted to the floor (Fernando et al., 2018). This exemplifies the need for better and more frequent screening to identify sepsis in patients who have been admitted to the floor rather than the intensive or coronary care unit. The difference in mortality rates between those patients admitted directly to the ICU versus those transferred from the floor may be secondary to a more complex clinical picture that includes surgical or comorbid medical conditions that may make diagnosis more challenging (Yealy et al., 2015).

The nurse-to-patient ratio on the floor may also be a factor, as caring for more patients makes it difficult for the nurse to closely monitor the patient and recognize early changes in the patient and respond in a timely fashion.

Screening tools can be useful for all nurses to help identify the development of sepsis and may be helpful to remind nurses to be aware of signs and symptoms of infection, worsening infection, and sepsis. Programs that promote the importance of routine daily monitoring for infection that may eventually lead to sepsis can also be of value. It is useful for nurses to perform a daily or per shift assessment for the presence of a productive cough and infection of common sites,

order sets independently for lactate levels, blood cultures, and fluid boluses if they suspected sepsis (Ferguson, Coates, Osborn, Blackmore & Williams, 2019). The study, which took place over a span of seven years, showed that sepsis bundle adherence in the emergency department increased from 40.5% to 73.7% ($P < .001$) with an average time from triage to antibiotics of 80 minutes (Ferguson et al., 2019). Sepsis-related rapid response team calls decreased from 2.2% to 0.85% ($P < .001$) and in-hospital sepsis-related mortality dropped from 12.5% to 8.4% ($P < .001$).

In 2015, St. Joseph Hoag Health (SJHH) in California began a three-phase sepsis program that included a dedicated sepsis nurse available 24/7, as well as an interdisciplinary team focused on improving outcomes for sepsis and decreasing cost (St. Joseph Code Sepsis Core Team, 2018). The program began with a Code Sepsis Response in the emergency department and included a Code Sepsis Core Team and Workgroup. The program is in Phase III and utilizes RNs to address all positive sepsis screens and provide the initial sepsis workup. A sepsis nurse then tracks all sepsis patients and monitors those patients on the floor. The hospital uses a high-alert application on a smart device that enables the sepsis nurse to get alerts on patients who are at high risk for sepsis that is worsening or may be progressing to shock. In addition to patient and family education, nurses are educated about sepsis and the Code Sepsis. The program uses an interdisciplinary rapid response team, dedicated sepsis nurses, standardized protocols, emergency guidelines, education, and communication to effectively improve outcome. The hospital has seen a 50% reduction in sepsis progression, decreased LOS, and a 42% mortality reduction. Bundle compliance has improved as well, from 63% to 91% (St. Joseph Code Sepsis Core Team, 2018).

caring for the patient to ensure continuity of care and that there are no lapses in treatment or diagnostic tests. Reporting and recording the mental status of patients is often overlooked in emergency situations and could be critical in the identification of early sepsis.

Responsibilities of emergency department nurses:

- Triage appropriately by recognizing signs and symptoms.
- Screen patients at risk, using an approved tool such as the SOFA.
- Be aware of sepsis protocol in their institution.
- Implement sepsis recommendations within one hour.
- Communicate effectively and thoroughly with providers and fellow staff members to coordinate care of the patient with sepsis.
- Inform the patient and family of each step in the plan of care.

including invasive sites, surgical sites, and wounds (Schorr et al., 2016). Floor nurses who have aides collecting vital signs need to make sure that abnormal vital signs are reported to the nurse immediately. Nurses should monitor daily for improvement or deterioration of health status for a patient with a known infection (Schorr et al., 2016). Nurses who are aware, educated, and vigilant about screening for sepsis in their patients may help reduce the mortality associated with later diagnosis and treatment.

Responsibilities of inpatient nurses:

- Assess and monitor for infection.
- Report signs and symptoms of infection or worsening infection.
- Ensure that aides who collect vital signs report abnormalities directly to the nurse.
- Be aware, educated, and vigilant about sepsis.
- Stay up-to-date on sepsis protocols and emerging evidence based practice guidelines for infection control and sepsis.
- Exemplify and encourage vigilant handwashing.

Nursing consideration: It is important for all nurses to know if their place of employment has a protocol in place for the screening and treatment of sepsis. Check with your institution's policies.

Responsibilities of all nurses

- Become familiar with personal stories of sepsis that can be found at <https://rorystauntonfoundationforsepsis.org/our-sepsis-stories/>
- Be educated on sepsis signs and symptoms and updates on treatments.
- Spread awareness of sepsis to co-workers and the community.
- Communicate effectively with other members of the health care team. If there is a concern about a patient, express that concern

- to the physician, nurse manager, or other nurses during a shift change. Be the patient's advocate; tell the team you are concerned about sepsis in the patient.
- Ensure proper precautions are followed to help prevent the spread of nosocomial infections.
- Educate patients, families, and community members about sepsis.

PREVENTION OF NOSOCOMIAL OR HEALTH CARE-ASSOCIATED INFECTION

Nurses are a crucial force in the prevention of sepsis and can help to decrease the incidence of nosocomial or health care-associated infections by using universal precautions and by educating patients, families, and coworkers on ways to prevent the development and spread of infection.

Following are general recommendations for prevention of the spread of nosocomial infections:

- Assess patients for the need for isolation precautions; all ICU patients should be screened for the following:
 - Neutropenic or immunological disorder.
 - Diarrhea.
 - Skin rashes.
 - Known communicable diseases.
 - Known carriers of an epidemic bacteria—such as methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococci*, glycopeptide-resistant *Staphylococcus aureus*, extended-spectrum lactamase producing *Enterobacteriaceae*, multidrug-resistant non-fermenting gram-negative bacteria, and *Clostridium difficile*—may pose a potential threat to patients in their vicinity.
- Identify patients who are at risk for developing nosocomial infection, including those patients who have the following:
 - Age older than 70 years.
 - Shock.
 - Major trauma.
 - Acute renal failure.
 - Coma.
 - Prior antibiotics.
 - Mechanical ventilation.
 - Drugs affecting the immune system (steroids, chemotherapy).
 - Indwelling catheters.
 - Prolonged ICU stay (> 3 days).
 - Open wounds or burns.

Standard precautions should be followed with every patient:

- **Gloves:**
 - Sterile gloves should be worn after hand hygiene procedure while touching mucous membranes and non-intact skin and performing sterile procedures, such as arterial, central line, and Foley catheter insertion.
 - Clean non-sterile gloves are safe for touching blood, other body fluids, contaminated items, and any other potentially infectious materials.
 - Change gloves between tasks and procedures in the same patient, especially when moving from a contaminated body area to a clean body area.
 - Never wear the same pair of gloves for the care of more than one patient.
 - Remove gloves after caring for a patient.
 - Practice hand hygiene whenever gloves are removed.
- **Gown:**
 - Wear a gown to prevent soiling of clothing and skin during procedures likely to generate splashes of blood, body fluids, secretions, or excretions.
 - The sterile gown is required only for aseptic procedures; for the rest, a clean non-sterile gown is sufficient.
 - Remove the soiled gown as soon as possible, with care to avoid contamination.
- **Mask/shield:**
 - Wear a mask and adequate eye protection (eyeglasses are not enough) or a face shield to protect mucous membranes of

the eyes, nose, and mouth during procedures and patient care activities likely to generate splashes/sprays of blood and body fluids.

- Patients, relatives, and health care workers presenting with respiratory symptoms, such as a cough, should also use masks (Mehta et al., 2014).

There are specific guidelines, in addition to standard precautions, for frequently encountered nosocomial infections, including ventilator-associated pneumonia (VAP) and urinary tract infection (UTI), central-line associated blood stream infections (CLABSI), and surgical site infection (SSI). These four types of infections are not only the most prevalent in hospitalized patients but also those that present the greatest risk for development of sepsis.

Nursing consideration: Nurses should make glucose control for the postoperative patient a priority and aim to keep levels < 200 mg/dL.

Suggestions for prevention of these specific nosocomial infections include the following:

- **Ventilator-associated pneumonia (VAP) prevention:**
 - Oral intubations are preferred to nasal unless contraindicated.
 - Keep head elevated at 30° to 45° in the semi-recumbent body position.
 - Daily oral care with chlorhexidine solution of strength 0.12%.
 - Monitor endotracheal tube cuff pressure (keep it > 20 cm H₂O) to avoid air leaks around the cuff that can allow entry of bacterial pathogens into the lower respiratory tract.
 - Closed endotracheal suction systems may be better than open suction.
 - Regularly empty condensate that collects in the tubing of a mechanical ventilator (Mehta et al., 2014).
- **Catheter associated urinary tract infection (CAUTI) prevention:**
 - Follow sterile technique for insertion of the urinary catheter.
 - Maintain a closed drainage system.
 - Maintain unobstructed urine flow. At all times, the urinary catheter should be placed and taped above the thigh, and the urinary bag should hang below the level of the bladder.
 - The urine collection bag should never make contact with the floor.
 - Changing indwelling catheters or drainage bags at fixed intervals is not recommended. Change only if there are clinical indications, such as infection or obstruction, or when the closed system is compromised.
 - Reevaluate the need for the catheter at least daily, and remove the catheter when it is no longer needed (Mehta et al., 2014).
- **Central line associated blood stream infection (CLABSI) prevention:**
 - A care bundle for central lines should be implemented, including staff education, catheter insertion cart, and a checklist for guidelines of insertion according to evidenced-based guidelines.
 - Nurses should ensure proper procedure is followed and speak up if they notice a discrepancy.
 - Use of maximal sterile barriers should be employed during the procedure: mask, cap, sterile gown, and draping of the patient.

EBP alert! A large study of immunocompromised pediatric patients, at risk of quick deterioration due to their susceptibility and lowered ability to fight infection, tested a prognostic tool to predict the trajectory of sepsis in this group of vulnerable patients (Jacobs et al., 2019). The pediatric sepsis biomarker risk model (PERSEVERE) found that the most common symptom of clinical deterioration was found in those with: new vasoactive requirement (27%), respiratory insufficiency (26%), or transfer to an ICU (25%), and new altered mental status (13%) and significant fluid resuscitation (11%) (Jacobs et al., 2019). In addition, those with organ transplants were more likely to deteriorate versus those with a cancer diagnosis or a bone marrow transplant, and 62% of patients who deteriorated were infected with bacteria (Jacobs et al., 2019). Using this information is helpful in the identification of patients who are at risk for deterioration and poor outcome that need special attention and care to improve outcome.

- Use of a chlorhexidine-based antiseptic for skin preparation before insertion and subsequent catheter care is suggested.
- For patients 18 and older, use a chlorhexidine impregnated dressing approved by the FDA indicated for reducing CLABSI.
- Choose the best site for the individual patient. Avoid the femoral site in obese adult patients.
- Daily assessment should include site evaluation for redness and tenderness, and appropriateness of possible removal of device (Marshall et al., 2014; Mehta et al., 2014).

Nursing consideration: The prompt removal of any unnecessary invasive medical device will lessen the likelihood for infection development. The nurse should ensure that any unnecessary invasive devices are promptly removed as per physician order or institution protocol. Question the continued use of devices on a daily or more frequent basis. Visit www.cdc.gov/hai/bsi/bsi.html for a full list of preventative techniques to reduce the occurrence of HAIs.

Hand washing

Health care-associated, or nosocomial, infections are responsible for many cases of sepsis. Proper hand hygiene is important in the reduction of the spread of infection. Inadequate hand washing or improper technique is considered by the Centers for Disease Control to be an important risk factor for the development of infection, along with severity of patient's illness, sanitization of equipment and environment, and adhering to proper infection control guidelines when performing invasive procedures, such as inserting central lines (CDC, 2002).

Pathogens can be present on normal skin flora and can be transferred during normal "clean" activities, such as taking a patient's pulse or blood pressure, if proper hand washing does not occur between patients. Perineal and inguinal areas are the most colonized by pathogens; but *Staphylococcus aureus*, *Proteus mirabilis*, *Klebsiella*, and *Acinetobacter* are also found on the axillae, trunk, and upper extremity skin, including the hands (CDC, 2002). In addition, as a result of the normal shedding of skin, bed linens, gowns, and bedside furniture can be sources of *Staphylococci* or *Enterococci* (CDC, 2002). Phones, call lights, remote controls, and pulse oximetry devices are frequently not disinfected and can act as sources of pathogens.

The CDC (2002) recommends the following hand hygiene guidelines:

- If hands are visibly dirty, wash with soap (non-antimicrobial or antimicrobial) and water.
- If hands are not visibly dirty, use an alcohol-based hand rub to decontaminate hands in the following situations:
 - Before direct and after patient contact.
 - Before donning sterile gloves for an invasive procedure, such as central line placement.

Educating patients and families

One very important role that nurses perform in and out of the health care setting is patient and family education. General awareness and spreading the word about sepsis and sepsis symptoms provide critical information for the public so that early symptoms are not ignored

● Surgical site infection prevention:

- Administer antimicrobial prophylaxis when indicated and timed so that the antimicrobial agent is established in the serum and tissues at time of incision.
- Administer appropriate parental antimicrobial agents before skin incision in cesarean section deliveries.
- In clean and clean-contaminated procedures, the administration of prophylactic antimicrobial agents should not be administered after the surgical incision is closed in the operating room, even if a drain is present.
- Glucose levels should be kept <200 mg/dL for diabetic and non-diabetic patients in the perioperative period.
- Address and treat any infection remote to the surgical site infection before elective surgery.
- Maintain perioperative normothermia.
- For patients with normal pulmonary function who need intubation, increase FIO₂ during surgery and after extubation in the immediate post-op period.
- Follow antiseptic prophylaxis, including having the patient shower with an antiseptic agent the night prior to surgery. Perform intraoperative skin prep with alcohol-based antiseptic unless contraindicated (Berrios-Torres et al., 2017).

For a full list of all recommendations, please visit <https://www.cdc.gov/infectioncontrol/guidelines/ssi/index.html>

EBP alert! A systematic review of ten studies revealed that keeping blood glucose levels <200 mg/dL in adult patients following cardiac surgery can reduce the occurrence of surgical site infections (Boreland, Scoot-Hudson, Hetherington, Frussinety & Slyer, 2015).

- Before donning gloves for peripheral catheter placement, urinary catheter placement, or placing other invasive devices that do not require surgery.
- After contact with a patient's skin (taking a patient's vital signs, lifting the patient).
- After contact with body fluids or excretions, non-intact skin, wound dressings, and mucous membranes if hands are not visibly soiled.
- Before moving to a clean body site after touching a contaminated body site during care of the patient.
- After contact with inanimate objects in the same general area as the patient (tables, chairs, IV poles, computer keyboards).
- After removing gloves.

For hands that are not visibly soiled, alcohol rubs are more effective than washing with antimicrobial soap (CDC, 2002). Use an alcohol-based hand sanitizer unless hands are visibly dirty, if *C. difficile* exposure or *Bacillus anthracis* is known or suspected, after contact with a patient with infectious diarrhea, before eating, and after using the restroom. For hands that are visibly soiled, it is recommended to wash with antimicrobial soap and water. When using an alcohol rub, thoroughly rub product into hands and rub until product is dry. When using soap and water, wash hands thoroughly for a minimum of 15 seconds. Repeated and frequent use of alcohol-based products that cause skin irritation may be replaced by handwashing.

Nursing consideration: Nurses should remember to wash their hands frequently during, before, and after patient care to reduce the spread of nosocomial infections. Wearing gloves does not replace the need to wash hands and the gloves must be changed between patients.

or minimized and care can be started earlier, allowing for a better outcome. The Global Sepsis Alliance has started an initiative known as World Sepsis Day to increase general awareness of sepsis.

Nurses can relay important educational information to patients and their families to prevent, recognize, and report symptoms of infection promptly. In the hospital setting, for example, a medical surgical nurse might educate the patient during their stay as to signs and symptoms of infection of a surgical wound, or the importance of preventing pneumonia with the use of incentive spirometry postoperatively.

In the outpatient setting, a nurse can educate patients as to the importance of vaccines to prevent such infections as pneumonia, meningococcus, and influenza, especially in those patients at high risk for infection. Nurses should encourage patients to quit smoking; smokers are at risk for pneumonia. Nurses can also take opportunities in everyday life to spread the word to the community and family and friends about signs and symptoms of worsening infection and who is at risk for sepsis because of comorbidities. It is important to teach the proper care of wounds. Wounds should be cleaned properly and monitored for signs and symptoms of infection. If redness, swelling, warmth or discharge is noted, medical attention should be sought to have the wound evaluated. Children may be particularly susceptible to wound infections because of the frequency of experiencing cuts and

Educating coworkers

It is part of the nurse's responsibility to ensure that other health care workers who come in contact with their patients follow proper techniques for infection control. The nurse should relay to others any contact precautions or neutropenic precautions that may be in place for a particular patient. If nurses see another health care worker not

Sepsis protocols and sepsis rapid response teams

Nurses are at the forefront of medical care. As such, continuing education for nurses is imperative to keep nurses up-to-date regarding evolving research on the pathology of sepsis and new evidence related to the care of patients with sepsis. Nurses can advocate for enactment and enforcement of sepsis protocols and the formation of sepsis response teams in their facility. They should always communicate with other members of the health care team to ensure timely response to an insidious process. Evidence-based practice guidelines should be part of the hospital policies on every unit, and nurses are responsible for setting the example in implementing these guidelines.

EBP alert! In 2013, New York State regulations mandated the use of protocols for sepsis recognition and treatment. A retrospective cohort study found that the mandated sepsis protocols were associated with a greater decline in mortality when compared with states that did not mandate sepsis care protocols (Kahn et al., 2019). It is uncertain if the findings can apply to other states because baseline mortality rates are different between New York and other states. More studies that examine the benefit of mandated sepsis protocols need to be done, however this particular study showed a significant decrease in mortality when compared to control states (Kahn et al., 2019).

The use of sepsis screening tools, sepsis protocols, and sepsis rapid response teams can help improve treatment and outcomes in patients identified early. An example of a sepsis rapid response team might include members of the hospital staff who have been thoroughly educated on sepsis and who can effectively communicate and work together to achieve a quick response and subsequent treatment of the patient suspected of having sepsis. A trained response team might include a physician, an ICU nurse, and a respiratory therapist.

Sepsis continues to have a high mortality rate when compared to mortality from other causes, with mortality rates from sepsis being reported as showing an increase of 140% higher compared to other causes (Epstein, Dantes, Magill & Fiore, 2016). Sepsis was shown to be a risk factor for in-hospital death, discharge to hospice, and 30-day hospital readmission (Dietz, Jones, Small, Gaieski & Mikkelsen, 2017).

scrapes, and the exposure to bacteria in schools or daycare that may lead to development of infection.

Nurses can use the mnemonic **SEPSIS** to teach those whom they come in contact with about the signs and symptoms of sepsis:

- Slurred speech.
- Extreme shivering or muscle pain.
- Passing no urine in a day.
- Severe breathlessness.
- "I feel like I might die."
- Skin that is mottled or discolored (UK Sepsis Trust, 2016).

Another simple mnemonic, TPR (temperature, pulse, respirations), can be a useful tool to teach the lay population regarding when to call the doctor. If a person has an infection or flu and at least two of the three following symptoms, it's time to be concerned about sepsis and contact a doctor:

- Temperature > 38.3°C (101°F) or < 36.1°C (97°F).
- Heart rate > 90 bpm.
- Respiratory rate > 20 to 22 rpm (Sepsis Watch, n.d.).

following proper protocol, they should educate the health care worker as to proper hand hygiene to protect not only other patients, but also themselves. Sharing unit data on HAIs, staff absenteeism from illness, MRSA rates, and sepsis cases may allow staff to see the value of vigilant precautions.

The Surviving Sepsis Campaign (SSC) gives the following example for an effective core leadership interdisciplinary team:

- Administrator over emergency department and critical care medicine.
- Critical care medicine (CCM) physician.
- ED physician.
- CCM nurse manager.
- ED nurse manager.
- ED charge/triage nurse.
- CCM charge nurse.

Additional team members could include these health care professionals:

- Pharmacist.
- Respiratory therapy supervisor.
- Process improvement facilitator.
- Laboratory supervisor.
- Technicians from ED.

An example of an effective sepsis work team includes the following:

- ED physician.
- Triage nurse.
- Staff nurse.
- Laboratory technician.
- Laboratory supervisor.
- Admissions clerk.

Additional team members could include these professionals:

- CCM physician.
- House officer.
- ICU charge nurse.
- Infectious disease physician (Surviving Sepsis Campaign, n.d.).

PROGNOSIS

Patients who survive sepsis are more likely to be admitted to the hospital following discharge, with the most common reason for rehospitalization being infection (unresolved or recurrent) (Prescott, Dickson, Rogers, Langa & Iwashyna, 2015; Sun et al., 2016). A recent study examined the circulating levels of inflammation biomarkers that were measured for a year in those who had survived sepsis (Yende et al., 2019). The findings were that persistent levels of inflammation and immunosuppression biomarkers were present in two-thirds of patients and were associated with poor long-term outcomes (Yende et al., 2019).

EBP alert! A study of 3,494 patients hospitalized with sepsis showed that 42.6% of patients were re-admitted to the hospital within 90 days of initial discharge with diagnoses of heart failure, pneumonia, COPD exacerbation, and UTI (Prescott, Langa & Iwashyna, 2015). It is not uncommon for those who have survived sepsis to be re-admitted to the hospital or have longer-term ramifications from sepsis.

Sepsis survivors are at risk for cardiovascular disease, impaired cognitive abilities, re-hospitalization for infection, and reduced life expectancy (Shankar-Hari & Rubenfeld, 2016). Those who survive sepsis are also at risk for developing post-sepsis syndrome.

Post-sepsis syndrome

Post-sepsis syndrome (PSS) occurs in up to 50% of patients who survive sepsis (Sepsis Alliance, n.d.c.). With this condition, physical or psychological symptoms may persist after the patient has been discharged from the hospital after being treated for sepsis.

Symptoms of post-sepsis syndrome may include psychological symptoms and vary in severity, and may include the following:

- Insomnia, difficulty getting to sleep or staying asleep.
- Nightmares, vivid hallucinations, and panic attacks.

- Disabling muscle and joint pains.
- Extreme fatigue.
- Poor concentration.
- Decreased mental (cognitive) functioning.
- Loss of self-esteem and self-belief (Sepsis Alliance, n.d.c.).

Post-sepsis syndrome may be linked to lasting physical impairments, such as amputations resulting from poor blood circulation and gangrene, and lasting damage to the lungs, kidneys, and liver.

GLOSSARY OF CONDITIONS, PATHOGENS, AND TERMS ASSOCIATED WITH SEPSIS

There are numerous health conditions, diseases, and various pathogens that may predispose or cause a person to develop sepsis. The following list includes a brief overview of diseases, pathogens, and terms associated with sepsis:

- **Appendicitis:** Inflammation and infection of the appendix from blocked stool or lymphatic tissue can lead to rupture of the appendix if not surgically removed. The rupture of the appendix can allow normally occurring bacteria from within the appendix to escape into the abdomen and possibly throughout the body.
- **Bacteremia:** This is the presence of bacteria in the blood. Usually the body will clear small amounts of bacteria present in the blood and there are no symptoms (Maggio, 2018). Conversely, there are occasions where bacteremia can lead to infection and sepsis.
- **Burns:** Skin that is compromised by a burn can allow bacteria to enter the bloodstream. The risk of infection is greater depending on the severity and extent of the burn.
- ***Clostridium difficile:*** *Clostridium difficile* is a bacterium that causes inflammation in the gut or colon. It is one of the most common health care acquired infections (HAIs), but it can also be found in the community. It is found in the stool of persons infected and is spread readily from direct or indirect contact. Sepsis can develop as the body tries to fight the infection. *Clostridium difficile* infection may result as a consequence of extensive use of antibiotics that were required for sepsis patients.
- **Cancer:** Patients being treated for cancer and are immunocompromised are at high risk for developing sepsis. Patients with cancer are highly susceptible to acquiring health care-associated infections and are at risk for infection from surgeries, indwelling urinary catheters, and any procedure that compromises skin integrity, such as an IV infusion. Patients with neutropenia are at particular risk for developing an infection that may lead to sepsis. Patients with cancer may also suffer from malnutrition, which makes them more vulnerable to infections. The respiratory tract is the most frequent site of infection for oncology patients, followed by the urinary tract.
- **Cellulitis:** Cellulitis is an infection of the skin and tissue beneath the skin. Any time the integrity of the skin is compromised, bacteria (most commonly group A streptococcal bacteria) can enter the body and lead to infection. Cellulitis can result from a simple cut or scrape, a bug bite or sting, burns, or surgical incisions. The most common site for cellulitis is in the lower extremities.

Those most at risk for developing cellulitis include patients who are:

- Immunocompromised.
- Diabetics.
- Lymphedema patients.
- Patients with skin conditions (such as eczema, shingles, chicken pox).
- Obese.

- Have a history of cellulitis.
- **Chronic obstructive pulmonary disease (COPD):** COPD is a chronic and progressive respiratory disease that affects those with emphysema, bronchitis, and asthma. It causes poor airflow in the lungs and increased mucous production. Those with COPD are at extreme risk for developing pneumonia, the leading cause of sepsis.
- **Dental issues:** Infections can occur in the gums, lips, palate, cheeks, tongue, or within and below teeth. A cavity or broken tooth can allow bacteria to enter the pulp of the tooth, which houses blood vessels, nerves, and connective tissue. Subsequently, a dental abscess forms and bacteria can move out of the tooth to the bone and surrounding tissue. Infections can occur after any dental work when bacteria are introduced into a scrape or cut in the mouth following such procedures as cleanings, fillings, root canals, or tooth extractions. In some instances, prophylactic antibiotics may be recommended for those patients with underlying cardiac conditions who would suffer an adverse outcome from infective endocarditis (ADA, 2019).
- **Diabetes:** Patients with diabetes are at risk for developing sepsis because of the tendency to have wounds and scrapes that take longer to heal and are a port of entry for bacteria. Type I diabetics are at greater risk than Type II.
- **Ebola:** Ebola is a virus that originated in animals and was first seen in humans in West Africa in 1976 (Sepsis Alliance, 2017c). Since that time, it has spread and has recently become a concern for travelers worldwide. As the body tries to fight the Ebola virus, sepsis often sets in (Sepsis Alliance, 2017c).
- **Gallstones (cholelithiasis):** Gallstones are hard deposits that form from a collection of cholesterol or bilirubin in the gallbladder. Gallstones can cause the gallbladder to become inflamed and block the flow of bile, which can lead to infection. Sometimes surgery, another risk for infection, is necessary to remove the gallbladder because of gallstones that are persistent and painful.
- **Gastrointestinal perforation:** The gastrointestinal tract may become perforated by any number of conditions, leading to leaking of gastrointestinal contents and causing a subsequent infection. These conditions include the following:
 - Appendicitis.
 - Diverticulitis.
 - Ulcerative colitis.
 - Toxic megacolon.
 - Strangulated hernia.
 - Peptic ulcer disease.
 - Forceful vomiting.

In addition, the GI tract can be perforated by a traumatic injury to the abdomen, such as a knife or gunshot wound, surgical event, or swallowing a corrosive or foreign object. If the contents of the GI tract leak into the abdomen, peritonitis may occur. If the

perforation is in the bowel, the condition is known as perforated bowel.

- **Group B *Streptococcus*:** Group B *Streptococcus* is commonly found in the GI tract. Typically, most healthy people do not develop infections from this bacterium. Newborns are most at risk for developing an infection from group B *Streptococcus*, but patients who are older or immunocompromised may develop an infection from *Streptococcus* B in their bloodstream, lungs (as pneumonia), skin or soft tissue, or bones or joints.
- **Health care-associated infections (HAIs):** Health care-associated infections (also known as nosocomial infections) can arise from any health care setting. HAIs are common in those who are elderly, young, or immunocompromised, through an exposure to a concentrated number of germs from invasive procedures.

Following are the most common types of invasive procedures associated with HAIs:

- **Central intravenous catheters (central lines):** Central lines are placed in the chest, groin, or neck in large veins to administer specific treatments that cannot be given via smaller veins. There is an increased risk for infection to spread rapidly in these lines because the access to the heart is more direct.
- **Urinary catheters:** Indwelling catheters that drain urine from hospitalized patients account for nearly 75% of all urinary tract infections in the hospital. It is the most common HAI.
- **Surgical site infection:** Surgical sites, as with any breakdown in skin integrity, can be a site for bacteria to enter the body. After patients undergo surgery, they are at risk for developing HAIs.
- **Ventilator-associated pneumonia (VAP):** Patients mechanically ventilated are at an increased risk of bacteria entering the lungs via the endotracheal tube used to assist breathing.

Common bacteria that cause HAIs include methicillin-resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile* (*C. diff.*), and vancomycin-resistant *Enterococcus* (VRE). The norovirus can also be a cause.

- **HIV/AIDS:** Sepsis is the most common cause of death in patients with HIV/AIDS. Patients with HIV/AIDS are more at risk than other patient populations because of a weakened immune response, frequent antibiotic use, and surgical procedures.
- **Immunocompromised:** Those patients with impaired immune system functioning are obviously more susceptible to infection. Patients receiving treatment for cancer, who have had a splenectomy, or who have received an organ transplant are at high risk for developing sepsis. Patients on certain medications that may suppress the immune response—such as corticosteroids, prednisone, and tubular necrosis factor (TNF) inhibitors—are also considered at greater risk for developing infections.
- **Infection:** The invasion of normally sterile tissue with a pathogen. Sepsis can start from ANY infection, from mild to severe.
- **Influenza:** Influenza is a respiratory viral infection that can lead to sepsis when the body attempts to clear the infection. It can also lead to sepsis if secondary infections, such as pneumonia, occur as a complication of the flu.
- **Kidney stones:** Kidney stones are hard deposits of calcium, uric acid crystals, cysteine, or struvite that form a stone-like structure that can block the ureter and lead to an infection in the kidney, known as pyelonephritis.
- **Liver disease:** Cirrhosis of the liver is a chronic liver disease in which healthy liver tissue begins to break down and is replaced by scar tissue that impairs blood flow. It is most commonly caused by alcoholism and hepatitis C in North America. Other causes of cirrhosis include hepatitis B and nonalcoholic fatty liver disease. Bacterial infections are commonly seen in those with cirrhosis and are a major cause of morbidity and mortality (Bunchorntavakul, Chamroonkul, & Chavalitdhamrong, 2016).
- **Malaria:** Malaria is transmitted via mosquito bites and is considered a parasitic disease, as a parasite infects the mosquito that then bites a person who is infected with malaria. Malaria is an uncommon cause of sepsis in developed countries.

- **Meningitis:** Meningitis is inflammation of the meninges that surround the spinal cord and brain. It is caused by a bacterium, a virus, a fungus, or a parasite:
 - **Bacterial meningitis:** The most severe type of meningitis, is caused by one of the following bacteria—*Haemophilus influenza*, *Streptococcus pneumoniae*, group B *Streptococcus*, *Listeria monocytogenes* (in newborns), and *Neisseria meningitidis*.
 - **Viral meningitis:** The most common type of meningitis, caused by either the flu virus or the mumps virus. Viral meningitis usually affects children under the age of five or those with a weakened immune system, and typically resolves on its own.
 - **Fungal meningitis:** Caused by a fungus and is the rarest type of meningitis. It is usually found only in those who are immunocompromised.
- **Methicillin-resistant *Staphylococcus aureus* (MRSA):** MRSA is a bacterium found in hospitals and the community and is resistant to various antibiotics. It is sometimes found on the skin. It is not problematic unless it enters the bloodstream through a break in the skin. It is a common cause of HAIs.
- **Multiple organ dysfunction syndrome (MODS):** MODS consists of the failure of more than one organ. MODS may be attributed to an infectious or noninfectious cause. MODS may be primary (directly linked failure to the injury) or secondary (failure not directly linked with the injury but as a subsequent result of the original injury). MODS can result from sepsis or septic shock.
- **Necrotizing fasciitis:** Necrotizing fasciitis is also commonly known as the flesh-eating disease. The most serious form is caused by the bacterium *Streptococcus pyogenes*. It enters the body through a break in the skin and quickly spreads, destroying skin, muscles, and tissues as it progresses. It can quickly develop into sepsis. People at risk for developing necrotizing fasciitis include those who have had surgery, have given birth, or have had a traumatic injury. It is important to note that this condition is not contagious.
- **Paralysis:** Those patients who have paralysis are highly likely to develop infections. This can be related to the inability to feel or express pain from, for example, a cut or a burn, which can result in a more severe injury that is more apt to lead to infection. Patients with paralysis may also need a urinary catheter, which leaves them more susceptible to UTIs. Infection may not be recognized early as a result of fluctuations in vital signs that often occur in a patient who has paralysis.
- **Parkinson's disease:** Parkinson's disease is a progressive neurological disease that affects muscles and causes tremors, poor balance, unsteady and stiff gait, and memory loss. A patient with Parkinson's disease is vulnerable to aspiration pneumonia, HAIs, and infections related to falls from broken bones or wounds.
- **Pneumonia:** Pneumonia is the most common cause of lung infection that leads to sepsis and septic shock (American Thoracic Society, 2018). It can be caused by bacteria, viruses, or fungi. Adults older than age 65 are more likely to be hospitalized and die from pneumonia than younger populations (CDC, 2019d).
- **Pregnancy and childbirth:** Women who are pregnant or have recently given birth may develop infections and sepsis related to cesarean section, prolonged or obstructed labor, ruptured membranes, mastitis, or viral or bacterial infection (Sepsis Alliance, 2017c). Women more apt to develop infections related to pregnancy and childbirth include those with preexisting conditions, such as lupus, renal/liver disease, and heart failure (Sepsis Alliance, 2017c). In low-income countries, access to clean water, proper sanitation, prenatal care, care during delivery, timely and appropriate medication, and infection control are all necessary for to prevent infection and sepsis (WHO, 2017).
- **Septicemia:** The presence of any infectious organism and its toxins in the blood, including bacterial, fungal, parasitic, and viral organisms. This term is often confusing, with many people assuming it means blood poisoning or sepsis. Sepsis is the body's dysregulated response to infection.
- **Septic shock:** Sepsis with the presence of circulatory, cellular, and metabolic dysfunction associated with a higher risk of mortality.

Clinically, septic shock is present when a patient who has sepsis requires vasopressors to maintain a mean arterial pressure (MAP) higher than or equal to 65 mmHg and who has a lactate level > 2 mmol/L.

- **Severe sepsis:** A term previously used to describe SIRS of infectious origin with organ dysfunction. The term *severe sepsis* is no longer used, as it is thought to be redundant.
- **Systemic inflammatory response syndrome (SIRS):** SIRS is a systemic inflammatory response by the body to an infectious or noninfectious cause. It is a cascade of effects that are a regulated response by the body. SIRS is the presence of at least two of the following factors, one of which must be either leukocytosis or elevated temperature:
 - Core temperature > 38.5°C (101.3°F) or < 36°C (96.8°F).
 - Tachycardia.
 - Tachypnea.
 - Leukocytosis.

SIRS is no longer part of the definition for sepsis. Sepsis was previously defined as SIRS in the presence of infection.

- **Strep throat:** Strep throat is caused by the bacteria group A *Streptococci*. Teens and children are most affected, but adults can contract strep throat as well. Strep throat is a bacterial infection that can lead to rheumatic fever, poststreptococcal glomerulonephritis (kidney infection), or sepsis.
- **Toxic shock syndrome (TSS):** Toxic shock syndrome is most commonly known as an infection caused by *Staphylococcus aureus* and more rarely group A *Streptococcus*. It is well known

for its association with superabsorbent tampons in the 1980s, which have since been taken off the market. TSS has also been associated with cellulitis and pneumonia. TSS can cause shock and multi-organ failure due to leaky capillaries and tissue damage secondary to the release of cytokines in response to the bacteria (Stevens, 2016). Those at higher risk for developing TSS include those who have had recent surgery, have had TSS in the past, have a viral infection like chicken pox, or have recently had a child, a miscarriage, or an abortion. TSS is also associated with patients who have necrotizing fasciitis (Stevens, 2016).

- **Urinary tract infections (UTIs):** UTIs are a common type of infection present in the urinary tract, including kidneys, ureter, bladder, and urethra. An upper UTI that affects the kidney is known as pyelonephritis. If the urethra is affected, the infection is known as urethritis. If the bladder is affected, the infection is known as cystitis. UTIs are either bacterial or, more rarely, fungal, as seen in patients with weakened immune systems.
UTIs can affect anyone, but are more common in females. Those with indwelling catheters or those who self-catheterize are highly susceptible to developing UTIs. Bacteria can easily be introduced into the urinary tract after defecating, during intercourse, or from unsanitary conditions. A urinary tract infection that leads to sepsis is known as urosepsis.
- **Viral infections:** Any viral infection can lead to sepsis, especially in those with weakened immune systems. Some of the more common viral infections include influenza, HIV, meningitis, and pneumonia.

Resources

A number of resources are available to the general public and health care providers to bring awareness to the number one cause of death from infection--sepsis. The following resources are useful for the public and for health care providers:

- **Sepsis Alliance**
(<http://www.sepsis.org>)
Sepsis Alliance is a charitable organization comprised of lay people and health care professionals dedicated to spreading awareness about sepsis. It was founded in 2007 by Dr. Carl Flatly, an endodontist, whose daughter Erin died of sepsis at age 23. The mission of Sepsis Alliance is to “save lives and reduce suffering by raising awareness of sepsis as a medical emergency.”
- **Global Sepsis Alliance**
<http://global-sepsis-alliance.org>
The Global Sepsis Alliance was started in 2010 to “elevate public, philanthropic, and governmental awareness and understanding of sepsis and to accelerate collaboration among researchers, clinicians, associated working groups, and those dedicated to supporting them.” The Global Sepsis Alliance started World Sepsis Day held annually on September 13, when activities take place globally to raise awareness of sepsis.
- **Sepsis Vitality**
<https://sepsisvitality.com>
Sepsis Vitality is a blog that was started by a sepsis survivor that helps to provide support and personal stories of survival and recovery.
- **Surviving Sepsis Campaign**
<http://www.survivingsepsis.org>
The Surviving Sepsis Campaign (SSC) was started in 2002. It is a collaboration of the Society of Critical Care Medicine and the European Society of Intensive Care Medicine. The SSC’s goal is to reduce mortality of sepsis by spreading awareness of sepsis and improving diagnosis and care of the patient with sepsis through guidelines of care and improvement performance programs. The SSC is a useful resource for health care professionals to stay

informed on the latest news and expert recommendations and guidelines about sepsis and septic shock.

- **The UK Sepsis Trust**
<https://sepsistrust.org>
Based in the UK and founded in 2012, the UK Sepsis Trust is a charity that was started to improve outcomes for those affected by sepsis by spreading awareness to the public, health care professionals, and politicians, and providing support to those affected by sepsis.
- **The Rory Staunton Foundation**
<https://rorystauntonfoundationforsepsis.org>
The Rory Staunton Foundation was started in 2012 by the parents of a boy named Rory Staunton, who died at the age of 12 from sepsis that resulted from a scrape on his arm. He was an otherwise healthy boy when he got the scrape on his arm on a Wednesday in gym class. By Sunday, he had died from sepsis. Although his parents took him to the pediatrician and later to the hospital, the diagnosis of sepsis was missed. His parents started the foundation to spread awareness of sepsis and reduce the number of deaths caused by sepsis through education and effective diagnosis and treatment, and to give those affected by sepsis a platform to share their story.

Government resources

- **National Institute of General Medical Sciences**
https://www.nigms.nih.gov/Education/Pages/factsheet_sepsis.aspx
- **Centers for Disease Control and Prevention**
<https://www.cdc.gov/sepsis/index.html>

Nursing consideration: Sepsis Awareness Month is September, a month-long concerted effort to spread awareness about sepsis. It was started in 2011 by Sepsis Alliance. September 13 is known as World Sepsis Day and was started by the Global Sepsis Alliance to bring people together worldwide in an effort to increase awareness. Mark your calendars, and spread the word about sepsis!

Areas of sepsis research

Sepsis is still widely researched and it is a complicated disease process. To stay up to date, nurses should be familiar with the latest areas of clinical research that is being conducted regarding this complicated disease process. The following are brief descriptions of recent and current studies:

- **ADRENAL trial:** This trial looked at the use of adjunctive glucocorticoid therapy on mortality rates among patients with septic shock who were undergoing mechanical ventilation. The results concluded that a continuous infusion of hydrocortisone did not result in lower 90-day mortality when compared with placebo

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- Yende S., Kellum J.A., Talisa V.B., Palmer, O., Chang, C., Filbin, M.R., ... & Angus, D.C. (2019). Long-term host immune response trajectories among hospitalized patients with sepsis. *Journal of the American Medical Association Network Open*, 2(8), e198686. doi:10.1001/jamanetworkopen.2019.8686.

NURSING MANAGEMENT OF SEPSIS

Self-Assessment Quiz Questions Answers and Rationales

1. The correct answer is A.

Rationale: Leukocytosis (elevated white blood cell count) may be present in the direct postoperative period as a result of circulating monocytes and neutrophils in response to injury. Neutrophils, in particular, are considered the first responders to injury and infection. WBC levels may peak the first postop day and gradually decrease in the days following surgery. Hemoglobin and hematocrit levels are highly likely to be low following surgery because of blood loss.

2. The correct answer is C.

Rationale: The latest information on the pathophysiology behind sepsis maintains that sepsis development includes a host response and dysregulation of proinflammatory mediators and antiinflammatory mediators in a complex back-and-forth process. Sepsis is not a localized inflammatory response. Sepsis always starts with an infection.

3. The correct answer is D.

Rationale: The nurse should be suspicious of a patient who is tachypneic and not oxygenating properly. The elevated blood sugar of 148 could indicate sepsis in a nondiabetic patient, but it may not have any clinical significance at this point for a diabetic patient. The body temperature is low and should be monitored at regular intervals, but is not below 35.5°C (96°F) and is not a red flag for sepsis. The heart rate of 84 bpm is within normal parameters for adults, and the blood pressure is slightly elevated but does not indicate sepsis at present. The presence of suspected infection (increased swelling, redness, and pain at incision site) plus the presence of tachypnea and poor oxygenation are cause for alarm in this postoperative patient.

4. The correct answer is C.

Rationale: The qSOFA tool is a bedside tool that is used for a quick evaluation of someone with unknown or suspected infection. The qSOFA uses evaluating changes in mental status, respiratory rate, and blood pressure as a way of screening patients.

5. The correct answer is C.

Rationale: Measuring lactate levels is part of early recognition and management of sepsis, which also includes obtaining blood cultures and administering antibiotics and securing venous access as necessary for administration of intravenous fluids. Ensuring airway and proper oxygenation is a standard of care that should be performed as priority as part of the ABCs (airway, breathing, circulation) of care. Diagnostic imaging is important for source control and identification of infectious source, but it is not immediately required care. Pneumonia is the suspected cause of infection in this patient.

6. The correct answer is B.

Rationale: Parasitic infections are a rare cause of sepsis and account for 1% to 3% of all cases of sepsis. The other three statements are true.

7. The correct answer is A.

Rationale: Mary is at a greater risk for sepsis as a result of a multiple gestation that is highly likely to require invasive and diagnostic procedures that may cause infection, such as cervical cerclage, serial amnioreduction, and fetal or placental surgery. Women carrying multiples are more at risk for pyelonephritis, urinary tract infection, viral and fungal infections, and infection after vaginal deliveries than those women carrying singletons (Dotters-Katz, Patel, Grotegut & Heine, 2015).

8. The correct answer is B.

Rationale: While it is true that vaccinations help to prevent certain infections, vaccines may be less effective for older people and do not protect the patient completely. Margaret is at risk for infection due to co-morbidities, poor nutritional intake, and HAI from living in a nursing home. All of the other statements are true regarding sepsis and the older patient.

9. The correct answer is B.

Rationale: A chest X-ray is the best imaging test for diagnosing a lung infection such as pneumonia. MRIs are helpful in diagnosing soft tissue infection. Ultrasounds are useful in diagnosing infection in such sites as the gall bladder and ovaries. CT scans are useful in diagnosing infection in the appendix, bowel, pancreas, or kidney.

10. The correct answer is C.

Rationale: The nurse should administer oxygen to ensure adequate oxygen delivery to tissues and organs. Intravenous fluids should also be administered to maintain adequate perfusion. Because the hospital has a sepsis protocol in place, the nurse should notify the physician of suspected sepsis and obtain blood cultures. The nurse should immediately notify the physician or a sepsis response team if there is likelihood of sepsis and obtain blood and wound cultures, if possible, before starting antibiotic therapy ordered by the physician, as long as doing so does not significantly delay the administration of antibiotic therapy (> 45 minutes is considered a significant delay). Vasoactive medications may be indicated if blood pressure does not improve with fluids or drops below 90, but must be ordered by a physician. Prompt broad-spectrum antibiotic therapy is critical in stopping the progression of sepsis leading to septic shock, MODS, and death and should be administered as soon as possible.

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How to complete continuing education

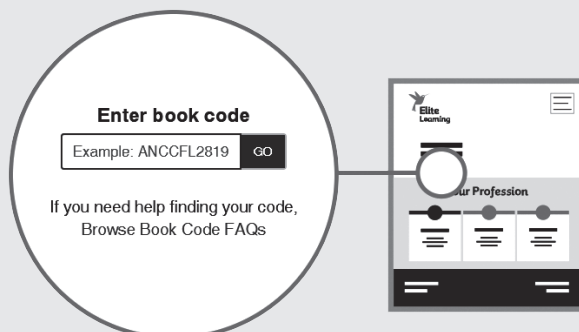
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Read and study the enclosed courses and complete the self-assessment exercises. To receive credit for your courses, you must provide your customer information and complete the mandatory evaluation. We offer four ways for you to complete. Choose an option below to receive credit and your certificates of completion.

Fastest way to receive your certificate

Online

- Go to **EliteLearning.com/Book**. Use the book code **ANCCSC3022** and enter it in the example box then click **GO**.
- If you already have an account created, sign in to your account with your username and password. If you do not have an account already created, you will need to create one now.
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- Read and study all course materials.
- Text **SCEVAL** to **386-245-9322**, then follow the link to complete affirmations.
- Use the book code **ANCCSC3022** and enter it in the example box then click **GO**.
- After completing affirmations, follow the link to get your certificate.

Per ANCC regulations, it is mandatory to complete a course evaluation for each course taken.

By mail

- Fill out the answer sheet and evaluation found in the back of this booklet. Please include a check or credit card information and e-mail address. Mail to Elite, PO Box 37, Ormond Beach, FL 32175.
- Completions will be processed within 2 business days from the date it is received and certificates will be e-mailed to the address provided.
- Submissions without a valid e-mail will be mailed to the address provided.

By fax

- Fill out the answer sheet and evaluation found in the back of this booklet. Please include credit card information and e-mail address. Fax to (386) 673-3563.
- All completions will be processed within 2 business days of receipt and certificates e-mailed to the address provided.
- Submissions without a valid e-mail will be mailed to the address provided.

Elite

PO Box 37 | Ormond Beach, FL 32175

Questions? Call us toll-free: 1-866-344-0971

South Carolina Nursing Professionals

CE Correspondence Package

Course Participant Sheet

Please fill in all the information below in CAPITAL LETTERS. Upon completion, please return this sheet, along with payment and mail to the address above. If paying by check or money order, please make payable to Elite for \$29.95. For even faster service, we offer this course participant sheet online with instant certificate issuance. Please visit EliteLearning.com/Book to complete your affirmation online.

Please PRINT NEATLY in the areas below using black or blue pen only:

First Name

M.I.

Last Name

Grid boxes for First Name, M.I., and Last Name.

Mailing Address

Grid boxes for Mailing Address.

Suite / Floor / Apt Number

City (do not abbreviate)

State

Grid boxes for Suite / Floor / Apt Number, City, and State.

Zip Code

Telephone Number (Please include area code)

SC Nursing License Number (Please provide for course credit)

Grid boxes for Zip Code, Telephone Number, and SC Nursing License Number.

E-Mail address (include to receive processing confirmation and instant certificate access)

Grid boxes for E-Mail address.

Payment Method

- Check / M.O. Enclosed for:
Entire Package only \$29.95
or
Discover

- Challenges in Attaining and Maintaining Good Nutrition - \$33.95
Child Abuse: Identification, Management, and Reporting - \$33.95
Communication in Health Care, 2nd Edition - \$22.95
Emerging Infectious Diseases - \$33.95
Nursing Management of Sepsis - \$33.95

Visa / Mastercard / AMEX / Discover Number

Credit Card Expiration Date

Grid boxes for Credit Card Number and Expiration Date.

Cardholder Signature:

Important Note:

The box below must be checked for verification sheet to be processed.

- By checking this box and signing below, I hereby affirm that I have completed this educational activity, including the self-assessment.

Signature

For Internal Use Only - Please Do Not Mark In This Area

ANCCSC3022

1926149226

Test Expires: 1/15/2023

1. ANCCSC07GN 2. ANCCSC06CI 3. ANCCSC04CH 4. ANCCSC06EI 5. ANCCSC07NM

NURSING - COURSE EVALUATION (ANCCSC3022 - Required)

To receive continuing education credits for this program, this mandatory evaluation form must be completed.

License Name: _____ **License #** _____

Your honest feedback is vital for the planning, evaluation, and design of future educational programs.

SECTION I: Demographics: Your current license type and education level: LPN/LVN ORN - Associate degree ORN - Bachelor's degree ORN - Master's degree APRN - Master's degree Doctorate / DNP / Other Doctorate Other (specify) _____

How long have you been a nurse: Less than 5 years 6 to 10 years 11 to 15 years 16 to 20 years Over 20 years Not a nurse

SECTION II: Course Evaluation
Please complete the following for each course you have completed. Mark the circle that best matches your evaluation of the question.

1. After completing this course, I am able to meet each of the Learning Outcomes.	7. The course demonstrated the author's knowledge of the subject.
2. The course content was unbiased and balanced.	8. I intend to apply the knowledge from this course to my practice.
3. The course was relevant to my practice.	9. What I have learned from this course will have an impact on my knowledge.
4. I would recommend this course to my peers.	10. What I have learned from this course will have an impact on patient outcome.
5. What I have learned from this course will have an impact on my practice.	11. The overall rating for this course.
6. The course was well-organized and clear.	

	Challenges in Attaining and Maintaining Good Nutrition 7 Contact Hours							Child Abuse: Identification, Management, and Reporting 6 contact hours				Communication in Health Care, 2nd Edition 4 Contact Hours			
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Excellent	Good	Average	Below Average	Poor	Excellent	Good	Average	Below Average	Poor	Excellent	Good	Average	Below Average	Poor
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	How many total hours did it take you to complete this course? Please indicate the number of hours:														
13	Please provide any additional feedback on this course: _____														

SECTION III: General
Fill in the circle below numbers
 How likely is it that you would recommend Elite to a friend or colleague?..... 0 1 2 3 4 5 6 7 8 9 10
 If your response is less than a 10, what about the course could we change to score a 10?

List other topics that you would like to see provided: _____
 I agree to allow Elite to use my comments. If you agree, please provide your name and title as you would like to see them to appear: _____

NURSING - COURSE EVALUATION (ANCCSC3022 - Required)

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5.	What I have learned from this course will have an impact on my practice.
6.	The course was well-organized and clear.
7.	The course demonstrated the author's knowledge of the subject.
8.	I intend to apply the knowledge from this course to my practice.
9.	What I have learned from this course will have an impact on my knowledge.
10.	What I have learned from this course will have an impact on patient outcome.
11.	The overall rating for this course.

	Emerging Infectious Diseases 6 Contact Hours						Nursing Management of Sepsis 7 Contact Hours				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Excellent	Good	Average	Below Average	Poor		Excellent	Good	Average	Below Average	Poor
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. How many total hours did it take you to complete this course?
 Please indicate the number of hours: _____

13. Please provide any additional feedback on this course: _____

SECTION III: General
Fill in the circle below numbers
 How likely is it that you would recommend Elite to a friend or colleague?..... 0 1 2 3 4 5 6 7 8 9 10
 0 1 2 3 4 5 6 7 8 9 10
 If your response is less than a 10, what about the course could we change to score a 10? _____

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 I agree to allow Elite to use my comments. If you agree, please provide your name and title as you would like to see them to appear. _____