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WHAT'S INSIDE

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What are the requirements for license renewal?

License Expires	Contact Hours Required	Mandatory Subjects
Licenses expire September 30 in the year of renewal	Physical Therapists - 40 Physical Therapy Assistants - 20 An applicant may obtain 75% of his or her total CE credit by taking correspondence or web-based courses, including pre-recorded professional presentations and pre-recorded webinars, from an approved CE sponsor.	• 3 hours of ethical practice of physical therapy • 1 hour on of sexual harassment prevention training • 1 hour implicit bias training per renewal period (beginning with 2023 renewals)

How much will it cost?

If you are only completing individual courses in this book, enter the code that corresponds to the course below online.

COURSE TITLE		HOURS	PRICE	COURSE CODE
Chapter 1:	Ethics for Physical Therapists and Assistants (Mandatory)	3	$36.00	PTIL03ET
Chapter 2:	Evidence-Based Implicit Bias Implications for Physicians and Healthcare Professionals (Mandatory)	1	$12.00	PTIL01EB
Chapter 3:	Preventing and Dealing with Sexual Harassment for IL Professionals (Mandatory)	1	$12.00	PTIL01SH
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How do I complete this course and receive my certificate of completion?

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Are you an Illinois board-approved provider?

Yes, Colibri Healthcare, LLC is recognized by the Illinois Department of Financial and Professional Regulation (Physical Therapy Sponsor #216.000315) as an approved provider of continuing education for physical therapists and physical therapy assistants.

Are my credit hours reported to the Illinois board?

No. The board performs random audits at which time proof of continuing education must be provided.

Is there a new Implicit Bias requirement?

Yes, for license or registration renewals occurring on or after January 1, 2023, physical therapists and physical therapy assistants who have continuing education requirements must complete at least a one-hour course in training on implicit bias awareness per renewal period. This course may count toward meeting the total credit hour requirements for continuing education.

Is my information secure?

Yes! We use SSL encryption, and we never share your information with third-parties. We are also rated A+ by the National Better Business Bureau.

What if I still have questions? What are your business hours?

No problem, we have several options for you to choose from! Online at EliteLearning.com/Physical-Therapy you will see our robust FAQ section that answers many of your questions, simply click FAQs at the top of the page, e-mail us at office@elitelearning.com, or call us toll free at 1-888-857-6920, Monday - Friday 9:00 am - 6:00 pm, EST.

Important information for licensees:

Always check your state's board website to determine the number of hours required for renewal, mandatory topics (as these are subject to change), and the amount that may be completed through home-study. Also, make sure that you notify the board of any changes of address. It is important that your most current address is on file.

Licensing board contact information:

Illinois Department of Financial and Professional Regulation
Website: https://idfpr.illinois.gov/profs/pt.html
Phone: (888) 473-4858

Springfield Office
320 West Washington Street, 3rd Floor
Springfield, Illinois 62786

Chicago Office
555 West Monroe Street, 5th Floor
Chicago, Illinois 60661

How to complete continuing education

Please read these instructions before proceeding.

Read and study the enclosed courses and answer the final examination questions. To receive credit for your courses, you must provide your customer information and complete the evaluation. We offer three ways for you to complete. Choose an option below to receive credit and your certificates of completion.

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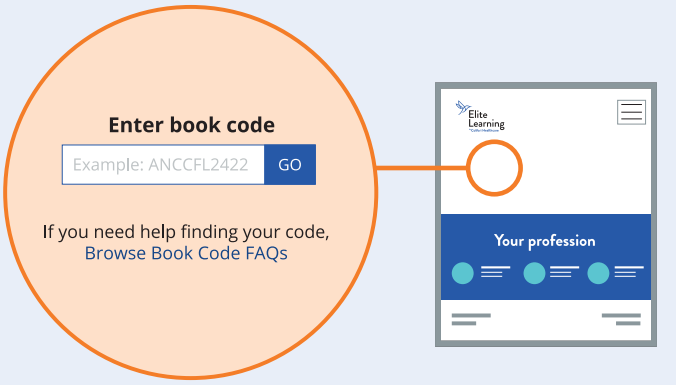
- If you already have an account created, sign in to your account with your username and password. If you do not have an account already created, you will need to create one now.
- Follow the online instructions to complete your final exam. Complete the purchase process to receive course credit and your certificate of completion. Please remember to complete the online survey.



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.

Chapter 1: Ethics for Physical Therapists and Assistants (Mandatory)

3 CE Hours

By: Staff Writer

How to receive credit

- Read the entire course online or in print.
- Depending on your state requirements you will be asked to complete:
  - A mandatory test (a passing score of 75 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
- Provide required personal information and payment information.
- Complete the mandatory Course Evaluation.
- Print your Certificate of Completion.

Disclosures

Resolution of conflict of interest
Colibri Healthcare, LLC 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.

Sponsorship/commercial support and non-endorsement
It is the policy of Colibri Healthcare, LLC not to accept commercial support. Furthermore, commercial interests are prohibited from distributing or providing access to this activity to learners.

Learning objectives

- Discuss the purpose and the principles of the Code of Ethics for the physical therapist and explain how these principles affect the practice, ideology and implementation of the duties performed by the physical therapist.
- Summarize the core values, their definitions, as well as the sample indicators; explain how these values fundamentally shape professionalism within the physical therapy profession.
- Recite the standards of ethical conduct for the physical therapist and the physical therapy assistant and summarize how these standards apply within daily practice.
- Define and describe relevant ethical ideals and practices, such as nonmaleficence, justice and autonomy, and how these – and other ideals – pertain to the practice of physical therapy.
- Discuss examples of federal statutory laws and state regulatory directives and give examples of each.
- Describe the HIPAA federal privacy statute and how this statute affects the decision-making process of physical therapists and physical therapy assistants.

Introduction

Periodic review of the Code of Ethics and the principles detailed within this document is important to fundamentally enhance the practice of the physical therapist. According to the American Physical Therapy Association, the physical therapist and the physical therapist assistant must always "strive to apply the principles of altruism, excellence, caring, ethics, respect, communication and accountability in working together with other professionals to achieve optimal health and wellness in individuals and within their communities" (2016).

Listed on the next few pages is the revised American Physical Therapy Association's (APTA's) Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant. Familiarizing yourself with these updated codes will assist you with examples given in this section.

CODE OF ETHICS FOR THE PHYSICAL THERAPIST

Preamble

The Code of Ethics for the Physical Therapist (Code of Ethics) delineates the ethical obligations of all physical therapists as determined by the House of Delegates of the American Physical Therapy Association (APTA). The purposes of this Code of Ethics are to:

1. Define the ethical principles that form the foundation of physical therapist practice in patient/client management, consultation, education, research, and administration.
2. Provide standards of behavior and performance that form the basis of professional accountability to the public.
3. Provide guidance for physical therapists facing ethical challenges, regardless of their professional roles and responsibilities.
4. Educate physical therapists, students, other health care professionals, regulators, and the public regarding the core values, ethical principles, and standards that guide the professional conduct of the physical therapist.
5. Establish the standards by which the American Physical Therapy Association can determine if a physical therapist has engaged in unethical conduct.

No code of ethics is exhaustive, nor can it address every situation. Physical therapists are encouraged to seek additional advice or consultation in instances where the guidance of the Code of Ethics may not be definitive.

This Code of Ethics is built upon the five roles of the physical therapist (management of patients/clients, consultation, education, research, and administration), the core values of the profession, and the multiple realms of ethical action (individual, organizational, and societal). Physical therapist practice is guided by a set of seven core values: accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility. Throughout the document, the primary core values that support specific principles are indicated in parentheses. Unless a specific role is indicated in the principle, the duties and obligations being delineated pertain to the five roles of the physical therapist. Fundamental to the Code of Ethics is the special obligation of physical therapists to empower, educate and enable those with impairments, activity limitations, participation restrictions and disabilities to facilitate greater independence, health, wellness, and enhanced quality of life.

Principles

PRINCIPLE 1

Physical therapists shall respect the inherent dignity and rights of all individuals.

(Core values: Compassion, integrity)

1A. Physical therapists shall act in a respectful manner toward each person regardless of age, gender, race, nationality, religion, ethnicity, social or economic status, sexual orientation, health condition, or disability.

1B. Physical therapists shall recognize their personal biases and shall not discriminate against others in physical therapist practice, consultation, education, research, and administration.

PRINCIPLE 2

Physical therapists shall be trustworthy and compassionate in addressing the rights and needs of patients/clients.

(Core values: Altruism, compassion, professional duty)

2A. Physical therapists shall adhere to the core values of the profession and shall act in the best interests of patients/clients over the interests of the physical therapist.

2B. Physical therapists shall provide physical therapy services with compassionate and caring behaviors that incorporate the individual and cultural differences of patients/clients.

2C. Physical therapists shall provide the information necessary to allow patients or their surrogates to make informed decisions about physical therapy care or participation in clinical research.

2D. Physical therapists shall collaborate with patients/clients to empower them in decisions about their health care.

2E. Physical therapists shall protect confidential patient/ client information and may disclose confidential information to appropriate authorities only when allowed or as required by law.

PRINCIPLE 3

Physical therapists shall be accountable for making sound professional judgments.

(Core values: Excellence, integrity)

3A. Physical therapists shall demonstrate independent and objective professional judgment in the patient's/client's best interest in all practice settings.

3B. Physical therapists shall demonstrate professional judgment informed by professional standards, evidence (including current literature and established best practice), practitioner experience, and patient/client values.

3C. Physical therapists shall make judgments within their scope of practice and level of expertise and shall communicate with, collaborate with, or refer to peers or other health care professionals when necessary.

3D. Physical therapists shall not engage in conflicts of interest that interfere with professional judgment.

3E. Physical therapists shall provide appropriate direction of and communication with physical therapist assistants and support personnel.

PRINCIPLE 4

Physical therapists shall demonstrate integrity in their relationships with patients/clients, families, colleagues, students, research participants, other health care providers, employers, payers, and the public.

(Core value: Integrity)

4A. Physical therapists shall provide truthful, accurate, and relevant information and shall not make misleading representations.

4B. Physical therapists shall not exploit persons over whom they have supervisory, evaluative or other authority (e.g., patients/clients, students, supervisees, research participants, or employees).

4C. Physical therapists shall discourage misconduct by health care professionals and report illegal or unethical acts to the relevant authority, when appropriate.

4D. Physical therapists shall report suspected cases of abuse involving children or vulnerable adults to the appropriate authority, subject to law.

4E. Physical therapists shall not engage in any sexual relationship with any of their patients/clients, supervisees, or students.

4F. Physical therapists shall not harass anyone verbally, physically, emotionally, or sexually.

PRINCIPLE 5

Physical therapists shall fulfill their legal and professional obligations.

(Core values: Professional duty, accountability)

5A. Physical therapists shall comply with applicable local, state, and federal laws and regulations.

5B. Physical therapists shall have primary responsibility for supervision of physical therapist assistants and support personnel.

5C. Physical therapists involved in research shall abide by accepted standards governing protection of research participants.

5D. Physical therapists shall encourage colleagues with physical, psychological, or substance-related impairments that may adversely impact their professional responsibilities to seek assistance or counsel.

5E. Physical therapists who have knowledge that a colleague is unable to perform their professional responsibilities with reasonable skill and safety shall report this information to the appropriate authority.

5F. Physical therapists shall provide notice and information about alternatives for obtaining care in the event the physical therapist terminates the provider relationship while the patient/client continues to need physical therapy services.

PRINCIPLE 6

Physical therapists shall enhance their expertise through the lifelong acquisition and refinement of knowledge, skills, abilities, and professional behaviors.

(Core value: Excellence)

6A. Physical therapists shall achieve and maintain professional competence.
6B. Physical therapists shall take responsibility for their professional development based on critical self-assessment and reflection on changes in physical therapist practice, education, health care delivery, and technology.
6C. Physical therapists shall evaluate the strength of evidence and applicability of content presented during professional development activities before integrating the content or techniques into practice.
6D. Physical therapists shall cultivate practice environments that support professional development, lifelong learning, and excellence.

PRINCIPLE 7

Physical therapists shall promote organizational behaviors and business practices that benefit patients/clients and society.

(Core values: Integrity, accountbility)

7A. Physical therapists shall promote practice environments that support autonomous and accountable professional judgments.
7B. Physical therapists shall seek remuneration as is deserved and reasonable for physical therapist services.
7C. Physical therapists shall not accept gifts or other considerations that influence or give an appearance of influencing their professional judgment.
7D. Physical therapists shall fully disclose any financial interest they have in products or services that they recommend to patients/clients.
7E. Physical therapists shall be aware of charges and shall ensure that documentation and coding for physical therapy services accurately reflect the nature and extent of the services provided.
7F. Physical therapists shall refrain from employment arrangements, or other arrangements, that prevent physical therapists from fulfilling professional obligations to patients/clients.

PRINCIPLE 8

Physical therapists shall participate in efforts to meet the health needs of people locally, nationally, or globally

(Core value: Social responsibility)

8A. Physical therapists shall provide pro bono physical therapy services or support organizations that meet the health needs of people who are economically disadvantaged, uninsured, and underinsured.
8B. Physical therapists shall advocate to reduce health disparities and health care inequities, improve access to health care services, and address the health, wellness, and preventive health care needs of people.
8C. Physical therapists shall be responsible stewards of health care resources and shall avoid overutilization or under-utilization of physical therapy services.
8D. Physical therapists shall educate members of the public about the benefits of physical therapy and the unique role of the physical therapist.

PROFESSIONALISM IN PHYSICAL THERAPY: CORE VALUES

BOD P05-04-02-03 [Amended BOD 08-03-04-10]

Core Values	Definition	Sample Indicators
Accountability	Accountability is active acceptance of the responsibility for the diverse roles, obligations, and actions of the physical therapist, including self-regulation and other behaviors that positively influence patient/client outcomes, the profession and the health needs of society.	1. Responding to patient's/client's goals and needs. 2. Seeking and responding to feedback from multiple sources. 3. Acknowledging and accepting consequences of his/her actions. 4. Assuming responsibility for learning and change. 5. Adhering to code of ethics, standards of practice, and policies/procedures that govern the conduct of professional activities. 6. Communicating accurately to others (payers, patients/clients, other health care providers) about professional actions. 7. Participating in the achievement of health goals of patients/clients and society. 8. Seeking continuous improvement in quality of care. 9. Maintaining membership in APTA and other organizations. 10. Educating students in a manner that facilitates the pursuit of learning.
Altruism	Altruism is the primary regard for or devotion to the interest of patients/clients, thus assuming the fiduciary responsibility of placing the needs of the patient/client ahead of the physical therapist's self interest.	1. Placing patient's/client's needs above the physical therapists. 2. Providing pro-bono services. 3. Providing physical therapy services to underserved and underrepresented populations. 4. Providing patient/client services that go beyond expected standards of practice. 5. Completing patient/client care and professional responsibility prior to personal needs.

Core Values	Definition	Sample Indicators
Compassion/ Caring	Compassion is the desire to identify with or sense something of another's experience; a precursor of caring. Caring is the concern, empathy, and consideration for the needs and values of others.	1. Understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment. 2. Understanding an individual's perspective. 3. Being an advocate for patient's/client's needs. 4. Communicating effectively, both verbally and non-verbally, with others taking into consideration individual differences in learning styles, language, and cognitive abilities, and so on. 5. Designing patient/client programs/interventions that are congruent with patient/client needs. 6. Empowering patients/clients to achieve the highest level of function possible and to exercise self-determination in their care. 7. Focusing on achieving the greatest well-being and the highest potential for a patient/client. 8. Recognizing and refraining from acting on one's social, cultural, gender, and sexual biases. 9. Embracing the patient's/client's emotional and psychological aspects of care. 10. Attending to the patient's/client's personal needs and comforts. 11. Demonstrating respect for others and considering others as unique and of value.
Excellence	Excellence is physical therapy practice that consistently uses current knowledge and theory while understanding personal limits, integrates judgment and the patient/ client perspective, embraces advancement, challenges mediocrity, and works toward development of new knowledge.	1. Demonstrating investment in the profession of physical therapy. 2. Internalizing the importance of using multiple sources of evidence to support professional practice and decisions. 3. Participating in integrative and collaborative practice to promote high quality health and educational outcomes. 4. Conveying intellectual humility in professional and interpersonal situations. 5. Demonstrating high levels of knowledge and skill in all aspects of the profession. 6. Using evidence consistently to support professional decisions. 7. Demonstrating a tolerance for ambiguity. 8. Pursuing new evidence to expand knowledge. 9. Engaging in acquisition of new knowledge throughout one's professional career. 10. Sharing one's knowledge with others. 11. Contributing to the development and shaping of excellence in all professional roles.
Integrity	Integrity is steadfast adherence to high ethical principles or professional standards; truthfulness, fairness, doing what you say you will do, and "speaking forth" about why you do what you do.	1. Abiding by the rules, regulations, and laws applicable to the profession. 2. Adhering to the highest standards of the profession (practice, ethics, reimbursement, Institutional Review Board [IRB], honor code, and so on). 3. Articulating and internalizing stated ideals and professional values. 4. Using power (including avoidance of use of unearned privilege) judiciously. 5. Resolving dilemmas with respect to a consistent set of core values. 6. Being trustworthy. 7. Taking responsibility to be an integral part in the continuing management of patients/clients. 8. Knowing one's limitations and acting accordingly. 9. Confronting harassment and bias among ourselves and others. 10. Recognizing the limits of one's expertise and making appropriate referrals. 11. Choosing employment situations that are congruent with practice values and professional ethical standards. 12. Acting on the basis of professional values even when the results of the behavior may place oneself at risk.
Professional Duty	Professional duty is the commitment to meeting one's obligations to provide effective physical therapy services to patients/clients, to serve the profession, and to positively influence the health of society.	1. Demonstrating beneficence by providing "optimal care." 2. Facilitating each individual's achievement of goals for function, health, and wellness. 3. Preserving the safety, security and confidentiality of individuals in all professional contexts. 4. Getting involved in professional activities beyond the practice setting. 5. Promoting the profession of physical therapy. 6. Mentoring others to realize their potential. 7. Taking pride in one's profession.
Social Responsibility	Social responsibility is the promotion of a mutual trust between the profession and the larger public that necessitates responding to societal needs for health and wellness.	1. Advocating for the health and wellness needs of society including access to health care and physical therapy services. 2. Promoting cultural competence within the profession and the larger public. 3. Promoting social policy that effect function, health, and wellness needs of patients/clients. 4. Ensuring that existing social policy is in the best interest of the patient/client. 5. Advocating for changes in laws, regulations, standards, and guidelines that affect physical therapist service provision. 6. Promoting community volunteerism. 7. Participating in political activism. 8. Participating in achievement of societal health goals. 9. Understanding of current communitywide, nationwide and worldwide issues and how they impact society's health and well-being and the delivery of physical therapy. 10. Providing leadership in the community. 11. Participating in collaborative relationships with other health practitioners and the public at large. 12. Ensuring the blending of social justice and economic efficiency of services.

STANDARDS OF ETHICAL CONDUCT FOR THE PHYSICAL THERAPIST ASSISTANT

HOD S06-09-20-18 [Amended HOD S06-00-13-24; HOD 06-91-06-07; Initial HOD 06-82-04-08] [Standard]

Preamble

The Standards of Ethical Conduct for the Physical Therapist Assistant (Standards of Ethical Conduct) delineate the ethical obligations of all physical therapist assistants as determined by the House of Delegates of the American Physical Therapy Association (APTA). The Standards of Ethical Conduct provide a foundation for conduct to which all physical therapist assistants shall adhere. Fundamental to the Standards of Ethical Conduct is the special obligation of physical therapist assistants to enable patients/clients to achieve greater independence, health and wellness, and enhanced quality of life.

No document that delineates ethical standards can address every situation. Physical therapist assistants are encouraged to seek additional advice or consultation in instances where the guidance of the Standards of Ethical Conduct may not be definitive.

Standards

Standard No. 1: Physical therapist assistants shall respect the inherent dignity and rights of all individuals.

1A. Physical therapist assistants shall act in a respectful manner toward each person regardless of age, gender, race, nationality, religion, ethnicity, social or economic status, sexual orientation, health condition, or disability.

1B. Physical therapist assistants shall recognize their personal biases and shall not discriminate against others in the provision of physical therapy services.

Standard No. 2: Physical therapist assistants shall be trustworthy and compassionate in addressing the rights and needs of patients/clients.

2A. Physical therapist assistants shall act in the best interests of patients/clients over the interests of the physical therapist assistant.

2B. Physical therapist assistants shall provide physical therapy interventions with compassionate and caring behaviors that incorporate the individual and cultural differences of patients/clients.

2C. Physical therapist assistants shall provide patients/clients with information regarding the interventions they provide.

2D. Physical therapist assistants shall protect confidential patient/client information and, in collaboration with the physical therapist, may disclose confidential information to appropriate authorities only when allowed or as required by law.

Standard No. 3: Physical therapist assistants shall make sound decisions in collaboration with the physical therapist and within the boundaries established by laws and regulations.

3A. Physical therapist assistants shall make objective decisions in the patient's/client's best interest in all practice settings.

3B. Physical therapist assistants shall be guided by information about best practice regarding physical therapy interventions.

3C. Physical therapist assistants shall make decisions based upon their level of competence and consistent with patient/client values.

3D. Physical therapist assistants shall not engage in conflicts of interest that interfere with making sound decisions.

3E. Physical therapist assistants shall provide physical therapy services under the direction and supervision of a physical therapist and shall communicate with the physical therapist when patient/client status requires modifications to the established plan of care.

Standard No. 4: Physical therapist assistants shall demonstrate integrity in their relationships with patients/clients, families, colleagues, students, other health care providers, employers, payers, and the public.

4A. Physical therapist assistants shall provide truthful, accurate, and relevant information and shall not make misleading representations.

4B. Physical therapist assistants shall not exploit persons over whom they have supervisory, evaluative or other authority (e.g. patients/clients, students, supervisees, research participants, or employees).

4C. Physical therapist assistants shall discourage misconduct by health care professionals and report illegal or unethical acts to the relevant authority, when appropriate.

4D. Physical therapist assistants shall report suspected cases of abuse involving children or vulnerable adults to the supervising physical therapist and the appropriate authority, subject to law.

4E. Physical therapist assistants shall not engage in any sexual relationship with any of their patients/clients, supervisees, or students.

4F. Physical therapist assistants shall not harass anyone verbally, physically, emotionally, or sexually.

Standard No. 5: Physical therapist assistants shall fulfill their legal and ethical obligations.

5A. Physical therapist assistants shall comply with applicable local, state, and federal laws and regulations.

5B. Physical therapist assistants shall support the supervisory role of the physical therapist to ensure quality care and promote patient/client safety.

5C. Physical therapist assistants involved in research shall abide by accepted standards governing protection of research participants.

5D. Physical therapist assistants shall encourage colleagues with physical, psychological, or substance-related impairments that may adversely impact their professional responsibilities to seek assistance or counsel.

5E. Physical therapist assistants who have knowledge that a colleague is unable to perform their professional responsibilities with reasonable skill and safety shall report this information to the appropriate authority.

Standard No. 6: Physical therapist assistants shall enhance their competence through the lifelong acquisition and refinement of knowledge, skills, and abilities.

6A. Physical therapist assistants shall achieve and maintain clinical competence.

6B. Physical therapist assistants shall engage in lifelong learning consistent with changes in their roles and responsibilities and advances in the practice of physical therapy.

6C. Physical therapist assistants shall support practice environments that support career development and lifelong learning.

Standard No. 7: Physical therapist assistants shall support organizational behaviors and business practices that benefit patients/clients and society.

7A. Physical therapist assistants shall promote work environments that support ethical and accountable decision-making.

7B. Physical therapist assistants shall not accept gifts or other considerations that influence or give an appearance of influencing their decisions.
7C. Physical therapist assistants shall fully disclose any financial interest they have in products or services that they recommend to patients/clients.
7D. Physical therapist assistants shall ensure that documentation for their interventions accurately reflects the nature and extent of the services provided.
7E. Physical therapist assistants shall refrain from employment arrangements, or other arrangements, that prevent physical therapist assistants from fulfilling ethical obligations to patients/clients.

Standard No. 8: Physical therapist assistants shall participate in efforts to meet the health needs of people locally, nationally, or globally

8A. Physical therapist assistants shall support organizations that meet the health needs of people who are economically disadvantaged, uninsured, and underinsured.
8B. Physical therapist assistants shall advocate for people with impairments, activity limitations, participation restrictions, and disabilities in order to promote their participation in community and society.
8C. Physical therapist assistants shall be responsible stewards of health care resources by collaborating with physical therapists in order to avoid overutilization or underutilization of physical therapy services.
8D. Physical therapist assistants shall educate members of the public about the benefits of physical therapy.

ETHICS FOR PHYSICAL THERAPISTS AND PHYSICAL THERAPIST ASSISTANTS: A ROADMAP

Introduction

This monograph overviews professional ethics and related jurisprudential concepts relevant to physical therapists and physical therapist assistants. Before commencing your study of the monograph's contents, look carefully at the five global objectives below and take the 20 multiple-choice-question pre-course self-assessment.

The monograph topics include: (1) sources of ethical and legal obligations, (2) the modern blending of health law and professional ethics, and (3) an analysis of the American Physical Therapy Association's Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant, presented through hypothetical case vignettes and self-paced exercises.

At the end of this course, please take the post-course assessment instrument, and compare your performance before and after instruction. I wish you all the best in your clinical practices, and thank you for your superlative service to patients and clients under your care, and to their significant others.

Pre-course assessment

1. An example of a federal statutory law is:
   a. A malpractice case decision.
   b. An American Physical Therapy Association Ethics and Judicial Committee advisory opinion.
   c. HIPAA (The Health Insurance Portability and Accountability Act).
   d. A licensing board administrative ruling.
2. An example of a state regulatory directive is:
   a. The Texas Executive Council of Physical Therapy's requirement to pass a jurisprudence exam every two years upon relicensure.
   b. OSHA (Occupational Safety and Health Administration) safety standards.
   c. A state-level malpractice case decision.
   d. An IRS letter ruling to a taxpayer.
3. Courts generally require _____ evidence of an incapacitated patient's intent in order to order withdrawal of artificial hydration and nutrition.
   a. Beyond a reasonable doubt.
   b. Substantial evidence.
   c. Clear and convincing.
   d. Preponderance, or greater weight, of evidence.
4. A patient suing a physical therapist for malpractice is called a:
   a. Dissatisfied customer.
   b. Plaintiff.
   c. Petitioner.
   d. Respondent.
5. How many different legal systems are there in the U.S.?
   a. One.
   b. Two.
   c. 51.
   d. Thousands, counting federal, state and municipal systems.
6. The American Physical Therapy Association's Code of Ethics for the Physical Therapist addresses patient informed consent in:
   a. Principle 2C of the code.
   b. Very specific terms.
   c. Terms of clinical and research settings.
   d. (a) and (c) are both correct.
7. HIPAA, the Health Insurance Portability and Accountability Act, is inapplicable:
   a. In military treatment settings.
   b. In workers' compensation cases.
   c. In certain states.
   d. Involving minors.
8. The elements of the ethical principle of justice includes all except:
   a. Patient access to health care services.
   b. Cost of health care service delivery.
   c. Quality of health care service delivery.
   d. Applicability of clinical practice guidelines.
9. The American Physical Therapy Association's Code of Ethics for the Physical Therapist was most recently revised to include for the first time:
   a. Pro bono service expectations of physical therapists.
   b. Prohibition of sexual relations with patients.
   c. Core values.
   d. Overutilization of physical therapy services.
10. The enumerated ethical obligations in the Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant closely mirror one another.
    O True O False
11. The requirement to participate in pro bono advocacy or service delivery to indigent patients is limited by American Physical Therapy Association core ethics documents to physical therapists.
    O True O False

Note: During the course, please refer to the American Physical Therapy Association's Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant provided at the beginning of this section. These documents are available for viewing, along with other core ethics reference documents, at *www.apta.org*. Suggested answers and approaches to questions posed appear at the end of the monograph.

Disclaimer: The materials presented herein are informational in nature, and are not intended to provide legal advice for any individual physical therapist or physical therapist assistant. Individual legal advice can only be rendered by one's personal attorney, based on state-specific o federal law, as indicated. Similarly, the ethical and legal examples provided in this monograph are purely hypothetical, and not based on any real-life scenarios. No reference is intended to any individual or entity with these presentations. Finally, my interpretations of ethics is my own, and not necessarily that of the American Physical Therapy Association, or its Ethics and Judicial Committee. For real-life scenarios, the Ethics and Judicial Committee may be able to provide advisory opinions to physical therapists and assistants who are members of the American Physical Therapy Association.

Physical therapists, like other co-primary holistic health professional colleagues within the traditional medical model (physicians, surgeons, advance-practice nurses and physician assistants), are charged by society with the highest ethical and legal standards owed to patients and clients under their care. Like other doctoring co-professionals, they are fiduciaries to their patients. As such, physical therapists (and physical therapist assistants as their extenders) are required to place patients' best interests above all others, including personal and organizational business interests.

There are five hierarchal sources of blended legal and professional ethical obligations governing the practices of physical therapists and physical therapist assistants. They follow in top-down order, focusing in this case on protection of patients' autonomy right to privacy. Federal Constitutional standards affecting health care, particularly the implicit First and Fourth amendments-based constitutional right of patient privacy while being treated in federal and state public facilities, require that physical therapists and physical therapist assistants respect and protect patient privacy and autonomy over care-related decision-making. (Keep in mind that state constitutions may augment federal constitutional protections, but not derogate from federal constitutional baseline protections.)

Federal treaty obligations require public and private businesses to abide by their provisions. Relevant to physical therapy, the North Atlantic Free Trade Agreement (1994) should allow for relatively seamless movement of licensed physical therapists between and among Canada, the United States and Mexico in order to work in any of the three nations.

Statutes are legislative-branch laws that are enacted at the federal (Congress) and state (legislature) levels. HIPAA – the Health Insurance Portability and Accountability Act – is an example of a federal privacy statute. State medical marijuana statutes, like the one in place in California since 1996, are examples of state-level statutes enacted by respective state legislatures.

Judicial, or judge-made, case law decisions are specific court case decisions affecting two or more parties, called the plaintiff (the party suing) and defendant (the party being sued). A jury or judge may decide whether a plaintiff wins a physical therapy malpractice lawsuit and is awarded money damages in order to make the plaintiff "whole."

There are at least 51 court systems in the United States (50 states plus the federal system), all potentially having different substantive laws and procedural rules. (One must also keep in mind that there are 14 United States territories, including, among others, Puerto Rico, which have their own judicial laws and standards.) A court decision from a state's highest-level court provides precedential (binding) authority to other courts within that state, and persuasive authority to other states, territories and the federal court system.

The Nancy Cruzan case (*Cruzan v. Director, Missouri Department of Health*, 497 U.S. 261 (1990)) is a legal-medical privacy case that was heard in both the Missouri state and federal court systems. It concerned the right of a patient in a persistent vegetative state (where the patient exhibits motor reflexes but lacks cognition) to terminate artificial hydration and nutrition, resulting in the patient's death. In that case, the Missouri trial-level court and the United States Supreme Court agreed that "clear and convincing evidence" of a patient's wishes is required before such actions can be undertaken.

The fifth level of legal obligation is concerned with administrative or regulatory laws. Like constitutions, statutes and case law, administrative regulations exist at the federal and state levels. An example of a federal regulation is the Internal Revenue Code governing the payment of federal income taxes. An example of a state regulation is a state insurance commission rule requiring physical therapists to carry professional liability insurance in order to practice.

This fifth level of legal obligation – compliance with administrative rules and regulations – is the most pervasive legal authority affecting physical therapists' and physical therapist assistants' practices. Unlike constitutions, statues and case law pronouncements, administrative standards are also promulgated at the municipal level, meaning that there are literally tens of thousands of jurisdictions exercising power over physical therapy professionals and others similarly situated, through widely divergent rules and regulations.

In sum then, the professional activities of physical therapists and physical therapist assistants are governed by five hierarchical sources of legal authority, which are, in descending order: the Constitution, international treaty obligations, federal and state statutes, judge-made case law, and regulatory agency directives at federal, state and municipal levels of authority. According to the late Dr. Kenneth Culp Davis – the "father of administrative law" – physical therapists and assistants have the most interface on a daily basis with regulatory agencies in carrying out their professional endeavors.

Traditionally, four sources of ethical obligations incumbent upon physical therapist and physical therapist assistants are recognized – beneficence, nonmaleficence, respect for patient autonomy, and the quest for justice in health care delivery. They are explored in greater detail below.

Beneficence is a derivative of a 15th century Latin word "beneficentia," meaning "doing good." As licensed health care professionals, physical therapists and physical therapist assistants are charged to "do good" on behalf of patients under their care. This basic biomedical ethical principle has been expanded modernly to mean "acting in patients' best interests," which means that physical therapists and assistants must act as fiduciaries toward their patients and clients.

Exercise 1:

Consider the following ethical dilemma. In caring for a patient referred for worker's compensation system evaluation and intervention, to whom is the duty of beneficence owed – the patient-client, or the client's employer? Inconsistent and contradictory case and statutory law muddle the situation and do not necessarily provide a definitive answer. Even the HIPAA Privacy Rule (applicable to all health care providers who transmit patient information electronically) is inapplicable in worker's compensation cases.

By remembering that every physical therapist and assistant has the fundamental ethical duty to act in every patient's best interests, the solution becomes self-evident – the duty owed to the patient is paramount, and all other duties are subordinate.

The American Physical Therapy Association's Code of Ethics for the Physical Therapist addresses beneficence in Principle 2A, in which it states that physical therapists must act in the best interests of patients and clients, over their own personal interests. Which Standard of Ethical Conduct for the Physical Therapist Assistant, if any, addresses beneficence? Hint: The applicable standard under the Standards of Conduct for the Physical Therapist Assistant mirrors that applicable to physical therapists.

Nonmaleficence literally means "do no harm." However, the practicalities of health care clinical practice require that certain examination parameters and interventions result in some physical discomfort to patients under care. Practically, then nonmaleficence requires clinical health care providers, including physical therapists and physical therapist assistants, to do no malicious intentional harm to patients under their care. Examples of malicious intentional harm might include sexual battery committed by a physical therapist upon a patient, or spanking a disobedient pediatric patient, even if done at the child's parents' request.

Respect for patient **autonomy** entails respecting patients' fundamental right of self-determination over their bodies, and over what is done to them by others. Every adult patient having mental capacity has the fundamental human right to decide what happens to him or her at the hands of others. This fundamental right is reflected in the concept of patient informed consent to clinical examination and intervention. Under the doctrine of informed consent, clinical health care professionals – including physical therapists as primary providers – have the ethical duty to disclose the following to patients under their care:

- Basic information about the examination and proposed clinical interventions.
- The patient's medical and physical therapy diagnoses.
- The expected benefits of proposed therapeutic interventions.
- Material (decisional) risks of possible harm to the patient from recommended interventions.
- A summary of alternatives to proposed interventions, if any, and their respective benefits and risks.

Exercise 2:

Consider the following recent report from the New York Times (McNeil, Oct. 1, 2010). From 1946 to 1948, American public health physicians intentionally infected some 700 Guatemalans with venereal disease in order to assess the effectiveness of penicillin as a cure. As part of the "experiment," syphilis-infected prostitutes were paid to have sex with Guatemalan prisoners, and some prisoners allegedly even had syphilitic bacteria poured onto induced open wounds or were injected with syphilis via spinal punctures.

Which fundamental biomedical ethical principles was/were violated by these acts? All four were violated by these gruesome experiments, including: beneficence, nonmaleficence, respect for patient autonomy, and justice.

These "researchers" personified the antithesis of fiduciary duties in their interaction with these patients. Secretary of State Hillary Rodham Clinton and Health and Human Services Secretary Kathleen Sebelius apologized to Guatemalan President Álvaro Colom, to the Guatemalan people, and especially to the survivors and descendants of the victims of this medical experiment, labeling researchers' conduct "clearly unethical." [The misconduct was uncovered in University of Pittsburgh archives by Wellesley College medical historian Prof. Susan M. Reverby.]

The American Physical Therapy Association's Code of Ethics for the Physical Therapist addresses physical therapists' ethical duties concerning patient informed consent in general terms. Look at the Code of Ethics for the Physical Therapist, and decide which principle addresses informed consent. If you chose Principle 2C, you are correct.

The ethical concept of **justice** reflects aspirations and endeavors in support of ensuring equal access to high-quality health care by all patients and clients, at an affordable cost. As primary health care professionals and support professionals, physical therapists and physical therapist assistants are in the vanguard of advocating for, and taking necessary steps to, ensure equality of access to physical therapy services for patients and clients they serve. [For more detailed analysis of the triad of access-cost-quality, see Sultz H. and Young K. *Health Care USA: Understanding Its Organization and Delivery,* 6th ed. 2008, Jones & Bartlett Publishers.]

The quest for justice in health care delivery is a bifurcated one, occurring simultaneously at the micro- or individual level, and at the macro- or societal level. Macro-level health care-related justice refers to how distinct groups of people with health problems are treated by the health care delivery system. Micro-level justice issues address how different individuals are cared for within the health care delivery system.

The Affordable Care Act, signed into law by President Barack Obama on March 30, 2010, reflects the federal government's commitment to facilitate justice in health care delivery for citizens and legal residents at both societal and individual patient levels. This controversial federal statute, when fully enacted in 2014, prohibits health insurers from dropping subscribers when they become sick, extends health coverage to more children, ends lifetime limits on health insurance coverage, and requires insurance companies to include preventive services for patients without cost-sharing. For more information on the law and its provisions, please access *www.healthcare.gov*

Augmenting the four fundamental biomedical ethical principles are "core values," which are individual or collective values that govern how and why we work and interact with others. Like the more global fundamental biomedical ethical principles already described above, core values are constant in nature, clarify who we are and what we stand for, and guide us in making important professional and personal decisions. The American Physical Therapy Association recently published its list of seven core values governing the conduct of member-physical therapists and physical therapist assistants. They are:

- **Accountability** (to patients and others for our decisions, judgments and actions).
- **Altruism** (an unselfish concern for patients' welfare).
- **Compassion** (empathy for patients' conditions, and the desire and will to alleviate their suffering).
- **Excellence** (consistent superlative performance of professional duties).
- **Integrity** (internal consistency of values, actions and outcomes, reflected in honesty and truthfulness).
- **Professional duty** (first and foremost, to patients under our care).
- **Social responsibility** (actively contributing to the betterment of society and its people, rather than focusing primarily on generating revenue or amassing personal wealth).

While the list of core values above, developed by the American Physical Therapy Association, reflects the professional association's viewpoint of what values its members possess, individual physical therapists and physical therapist assistants may have more expansive lists of individual core values reflecting their worldviews. My list of personal core values has 14 elements, including:

1. Accountability.
2. Advocacy.
3. Altruism.
4. Autonomy.
5. Compassion.
6. Empathy.
7. Fiduciary duty.

8. Lifelong learning.
9. Loyalty.
10. Patience.
11. Social responsibility.
12. Staying focused under stress.
13. Team play.
14. Truthfulness.

Reflect on the core values that define you individually as a physical therapist or physical therapist assistant. Write them down in the form of one- or several-word descriptors for each core value.

In summary, legal duties incumbent upon physical therapists and physical therapist assistants are defined by the Constitution (and complementary state constitutions), international treaties, federal and state statutory laws, judge-made case law, and administrative agency rules and regulations. Ethical duties incumbent upon physical therapists and assistants are grounded in the four foundational biomedical ethical principles of beneficence, nonmaleficence, respect for patient autonomy, and the quest for justice in health care delivery, augmented by descriptive core values at individual, organization, system or association levels.

While in ancient times, there existed a bright-line distinction between legal and ethical duties, today these two complementary sets of standards are melded into a unitary standard of conduct for health professionals, including physical therapists and physical therapist assistants. In medieval times, there were separate "law" and "equity" courts that decided court cases and heard disputes centered on fundamental fairness, respectively. By the end of the Middle Ages, these two legal systems were merged into one, a system still exists today.

Modern-day courts regularly refer to ethical standards, such as the American Physical Therapy Association's core ethics documents, in order to ascertain what customary practice standards are.

Perhaps the best example of blended ethical-legal standards is each state's licensing statutes, regulations and advisory opinions governing the licensed health professional practice of in-state physical therapists and assistants. Remember that while all state health professional licensing statutes are grounded in the same four fundamental biomedical ethical principles and similar core values, each of the 50 state licensing laws governing the practices of in-state physical therapists and assistants is unique, with slight variations based on disparate customs, mores and standards.

Interestingly, the discipline of physical therapy, with its two professions – physical therapist and physical therapist assistant – is one of the few professions that is characterized by two separate codes of ethics for members within a single professional association, the American Physical Therapy Association. The Code Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistants mirror and complement one another, each encompassing ethical requirements appropriate for each profession's domain of practice.

Each ethics document contains a preamble. The preambles to the Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant delineate the principle purposes for the requirements within the bodies of the documents, which are similar to those of state licensing regulations. The broader enumerated purposes of the Code of Ethics for the Physical Therapist are to educate physical therapists and assistants on their ethical duties, and to provide a framework for public accountability for member-physical therapists and physical therapist assistants. The principle stated purpose for the Standards of Ethical Conduct for the Physical Therapist Assistant in its preamble is physical therapist assistants' obligation to enable patients and clients to achieve greater independence, health and wellness, and enhanced quality of life.

At least two points of critique about the American Physical Therapy Association's Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant are noteworthy.

First, this iteration of the association's ethics documents, effective July 1, 2010, represents the fourth substantive revision of ethical code provisions and standards for member physical therapists and assistants in the past 15 years. While ethical standards do evolve (typically slowly) over time with changing social values, expectations and mores, too-frequent changes to a primary health discipline's ethics standards may confuse professionals and the patient-public, as to what are physical therapists' and assistants' ethical obligations to them.

Second, while each of the principles in the current version of the Code of Ethics for the Physical Therapist makes brief parenthetical references to selected core values, similar references to these new core values or professional duties do not complement the Standards of Ethical Conduct for the Physical Therapist Assistant, which should be corrected as a matter of clarity and equity.

At the time of the writing of this monograph (October 2010), new versions of the explanatory *Guide for Professional Conduct* and *Guide for Conduct of the Physical Therapist Assistant* were not publicly available on the American Physical Therapy Association's website. Instead, members of the two professions and the patient-public were referred by the Ethics and Judicial Committee to the Code of Ethics for the Physical Therapist and Standards of Ethical Conduct for the Physical Therapist Assistant, respectively, for information about ethics standards.

Both core ethics documents of the American Physical Therapy Association – the Code of Ethics for the Physical Therapist and the Standards of Ethical Conduct for the Physical Therapist Assistant – contain eight major divisions. Each is examined in detail below.

Exercise 3:
In order to become familiar globally with the closely mirrored content of these two documents, review them, then come up with a one-to-three-word descriptor for each principle and standard. List them, before reviewing the suggested descriptors at the end of the module.

Principle 1 of the Code of Ethics for the Physical Therapist and Standard 1 of the Standards of Ethical Conduct for the Physical Therapist Assistant virtually mirror each other, requiring physical therapists and assistants: to respect the rights and dignity of all individuals (1A); to recognize and sublimate their personal biases; and to not discriminate against any recipient of physical therapy services in any practice setting (1B).

Principle 2 of the Code of Ethics for the Physical Therapist and Standard 2 of the Standards of Ethical Conduct for the Physical Therapist Assistant address physical therapists' and assistants' trustworthiness and compassion toward patients. Both Principle 2A (for physical therapists) and Standard 2A require members to practice beneficence by acting in patients' best interests. Principle 2A additional binds physical therapists to adhere to the association's new core values. Principle and Standard 2B address compassionate patient care and respect for cultural diversity. Principle 2C and Standard 2C address providing patients with disclosure information sufficient for them to make informed treatment decisions. Principle 2D requires physical therapists to collaborate with, and empower, patients under their care. Principle 2E and Standard 2D require physical therapists and assistants to respect patient confidentiality, but go on to say that they "may" disclose confidential patient information to authorities when allowed or required by law. These provisions are somewhat unclear, and seem to sanction permissive or elective disclosure of patient data by physical therapists and assistants, even when the law otherwise requires it.

Principle 3 and Standard 3 address sound professional judgment and decisions, respectively. Each contains five

sections, which should be reviewed before addressing the following hypothetical exemplar.

Exercise 4:
A is a physical therapist in a solo private practice. B is A's part-time staff physical therapist assistant. C is a patient referred by Dr. D for sharp debridement of a necrotic diabetic right foot ulcer. A is relatively unfamiliar with sharp debridement, but B has had substantial wound care experience. Is it appropriate for A to delegate C's wound care to B?

Principle 4 and Standard 4 (each with seven sections) are virtually identical, addressing physical therapist and assistant integrity in interacting with patients and their significant others, professional colleagues (including referring entities and students), employers, payers and the general public. Perhaps more than any other standard, Standard 4 illustrates the autonomous professional status of physical therapist assistants, in that it requires physical therapist assistants to exercise independent judgment to report illegal or unethical comportment by other health professionals – including supervising physical therapists – to administrative and legal authorities, when warranted (Standard 4C). Consider the following hypothetical example, based on Standard and Principle 4.

Exercise 5:
E is a 20-year-old male physical therapy aide employed at ABC Hospital. F is a 19-year-old female inpatient, receiving inpatient physical therapy services. In part to increase non-operational revenue, ABC has a program in place to provide gourmet meals to inpatients and guests during dinner hours for a moderate fee. F invites E to join her in her hospital room this evening for a dinner-date. E shares this information with G, a supervising physical therapist assistant in the clinic. How should G respond?

Principle 5 and Standard 5 deal with physical therapists' and assistants' legal obligations. The provisions within this principle and standard mirror one another, except for the addition of principle 5F, which requires physical therapists in general terms to provide information about alternatives to patients still requiring services when the physical therapist unilaterally disengages from care of such patients.

Principle 6 and Standard 6 address continuing competence, career advancement and lifelong learning. Principle 6 is somewhat more detailed, including provisions for critical self-assessment and reflection, particularly about the strength of evidence and applicability of newly acquired professional development skills before implementation into clinical practice.

Principle 7 and Standard 7 address business and financial issues. Each document requires physical therapists and assistants to refrain from accepting gifts from patients and others that do, may, or create the impression of affecting their professional judgment (7B). Each document also requires physical therapists and assistants to reveal to patients any financial interest they may have in products and/or services recommended to patients (Principle 7D, Standard 7C). Each also holds physical therapists and assistants ethically accountable for accurate documentation and billing for professional services (Principle 7E, Standard 7D). The Principle (7F) and Standard (7E) also mandate that physical therapists and assistants avoid employment or other business arrangements that derogate from their paramount ethical and professional duties owed to patients under their care. Consider the following hypothetical case.

Exercise 6:
H is a private practice physical therapist who employs I as a staff physical therapist assistant. H's practice is in a financial crisis. As part of his financial stimulus strategy, H begins to market transcutaneous electrical nerve stimulation devices to virtually all of his patients – in many cases inappropriately – at highly inflated prices. I is aware of H's strategy to save his business, but takes no action to confront H or otherwise stop what is going on. What principles and standards have H and I violated relevant this marketing initiative? What must be I's next step(s)?

Principle 8 and Standard 8 address, in isomer fashion, the ethical obligations of physical therapists and assistants relevant to public advocacy and *pro bono publico* health care service delivery to indigent patients. Each core ethics document contains four divisions, which closely mirror and complement one another. Consider the following exemplar.

Exercise 7:
J is a physical therapist-member of the American Physical Therapy Association. J is passionate about fulfilling the biomedical ethical duty of justice for patients in her community, a large city in the Southwestern United States. How can J accomplish her goals?

Conclusions

This monograph overviews ethical duties incumbent upon physical therapists and physical therapist assistants, focusing on the ethical provisions found in the core ethics documents of the American Physical Therapy Association – the Code of Ethics for the Physical Therapist and the Standards of Ethical Conduct for the Physical Therapist Assistant. While the provisions in these two documents are directly applicable only to members of the American Physical Therapy Association, they also fairly and generally represent the ethical duties owed to patients and others, incumbent upon all physical therapists and physical therapist assistants.

As a final exercise, compare and contrast the provisions found in the American Physical Therapy Association's Code of Ethics for the Physical Therapist and the Standards of Ethical Conduct for the Physical Therapist Assistant to those mixed ethical-legal standards in your applicable state licensing statutes and implementing regulations. As practicing physical therapists and assistants, we must always adhere to applicable state licensing ethical-legal standards, and should, as a matter of principle, conform our official conduct to the provisions of both licensing law and American Physical Therapy Association ethical standards, regardless of whether we are members of the American Physical Therapy Association. In that way, we are always "good to go!"

Selected references and suggested readings

- APTA Core Ethics Documents (Code of Ethics for the Physical Therapist, Standards of Ethical Conduct for the Physical therapist Assistant), www.apta.org. Accessed Oct. 23, 2010.
- *Cruzan v. Director, Missouri Department of Health*, 497 U.S. 261 (1990).
- Scott R. *Guide for the New Health Care Professional.* 2007, Jones and Bartlett Publishers, Sudbury, MA.
- Sultz H. and Young K. *Health Care USA: Understanding Its Organization and Delivery,* 6th ed. 2008, Jones & Bartlett Publishers. Sudbury, MA.
- www.healthcare.gov. Accessed Oct. 23, 2010.
- www.hhs.gov/ocr/hipaa. Accessed Oct. 23, 2010. Take a few minutes to peruse this government web site for patients' rights and your ethical and legal obligations under the HIPAA statute.

Suggested answers and approaches to exercises posed

Exercise 1
Standard 2A of the Standards of Ethical Conduct for the Physical Therapist Assistant addresses beneficence.

Exercise 2
Although the current version of the Code of Ethics for the Physical Therapist does not delineate specific informed consent disclosure elements required of physical therapists, principle 2C does set out in general terms that physical therapists interacting with patients and clients must provide them with sufficient information necessary to make informed decisions about care or about participation as subjects in medical research.

Exercise 3
My abbreviated word descriptors for the Code of Ethics for the Physical Therapist and Standards of Conduct for the Physical Therapist Assistant provisions are as follows. For the Code of Ethics for the Physical Therapist Assistant, they are in order: (1) respect, (2) compassionate empowering fiduciary, (3) accountability, (4) integrity, (5) legality, (6) continuing competence, (7) financial responsibility, and (8) advocacy and *pro bono* service. For the Standards of Ethical Conduct for the Physical Therapist Assistant, they are: (1) respect, (2) compassionate empowering fiduciary, (3) appropriate collaborative practice, (4) integrity, (5) legality, (6) continuing competence, (7) financial responsibility, and (8) patient and professional advocacy.

Exercise 4
A may be violating Principles 3B, C and E by delegating advanced clinical care activities to B, for which A has insufficient practice experience and expertise to supervise.

Exercise 5
G should inform E that his prospective conduct constitutes an impermissible conflict of interest. As a physical therapy aide, E is not subject to the requirements of the American Physical Therapy Association's Code of Ethics for the Physical Therapist or Standards of Ethical Conduct for the Physical Therapist Assistant. G, however, is subject to professional ethical standards as a physical therapist assistant. If E does not heed G's admonition, then pursuant to Standards 4C (misconduct) and D (vulnerable adult), G must report E's prospective misconduct to the supervising physical therapist and/or other relevant authority. E's conduct may also constitute an express violation of ABC's organizational ethics standards for employees, making its prohibition more straightforward.

Exercise 6
H has arguably violated Principles 1A, 2A-D, 3A, B and D, 4A-C, 5A, 6A, 7B, D-F, and 8C. I has violated Standards 1A, 2A-C, 3A, B and E, 4A-D, 5A and E, 7A, C-E, and 8C and D. I's next steps are (1) to consult with personal legal counsel for advice, and (2) if cleared by legal counsel, to respectfully confront H, and, if H does not expeditiously and fully rectify the fraud committed on patients and third party payers, report H to legal and regulatory authorities, pursuant to Standards 4D and E, 5E, and 7A, D and E.

Exercise 7
J can work individually or in concert with other physical therapists, physical therapist assistants, and other health care professionals to achieve her goals. In her own clinical practice, J can set aside a finite number of *pro bono* patient slots, and rotate free-care patients in as existing ones are discharged. J can work with area physical therapists and assistants to form *pro bono* service networks, and share the load among many participants. The American Physical Therapy Association should consider offering organizational assistance to *pro bono* networks, at the district, state and national levels, similar to what is offered by attorney professional organizations, such as the American Bar Association.

Answers to pre-course assessment questions

1. **(c).** HIPAA, the Health Insurance Portability and Accountability Act of 1996, is designed to safeguard patient protected health information (PHI) from impermissible release to third parties.
2. **(a).** State licensing board regulations, rules, and other requirements constitute the pervasive regulatory prong of the law.
3. **(c).** Courts require clear and convincing evidence of an incapacitated person's intent in order to order withdrawal of hydration and nutrition. This higher-level legal standard is intended to respect patient autonomy over treatment-related decision-making.
4. **(a).** A patient suing a physical therapist or an assistant is called the plaintiff. The physical therapist or assistant being sued are the defendants in the case. For ethics and license board proceedings, the person being charged with a violation is called the respondent.
5. **(d).** Counting municipal legal entities, there are tens of thousands of legal "systems" affecting the practices of physical therapists and assistants within the United States.
6. **(d).** Responses (a) and (c) are both correct about the American Physical Therapy Association's Code of Ethics' treatment of patient informed consent.
7. **(b).** HIPAA, the Health Insurance Portability and Accountability Act, is inapplicable in workers' compensation cases. This is so because of the need to communicate client safety-oriented information to case workers and employers.
8. **(d).** Justice addresses how patients are treated by the health care delivery system at the societal and individual levels.
9. **(c).** Core values appear after each principle in the Code of Ethics for the Physical Therapist, but are not enumerated in the Standards of Ethical Conduct for the Physical Therapist Assistant.
10. **True.** See Suggested Answers and Approaches to Problems Posed, No. 3, above.
11. **False.** Principle 8A of the Code of Ethics for the Physical Therapist mandates that member physical therapists provide pro bono services to economically disadvantaged patients. Standard 8A of the Standards of Ethical Conduct for the Physical Therapist Assistant mandates further that member physical therapist assistants support organizations that meet the health needs of economically disadvantaged patients.

Additional activities, cases and exercises

1. Refer to pages 44-47 for the most recent version of the American Physical Therapy Code of Ethics (version July 2010). Consider the following five hypothetical activities, cases and questions based on the code's provisions and other relevant resources. Keep a brief journal of your answers, comments, ideas, questions, and suggestions generated from this exercise. After addressing all questions posed, compare and contrast your responses with those of your colleagues, and with the suggested model answers that follow the discussion.
    a. Look at the Preamble to the American Physical Therapy Association's Code of Ethics, and answer the following questions.
        i. How many express purposes of the Code of Ethics are stated in the Preamble?
        ii. How many purposes for the Code of Ethics expressly and directly address what is universally agreed to be the primary purpose of a health professional ethics code – protection of the patient-public from harm by members of the profession who might act unethically?

iii. The first narrative paragraph after the enumeration of the five purposes for the code invites physical therapists and physical therapist assistants to seek additional advice when the Code of Ethics is not clear or definitive. Where can physical therapists and assistants find such advice?
iv. How many formal American Physical Therapy Association Ethics and Judicial Committee opinions have been issued as of December 2010?
v. In the last sentence of the Preamble to the Code of Ethics, the Ethics and Judicial Committee states that the fundamental purpose of the Code of Ethics is to educate and empower the patient-public. In your clinical practice, how best can you educate your patients and their families and significant others about the American Physical Therapy Association's Code of Ethics, and your adherence to its principles and core values?

2. In how many venues (settings) may adverse actions against a physical therapist or physical therapist assistant be processed for an alleged ethics violation against a patient?
3. Consider the following scenario. A, an outpatient of physical therapist B, enters B's clinic and alleges that she was burned at home while using a heating pad that B had instructed her on, and supplied to her, during B and A's final home care education in-clinic session. B becomes angry, denies responsibility, and immediately discharges B from further care, without any other intervention. Based on these facts alone, and using the Code of Ethics as a guide, which ethical principles has B violated in her most recent interaction with A? Which core values has B breached?
4. Assume that, in the hypothetical example 3 above, that A files a written ethics complaint against B, with B's state chapter of the American Physical Therapy Association. After determining that A's complaint is valid, the chapter ethics committee chairperson mails a copy of A's complaint to B for input. What steps should B take before answering the complaint to protect her legal position and interests?
5. Principle 8 of the American Physical Therapy Association's Code of Ethics and Standard 8 of the Standards of Ethical Conduct for the Physical Therapist Assistant requires physical therapist-and physical therapist assistant-members of the American Physical Therapy Association to participate in efforts to meet patient's health needs, including providing and/or supporting *pro bono publico* patient care services to those who need them. What specific steps can physical therapist sand assistants undertake to fulfill these lofty mandates, and where can they obtain more information on how to proceed?

Suggested model answers to additional activities, cases and exercises

1. (a)(i) 5 purposes. (a)(ii) 1, Purpose 2 ("professional accountability to the public"). a(iii) Under its Resolving Disputes or Complaints tab, the American Physical Therapy Association offers several ways to find additional information about whether conduct might be unethical, principally, hire an attorney. One option not well detailed, but commonly used in this and other disciplines, is to seek a formal advisory opinion from the American Physical Therapy Association's Ethics and Judicial Committee involving an ethics issue that has not previously been addressed in the Committee's library of formal ethics opinions. a(iv) 5 Ethics and Judicial Committee opinions are delineated within the American Physical Therapy Association's Ethics and Legal resources tab. These should be perused for possible future reference at this time. a(v) (1) Post a copy of the Code of Ethics prominently in a public area of the clinic, such as in the waiting area. (2) Provide patients and visitors with interesting and succinct educational materials about the Code of Ethics and our professions' (physical therapists and physical therapist assistants) core values.
2. Because ethical and legal practice standards frequently overlap, an ethics violation committed against a patient is almost always also an unlawful act. There are at least five venues in which adverse action may occur against a licensed physical therapist or physical therapist assistant for such an allegation: (a) in civil court, in a physical therapy malpractice action brought by a patient or a patient's representative, (b) in criminal court, for a felony or misdemeanor crime, brought by a public prosecutor on behalf of a city, county, state or the federal government, (c) by the physical therapist's or assistant's state license board, for possible reprimand, or license suspension or revocation, (d) by the physical therapist's or assistant's employer for misconduct, with possible loss of employment, and (e) by the American Physical Therapy Association's Ethics and Judicial Committee for an ethics violation, if the physical therapist or assistant is a member of the American Physical Therapy Association.
3. Look carefully at the language of each of the eight principles of the Code of Ethics, and all sections within each principle, when assessing B's conduct in this case. This is the same process that a chapter president, the members of the Ethics and Judicial Committee, and a staff attorney of the American Physical Therapy Association will undertake every time an ethics complaint is lodged against a member of the association. In this hypothetical case, B appears to have violated Principles 1, 2, 3, 4, 5 and 7 of the Code of Ethics. Specifically, B failed to respect A's dignity and right to continued care with B, especially in light of the probability that B shares responsibility for A's alleged injury, in violation of Principle 1.

   B's abrupt discharge of A may also constitute legally actionable patient abandonment. A physical therapist is not free to become angry at, deny care to, or unilaterally discharge an existing patient without legal justification. B's conduct also violated Principle 2 in that it evidenced a lack of compassion, and a failure to collaborate with A in such a way as to empower her as a patient. B's abrupt, angry, self-focused conduct was not characteristic for a fiduciary and did not constitute sound professional judgment, in violation of Principle 3. B demonstrated a lack of integrity in official interpersonal relations, both with patient A and with A's referring entity, by abruptly discharging A, thus violating Principle 4. B also breached Principle 5 by not fulfilling B's legal and professional obligations, specifically, by not fulfilling B's legal duty to care for A until A's condition resolved, or until A reached the zenith of her rehabilitative potential. B's willful abandonment of A is a legally actionable intentional tort. (Look closely at Principle 5F. If B wanted to discharge patient A during an ongoing care regime, B was ethically required to assist A in finding an alternate physical therapy provider; communicating with the gaining provider about A's condition; and expeditiously supplying A's patient care records to the substitute therapist.)

   Finally, B violated Principle 7 by failing to abide by the foundational biomedical ethical principle of beneficence, by not acting in patient A's or society's best interests in her official conduct. Regarding the seven core values enunciated by the American Physical Therapy Association – accountability, altruism, compassion, excellence, integrity, professional duty and social responsibility – a strong case can easily be made that B violated all seven of them in her official final interaction with patient A. If B's conduct is adjudged by the Ethics and Judicial Committee to be unethical by a preponderance, or greater weight, of evidence, the sanction awarded against B can range from a reprimand to suspension or even expulsion from membership in the American Physical Therapy Association.

4. Before making any official statement to anyone or taking action that may jeopardize her legal position or interests, B should seek out and establish a formal attorney-client relationship with an attorney-at-law regarding this specific legal matter. If B already has engaged an attorney who has expertise in handling a health professional ethics complaint, and she trusts him or her, then she should use the services of her existing attorney for this hypothetical matter.

   The attorney-client relationship is the most "privileged" legal relationship in existence. Privilege means that within an attorney-client relationship with a specific individual, an attorney is the highest-level confidant possible, and may not reveal what the client says to him or her, even if it involves a crime or breach of ethics that the client may have committed. The only exceptions to the attorney-client privilege that allow attorneys to reveal to authorities what clients say involve threats to commit crimes in the future involving serious bodily harm or death; future threats to national security; or legal malpractice actions between attorneys and clients. Other legally recognized privileges of lesser intensity between parties include: the minister-parishioner privilege, the psychotherapist-patient privilege, and the spousal privilege.

   How does B go about finding an attorney to represent her in the hypothetical ethics adverse action against her? A good starting point is to contact the American Physical Therapy Association or B's state license board for a list of attorneys registered with these organizations who specialize in physical therapy legal issues. If these entities do not maintain such listings, then they can and should be strongly encouraged to do so in the future, as an important service to their members. A second option is to consult with professional colleagues who have recently used the services of attorneys whom they believe to be competent, trustworthy, and who produce satisficing results; solicit their referrals; and take advantage of their advice.

   Another acceptable option is to contact the city, county or state bar association (the state-level attorney combined licensing board and professional association), and ask its LRS (lawyer referral service) representative for an initial low- or no-cost consultation with a registered attorney who specializes in physical therapy legal matters – in this case, specifically ethics complaints. The nominal fees paid do not go to attorneys who provide the initial advice to LRS clients. Bar association lawyer referral services are public services whose nominal fees and revenue are dedicated to indigent legal services. All attorneys registered with their respective lawyer referral services are active members of the bar in good standing, who do not have ethics actions against them or a history of ethics violations, and who are specialists in focused areas of the law, like physical therapy ethics adverse actions.

   The least recommended methodology to locate an attorney is perhaps the most often used – picking out the glitziest or most subjectively attractive ad in a phone directory without having the insight of any neutral third party's recommendation. At an initial consultation session, a physical therapist can get to know the consulted attorney, and make an informed decision about whether he or she is sufficiently comfortable with the attorney to retain the attorney as legal counsel.

   As part of the formation of the attorney-client contractual agreement, a fee schedule and estimated expenses will be agreed to by the parties. For representation in an ethics adverse action, an attorney typically will price his or her services hourly or globally for the tasks requested. A proportional "contingency fee," typical in a health care malpractice legal case, in which an attorney represents a patient-plaintiff, is not normally appropriate in a business-case scenario like the one in this hypothetical. Once retained, the attorney is at once an advisor, confidant, counselor, legal expert, partisan advocate and, most important, a trustworthy fiduciary who is charged by law to place the client's best interests first. This official relationship, if successful, may result in a lifelong business affiliation between the parties.

5. Pro bono publico service obligations are among the most critically important ethical duties that licensed professionals can undertake. Part of the privilege of being licensed to carry out high-prestige professional services and of being privileged to invade clients' intimate physical and mental spaces is the duty to "give back" to those persons who cannot afford the practitioners' vital services. Principle 8 and Standard 8 for physical therapists and assistants who are members of the American Physical Therapy Association reflect that important duty. In fact, in this iteration of the Code and Standards, the ethical duty to provide or otherwise participate in pro bono physical therapy service delivery is mandatory, not just advisory.

   How can physical therapists and assistants educate themselves more on our professions' and others' pro bono service philosophies and histories? A good internal place to start is the American Physical Therapy Association's Ethics in Physical Therapy and Law & Liability monographs, Parts 1 and 2, published by the association in 1998, which contain select articles addressing pro bono physical therapy service delivery. Externally, it may be helpful to examine the attorney model for pro bono legal service delivery, in place in all 50 states through each state's bar association. Attorneys have the most extensive history of any profession of pro bono services for indigent clients. While it cannot constitutionally be required by a state (because it would violate the 13th amendment), most or all attorneys customarily render a minimum of 50 hours of documented pro bono legal services per year as part of their licensure. For attorneys, pro bono service networks are in place in every jurisdiction across the United States – most administered by city, county and state bar associations, which connect clients needing pro bono legal services and attorney-volunteers.

   Health professional associations – especially including the American Physical Therapy Association, its chapters and components, the Federation of State Boards of Physical Therapy and the 50 state licensing entities – should review these models in place, and take necessary action to move to the forefront of pro bono service delivery to physical therapy patients and clients. As individuals and in small groups – in consultation with practice or American Physical Therapy Association attorneys – physical therapists and assistants should consider forming organized pro bono service networks at the district and chapter levels, and disseminating information about them to others similarly situated, so that this process grows all the more rapidly.

   For further information about physical therapy pro bono service delivery, please see the American Physical Therapy Association's website (*www/apta.org*), and search for "pro bono" under the search tab. Of particular note is Mount St. Mary's College's neurological physical therapy pro bono services program for indigent patients, which was presented at the 2010 annual conference in Boston, Massachusetts, in June 2010 (Abstract No. 28549), and the somewhat dated 1993 House of Delegates resolution (HODG06-93-21-39), encouraging the development of pro bono physical therapy patient service networks, and inviting organizers to correspond with the association's General Counsel (phone number included in the resolution).

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ETHICS FOR PHYSICAL THERAPISTS AND ASSISTANTS

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 81 or complete your test online at **EliteLearning.com/Book**

1. Physical therapists' practice is guided by a set of seven core values that include:
   a. Altruism.
   b. Compassion/caring.
   c. Social responsibility.
   d. All of the above.

2. Beneficence is a derivative of a 15th century Latin word "beneficentia," which means what?
   a. Doing no harm.
   b. Duty.
   c. Doing good.
   d. None of the above.

3. _____ is steadfast adherence to high ethical principles or professional standards; truthfulness, fairness, doing what you say you will do, and "speaking forth" about why you do what you do.
   a. Integrity.
   b. Professional duty.
   c. Altruism.
   d. Compassion/caring.

4. The Health Insurance Portability and Accountability Act (HIPAA) is example of what sort of statute?
   a. State statute.
   b. Federal privacy statute.
   c. Beneficence.
   d. None of these.

5. Physical therapists are required to place _____ best interest above all others, including personal and organization business interests.
   a. Their own.
   b. Their families'.
   c. Their patients'.
   d. Their supervisors'.

6. The ethical concept of _____ reflects aspirations and endeavors in support of ensuring equal access to high-quality health care by all patients and clients, at an affordable cost.
   a. Autonomy.
   b. Personal health care for all.
   c. Justice.
   d. Nonmaleficence.

7. Respect for patient_____ entails respecting patients' fundamental right of self-determination over their bodies and over what is done to them by others.
   a. Discretion.
   b. Beneficence.
   c. Autonomy.
   d. Justice.

8. What is NOT one of the seven core values governing the conduct of American Physical Therapy Association member-physical therapists?
   a. Accountability.
   b. Professional duty.
   c. Social responsibility.
   d. Personal continuing education.

9. Nonmaleficence literally means what?
   a. Do no harm.
   b. Aspirations and endeavors.
   c. Bullying.
   d. Respect privacy.

10. What core value is defined as "active acceptance of the responsibility for the diverse roles, obligations and actions of the physical therapist, including self-regulation and other behaviors that positively influence patient/client outcomes, the profession and thee health needs of society."
    a. Altruism.
    b. Compassion/caring.
    c. Accountability.
    d. None of the above.

Content Code: PTIL03ET

Chapter 2: Evidence-Based Implicit Bias Implications for Physicians and Healthcare Professionals (Mandatory)

1 CE Hour

Faculty

Author:
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Benjamin D. Reese has disclosed that he has no significant financial or other conflicts of interest pertaining to this course.

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Dawn Demangone-Yoon, MD, is an experienced medical professional with more than 20 years of clinical experience as a Board-Certified Emergency Physician in Academic and Community settings. She has been a Medical Educator in multiple settings and author, and contributor for an online CME company. She also has provided didactic, hands-on, and bedside education of physicians, residents, and medical students. She has also authored and contributed to original research and case reports, as well as topic review articles on a wide range of subjects. Target educational audiences have ranged from the physician specialist to the highly diverse inter-professional audience and post-graduate level students.

Dawn Demangone-Yoon has disclosed that he has no significant financial or other conflicts of interest pertaining to this course.

How to receive credit

- Read the entire course online or in print.
- Depending on your state requirements you will be asked to complete:`
  - A mandatory test (a passing score of 75 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
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Purpose statement

The purpose of this course is to provide a historical context of race and racism and its relationship to the development of racial implicit bias. The development of implicit bias will be discussed along with research demonstrating the impact of implicit bias on the clinical encounter. Recommendations for mitigating implicit bias are offered.

Learning objectives

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

- Know how the history of race in America informs the development of racial implicit bias.
- Explain the definition of implicit bias and how it differs from explicit bias.
- Describe factors that contribute to the development of implicit bias.
- Describe research related to the impact of implicit bias on the clinical encounter and patient referrals.
- Describe the relationship between racial implicit bias and healthcare disparities.
- Describe strategies to mitigate the impact of implicit bias in decision making.

INTRODUCTION

Although implicit or unconscious bias and its impact on healthcare can be understood in relationship to a range of identity characteristics (age, gender, sexual orientation, etc.), implicit bias related to *race* is particularly salient in the United States. This focus on racial implicit bias can be understood in the context of the history of race and racism in America.

The enslavement of Africans

The first Africans were brought to this country forcibly on ships, arriving on the Southern shores of our nation. Packed body-next-to-body in the hull of ships, those that survived disease, malnutrition, and abuse entered this country as cargo…property. White farmers and various businessmen purchased Africans to plant and harvest crops and to cook, clean homes, and care for their children. They were the *property* of the individuals and families that purchased them. This forced enslavement of Africans was maintained by a system of inhumane physical and psychological abuse, norms, accepted practices, and laws.

As *property*, Africans weren't considered human. They were *property* to be purchased, sold,and even named in the will of individuals before they died, like one might leave a house or wagon to a spouse or children. Like the evaluation or assessment of a used car or house, enslaved Africans were evaluated and rated according to their fitness and/or physical defects. They were not viewed as human beings on par with Whites (Franklin &Higginbotham, 2011).

The ingrained nature of this racist system afforded *any* White person the right to stop *any* African American individual, question them, search them, and even physically abuse them. These actions were accepted practice and, in many cases, were part of legal codes and regulations. Thus, the systemic and structural nature of racism in this country was not only built on the economic practice of enslaving African Americans for individual and family profit, but was built on the practices, beliefs, and laws that created and supported the belief that Africans were not fully human (Medical News Today, 2021).

In the 18th and 19th centuries the support of this belief of inhumanity took the form of scientific racism or pseudoscience. Many people, both professionals and laypersons,thought that African American people had an innate tendency to want to run away from the confinement of the plantation, had thicker skin and skulls, and had fewer nerve endings and therefore could endure more pain. This rationale was often used for the extreme brutalization and whipping experienced by African American men, women, and children (Gilder Lerhman Institute of American History, 2021). These beliefs contributed to the medical experimentation conducted on African American bodies, sometimes without any attempt to reduce the pain and suffering of African American patients or experimental subjects (Cohen, 2021; Dimuro, 2018).

Although current laws, policies, and accepted medical practices have eliminated the horrendous abuses of African American bodies, it is important to recognize how deeply embedded many of the beliefs and perceptions of African American people are within American culture, both consciously and implicitly. A 2016 study revealed that almost half of the medical students and residents surveyed endorsed notions of pseudoscience, believing that African American people had thicker skin, less sensitive nerve endings, and experienced less pain than Whites (Hoffman et al, 2016; Skibba, 2019). In spite of conscious endorsements of equity, fairness, social justice, and providing the highest level of care, there is this parallel process of unconscious or implicit bias. It is not that providers are inherently bad. Rather, they are human and prone to internalize, to a greater or lesser extent, the beliefs and stereotypes resulting from centuries of systemic and structural racism. These beliefs and internalized stereotypes can cause physicians to behave in ways that violate their deeply held values of fairness and equity. The process is unconscious or implicit.

Definition

Implicit bias can be defined as those attitudes, beliefs, and stereotypes that affect our understanding, behavior, and actions in an unconscious (implicit) manner. A relatively small portion of the information the brain processes is conscious. The majority of information is processed unconsciously, out of awareness. As people process this information, their unconscious association can reinforce stereotypes that most often differ from their conscious assessment of an individual or group. These unconscious associations can contribute to the unequal treatment of people based on their race, ethnicity, gender, gender identity, age, disability, sexual orientation, etc. Although implicit bias and unconscious associations can be a *subtle* influence on cognition and behavior, their impact on decisions can be *significant* (DeAngelis, 2019; Edgoose et al., 2019). California is a leader in recognizing the criticality of implicit bias in healthcare (California Legislative Information, 2021).

ASSEMBLY BILL NO. 241
CHAPTER 417

An act to amend Sections 2190.1 and 3524.5 of, and to add Section 2736.5 to, the Business and Professions Code, relating to healing arts.

[Approved by Governor October 02, 2019.
Filed with Secretary of State October 02, 2019.]

LEGISLATIVE COUNSEL'S DIGEST

This bill would require the Board of Registered Nursing, by January 1, 2022, to adopt regulations requiring all continuing education courses for its licensees to contain curriculum that includes specified instruction in the understanding of implicit bias in treatment. Beginning January 1, 2023, the bill would require continuing education providers to comply with these provisions and would require the board to audit education providers for compliance with these provisions, as specified.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. The Legislature finds and declares all of the following:

a. Implicit bias, meaning the attitudes or internalized stereotypes that affect our perceptions, actions, and decisions in an unconscious manner, exists, and often contributes to unequal treatment of people based on race, ethnicity, gender identity,sexual orientation, age, disability, and other characteristics.
b. Implicit bias contributes to health disparities by affecting the behavior of physicians and surgeons, nurses, physician assistants, and other healing arts licensees.
c. Evidence of racial and ethnic disparities in healthcare is remarkably consistent across a range of illnesses and healthcare services. Racial and ethnic disparities remain even after adjusting for socioeconomic differences, insurance status, and other factors influencing access to healthcare.
d. African American women are three to four times more likely than White women to die from pregnancy-related causes nationwide. African American patients often are prescribed less pain medication than White patients who present the same complaints,and African American patients with signs of heart problems are not referred for advanced cardiovascular procedures as often as White patients with the same symptoms.
e. Implicit gender bias also impacts treatment decisions and outcomes. Women are less likely to survive a heart attack when they are treated by a male physician and surgeon. LGBTQ and gender-nonconforming patients are less likely to seek timely medical care because they experience disrespect and discrimination from healthcare staff, with one out of five transgender patients nationwide reporting that they were outright denied medical care due to bias.
f. The Legislature intends to provide specified healing arts licensees with strategies for understanding and reducing the impact of their biases in order to reduce disparate outcomes and ensure that all patients receive fair treatment and quality healthcare.

The process of implicit bias in no way diminishes the importance of conscious,deliberate behavior. Physicians' conscious endorsements of the values of equity and fairness can be an important element of their service to patients. In addition to deeply held values, creating equitable healthcare environments requires physicians' conscious *actions* to build systems and processes that move them towards the elimination of disparities. It is not only the responsibility of those with particular titles,like a chief diversity officer, but all healthcare providers must be "activists" in their own areas of work: in the treatment room, in the laboratory, or in the administrative suite. The focus on implicit bias does not absolve providers of conscious, focused,deliberate action, it simply highlights an important parallel process.

Early childhood research

Did you Know?

Much of the research on implicit bias has only occurred in the last 40 years. It has provided increasing support for theories related to the development of implicit biases and ways in which unconscious biases impact decision making.

One of the important areas of implicit bias research focuses on the question, *how early in one's development does implicit bias begin to show up?* Recent research suggests that the foundation for what later shows up as implicit bias occurs in infancy. For example, if we track the eyes of infants, at about 4 weeks of age, they will stare longer and more frequently at female faces if a woman has been the primary caregiver. This is clearly not implicit bias, but it appears to reflect a differential association or a preference. This process of differential response in terms of what types of faces infants tend to stare at continues to evolve (Balaset al., 2011; Lee at al., 2017). Although care has to be taken to not infer bias from infant behavior, it appears that responsiveness to faces that are similar to the infant or the individual who provides nurturing/food may be a precursor to preferences later in development.

As toddlers and older children begin to spend time online, watch television, and read books,they sense the race or gender of the people who tend to be in leadership roles, those who appear dangerous, those who are police and fire people, those who are doctors, etc. Inequities and biases in the broader society get incorporated into media, which get consumed by children, whether intentionally or not. These portrayals then influence and shape unconscious associations in children of all ages (Williams & Steele, 2017). Children are also influenced by the behavior of parents, caregivers, and other significant adults in their life, noticing the complexion and gender of their close friends, as well as comments and jokes. It's not only the things that parents and caregivers say to convey fairness and kindness for all people, but it's also what children observe day-to-day in the behavior of those adult models (Pirchio et al., 2018).

The process of unconscious associations can also be seen in the way adults begin to view and interact with children. In a study at the Yale Child Study Center in 2016, preschool teachers viewed videos of African American and White children walking around a classroom,talking and interacting with each other (Gilliam et al., 2016). The viewing device also recorded who and what the teachers were looking at during the study. When teachers were told that there might be challenging behavior, the device revealed that they began to look at and track the African American children. Further, their eyes tracked the African American boys more than the other children. The teachers did not have any conscious idea of their viewing behavior.

Adult research

Within the racial history of America, the complexion of African American people has always been a complex dynamic. The One Drop Rule, in practice and then in law, has existed since Africans were forcibly brought to this country. Interracial relationships, both forced and voluntary, resulted in biracial children and adults. Essentially, any African ancestry ("one drop of African American blood") classified an individual as African American (O'Connell et al., 2020). In addition, lighter-skinned African Americans were sometimes viewed as slightly higher in status than darker-skinned African Americans. Darker-skinned African Americans often had fewer employment opportunities and were treated more harshly. Although the deliberate disparate treatment of light-skinned and darker-skinned African Americans has significantly diminished, unconscious bias related to the complexion of people still exists in many sectors of American society. Hiring and promotions of African Americans can sometimes be significantly influenced by implicit racial bias related to complexion (Grant, 2020; Louie & Wilkes, 2018). In one experiment, subjects were sent to one of two rooms. In one room subjects saw the subliminal presentation of the word "ignorant" on a screen,followed by the subliminal presentation of the face of an African American male. In the other room, subjects saw the subliminal presentation of the word "educated" and the subliminal presentation of the face of the same man. In the next phase of the experiment, subjects in both rooms saw seven variations of the same man's face: three images were lighter-skinned versions, three images were darker-skinned versions, and one image was identical to the first subliminal presentation. From the seven photographs, subjects were asked to select the version that was identical to the subliminal presentation. Researchers found that subjects primed with the word "ignorant" selected a darker-skinned version of the man, while those primed with the word "educated" selected a lighter-skinned version (Ben-Zeev et al., 2014).Judgements about the worth or intellect of the African American man appeared to be unconsciously influenced by his complexion. Although not reported in the research, subjects would probably deny making judgements based on complexion. It should be noted that in recent generations, discrimination based on skin tone appears to be diminishing (Braniganet al., 2019).

Excessive and biased focus on African American youth's behavior in schools contributes to the disparate suspension rate for African American versus White students in primary and secondary schools (Erickson & Pearson, 2021). This does not appear to be the result of conscious discrimination. It appears that similar behavior is judged differently when occurring by an African American versus a White student. Blake and colleagues went a step further and examined race, complexion, and suspension rates. They found that African American teenage girls with darker complexions were suspended at a higher rate than those with lighter complexions (Blake et al., 2017). Again, unconscious bias seems to be a major factor.

Case study exercise 1

You've just come from a meeting with a group of African American and Latinx community residents. They presented the committee, which you are a part of, with a list of demands related to what they perceive as a racist hospital environment.

Your first patient is a 24-year-old African American male, dressed in a t-shirt and jeans. You greet him and before you can ask any questions, he asks ***you*** *a few questions. "Where did you grow up?" "Did you have any Black friends?" "Why are you looking at your watch?" "Is this going to be more than a 10-minute visit?"*

Question 1:

Why might the community members perceive a hospital or healthcare system as being racist?

Commentary on question 1:

In addition to the history and present state of a particular hospital or healthcare system, the history of racism in America in general, as well as continuing racial health disparities, may contribute to some African Americans and Latinx community residents perceiving a hospital as being racist.

Question 2:

Why might some African American patients question White providers about their background and experience in working with African American patients?

Commentary on question 2:

The history of race relations in America has contributed to many divisions. White providers may not have many close friends who are African American or spend significant amounts of time in predominately African American communities. Stereotypes about casually dressed young African American men may operate for some providers.

As mentioned earlier, implicit bias operates not only for race, given the historical context of race in America, but gender, sexual orientation, height, weight, and even accent can unconsciously influence attitudes and decisions. In one experiment, subjects listened to two separate English speakers reading the same script. When they saw a photograph of an Asian person as the speaker, they rated the accent as being stronger than when the speaker was paired with a photo of a White person. They also rated the understanding of the content as being more difficult to understand when they saw the face of an Asian person. The assessment of the speaker, prompted by the photograph of an Asian individual, appeared to be influenced by unconscious bias (Zheng & Samuel, 2017).

Before the Covid-19 pandemic, it was more common to have online courses with Power Point slides and videos, without seeing the actual instructor. MacNell constructed a research design where a male and a female instructor each led two sections of a discussion group. During one section they both used a male name; during the other section they both used a female name. Students couldn't see the face of the instructor or hear their voice. They tried to teach all four sections similarly. At the end of the semester, the students in all four discussion groups were asked to rate the instructors on 12 different traits, covering characteristics related to their effectiveness and interpersonal skills. The male-named instructors were rated highest on all characteristics, regardless of whether the instructors were actually male or female. Class work was graded and returned to students at the same time in all four sections. Students who thought that they were being taught by a male instructor gave a promptness rating of 4.35 out of 5. Student gave the female-named instructors a rating of 3.55 (MacNell et al., 2014; Mitchell & Martin, 2018). Again, this points to the powerful influence of unconscious bias.

Healthcare research

What does this have to do with healthcare? In addition to a provider's conscious adherence to high ethical standards and a commitment to quality care, they are also subject to implicit bias, like the rest of the population. Fitzgerald and Hurst examined 42 peer-reviewed articles(FitzGerald & Hurst, 2017). The evidence indicated that healthcare professionals exhibit the same level of implicit bias as the wider population. A couple decades earlier, Shulman and his colleagues published research that many view as a major stimulus for further research regarding implicit bias and healthcare (Schulman et al., 1999). They presented 720 physicians with videos of patients (actors) who were similar in physical appearance and medical history, differing only by race and sex. All were candidates for cardiac catheterization. After the physicians saw the videos of the patients and reviewed their history, the researchers found that women and African Americans were less likely to be referred for cardiac catheterization than men and Whites. It appeared that, in spite of the conscious commitment to equitable care, unconscious bias was an influence in referral decision making.

The national interest in implicit bias in healthcare intensified when the Institute of Medicine delivered its report, *Unequal Treatment*, in 2003 (Smedly et al., 2003). It concluded that implicit bias against social groups, including racial and ethnic groups, can impact the clinical encounter. Much of the research supporting this report utilized the online Implicit Association Test (IAT). The IAT measures the strength of associations between concepts such as African American or White, old or young, good or bad, desirable or undesirable, and dangerous or friendly. The reaction time (association) to various pairs of words or photographs is a measure of the strength of the association. Millions of people used this website (operated by Harvard University) to take the IAT or one of the other tests.

The racial disparity in the judgement of pain has been studied as an example of implicit bias in healthcare. In research by Mende-Siedlecki and colleagues, White providers demonstrated more stringent thresholds in perceiving pain on African American faces versus White faces, and those with more stringent thresholds for African American patients prescribed fewer non-narcotic pain relievers (Mende-Siedlecki et al., 2019). This was not true for Asian faces, suggesting that other-face dynamics were not at play. This research did not investigate whether gaps in empathy or perspective taking skills might be a partial explanation for the disparity.

Implicit bias has also been shown to impact the quality of the clinical encounter, particularly communication. In an early study, primary care physicians took the IAT and had their clinical encounters recorded (Cooper et al., 2012). Provider race bias on the IAT was associated with lower quality communication with African American patients, such as more provider verbal dominance, lower patient positive affect, poorer patient ratings of interpersonal care,lower perceptions of respect from clinicians, and lower likelihood of recommending the clinician.

Case study exercise 2

John is a White nurse caring for an African American pregnant woman in an obstetrics unit in a hospital. The patient is a lesbian and had an in vitro fertilization. Her partner is White and asks to speak to you, the physician, in private and not in the patient's room. The partner mentions that she recently saw a news story about how African American women are treated unfairly in comparison to White women.

You're sure that her partner will be given the same level of care as other patients, and you give this reassurance consciously in a deliberate manner. However, you know that, in addition to this conscious process, there are potential areas of implicit bias that might occur,both in decision making and in communication.

Question 1:

How might the racial difference between the nurse, John, and the patient influence provider-patient communication?

Commentary on question 1:
Given the history of racism in America, racial discordance between provider and patient may negatively impact trust in the clinical encounter. African American patients may have experienced racial insensitivities, bias, or discrimination in the past and may be vigilant for signs of caring and trust from the provider. In addition to racial implicit bias, there can be implicit bias based on other characteristics, such as sexual orientation.

Question 2:

How might implicit bias show up in this case?

Commentary on question 2:
Given that there might be a difference between conscious attempts to be fair and equitable and implicit bias, care needs to be taken to ensure that word choice and nonverbal communication (eye contact, smiling, etc.) do not reflect unintentional bias. Self-reflection and awareness can be useful tools. Reflecting on the question, *Would I react differently if the patient was White or heterosexual?* can be a useful strategy.

The quality of communication is also related to word choice. One hundred and seventeen videotaped racially discordant physician-patient encounters were analyzed using the Linguistic Inquiry and Word Count software. Providers with higher levels of implicit racial bias(based on IAT scores) more frequently used first-person pronouns and anxiety-related words than providers with lower implicit racial bias scores (Hagiwara et al., 2016). Communication is also a major factor in a patient's experience of trust in the clinical encounter (Cuevas etal., 2019).

There is abundant evidence that even when controlling for variables such as insurance,socioeconomic status, and geography, implicit bias is an important influence on patient satisfaction and referral for treatment, both contributors to healthcare disparities (Saluja &Bryant, 2020; Wilson et

al., 2021). Even high-status African American patients can experience disparate treatment. When giving birth, tennis star Serena Williams suffered a pulmonary embolism. Although thankful for the care she received, she noted that her status likely contributed to her getting a level of care not afforded to all African American women (Salam, 2018). Ms. Williams' experience causes some to reflect on the 2019 CDC report that indicated a racial disparity in pregnancy-related deaths. Implicit bias can not only influence the assessment of pain but can also influence provider decision making in high-discretion situations (Johnson et al., 2019; Roeder, 2018). For example, of the two or three tests that might be available for a particular condition, there is sometimes discretion on the part of the provider in terms of which test is given or how soon a test is recommended. While consciously endorsing values of equity, fairness, high quality care, etc., provider behavior can be influenced by implicit bias.

Accelerating implicit bias

Given the rapid, unconscious associations that characterize implicit bias, factors that impede the slow, careful refection of multiple factors can be fertile ground for implicit bias.

Many providers may see these factors as basically describing their day-to-day work. But recognizing these factors can provide an opportunity to try to make small modifications,where possible, to mitigate the influence of implicit bias. (Johnson et al., 2016)

Quick Implicit Bias Facts

Several factors can accelerate implicit bias or make it more likely to be a significant influence:

- *Time constraints (e.g., limited time to see a patient).*
- *Complexity (e.g., multitasking or needing to consider multiple factors quickly).*
- *Physical constraints (e.g., working long hours).*

Mitigating implicit bias

There are several strategies that have shown promise in mitigating or reducing the occurrence of implicit bias. Given the brain's innate rapid processing of large amounts of data every second and the acceleration factors mentioned above, there is no strategy that can completely eliminate unconscious associations or bias. Further, approaches to mitigating or reducing implicit bias are most effective when more than one strategy is utilized. Strategies to consider include the following (Di Brito et al., 2019; "Eight Tactics,"2020; IHI Multimedia Team, 2019;Narayan, 2019):

Increasing knowledge

It is useful for workshops and presentations to describe how implicit bias develops and its relationship to societal stereotypes (race, gender, sexual orientation, disability, etc.).Presentation of research findings can help providers understand how implicit bias can negatively impact various aspects of the clinical encounter and contribute to healthcare disparities. As a component of workshops, case studies can help providers apply knowledge to realistic, complex situations. Refresher experiences are also useful.

Self-awareness

With knowledge of the development and process of implicit bias as a foundation, a pause-and-reflect approach can increase the occasions when providers deliberately take a few moments to reflect on their thoughts and behaviors when interacting with a patient and/or making an important decision. Pausing allows for a few seconds to reflect on the kinds of associations that they may be making as the patient walks through the door based on the way they're dressed, their gender, their race, or any other characteristic. Discovering personal tendencies or becoming aware of an area of personal bias can help in modifying communication, where necessary. Such self-awareness can prompt providers to focus on seeing a given patient as an *individual (individuation)* and trying to see things from the *patient's perspective* (perspective taking).

Organization systems and processes

Implicit bias can play a key role in fostering and reinforcing systems of inequities in hiring and promotion. Race, gender, accent, weight, etc. are factors that not only impact implicit bias in patient care but can also influence hiring and promotion decisions. Mitigating unconscious bias in rewards and recognition, as well as in selection decisions, is of critical importance in the work to increase the diversity of medical students, clinical providers,researchers, managers, and senior healthcare providers.

Cues and reminders

Information about implicit bias as well as motivation to reflect on personal biases can begin to fade months and even weeks after the initial intervention. Strategies to stimulate recall or remind providers about the work to mitigate implicit bias can be useful. Key words or phrases on the treatment room computer screen or even a specially designed screen saver can be used as a reminder. A mobile phone background can contain a photo or a word that serves as a reminder every time the provider uses the phone. Changing the photo or word periodically can help to avoid habituation. The inside cover of a folder containing CVs can list key phrases to remind search committee members to avoid bias in the screening process.

Disparities in access to and delivery of healthcare services

As it is quite apparent that disparities in healthcare exist, The Department of Health and Human Services intends to directly address this inequality by 2026. It has posted a draft of its strategic goals for the fiscal years 2022-2026, and impartial access to healthcare is of particular interest. The first of the five stated goals is to "Protect and Strengthen Equitable Access to High Quality and Affordable Healthcare" (HHS.gov, 2021a). As part of this goal,one strategic objective specifies an intent to "expand equitable access to comprehensive,community-based, innovative, and culturally-competent healthcare services while addressing social determinants of health". They describe improved access to health-related services for an underserved population through the removal of barriers to access, a reduction in disparities in healthcare, and support of community-based services. An increase in healthcare facilities, a more diverse healthcare workforce, and collaboration with cultural and community services can all contribute to improvements in access disparities (HHS.gov, 2021b). Chin et al provided specific suggestions for community involvement through school-based care, household outreach, and religious-based care delivery. Members of the community may be involved as peer coaches, peer educators, and patient care navigators to enhance use of healthcare services. Educational material intended to address specific cultural perspectives can target unique characteristics of the community and "open door"clinic policies and streamlined referral processes may contribute to an increase in patient participation. Chin et al also suggest that reduced out of pocket costs or free giveaways can serve as financial incentives to improve participation in healthcare services. Lastly,psychological services and support through family therapy, motivational interviewing, and counseling can help to encourage access to additional services and care (Chin et al., 2012).

Conclusion

The history of race and racism in America is central to the development of racial implicit bias across various sectors of our society and is a major contributor to racial healthcare inequities. However, we must not lose sight of the intersection of implicit bias and gender,sexual orientation, weight, race, and other individual and group characteristics. Our patients bring their unique physical condition, their intersectional identity, and, in many cases,significant time, living within the ingrained structures, attitudes, and beliefs of this nation. It's our responsibility to not only engage what we are consciously aware of but also work to uncover personal and organizational biases that impede our movement towards a healthcare environment and society of true equity and the highest quality care for all.

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Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 81 or complete your test online at **EliteLearning.com/Book**

11. Which of the following was NOT a common pseudoscience belief about enslaved Africans?
    a. Elongated neck.
    b. Thick skull.
    c. Less sensitive nerves.
    d. Can endure extreme pain.
12. The definition of implicit bias includes which of the following?
    a. Differences in blood type.
    b. Differences in beliefs, attitudes, and behavior.
    c. Differences cultural competence.
    d. Differences in cultural humility.
13. Implicit biases typically develop from which of the following?
    a. Side effect of certain medical procedures.
    b. Losing a close friend early in life.
    c. Cross-cultural relationships.
    d. Online Media, television, parents, and significant people in your life.
14. Bias related to the complexion of African Americans:
    a. Shows up in school suspension.
    b. Tends to be related to gender.
    c. Only occurs in Southern states.
    d. Was eradicated in the 1950's.
15. Research indicates bias related to names takes the form of:
    a. Higher salaries for shorter names.
    b. Preference given to male names in some teaching evaluations.
    c. Preference given southern sounding names.
    d. Preference given to two syllable names in some hiring situations.
16. What did the 1999 Shulman study show?
    a. Age bias.
    b. Bias towards professionals with tattoos.
    c. Bias in treatment of pain.
    d. Bias in referral for cardiac catheterization.
17. The implicit bias association test:
    a. Measures conscious judgements of specific individual characteristics
    b. Is available only to healthcare professionals
    c. Must be completed for medical licensing
    d. Measures strength of associations to specific individual characteristics
18. Implicit bias can occur more frequently when:
    a. Seeing patients in the early morning.
    b. Seeing patients in the middle of the day.
    c. Working without nurses or other assistants.
    d. Rushing, multitasking, and working long hours.
19. Implicit bias in hiring can frequently be related to:
    a. Large search committees.
    b. Hospital location in urban area.
    c. Race, gender, or weight of candidate.
    d. Location in rural area.
20. Which of the following is NOT a good strategy to try to mitigate implicit bias?
    a. Use reminders.
    b. Pausing.
    c. Make quick decisions.
    d. Increase knowledge of implicit bias.

Course Code: PTIL01EB

Chapter 3: Preventing and Dealing with Sexual Harassment for IL Professionals (Mandatory)

1 CE Hour

Faculty

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The contributors to this course have no conflicts of interest relative to its content.

How to receive credit

- Read the entire course online or in print.
- Depending on your state requirements you will be asked to complete:
  - A mandatory test (a passing score of 75 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
- Provide required personal information and payment information.
- Complete the mandatory Course Evaluation.
- Print your Certificate of Completion.

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Learning outcome

The purpose of this course is to provide current information about sexual harassment in the workplace and to ensure that physical therapists comply with the educational requirements of Illinois Public Act 100–0554. This includes understanding how to prevent and deal with sexual harassment and how to report such harassment.

Learning objectives

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

- Define sexual harassment according to Illinois Public Act 100–0554.
- Describe mandates of Illinois Public Act 100–0554.
- Discuss federal mandates related to sexual harassment in the workplace.
- Explain how to report sexual harassment in the workplace.
- Discuss the impact of sexual harassment in the workplace.
- Discuss ways to prevent sexual harassment in the workplace.

INTRODUCTION

Scenario 1

Jason is a newly promoted rehab manager. He worked hard for this promotion and is eager to fulfill his responsibilities as part of the management team. Jason currently serves on an interdisciplinary task force. The organization's chief executive officer (CEO) frequently attends these task force meetings. The CEO stops Jason after one of these meetings and asks that he make an appointment to discuss Jason's ideas. Jason is flattered and makes the appointment with Mark Williams, the CEO. When Jason arrives, Mark encourages him to sit down next to him on the couch in his office. There are pictures of Mark's wife and three children displayed prominently around the office. As Jason begins to explain his ideas, Mark nods and places his hand on Jason's upper thigh. Mark smiles and says, "You know, Jason, I really admire you. You have a great work ethic and innovative ideas. I am in a position to help you advance in your career. I think we could become good friends and enjoy ourselves outside of the workplace as well. Our friendship could benefit both of us, and no one ever needs to know." Jason is horrified. "What do I do?" he thinks. "This guy is a married man with kids who is propositioning me! He could really mess up my career. What do I do? Whom do I tell? Would anyone believe me?"

Scenario 2

Carolyn is a lead physical therapist in a busy outpatient clinic. During monthly staff meetings William, another lead physical therapist, makes it a point to sit next to Carolyn. He enjoys sharing pictures of pornography and jokes that contain numerous sexual innuendos with her. Carolyn has firmly told him that these behaviors offend her, and she insists that he stop. William laughs and tells her she is a prude and needs to lighten up. "I've shown this stuff to most of the women in this clinic and you're the only one that can't take a joke," he says. Carolyn doesn't care what other people do or do not do. As soon as the meeting concludes, she marches to the human resources office to file a sexual harassment complaint per organizational policy.

Scenario 3

Dana is a newly licensed physical therapist. She is a bit intimidated by her colleagues, all of whom have worked at her clinic for a number of years. Martin is an physical therapist assistant with 20 years of experience. Although he provides excellent patient care, he has a reputation of being arrogant and a bit of a bully with younger colleagues. His behavior has been tolerated over the years because of his excellent clinical skills. One afternoon Dana is in the utility room gathering supplies. Martin follows her into the room and shuts the door firmly behind him. He blocks her exit from the utility room. "You know Dana, you're not a bad therapist, just young and inexperienced. I could help you out and help you get ahead in this place. I have connections. I've worked here forever. I can stop other people from giving you a hard time. All you have to do is to be nice to me." Martin then grabs Dana with both arms and forcibly kisses her on the lips. Dana breaks free and slaps William across the face. At that moment the rehab manager enters the utility room and witnesses the slap. Martin immediately shouts, "She assaulted me! I'm going to file charges and get her fired!" Dana immediately begins to shout her own accusations. The rehab manager has both Dana and Martin accompany her to the human resources department. The manager is following hospital protocol to seek human resources mediation for these types of conflicts.

Each of these scenarios presents a serious event that requires action. The applicable laws and necessary actions will be discussed in detail in this education program. Anyone can be sexually harassed regardless of sex, gender identification, or age. Both men and women can be targets of sexual harassment, and it can be peer against peer, supervisor against employee, and even subordinate against supervisor (Wolters Kluwer Office Management & HR, 2018).

Data from the Marketplace-Edison Research Poll (Edison Research Marketplace, 2018) showed that 27% of women said that they had, at one time or another, experienced sexual harassment in the workplace. Some 14% of men surveyed reported workplace sexual harassment. Regionally, those in the South (25%) were the most likely to have experienced sexual harassment at work. The Northeast was the next highest at 21%, and the West and Midwest were the lowest at 18% and 17%.

Of the 4,392 persons who filed some type of discrimination charges (including sexual harassment) with the U.S. Equal Employment Opportunity Commission (EEOC) in fiscal year 2017, 5.5% were related to sexual charges. In that same year, 31.9% of charges made by people from Illinois were related to sexual charges. It is important to note that because individuals often file charges of multiple types of discrimination, the number of total charges for any given fiscal year will be less than the total of the 10 types of discrimination listed by the EEOC (EEOC, 2018).

The purpose of this education program is to help Illinois physical therapists identify sexual harassment in the workplace, prevent it, and take appropriate action if it occurs.

ILLINOIS PUBLIC ACT 100–0554

On November 16, 2017, Governor Bruce Rauner signed into law Illinois Public Act 100–0554, which was directed to respond, in part, to a growing antisexual harassment movement in the workplace. The act (now law) bans members of the General Assembly from using any public funds, including their member office allowances, as "hush money" to keep persons who say they have experienced sexual harassment silent or as part of a settlement to stop an allegation or investigation into sexual harassment accusations. Also mandated is a requirement that professionals licensed by the state of Illinois participate in at least one hour of sexual harassment prevention training. This law will apply to license renewals starting January 1, 2020 (Griffin, 2017; Pearson, 2018).

The state of Illinois defines sexual harassment as follows:

> "*Any unwelcome sexual advances or requests for sexual favors or any conduct of a sexual nature when:*
>
> - *Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment.*
> - *Submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such individual.*
> - *Such conduct has the purpose or effect of substantially interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment."*(State of Illinois, 2017).

For the purpose of this definition, the phrase working environment is not limited to a physical location an employee is assigned to perform his duties and does not require an employment relationship (State of Illinois, 2017). For example, a vendor or salesperson may be a sexual harasser even though she is not directly employed by the organization.

Mandates of Illinois Public Act 100–0554 pertaining to sexual harassment

Sexual harassment policy

Legislation mandates that state government leaders and employees in the General Assembly, state executive branches, and state agencies institute an antiharassment policy (Griffin, 2017). New sexual harassment allegations against all types of public figures continue to garner headlines on an almost daily basis. It would behoove all organizations and businesses to establish a sexual harassment policy that addresses the issue and take steps to prevent or minimize the occurrence of sexual harassment (Griffin, 2017).

According to laws of the state of Illinois, a written sexual harassment policy should include, at a minimum, the following:

- A prohibition on sexual harassment.
- Details on how an individual can report an allegation of sexual harassment, including options for making a confidential report to a supervisor, ethics officer, inspector general, or the Department of Human Rights.
- A prohibition on retaliation for reporting sexual harassment allegations, including availability of whistleblower protections under the State Officials and Employee Ethics Act, the Whistleblower Act, and the Illinois Human Rights Act.
- The consequences of a violation of the prohibition on sexual harassment and the consequences for knowingly making a false report (State of Illinois, 2017).

The sexual harassment policy is to be made available to any individual within two business days upon written request, including electronic requests. Any person may contact the authorized agent of the registrant to report allegations of sexual harassment (State of Illinois, 2017).

Continuing education mandate

As noted earlier, Illinois law now requires that professionals licensed by the state of Illinois obtain at least one hour of sexual harassment prevention training. This law will apply to license renewals starting January 1, 2020 (Griffin, 2017; Pearson, 2018). Physical therapists will be required to complete this training with every license renewal and it may count as part of the 20 hours of required continuing education (Illinois Department of Financial and Professional Regulation, 2019).

Sexual abuse hotline

Illinois law required the Illinois Department of Human Rights to establish and operate a sexual harassment hotline as of February 16, 2018. The Illinois Sexual Harassment & Discrimination Helpline (2018a) can be accessed at 1-877-236-7703. Its website (https://www2.illinois.gov/sites/sexualharassment/Pages/default.aspx) provides links to legal protections, reporting, legal assistance, and counseling. Details of each of these issues are discussed in the next section, which details the reporting of sexual harassment.

The Sexual Harassment Hotline Call Center can be reached between 8:30 a.m. and 5 p.m. Monday through Friday with the exception of state holidays. By law, all communications received via the hotline or accompanying website are confidential and exempt from disclosure under the Freedom of Information Act (Kane County Connects, 2018).

Whistleblower laws in Illinois

Illinois defines a whistleblower as "someone who exposes wrongdoing, fraud, corruption, and/or waste" (Illinois.gov., 2018). The Illinois Whistleblower Act "protects every citizen, including state and local government employees, when they blow the whistle on government corruption" (Illinois.gov., 2018).

The Illinois Whistleblower Reward and Protection Act expanded the 1991 law to cover all levels of state government and reward citizens who blow the whistle. A whistleblower can get up to 30% of the amount recovered as a reward upon completion of a successful whistleblower suit (Illinois.gov., 2018). The identity of a whistleblower is kept confidential except in rare circumstances where disclosure is required by law (Illinois.gov., 2018).

The law further states:

> *If you are a State employee and you disclose or threaten to disclose to your supervisor or any public body something you believe is illegal; or provide information to any public body investigating corruption; or participate in a proceeding to enforce the State Officials and Employees Ethics Act … [If retaliation occurs, remedies can include] reinstatement; two times back pay; interest on back pay; and/or payment of reasonable costs and attorneys' fees (Illinois.gov., 2018).*

Illinois also offers the following tips for successful whistleblowers:

- Successful whistleblowers need evidence. Be sure to keep records and documentation of corrupt activity.
- Do not break any laws yourself. Exposing corruption will not necessarily relieve you of liability. If you are worried about your behavior, seek independent legal advice.
- Read your employment contract. Your union or other employment contract may contain whistleblower protections (Illinois.gov., 2018).

For further details about the whistleblower laws in Illinois, including various telephone numbers for reporting, access *https://www2.illinois.gov/sites/whistleblower/Pages/default.aspx*

FEDERAL LEGISLATION REGARDING SEXUAL HARASSMENT

Sexual harassment is a form of sex discrimination that violates Title VII of the Civil Rights Act of 1964. Title VII of this act applies to employers with 15 or more employees, including state and local governments. It also applies to employment agencies, to labor organizations, and to the federal government (U. S. Equal Employment Opportunity Commission, n.d.).

According to the U. S. Equal Opportunity Commission, unwelcome sexual advances, requests for sexual favors, and verbal or physical conduct of a sexual nature constitute sexual harassment (EEOC, n.d.a). "The federal law does not prohibit simple teasing, offhand comments, or isolated incidents that are not very serious. Harassment is illegal when it is so frequent or severe that it creates a hostile or offensive work environment or when it results in an adverse employment decision (such as the victim being fired or demoted" (EEOC, n.d.b).

The EEOC (n.d.a) noted that sexual harassment can occur in a variety of circumstances, including but not limited to the following:

- The victim as well as the harasser may be a woman or a man. The victim does not have to be of the opposite sex.
- The harasser can be the victim's supervisor, an agent of the employer, a supervisor in another area, a coworker, or a nonemployee.
- The victim does not have to be the person harassed but could be anyone affected by the offensive conduct.
- Unlawful harassment may occur without economic injury to or discharge of the victim.
- The harasser's conduct must be unwelcome.

It is also "unlawful to retaliate against an individual for opposing employment practices that discriminate based on sex or for filing a discrimination charge, testifying, or participating in any way in an investigation, proceeding, or litigation under Title VII" (EEOC, n.d.a).

The following examples are helpful to think through different cases pertaining to sexual harassment:

Example 1

Marilyn is attending her organization's annual employee appreciation picnic, which is being held at an exclusive country club, thanks to the administrative team's membership. Marilyn is in a two-piece bathing suit preparing to enter the club's swimming pool when a male coworker calls out to her, "Hey Marilyn, looking good! Too bad you can't wear bathing suits to work." Is this sexual harassment?

The answer is ***no***. Legislation does not prohibit simple teasing, offhand comments, or isolated incidents that are not very serious. However, if Marilyn's colleague makes comments that are frequent or so severe that it creates a hostile or offensive work environment or when it results in an adverse employment decision (such as the victim being fired or demoted), it would be sexual harassment (EEOC, n.d.b). One offhand comment is not generally considered sexual harassment.

Example 2

Jason is a staff physical therapist who has applied for promotion to the position of rehab manager for his clinic. Danielle, director rehabilitation for the company, is interviewing Jason as part of the application process. Jason is not comfortable around this woman, as she often finds excuses to talk to him alone and generally includes multiple sexual innuendos throughout the conversation. During the interview process, Danielle makes comments about how lonely she is since her divorce and asks about the state of Jason's marriage. She says, "If you are ever looking for a little action on the side, I'm your woman. In fact, I would give you the promotion in a heartbeat if we can have a more 'beneficial' relationship." Is this sexual harassment?

The answer is ***yes***. The director of rehabilitation executive has displayed a pattern of behavior that constitutes sexual harassment. Additionally, she is making Jason's promotion contingent on sexual favors. The elements that make this situation sexual harassment are that the comments are in reference to the employee's intimate personal situation, include an offer of action (clearly intimating sexual contact), and offering employment advancement with an "if" of engaging in sexual actions. This offer is coercion, and Danielle's repeated sexual innuendo encounters create a hostile work environment.

BRIEF HISTORY OF THE ANTI-SEXUAL HARASSMENT MOVEMENT

Some people may believe that the issue of sexual harassment has only recently been openly discussed. Forty years ago, Lin Farley wrote a mass-market paperback called *Sexual Shakedown*. Coining the phrase sexual harassment, Farley described "women's pervasive experiences of sexual intimidation and outright abuse on the job." Farley insisted that society understand the systemic role that verbal and physical sexual assault has played in the workforce.

Although Farley's book is no longer in print, it is as relevant today as it was then, if not more so. Issues of unequal pay, lack of promotional opportunities, unjust firing, and ongoing gender segregation in the workplace continue (Kessler-Harris, 2018).

As sexual harassment and sexual discrimination continued throughout the years, a glimmer of hope for change occurred when the 1964 Civil Rights Act was passed. For the first time, federal legislation prohibited discrimination on the basis of sex in addition to discrimination based on race and religion.

One of the first court cases based on this act was instigated by Diane Williams, an African-American employee of the U.S. Justice Department. Williams sued to regain her job after she was wrongfully terminated because she refused to sleep with her boss. She was victorious, and her case set a precedent for women fighting against demands for sexual favors in exchange for conditions of employment (Kessler-Harris, 2018).

Over the years, more cases followed. Although not all women were victorious, it began to be noticed that sexual harassment was a legally prohibited type of discrimination that limited the opportunities of women in the workplace (Kessler-Harris, 2018).

Even though some advances have been made, sexual harassment continued (and continues) to flourish in certain environments. One of the most significant occurrence in the struggle against sexual harassment in recent years was the emergence of the Me Too movement. Although many people think that this phrase was first used within the last few years, it was actually coined in 2006 by Tarana Burke who used it to help survivors of sexual violence. Now, more than a decade later, the phrase has become the widely recognized slogan of the antisexual harassment movement. This movement has brought about the downfall of some of the most powerful men in business, entertainment, and politics (Johnson & Hawbaker, 2018).

What does this movement mean for the average American woman (and man) who is dealing with sexual harassment in the workplace? How can such harassment be prevented? How can we remember that although the majority of sexual harassment victims are women, it impacts men as well? How can we educate society to comprehend that sexual harassment can affect anyone, regardless of age, gender, race, sexual orientation, socioeconomic status, or hierarchical position within an organization?

REPORTING SEXUAL HARASSMENT IN ILLINOIS

The following section discusses the procedures, guidelines, and documentation for reporting sexual harassment in Illinois.

Actions and documentation

There are several initial steps to take when sexual harassment occurs:

- **Object to the behavior**: The first step in dealing with sexual harassment is to overtly object to the harasser's behavior. Let the harasser know that his actions are unwelcome and offensive. Tell the harasser that you are offended by these actions and that you want them to stop. During sexual harassment investigations, detailed questions will be asked about the circumstances of the harassment. Victims will be asked if they made it clear that the perpetrators actions were unwelcome.
- **Identify witnesses**: Were there any witnesses to the harassment? Was anyone else subjected to harassment by this perpetrator? It is often the case that others have been harassed by this perpetrator as well.
- **Notify management**: Though not necessary, it is a good idea to report the incident to the supervisor. If the supervisor is the sexual harasser, see his or her supervisor, and report the incident to the affirmative action officer or human resources. Be familiar with your organization's policies and procedures regarding sexual harassment.
- **Notify law enforcement as indicated**: If the harassment is of a criminal nature—for example, rape—law enforcement should be called immediately.
- **Document everything**: Documentation is essential to fighting sexual harassment. Documentation must include the following:
    - What happened, when it happened, and where it happened.
    - Exactly what was said and what behaviors occurred with each instance of harassment.
    - Any threats the harasser made.
    - Any promises that were made in exchange for sexual favors.
    - Any witnesses to the harassment.
    - Your experience reporting the harassment; how organizational policies and procedures were followed, outcome of following those procedures, outcomes of all actions taken to report the harassment.
    - If the police were called, why they were called, when they were called, and the outcome of calling the police.
    - Status of your work productivity. Have copies of work-related activities such as performance evaluations, awards, and promotions (American Association of University Women, 2018; Kane County Connects, 2018).

The following scenarios show that the reporting of sexual harassment is not a simple process. In Scenario 4, Ashley finds that having accurate documentation regarding sexual harassment is essential. Scenario 5 shows that not all claims of sexual harassment are true. It is important to have policies and procedures in place that provide for objective evaluation of all circumstances and that protect the rights of all involved parties.

Scenario 4

Ashley is a physical therapist with 15 years of experience and is a board certified clinical specialist who has applied for a promotion. Her manager is James, who is highly regarded by the executive team because of the consistently high achievement of desired patient outcomes and his ability to run his unit within budget. Over the past six months, James has been making comments of an offensive sexual nature directed toward Ashley. These comments always occur out of sight and hearing of other people. These comments are affecting Ashley's ability to concentrate, and she hates coming to work. Ashley decides to file a sexual harassment grievance. According to facilities policy, the first step is to discuss the situation with her manager. Because her manager is the harasser, Ashley must go to a human resources counselor. When she meets with Marcie, the human resources counselor, Ashley says that she has been the victim of sexual harassment committed by her manager. Marcie is objective and open to discussion. Their conversation follows:

***Marcie**: Ashley, how long has James been making these comments?*

***Ashley**: A few months, maybe six or so. I'm not really sure. It seems like forever.*

***Marcie**: Do you have any documentation regarding what James said, when he said it, and where these conversations took place?*

***Ashley**: No, not really. I mean I didn't write things down. He used foul language and talked about what he'd like to do to me, sexually I mean. It seemed like a lot. He says if I'm nice to him, I could get that promotion to clinical nurse III.*

***Marcie**: Did you get the promotion?*

***Ashley**: I don't know. I haven't heard.*

***Marcie**: Ashley, I must tell you that James has filed a sexual harassment suit citing you as the perpetrator. He has recorded dates and times of occurrence and what was said by each of you. He alleges that you offered to trade sexual favors in exchange for getting that promotion. He has notified the Illinois Department of Human Rights.*

Ashley is horrified. It is coming down to her word against James's word, and James has documented what he claims happened, including dates, times, and what was said.

Scenario 5

Marlena and her partner Jessica have been dating for nearly a year. They have been talking about moving in together. Both Marlena and Jessica work in a large outpatient clinic. Jessica is Marlena's supervisor. As Marlena excitedly makes plans to move into Jessica's apartment, something goes wrong. Jessica approaches Marlena and tells her, "I really don't want to hurt you, but I've met someone else. We're getting pretty serious pretty quickly, and she's moving in with me next week."

Marlena is shocked and heartbroken. After a few days, sorrow turns to anger and finally a desire for revenge. Marlena makes up a documentation record of alleged sexual harassment occurrences. She cites Jessica as the harasser, claiming that Jessica used her power as supervisor to coerce Marlena into a sexual relationship.

After an extensive investigation by the human resources department and the Illinois Department of Human Resources, it was determined that the allegations were false. Marlena was disciplined for making false claims against her supervisor.

GUIDELINES FROM THE ILLINOIS SEXUAL HARASSMENT AND DISCRIMINATION HELPLINE

The Illinois Sexual Harassment and Discrimination Helpline (2018b) offers guidelines for reporting sexual harassment. Persons who have experienced sexual harassment in the workplace have a number of reporting options. Where a person can report sexual harassment depends on where the harassment occurred. If the harassment was in either the private or public sector (the part of the economy composed of all levels of government and government-controlled enterprises), a person needs to contact her human resources department, manager, or supervisor. Many employing organizations have specific policies and procedures for the reporting of sexual harassment. (Illinois Sexual Harassment and Discrimination Helpline, 2018b). For those individuals working in the public sector, a number of agencies and offices handle sexual harassment complaints. For specific details, access the Public Sector Only section at https://www2.illinois.gov/sites/sexualharassment/Pages/Reporting.aspx

A person may also contact the Illinois Department of Human Rights (IDHR) at https://www2.illinois.gov/dhr/FilingaCharge/Pages/default.aspx

The IDHR has jurisdiction over complaints of sexual harassment in employment, housing, public accommodation, and education (Illinois Department of Human Rights, 2018).

Figure 1 is the Complainant Information Sheet used in the intake process. The entire form can be viewed at https://www2.illinois.gov/dhr/FilingaCharge/Documents/CIS_Emp_PA_FC_SHXX.pdf

Documentation process

The documentation process involves five steps:

- **Step 1: Intake**: Documentation must be completed. Such documentation may be mandated by and organization as well as the state of Illinois.
- **Step 2: Mediation**: Mediation is optional and is an alternative to an investigation and may quickly resolve a charge. Medication is a no-cost information process in which the parties involved meet voluntarily with a trained and certified IDHR mediator who helps in the exploration of a possible resolution of the charge.
- **Step 3: Investigation**: Investigation occurs if the involved parties do not participate in mediation or if the mediation is unsuccessful. Complainants (persons filing complaints) and respondents (persons responding to accusations of harassment) have a responsibility to cooperate with IDHR's investigation. IDHR has the power to subpoena relevant documents and persons. The role of IDHR is to conduct a neutral investigation into the allegations of the charge. Respondents are forbidden from retaliating against any person because he has filed or has otherwise participated in the investigation of a charge. If a person believes that he has been retaliated against, he can file a retaliation charge with IDHR. Both parties may be required to attend a fact-finding conference, which is a face-to-face meeting conducted by an IDHR investigator where the complainant and representatives of the respondent answer questions so the investigator can determine if there was a violation of the Human Rights Act. During the fact-finding conference, either party may bring legal counsel if the attorney has entered a Notice of Appearance. However, the attorney's role is strictly advisory, and she may not testify at the conference except on matters of which she has first-hand knowledge, nor may she ask direct questions of either party. Representation by an attorney is not required. If IDHR does not make a finding by the 365th day (plus the number of days for extensions, if any, or any tolling period while a request for review is pending), the complainant has 90 days to file a complaint with the Human Rights Campaign or to file a complaint in the state circuit court. After completing the investigation, the investigator writes a report summarizing the information obtained and making a recommended finding based upon the relevant evidence. After approval, IDHR sends a copy of the report to both parties.
- **Step 4: Findings and results**: The written report mentioned in Step 3 is prepared recommending whether there is substantial evidence of a violation of the act. A finding of substantial evidence means that there is enough evidence for the complainant to take the case before either an administrative law judge at the Illinois Human Rights Commission or an appropriate state circuit court. The complainant has the option of either requesting IDHR to file a complaint on the complainant's behalf with the commission or commencing a civil action in a sate circuit court of appropriate venue. If IDHR finds a lack of substantial evidence, the complainant can either file a request for review with the commission or start a civil action in a state circuit court of appropriate venue. If the respondent has failed to file a timely verified response to the charge, or has failed to attend the fact-finding conference, a notice of default may be entered. Within the period specified in

the act, the respondent may file a request for review with the commission. Final orders of the commission may be appealed to the appropriate appellate court.

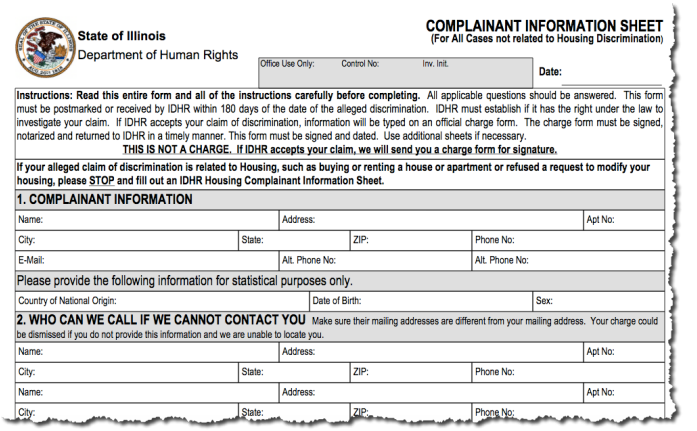
- **Step 5: Legal review**: Several options are available to complainants and respondents after receiving the investigation report:
  - **Request for review rights**: For charges that are dismissed, complainants have the right to file a request for review within 90 days of service of the dismissal with the HRC. The respondent may file a request for review with the HRC within 30 days of service of a notice of default recommendation.
  - **Public hearing**: If substantial evidence is found, complainants have the option of requesting that IDHR file a complaint, on the complainant's behalf, with the HRC within 90 days of service of the department's substantial evidence finding.
  - **Complainant requests IDHR to file a complaint with the HRC**: In this case, IDHR provides the parties the opportunity to reach a settlement through conciliation with a staff attorney or mediator (nonhousing cases). If a settlement agreement is not reached, IDHR will file a complaint of civil rights violation with the HRC on behalf of the complainant.
- **Legal representation**: Both parties will need to obtain legal representation to properly present or defend the case before the administrative law judge. If the administrative law judge recommends a finding that the respondent has discriminated against the complainant, the administrative law judge can recommend remedies deemed necessary to make complainant "whole," that is, placing the compliant in a position as if the discrimination had not occurred. A three-member panel of the HRC can review the recommendation of the administrative law judge. If the case goes to public hearing, the entire process could take several years.

THE IMPACT OF SEXUAL HARASSMENT IN THE WORKPLACE

Sexual harassment has many physical and psychological impacts on the victim. The following scenario and section describe the effects that sexual harassment can have on an individual's health.

Scenario 6

Nancy is a rehab manager who recently filed a sexual harassment claim with IDHR, citing the hospital's chief operating officer (COO) as the harasser. The results of the ensuing investigation were that there was substantial evidence to indicate that sexual harassment occurred. A complaint on her behalf was filled with the HRC. A financial settlement was reached, and the COO was terminated from his position. Even though the investigative results supported her claim and she received compensation, Nancy cannot, as she put it, return to normal. She is having nightmares about the circumstances of the sexual harassment and is showing signs of depression. Her blood pressure is elevated, and she is experiencing ongoing gastrointestinal issues. Nancy is suffering from the physical and psychological effects of dealing with sexual harassment.



State of Illinois
Department of Human Rights

COMPLAINANT INFORMATION SHEET
(For All Cases not related to Housing Discrimination)

Office Use Only: Control No: Inv. Init. Date:

Instructions: Read this entire form and all of the instructions carefully before completing. All applicable questions should be answered. This form must be postmarked or received by IDHR within 180 days of the date of the alleged discrimination. IDHR must establish if it has the right under the law to investigate your claim. If IDHR accepts your claim of discrimination, information will be typed on an official charge form. The charge form must be signed, notarized and returned to IDHR in a timely manner. This form must be signed and dated. Use additional sheets if necessary.
THIS IS NOT A CHARGE. If IDHR accepts your claim, we will send you a charge form for signature.

If your alleged claim of discrimination is related to Housing, such as buying or renting a house or apartment or refused a request to modify your housing, please STOP and fill out an IDHR Housing Complainant Information Sheet.

1. COMPLAINANT INFORMATION

Name:	Address:	Apt No:
City:	State: ZIP:	Phone No:
E-Mail:	Alt. Phone No:	Alt. Phone No:

Please provide the following information for statistical purposes only.

Country of National Origin:	Date of Birth:	Sex:

2. WHO CAN WE CALL IF WE CANNOT CONTACT YOU Make sure their mailing addresses are different from your mailing address. Your charge could be dismissed if you do not provide this information and we are unable to locate you.

Name:	Address:	Apt No:
City:	State: ZIP:	Phone No:
Name:	Address:	Apt No:
City:	State: ZIP:	Phone No:

Physical and psychological effects of dealing with sexual harassment

Some of the most powerful businessmen and celebrities have been charged with sexual harassment in the workplace. The media focus on high-profile firings and criminal trials that have taken place as a result of sexual harassment complaints. However, there has been relatively little focus on the emotional and physical impact of having been sexually harassed (Thompson, 2017).

People who have been (or are being) sexually harassed frequently experience mental health problems that can lead to a negative impact on physical health. These issues do not cease with the successful conclusion (for the complainant) of a sexual harassment complaint. The effects of dealing with the harassment and filing a complaint can be long term (Thompson, 2017).

Compounding the impact of sexual harassment is the fact that it is significantly under-reported. Many victims of such harassment suffer in silence; some continue to work in a toxic workplace environment that allows harassment to exist and, in some cases, to flourish (Patrick, 2017). The people reporting sexual harassment may often face a stigma at work, especially if the charged harasser is popular or particularly valued by the organization. This stigma contributes to the mental health consequences faced by the reporting individual.

Victims of sexual harassment are often bombarded with questions about why they did not come forward or why they came forward years after the harassment took place. There are a number of reasons for these issues:

- Fear of retaliation.
- Feelings of shame, embarrassment, and guilt (Did something I said or did make the harassment my fault?).
- Loss of job or loss of possible promotions.
- Damage to their reputation.
- Conflicting emotions if the harasser was viewed as a friend or mentor until the sexual harassment occurred (Patrick, 2017).

In addition to the physical and emotional impact of sexual harassment, there is often a financial toll. Physical and emotional effects (physical illness, depression) may lead to absenteeism and a negative impact on job performance (Patrick, 2017).

Some people leave their jobs (even jobs they love) to get away from their harassers. Patrick (2017) pointed out, "Sexual harassment victims don't quit jobs; they quit bosses." Even if their immediate supervisors are not the harassers, victims may view the workplace as toxic and cite a lack of support from their employing organization.

Physical symptoms related to stress

When faced with a threatening set of circumstances, the body responds with a complex physiological reaction. When confronted by such circumstances, the hypothalamus releases a chemical messenger into the bloodstream that travels directly to the pituitary gland. The pituitary gland responds to this messenger by producing adrenocorticotropic hormone (ACTH). ACTH travels through the blood stream until it reaches the adrenal glands. ACTH stimulates the adrenal cortex to produce

corticoids, which work to release the body's stored energy (Stress-Relief-Tools.com., 2015a).

The hypothalamus also stimulates the medulla of the adrenal gland to produce epinephrine. Epinephrine produces rapid, short-term high energy levels to deal with the stressor. Heart rate and blood pressure are elevated, digestion slows, sweating increases, and all of the senses become more acute. Energy levels increase, muscle tension increases, and bronchi dilate facilitating the entry of air into the lungs (Stress-Relief-Tools.com., 2015a).

All people experience stress at one time or another. The body responds to stress is the general adaptation syndrome (GAS), which has three phases:

1. **Alarm**: Alarm is the flight-or-fight response. The autonomic nervous system is activated and there is an adrenaline surge. All body systems rally and the body increases energy needed to either flee from the stressor or confront it.
2. **Resistance**: During resistance, the body works to regain homeostasis. Coping and adaptation take place. Because the body cannot maintain the high energy levels of the alarm stage, it redirects the stress response to a level that is manageable. Resistance occurs with the assumption that the stressful circumstances are resolved or manageable.
3. **Recovery or exhaustion**: With the resolution or management of stressors, the body recovers and regains homeostasis. However, if the stress continues unabated, the body becomes exhausted, and the impact of elevated cortisol and other hormones begin to negatively impact health (Stress-Relief-Tools.com., 2015b).

As the body tries to deal with ongoing stressors such as sexual harassment and filing a complaint of sexual harassment, three body systems are particularly affected:

1. The cardiovascular system.
2. The gastrointestinal system.
3. The immune system (Stress-Relief-Tools.com., 2015c).

Cardiovascular system

Stress leads to more rapid and forceful contractions. Blood pressure rises and, if the stress is long term, hypertension may occur. Blood vessels constrict, which makes it harder for blood to reach body systems and provide the nourishment tissues and organs require. Stress also leads to the release of cholesterol into the bloodstream. This can lead to atherosclerotic plaque buildup in the coronary arteries, which increases the risk of heart attack.

Gastrointestinal system

During the acute stage of stress, blood flow is diverted from the gastrointestinal system to muscles that need it as part of the flight-or-fight response. Digestion slows, intestinal blood vessels constrict, and peristalsis and intestinal tone is decreased. Unrelieved or prolonged stress can lead to gastrointestinal problems such as ulcers or chronic constipation.

Immune system

Elevated adrenal hormonal levels during stress inhibit the body's production of T lymphocytes, which are critical to adequate response of the immune system. This can increase susceptibility to infection and other immune system-related diseases and disorders.

Physical therapists faced with the stress of a hostile work environment or the stress of reporting sexual harassment may increase their absenteeism because of these physiological consequences of the stress. Increased absenteeism further compounds the stigma they face but should be seen as a need for support.

Mental health issues related to stress

The mental health effects of sexual harassment can be significant. The impact of ongoing stress can, and often does, trigger a variety of mental health issues, including three serious disorders:

1. Depression.
2. Flashbacks.
3. Post-traumatic stress disorder.

Depression

One of the most common mental health problems associated with sexual harassment is depression. It is normal for survivors of sexual harassment (and other forms of sexual assault) to feel sad, unhappy, and even hopeless. However, if these feelings persist, they may indicate depression (Rape, Abuse, & Incest National Network [RAINN], 2018a). It is important for sexual harassment survivors to know that depression is not a sign of weakness, nor is it something you can just "get over." It is a serious mental health disorder, and persons experiencing depression frequently find that seeing a mental health professional is a significant help (RAINN, 2018a).

Major depressive disorder is defined as a "persistent sad mood lasting two weeks or longer" (Gersch, Heimgartner, Rebar, & Willis, 2016). It is characterized by feelings of extreme sadness accompanied by guilt, helplessness, hopelessness, poor concentration, sleep disturbances lethargy, changes in appetite, and loss of ability to feel pleasure (Gersch, Heimgartner, Rebar, & Willis).

Major depression can affect a person's social, interpersonal, and career functioning. The feelings that accompany depression can inhibit the ability to focus at work and at home and in social settings. Employers, friends, and family members may become frustrated with the person's inability to function at the same level as before the harassment occurred (Gersch, Heimgartner, Rebar, & Willis, 2016).

Serious complications of major depression are suicidal ideation, suicide attempts, and completed suicide. Persons who suffer depression may feel that life is no longer worth living. In fact, almost 15% of people with undiagnosed depression commit suicide. What is equally disturbing, if not more so, is the fact that most people with depression who commit suicide sought help from a doctor within one month of their deaths (Gersch, Heimgartner, Rebar, & Willis, 2016).

Flashbacks

Those who have experienced sexual harassment often experience flashbacks, which are memories of the harassment that are so acute they believe that the harassment is occurring in the current moment. During a flashback, it may be difficult to connect with reality. People may even feel as though the harasser is physically present (RAINN, 2018b).

Flashbacks may occur in response to circumstances that trigger memories of the sexual harassment. A smell, sound, tone of voice, or even the appearance of someone who resembles the harasser can provoke a flashback (RAINN, 2018b).

Post-traumatic stress disorder (PTSD)

PTSD is a trauma-related and stressor-related disorder. It occurs after experiencing or witnessing a serious trauma such as sexual harassment. PTSD can range from mild to severe and can affect all aspects of a person's life (Gersch, Heimgartner, Rebar, & Willis, 2016).

There are three main characteristics of PTSD:

1. **Re-experiencing**: During re-experiencing, people feel as though they are reliving the event via flashbacks, dreams, or intrusive thoughts.
2. **Avoidance**: Avoidance is the intentional or subconscious change of behavior to avoid circumstances associated with the traumatic event.
3. **Hyperarousal**: Hyperarousal is a feeling of being on edge or alert to danger all of the time. Persons in a state of

hyperarousal have difficulty sleeping, are easily startled, and are prone to abrupt emotional outbursts (RAINN, 2018c).

Additional problems associated with sexual harassment

A number of additional problems can occur as the result of sexual harassment:

- **Self-harm**: Self-harm is the deliberate harming of oneself or self-injury that occurs when a person inflicts physical harm on herself.
- **Sexually transmitted infections (STIs)**: If the harassment includes physical contact, bacterial or viral STIs may be transmitted through vaginal, anal, or oral contact. Pregnancy may also be a concern if the harassment includes physical sexual activity.
- **Substance abuse**: Persons who have been sexually harassed may seek out ways to feel better and to escape dealing with the stress and impact of the trauma.
- **Dissociation**: Dissociation is detachment from reality and can range from mild—for example, daydreaming—to severe when it becomes chronic and makes it difficult to function at work, home, or in social situations.
- **Eating disorders**: Eating disorders such as anorexia nervosa, bulimia nervosa, and binge eating disorder may develop. Some survivors of sexual harassment use food as an attempt to establish control over their lives and deal with trauma. Warning signs of eating disorders include dramatic weight gain or loss; preoccupation with food, calories, and dieting; frequent trips to the bathroom to purge food that has been eaten; and refusing to eat out (RAINN, 2018e).
- **Sleep disorders**: Symptoms of sleep disorders include sleeping too much or too little, having trouble falling asleep, or having trouble staying asleep. Proper rest is essential for good health. Evaluation of sleep and rest should be part of the interventions for persons who have been sexually harassed.
- **Suicide**: As previously noted, persons who have experienced trauma and suffer depression or PTSD are at risk for suicide. Sexual harassment survivors should be evaluated for suicidal ideation (RAINN, 2018a; RAINN, 2018d).

WAYS TO PREVENT SEXUAL HARASSMENT IN THE WORKPLACE

To prevent sexual harassment at work, people must talk about it. The CEO has to talk about it, management has to talk about it, staff members have to talk about it (Ryan, 2016).

Leadership must make it clear that their organizations have zero tolerance for sexual harassment. Jones (2017) offered the following eight ways for leadership to support victims of sexual harassment and to prevent its occurrence:

1. Establish a clearly understood policy regarding sexual harassment. Make sure that this policy defines sexual harassment, emphasizes a zero tolerance for sexual harassment, identifies disciplinary actions against perpetrators, and explains how complaints are to be handled.
2. Provide accessible mental health resources to employees.
3. Take all complaints seriously, and provide support to victims.
4. Provide mandatory education regarding sexual harassment semiannually. Bring in experts to provide education.
5. Train supervisors and managers on how to handle sexual harassment complaints.
6. Monitor the workplace for signs of sexual harassment.
7. Hire diverse people to balance power dynamics. Diversity helps to provide varying perspectives, views, and solutions.
8. Talk to mental health experts for additional education needs.

It is not enough to have policies in place. The culture of the organization must be such that employees know what sexual harassment is, that it is not tolerated, how to report it, and consequences for being a harasser. Employees must be able to see that leadership is committed to preventing sexual harassment.

Most experts emphasize the importance of establishing and consistently implementing a zero tolerance harassment policy. Any policy must be written in conjunction with Illinois legislative mandates. Remember that a zero tolerance harassment policy should, at a minimum, adhere to state mandates and include the following:

- A definition of sexual harassment.
- A harassment prohibition statement emphasizing zero tolerance for such harassment.
- A description of the complaint procedure.
- A description of disciplinary measures.
- A statement of protection against retaliation.

(Wolters Kluwer Office Management & HR, 2018)

Conclusion

Sexual harassment can affect anyone. Its impact on survivors can lead to both physical and mental health diseases and disorders. Sexual harassment creates a toxic work environment that leads to increased attrition and decreased productivity. All employees, at all hierarchical levels of an organization, must work together to prevent such harassment and support those who experience it.

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PREVENTING AND DEALING WITH SEXUAL HARASSMENT FOR IL PROFESSIONALS

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 81 or complete your test online at **EliteLearning.com/Book**

21. According to the Illinois definition of sexual harassment, the term "working environment":
    a. Means an employment relationship is required for sexual harassment to occur.
    b. Is not limited to an employment relationship or a physical location.
    c. States that a working relationship requires a physical location.
    d. Means that the person who commits sexual harassment must be an employee of the organization.

22. According to laws of the state of Illinois, a written sexual harassment policy must include, at a minimum:
    a. Prohibition on sexual harassment.
    b. Details on how an individual can report an allegation of sexual harassment.
    c. A prohibition on retaliation for reporting sexual harassment allegations.
    d. All of the above.

23. The EEOC states that sexual harassment can occur in a variety of circumstances. The EEOC describes sexual harassment victims as:
    a. Members of the opposite sex only.
    b. People who have experienced economic injury as the result of the harassment.
    c. Anyone offended by the offensive conduct.
    d. Only those who are in a supervisory position.

24. For the first time, federal legislation prohibited discrimination on the basis of sex in addition to discrimination based on race and religion with the passage of:
    a. Illinois Public Act 100-0554.
    b. Whisteblower laws.
    c. Title VII of the Civil Rights Act of 1964.
    d. EEOC mandates.

25. The first step in dealing with noncriminal sexual harassment is to:
    a. Overtly object to the harasser's behavior.
    b. Call the police.
    c. Hire an attorney.
    d. Avoid future interaction with the harasser.

26. Which of the following examples is the best documentation of sexual harassment?
    a. "Anthony Smith, PT, Rehab Manager, continually makes comments of a sexual nature that are directed toward me."
    b. "On October 1, 2018, in the utility room on 3 West, Anthony Smith, PT, Rehab Manager, implied that if I slept with him he would see that I was promoted."
    c. "On October 1, 2018, at 2 p.m. in the conference room on 3 West, Anthony Smith, PT, Rehab Manager, said to me "If you go to bed with me, I might be able to see that you get that promotion you wanted."
    d. "Anthony Smith, PT, Rehab Manager, threatened me by saying, 'If you don't agree to have sex with me I'll see that you are fired.'"

27. Which of the following is a reason why victims of sexual harassment do not come forward or come forward years after the event?
    a. It no longer bothers them.
    b. Feelings of shame, embarrassment, or guilt.
    c. Their work environment and job performance were not negatively affected.
    d. They didn't want a lawsuit.

28. When the body experiences unrelieved stress:
    a. Blood vessels dilate.
    b. Cholesterol is released into the bloodstream.
    c. Peristalsis increases.
    d. Production of T lymphocytes increases.

29. Which of the following statements about mental health issues related to stress is accurate?
    a. 15% of people with undiagnosed depression commit suicide.
    b. During flashbacks, people find that they are significantly connected to reality.
    c. Research has shown that sexual harassment survivors seldom become involved with substance abuse.
    d. PTSD often makes a person lethargic and less alert to danger.

30. To help prevent sexual harassment, workplace leadership should:
    a. Hire employees that are similar to each other in order to reduce potential conflict.
    b. Tell their employees to find education classes on sexual harassment on their own time.
    c. Refrain from talking about it often in order to avoid upsetting their employees.
    d. Take all complaints seriously and establish a clear zero tolerance policy.

Course Code: PTIL01SH

Chapter 4: An Overview of Hip and Knee Rehabilitation for the Physical Therapist, Updated

4 CE Hours

By: Amanda Olson, PT, DPT, PRPC

Learning objectives

- Describe the functional relationship and physical therapy examination of the hip and knee.
- Identify valid and reliable outcome measures for the hip.
- Describe hip pathologies and their physical therapy interventions.
- Identify valid and reliable outcome measures for the knee.
- Describe knee pathologies and their physical therapy interventions.

Course overview

Due to the anatomy and importance of the essential functions of the hips and knees, severe pain in either one or both of these areas can have a direct adverse effect on everyday life and can severely reduce quality of life. There is a biomechanical reliance on each of these joints to function optimally during activities of daily living. Approximately 22% of the general population suffers from knee pain, and knee and hip pain are even more common in older people (Damen, 2019). Disruption in either one can result in aberrant movements of the other, and they rely on coordination and common nerve and muscular performance during ambulation.

This course will focus on these two joints individually and as they relate to each other, and discuss various symptoms, treatments, and effective plans of treatment for optimum patient outcome.

THE FUNCTIONAL RELATIONSHIP OF THE HIP AND KNEE AND IMPLICATIONS FOR REHABILITATION

Due to their proximity anatomically, biomechanical relationships during ambulation, and sharing of musculature and nerves, both the knee and hip should always be considered in treatment plans for the other. For example, hip joint impairments have been identified in many patients with knee pain, including osteoarthritis (OA), and thus treatment of the hip is often implicated to address the primary symptom of knee pain.

Evaluation of the hip and knee

Prior to the physical therapy evaluation of a new patient, the physical therapist can gather pertinent information through analysis of a body chart and subjective information provided on intake forms. When analyzing the body chart, the physical therapist should take note of the areas demarcated, type of pain, and duration of symptoms. The physical therapist must also screen for red flags including night sweats, change in appetite, sudden unexplained weight loss or gain, nausea, vomiting, and changes in bowel or bladder habits. If there is not a clear explanation for these red flags and symptoms do not appear to be musculoskeletal in nature, the patient should be immediately referred to their physician. Additionally, bone pain and visceral pain must be ruled out, as both tend to be painful regardless of position.

Differential diagnosis requires the physical therapist to discern between localized pain and referred pain. The third lumbar nerve (L3 nerve root) refers pain to the lateral aspect of the hip, therefore evaluation of the spine is necessary to rule out lumbar pathology as the cause of hip pain. Analyses of risk factors for hip pathology include prior hip injury, developmental disorders, advanced age, and presence of osteophyte formation on radiograph films. Patient-reported problems and functional limitations should be noted, and goals should be made based upon this information (Cibulka et al., 2009).

Objective evaluation measures should begin with an assessment of the patient's dynamic capabilities including:

- Visual inspection of posture and alignment of the body, including pelvic position, knee alignment, and foot position: Take note of visible muscle wasting, swelling, discoloration, and deformities.
- Gait analysis: Observe in both the sagittal and frontal plane, noting the type of assistive device used if necessary.
- Functional squat test: Ask the patient to squat down to the ground and observe symmetry of the lower extremities, alignment of the trunk, hips, and knees. Additionally, observe the patient's ability to return to standing, and whether or not it is necessary to rely on the use of upper extremities.
- The ability to perform 10 heel raises with or without upper extremity support: Note symmetry of muscle tone in the lower extremity, and balance.
- Single limb stance: Note the duration of balance on each leg.

Objective measures and provocative testing should include, at a minimum:

- Spine range of motion in flexion, extension, side-bending, and rotation.
- The Stork (Gillet) test to assess sacroiliac joint mobility and dysfunction.
- Manual muscle testing of all hip, abdominal, and knee musculature, with particular attention to weak hip abductor musculature, which is highly correlated with many forms of knee pathology including patellofemoral pain syndrome and general knee pain (Noehren, 2010).
- Hip and knee range of motion including hip flexion and extension, internal and external rotation, and knee flexion and extension.
- Flexion, Abduction, External Rotation (FABER) test to assess hip mobility and pain in the sacroiliac joint.
- Ober test to assess iliotibial band tightness.
- Thomas test to assess quadriceps length.
- Hip scour to assess pain between the femoral head and acetabulum.
- Posterior Shear (POSH) test of the pelvis to assess sacroiliac joint mobility and pain.
- Straight-leg raise, both passive and active, to assess for disc lesion and the effect of core strength on lower back and hip symptoms.
- Spine passive intervertebral test to assess joint mobility.
- Hamstring flexibility.
- Limb length, which is measured from the anterior superior iliac spine to the medial malleolus.

Assessment specific to the knee patient will include all of the above tests in addition to:

- Lachman's test to assess for integrity of the anterior cruciate ligament (ACL).
- Anterior drawer test to assess the integrity of the ACL.
- Pivot shift test, a clinical phenomenon of anterior subluxation of lateral tibial plateau in relation to the femoral condyle when the knee approaches extension, used to diagnose ACL injury.
- Posterior drawer test to assess the integrity of the posterior cruciate ligament (PCL).
- McMurray's test to assess for meniscus tear.
- Varus/Valgus test to assess for lateral collateral or medial collateral integrity, respectively.
- Apley's Grind test to assess for meniscus tear.
- Patella Grind test to assess for sub-patellar dysfunction.
- Patella lateral apprehension test to assess for patellar hypermobility and subluxation.
- Ely's test to assess rectus femoris length.

Outcome measures for the hip

Outcome measures are standardized assessment tools used to assess baseline levels of ability or pain, and utilized during re-evaluation and progress reporting to demonstrate progress towards goals set by the patient and physical therapist. Some outcome measures are based on the patient's self-report and some tools and tests are conducted by a physical therapist or other qualified examiner. The following tools are the most widely used and validated tools used for the hip:

- **Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC):** This patient self-report tool assesses pain, stiffness, and physical function in patients with osteoarthritis (OA) in the knee or hip. There are 24 patient self-reported items within three subcategories (pain, stiffness, and physical function; American College of Rheumatology, n.d.). The WOMAC tool is useful to analyze changes in patient function following physical therapy treatment. The WOMAC tool has been validated for delivery via mobile phone, making it a quick and convenient method for patient use (Bellamy et al., 2011).
- **Lower-Extremity Function Scale (LEFS):** The LEFS is a self-reported measure of activity limitation developed for the lower extremities and has been shown to be a valid tool in the measurement of lower-extremity function in a population of patients with orthopedic problems. A change of 9 points on the LEFS has been shown to represent a minimal clinically important difference (Binkley et al., 1999).
- **Hip Disability and Osteoarthritis Outcome Score (HOOS):** This a self-reported measure useful for evaluation of patient-relative outcomes including pain, sport and recreation, and hip-related quality of life for patients with OA, and was most recently found to be valid and responsive for patients undergoing total hip arthroplasty. It was found to be most responsive for patients under 66 years of age (Nilsdotter et al., 2003).
- **Harris Hip Score:** This is a 10-point self-reported functional outcome measure valid for use on patients with hip OA. A change in 4 points indicates a clinically meaningful difference. This outcome is often used for research purposes (MacDonald et al., 2006).
- **Timed Up and Go (TUG):** This tool is conducted by an examiner and measures the time in seconds that a patient requires to stand up from an armless chair (chair height = 45 cm), walk a distance of 3 meters, turn, walk back to the chair, and sit down (Ibrahim, 2017).
- **Patient-specific Functional Scale:** This clinical outcome measure allows patients to report their functional status in areas meaningful to them at baseline and follow-up (Mathis, 2019).

HIP PATHOLOGIES AND EVIDENCE FOR INTERVENTIONS

Hip pathology and impairments are prevalent across all ages and genders (Larkin, 2017). Additionally, they are commonly seen in the clinical environment, thus a thorough examination to determine the driver of impairment is important for proper plan of care and intervention strategy.

Hip osteoarthritis

Osteoarthritis (OA) is a progressive disorder characterized by loss of articular cartilage and formation of osteophytes resulting in loss of motion, decreased functional capability, and decreased quality of life. OA is associated with joint pain and functional limitation and is a leading cause of disability among older people. OA is considered the most common form of arthritis from which 15-18% of the population suffers (Damen 2019).

Hip OA also affects younger adults, with a profound impact on well-being and work capacity. Structural hip deformities including those contributing to femoroacetabular impingement syndrome are strong predictors of early-onset hip OA. Increased rates of obesity and sports injuries may induce a future surge in OA incidence among younger people (Akerman, 2017).

Assessment of hip OA in younger people should focus on a patient-centered history, comprehensive physical examination, performance-based measures, and patient-reported outcome measures to enable monitoring of symptoms and function over time. Referral for imaging should be reserved for people presenting with atypical signs or symptoms that may indicate diagnoses other than OA.

Nonpharmacological approaches are core strategies for the management of hip OA in younger people, and these include appropriate disease- related education, activity modification (including for work-related tasks), physical therapist-prescribed exercise programs to address identified physical impairments, and weight control or weight loss. Referral for joint-conserving or joint replacement surgery should be considered when nonpharmacological and pharmacological management strategies are no longer effective (Akerman, 2017).

The American College of Rheumatology (ARC) guidelines for the medical diagnosis of hip OA is the presence of hip pain for more than 25 of the past 30 days and at least two of the following criteria:

1. Erythrocyte sedimentation rate (ESR) of <20 mm/1st hour.
2. Osteophytes on plain film radiograph (x-ray) examination.
3. Obliteration of the joint space.

(Altman et al., 1991)

A large proportion of persons with hip complaints not fulfilling the ACR criteria at baseline develop hip OA after 2 and 5 years of follow up (Damen, 2019).

Once the diagnosis of hip arthritis has been made, perhaps the most important aspect of treatment is to encourage the patient to remain active. The American College of Rheumatology's general recommendations for management of knee and hip OA include exercise, weight loss in patients who are overweight or obese, self-efficacy and self-management programs, tai chi, cane use, tibiofemoral bracing for tibiofemoral knee OA, topical nonsteroidal anti-inflammatory drugs (NSAIDs) for knee OA, oral NSAIDs, and intraarticular glucocorticoid injections for knee OA. Conditional recommendations are made for balance exercises, yoga, cognitive behavioral therapy, patellofemoral bracing for patellofemoral knee OA, acupuncture, thermal modalities, radiofrequency ablation for knee OA, topical NSAIDs, intraarticular steroid injections, topical capsaicin for knee OA, acetaminophen, duloxetine, and tramadol (Kolasinski 2020).

In 2005, a multidisciplinary group of health care practitioners established the MOVE consensus, a set of guidelines for the management of hip and knee OA based on evidence (Grades 1A through 4). The group established 10 propositions to manage patients based on the evidence in literature (Roddy et al., 2005):

1. Both strengthening and aerobic exercise can reduce pain and improve function and health status in individuals with hip and knee OA.
2. Few contraindications exist to the prescription of strengthening or aerobic exercise in individuals with hip and knee OA.
3. Prescription of both general aerobic fitness training and local strengthening exercises is an essential aspect of management of hip or knee OA.
4. Exercise therapy for OA of the hip or knee should be individualized and patient-centered, taking into account age, comorbidity, and overall mobility.
5. To be effective, exercise programs should include advice and education to promote a positive lifestyle change with an increase in physical activity.
6. Group exercise and home exercise are equally effective and patient preference should be considered.
7. Adherence is the principle predictor of long-term outcome from exercise in patients with hip or knee OA.
8. Strategies to improve and maintain adherence should be adopted including long-term monitoring, review by patient and health care provider, and inclusion of spouse and/or family in the exercise program.
9. The effectiveness of exercise is independent of the presence or severity of radiographic findings.
10. Improvement in muscle strength and proprioception gained from exercise programs may reduce the progression of knee and hip OA.

In addition to exercise, manual therapy is an important evidence-based component of management of the patient with hip OA. When comparing manual therapy and exercise in isolation against each other, patients receiving manual therapy alone demonstrated significantly better outcomes on pain, stiffness, hip function, and range of motion, with effects lasting 6 months following treatment compared with patients receiving exercise therapy alone. The manual therapy techniques found to be beneficial in this study included manual stretching of shortened muscles, traction of the hip joint, and manipulation in each direction of limited motion (Hoeksma et al., 2004). When patients are placed in subcategories based on severity of symptoms (mild, moderate, or severe), patients with severe hip OA demonstrate less progress in range of motion following manual therapy than patients with mild or moderate symptoms (Hoeksma et al., 2005).

Furthermore, MacDonald et al. (2006) conducted a case series in which they analyzed the effects of exercise and manual therapy on patients with hip OA; patients in this study receiving both exercise and manual therapy demonstrated increases in passive range of motion in addition to clinically meaningful improvements in functional abilities according to their Harris Hip scores.

Aquatic therapy has been shown to have short-term positive effects on patients with hip OA, however long-term studies have yet to be conducted. When compared with no intervention, aquatic therapy has been shown to improve strength, mobility, functional capability, pain, and quality of life at 6-week follow-up. Patients who do not progress with land-based physical therapy may be considered candidates for aquatic therapy (Cibulka et al., 2009).

Other treatments may include gait training, education, recommendation for assistive devices such as a cane or walker to decrease pain and pressure on the hip joint, and balance training to promote functional capabilities of the patient (Cibulka et al., 2009).

It is important to consider that following radiograph findings of OA, a patient may have been told by a health care provider that the condition is permanent, thus bestowing a hopeless outlook. Evidence for the role of physical therapy suggests that reversal of loss of range of motion and stiffness is possible, with subsequent decrease in pain and improved quality of life. Patient education is important for maintaining activity and the positive outcomes of manual therapy can motivate the patient and instill a more hopeful outlook.

Total hip arthroplasty

As previously mentioned, when conservative measures for hip OA fail, total hip arthroplasty (THA) may be indicated. Other pathologies that may lead to THA include avascular necrosis and fracture. On the basis of data from 2000 to 2014, primary total hip arthroplasty (THA) is projected to grow 71%, to 635,000 procedures, by 2030 (Sloan, 2018). Though rehabilitation protocols may vary by operating physician, it is common to see physical therapy orders for weight bearing as tolerated (WBAT) following a cemented THA and toe-touch weight bearing (TTWB) for uncemented THA. Additionally, it is necessary to verify the approach the operating physician used to perform the THA. A posterolateral approach commonly requires avoidance of hip adduction, internal rotation, and flexion beyond 90° to prevent dislocation of the femoral head. Patient education is pertinent, and an abduction pillow to prevent the impaired lower extremity from adducting is advised.

A THA administered surgically through the anterolateral approach generally results in fewer dislocations postoperatively, however, post-op restrictions are still recommended. A study by Peak, et al. (2005) demonstrated low dislocation rate (0.33%) in patients who underwent anterolateral approach with uncemented hip components when they were given post-op restrictions. Patients were advised to limit hip flexion to less than 90°, restricted to 45° of internal and external hip rotation, and limited adduction of the hip was advised with instructions to sleep on their backs with an abduction pillow in place to prevent passive adduction during sleep.

A study by Slaven (2012) investigated whether predetermined variables could be used to identify patients who might have functional limitations at 6 months following THA. Demographics and baseline measures including age, sex, and preoperative LEFS score were assessed at 1 to 3 weeks prior to surgery, and an additional LEFS score was recorded at 6 weeks post-op. Walking speed and balance were assessed using the 10-meter walk test and TUG, and a functional reach test. Results demonstrated that body mass index (BMI) >34 kg/m2, female sex, and age above 68.5 years were found to be predictors to classify patients that did not reach successful outcome status. Similarly, another study by Nankaku et al. (2013) analyzed preoperative factors likely to estimate ambulatory status of patients undergoing THA at 6 months post-op. Findings of this study suggest that patients with a preoperative TUG score of <10 seconds are likely to walk without an assistive device at 6 months after THA.

A study conducted in 2003 determined that treadmill training with partial body weight support (TT-BWS) following THA was more effective than conventional physical therapy alone for the purpose of restoring symmetrical independent walking after hip replacement surgery. The investigators conducted 10 days of treatment on patients randomized into either the conventional physical therapy group (control) or treadmill physical therapy group (experimental), and found that Harris Hip scores were 13.6 points higher in the treadmill group. Furthermore, hip extension was 6.8° greater, symmetry more significant, and hip abductor strength greater in the treadmill group as well, with results persisting at 12 months post-intervention (Hesse et al., 2003).

Greater trochanteric bursitis (greater trochanter pain syndrome)

Greater trochanteric bursitis is caused by friction or inflammation of the bursa lying lateral to the greater trochanter and medial to the iliotibial band (OrthoInfo, n.d.a.). Pain is reported to be sharp and located at the lateral aspect of the hip. The patient may report pain to be worse at night when lying on the painful side, or when attempting to rise from seated position after prolonged sitting, with walking, or squatting. It is most commonly diagnosed in the middle-aged and geriatric population (OrthoInfo, n.d.a.)

The bursa may be septic or aseptic, and the condition is thought to be secondary to overuse via friction of the gluteus maximus tendon at the iliotibial band insertion. Risk factors include pelvic asymmetry, repetitive running on a crowned road (the downhill side is most often affected), repetitive stair climbing or step aerobics, or weakness in the gluteus medius resulting in a Trendelenberg gait pattern.

This common diagnosis must be verified in the physical therapy clinic by examining the lumbar spine to rule out an L3 referral issue. Other differential diagnoses included tensor fascia latae strain, entrapment neuropathy, and femoral neck stress fracture. Thus, a proper evaluation including a neuromuscular screen and provocative hip tests is important.

A recent systematic review on conservative management of trochanteric bursitis revealed a lack of high-quality research in this area (Barratt et al., 2017). While there is little evidence for the provision of exact physical therapy treatment protocols, it can be inferred that treatments to reduce pain including anti-inflammatory iontophoresis, as well as exercise to improve pelvic and hip strength, correction of gait deviations, and education in body mechanics to reduce continued strain are beneficial (Shbeeb & Matteson, 1996).

Gluteus medius tendinopathy

Gluteus medius tendinopathy is an overuse injury of the gluteus medius tendon resulting in calcification in the tendon and is more commonly found in women. Compression of the gluteus medius tendon by the iliotibial band when the leg is adducted, particularly with external rotation of the hip, is a common mechanism of injury (Cook, 2012). This is associated with habitual positions such as leg crossing while seated, stair climbing by taking the stairs two at a time, and during ambulation when excessive relative adduction of the pelvis on femur occurs, as is commonly observed in the case of poor hip abductor strength lending to poor pelvic control in the single-limb stance phase of gait (Cook, 2012).

Similar to greater trochanteric bursitis, it is necessary to rule out lumbar radiculopathy. Differential diagnosis for the implication of gluteus medius tendinosis includes pain with contraction of the gluteus medius muscle against resistance. The patient may report persistent pain in the lateral hip radiating along the lateral aspect of the thigh to the knee, and occasionally below the knee and/or buttock (Williams, 2009).

Physical examination should include the following clinical tests (Grimaldi, 2015):

- **FADER (Flexion Adduction with External Rotation)**: To perform this test, have the patient positioned in supine on the treatment table. Place the patient into 90° hip flexion, and hip adduction coupled with external rotation, then ask the patient to actively resist external rotation. A report of pain provocation is considered positive.
- **Modified Ober's**: To perform this test, have the patient positioned in side-lying position, with therapist behind the patient. The therapist will passively adduct the top hip and monitor for pain.

Treatment should begin by strengthening of the gluteus medius eccentrically first, then concentrically. Exercises should be performed bilaterally to ensure muscle balance and to prevent subsequent injury to the contralateral side; core strengthening is recommended to promote pelvis and hip stability.

Femoral acetabular impingement & acetabular labrum lesions

The primary purpose of the acetabulum of the hip is to provide stability to the joint, and decrease forces transmitted to the articular cartilage. Stability of the joint is dependent on the depth of the acetabular recession and, thus, if the acetabulum is abnormally shallow, there will be increased stress on the labrum and joint capsule. Nerve endings within the capsule provide proprioceptive feedback; however, they can also be a source of pain if impinged upon (Martin et al., 2006).

Femoral acetabular impingement (FAI) is a disorder of the hip involving excessive friction between the femoral head and the acetabulum. The etiology differs by patient and continues to be studied (Van Klij, 2018). It is thought to occur as a result of abnormality in either the femur or acetabulum itself. Bony abnormality associated with FAI is commonly observed on radiograph film at the femoral neck. Pain during movement of the individual is often provoked with end ranges of hip flexion and adduction. When FAI is present, bony spurs develop around the femoral head or in the acetabulum and over time, this friction causes tearing and degeneration of the articular cartilage in the anterior aspect of the joint and can result in osteoarthritis (Powers, 2016). Patients with FAI will report pain or a dull ache in the groin or deep within the hip itself, popping, clicking, and a sense of the hip giving way (Thornborg, 2018). Pain is often aggravated with physical activity, including running, and may present with an audible click during flexion or extension of the hip (Loudon & Reiman, 2014).

Examination should include an FAI-specific test. With the patient supine on a table, therapists should use a combined movement of 90° passive hip flexion on the symptomatic side followed by forced adduction and internal rotation, also referred to as FADIR (Laborie et al., 2013). The test is positive if pain is reproduced. Some evidence suggests that healthy individuals without FAI may exhibit a positive response in this particular test; a radiograph may be required for definitive diagnosis (Laborie et al., 2013).

Tears of the acetabular labrum may also result from significant trauma or dislocation. Martin et al. (2006) noted in a study that a labral tear was arthroscopically identified in 90% of individuals with mechanical hip symptoms. Non-traumatic disruption is often associated with the presence of a capsular laxity, femoral acetabular impingement, dysplasia of the acetabulum, cyst formation, and chondral lesions. Patient history is important in the differential diagnosis of acetabular labral lesions, and often the patient will report a twist of the hip or a fall (Martin et al., 2006).

Symptoms include painful catching, popping, and clicking of the hip, worsening of symptoms over time, and possible groin pain which is worsened with running in athletic patients. Physical examination should include lumbo-pelvic mobility and mechanics, and most often reveals pain with combined hip flexion, internal rotation, and adduction, often without range of motion restrictions. Suggested imaging for confirmation of this diagnosis include arthrography, magnetic resonance imaging (MRI), and computerized tomography (CT) arthrography.

Physical therapy is recommended as the first line of conservative treatment prior to surgery for labral tear and FAI. Physical therapy management should involve activity modification including rest if the patient is highly aggravated, and education to avoid end ranges of hip flexion and adduction. Manual therapy to the hip to improve hip glide in flexion as well as strengthening of the hip is indicated as well (Loudon & Reiman,

2014). Specifically, patients with FAI have been identified as exhibiting weakness in the tensor fascia latae (TFL), hip external rotators, hip abductors, and adductors (Casartelli, 2011).

If physical therapy has not assisted in reducing pain and symptoms after 6 weeks of earnest treatment, surgical management may be considered. Arthroscopic procedures are commonly performed, though physical therapy treatment may be warranted post-operatively to aid in return to sport conditioning.

Ischemic necrosis of the femoral head

Ischemic necrosis of the femoral head presents as degeneration of the femoral head due to poor blood supply. Impingement to blood supply and alcoholism have been cited as causes for this disease. Progression of ischemic necrosis of the femoral head is classified into four categories with Stage IV being the most significantly impaired. Medical management of this impairment when identified prior to complete collapse of the femoral head includes education in alcohol consumption, careful use of corticosteroids, and resting the joint including non-weightbearing and range of motion exercises (Orrin & Crues, 2004).

Surgical intervention is required for Stage II and beyond. Core decompression is often performed on Stage II hips with the goal of reducing intramedullary pressure and halting ischemic damage. Patients with Stage III impairments may be treated with osteotomy or surface hemiarthroplasty. Stage IV patients most often undergo total hip arthroplasty (Orrin & Crues, 2004).

Physical therapy treatment in early stages consists of educating the patient in range of motion exercises, while treatment for later stages is dependent on the type of surgery performed to reconcile the hip lesion.

Septic arthritis

The incidence rates of septic arthritis (SA) in developed countries range from about 2 to 7 cases per 100,000 people and the incidence appears to be increasing (Nair, 2017). Possible factors to account for this include: an aging population, more orthopedic and invasive procedures, and more frequent use of immunosuppressive therapies. Septic arthritis of the hip is uncommon in patients who have a competent immune system. Patients with septic arthritis of the hip often have an underlying hip injury that predisposes it to infection after bacteremia. Risk factors include people age 80 years or greater, diabetes, rheumatoid arthritis, hip or knee prostheses, skin infection, and immunosuppression (Nair, 2017).

The most common route for the pathogen to enter a joint is via hematogenous spread. Older adults are particularly susceptible to this route of infection because of primary diseases affecting their joints, like rheumatoid arthritis and the presence of comorbid conditions such as diabetes, skin infections, and cancer. Other routes include direct inoculation such as through trauma, or rarely, iatrogenic, such as therapeutic intraarticular corticosteroid injection (Nair, 2017).

Acute SA in children is most often associated with blood-borne infection. The slower blood flow in the metaphyseal capillaries makes growing bones in children more susceptible to infection from SA after any trauma or infection. SA is more common in males than females with a ratio of 2:1. The incidence in developed countries is 4-5 cases per 100,000 children per year (Pääkkönen, 2017).

Symptoms of SA include patient report of a few days of redness, warmth, pain, and swelling with decreased range of motion of the involved joint, and sometimes fever. Medical management includes antibiotic treatment, arthroscopic lavage, and possible surgical drainage to preserve the articular cartilage. In progressive cases, total hip arthroplasty may be required (Nair, 2017).

Physical therapy treatment includes gentle mobilization of the hip after 5 days of medical treatment, and once the physical signs of joint synovitis have completely resolved. After the patient has been cleared medically, aggressive physical therapy to regain range of motion and strength of the hip is advised (Orrin & Crues, 2004).

HIP FRACTURES

Approximately 50% of older adults who sustain a hip fracture experience functional decline and demonstrate decline in their ability to perform activities of daily living (ADLs). The sequelae of hip fracture are often so debilitating that up to 20% of older adults with hip fracture will be placed in institutionalized care 3 months after hospital discharge (McGilton, 2016).

Functional training, such as ambulation and transfers, is an integral part of rehabilitation after hip fracture. Evidence suggests that rehabilitation strategies after hip fracture vary, and better survival rate, improvement of pain, quality of life, and physical functioning are associated with early assisted ambulation beginning while the patients are in hospital. According to a systematic review and two Cochrane reviews there are no set guidelines for best-practice training programs after discharge from hospital (McGilton, 2016). To maintain the continuity in rehabilitation, physical therapists should assume that it is of utmost importance to continue and progress functional training during the sub-acute phase. This section describes the various types of hip fractures.

Femoral neck fractures

Often the result of a fall, femoral neck fractures may be handled medically first with fixation (internal or external) of the femoral neck with cannulated screws. Post-surgical rehabilitation protocols can vary by surgeon, and often include partial weight-bearing orders for 4 to 6 weeks, with advancement to full weightbearing when the patient has been cleared by the physician.

Intertrochanteric hip fracture

By definition, intertrochanteric fractures occur between the greater trochanter and lesser trochanter. Patients often undergo surgical repair consisting of open reduction internal fixation (ORIF; Kellam, 2020). Patients are often instructed by their orthopedist to weight bear as tolerated and may be prescribed use of an assistive device such as a front-wheel walker for initial ambulation. Physical therapy treatment following intertrochanteric fracture consists of aerobic reconditioning, lower-extremity strengthening, functional training, and stretching of the lower extremity (Heiberg, 2017).

Subtrochanteric hip fracture

A subtrochanteric fracture is a fracture occurring within 5 cm below the lesser trochanter and comprises 10% to 30% of all hip fractures (Lee, 2020). This fracture type is most commonly seen in two very different populations: geriatric osteoporotic patients sustaining low-energy falls directly onto the hip, and young athletes sustaining high-impact trauma (Lee, 2020). During the past few years, another population has been identified as at-risk for this type of fracture: patients taking bisphosphonate medications. A careful screen of patient medications may be helpful in identifying patients taking bisphosphonates who may be at risk for osteoporosis (Lee, 2020).

Femoral neck stress fracture

Femoral neck stress fractures comprise 2% to 7% of all stress fractures, and are commonly identified in runners (Lamonthe, 2018). Early diagnosis is difficult, as symptoms tend to be non-specific with insidious onset, and pain is generalized to the anterior thigh and groin. The patient may report difficulty

performing sit to stand tasks, pain while running or ambulating, and pain in single limb stance. Objective findings include pain and spasms with palpation of soft tissue over femoral neck such as psoas and hip adductors. Additionally, findings may reveal a patient report of pain in the hip at end range in all directions during range of motion testing. Manual muscle testing often demonstrates weakness in hip flexors and adductors. If a femoral neck stress fracture is suspected, a referral back to a physician is warranted, where the physician may order MRI imaging to make a definitive diagnosis (Lamothe, 2018).

Recommended treatment is partial weight bearing for up to 12 weeks, with significant activity modification. Specific return to sport rehabilitation may be prescribed to prepare athletes for safe return and prevent future injury.

Female athletes presenting with a stress fracture may benefit from hormonal testing and CT scan to identify possible osteoporosis or presence of relative energy deficiency syndrome (RED-S). Nutritional counseling from a licensed professional may also be indicated for female athletes to promote health and prevent future injury (Statuta, 2017).

COMMON CHILDHOOD HIP DISORDERS AND TREATMENT

Developmental and congenital hip impairments require understanding signs and symptoms, as well as screening to catch them as early as possible. Screening is often performed by a pediatrician or primary care provider, however some physical therapists may be the first point of contact for evaluating the hip of a child.

Developmental hip dysplasia and dislocation

Developmental Hip Dysplasia (DDH) is a diagnostic term for a spectrum of hip diseases ranging from a hip which is poorly centered within the acetabulum, to a hip that is completely dislocated. DDH affects predominantly females (80%) and is usually detected at infancy (International Hip Dysplasia Institute, n.d.). The etiology of DDH is both genetic and developmental due to position in utero (for example, breech position) or positioning/carrying during infancy. Diagnosis is usually made by a pediatrician during the first few weeks of life (Dorman, 2016). It is commonly treated with a Pavlik harness, a bracing system that is worn for approximately three months. This bracing system provides a 95% chance of normal hip formation if used diligently.

If this hip impairment goes undiagnosed, or the Pavlik harness is not worn appropriately, the femoral head and acetabulum may not develop properly and surgery may be required. Improper development of the acetabulum may result in the growth of a false acetabulum with subsequent dislocation of one or both hips, leading to degenerative disease later in life (Dorman, 2016).

Treatment of patients presenting with developmental dislocation of the hip begins with reduction of the hip as early as possible in hopes of providing stimulus for resumption of normal hip joint growth and development. A further concern for missed opportunity at reduction is the development of avascular necrosis and degeneration of the joint surfaces (Dorman, 2016).

Physical therapy treatment for non-infant patients with developmental hip dysplasia consists of gentle movement and stretching to promote lubrication of the joint surfaces. Hip abductor and external rotation strengthening exercises should be administered as well, with education about a home exercise program. Gait training and balance exercises should also be provided. Patients with limb length discrepancy will benefit from a heel lift or in-shoe orthotic to balance the pelvis and promote efficient ambulation (International Hip Dysplasia Institute, n.d.).

Legg-Calve-Perthes disease

Legg-Calve-Perthes disease (also referred to as Perthes disease) is a disorder of the hip presumed to consist of a disorder of the epiphyseal cartilage at the proximal femur. This results in poor blood supply, possible avascular necrosis, and disturbance of the physeal plates, which may manifest as a shortened femoral neck and trochanteric overgrowth, among other femoral head deformities. It is most commonly diagnosed in boys aged 4 to 10, and the first sign is generally a limp. Some patients with Perthes disease experience bone remodeling typical of natural development and, therefore, experience reduced symptoms without additional treatment. Those without natural bone remodeling and subsequent femoral neck and head deformity are known to experience degenerative joint disease in long-term retrospective studies. The most important prognostic factor in outcome is residual deformity of the femoral head and resulting hip joint incongruity (Dorman, 2016).

Recommended physical therapy treatment for youth aged 3 to 12 with identified Perthes disease includes balance activity, gait training, lower extremity strengthening exercises, and range of motion exercises (Karkenny, 2018).

Slipped capital femoral epiphysis

Slipped capital femoral epiphysis (SCFE) is a disorder in which the capital femoral epiphysis is displaced through the physeal plate. It occurs more often in children and adolescents age 10 and older, and more commonly in males than females. Endocrine abnormalities, such as hypothyroidism and treatment with growth hormones, have a tendency to weaken the physis thereby increasing the frequency of SCFE (Dorman, 2016).

This impairment is classified into three categories based upon patient presentation and radiographic findings: mild, moderate, and severe (Dorman, 2016). The slip may also be classified as stable or non-stable. Acute slips are those that are found within 2 weeks of symptom onset. The pain experienced from the acute slip is usually enough to prevent weight bearing, and if the patient can walk, it is generally with a limp. Patients with chronic-slipped capital femoral epiphysis often present with a history of knee or lower thigh pain first, with symptoms progressing to the groin or medial thigh pain over a span of months to years (Dorman, 2016).

Thus, differential diagnosis is important in these cases. Patients may have been improperly diagnosed with a groin strain, or with mechanical knee pain, and sent to physical therapy. If knee pain becomes progressively worse in the absence of continued trauma, a reasonable suspicion of SCFE should be elicited and discussed with the child's physician (OrthoInfo, n.d.c).

Initial treatment begins with surgery, usually within 24 to 48 hours of diagnosis, and varies depending on the degree of slippage. Most procedures involve placing a screw through the femoral epiphysis, with highly displaced slips requiring additional screws (OrthoInfo, n.d.c).

Physical therapy treatment may be prescribed following surgery and should consist of hip strengthening, aerobic conditioning, and gait and balance training.

Juvenile rheumatoid arthritis

Juvenile rheumatoid arthritis (JRA), also referred to as juvenile idiopathic arthritis, is the most common form of arthritis diagnosed in children under the age of 16. The disease causes pain, stiffness, and swelling in the joints (Mayo Clinic, 2017). Once diagnosed with JRA, the child or adolescent is often medically managed with aspirin or NSAIDs to relieve symptoms. Corticosteroid injections may be administered for temporary relief of synovitis, and disease-modifying antirheumatic drugs (DMARDs) may be used to reduce or prevent joint damage from JRA, prevent loss of function, and alleviate pain. These pharmaceuticals including methotrexate, sulfasalazine, hydroxychloroquine, and leflunomide are considered standard of medical care for JRA (Mayo Clinic, 2017).

Physical therapy treatment is often prescribed to address pain, range of motion restrictions, and to educate the child and family in joint protection. Splints and braces may be used for joint protection as well.

OUTCOME MEASURES FOR THE KNEE

As with the hip, there are several outcome measures for the knee that are used to establish baseline scores and track changes over time. Some of these tools are self-report and some are administered by a physical therapist or other qualified examiner. The following are some of the most widely used and validated tools:

- **Knee injury and osteoarthritis outcome score (KOOS)**: This is a scale measuring pain, functional ability, quality of life, and sport and recreation participation. A higher score indicates fewer problems.
- **Rheumatoid and Arthritis Outcome score for the lower extremity (RAOS)**: The RAOS, an adaptation to the KOOS, evaluates functional limitations of individuals with inflammatory joint diseases and impairments to the lower extremities. Additionally, it takes into consideration pain, symptoms, sports and recreation, and quality of life.
- **Lower-extremity functional score (LEFS)**: This outcome measure is applicable to all lower-extremity impairments and has a minimum clinically significant difference of 9 points.
- **Lysholm knee scale**: This is a 10-point questionnaire covering pain and symptoms including swelling, locking, ambulatory device, stair climbing, and squatting. It is quick to score, but it is very specific regarding symptomology and does not include many functional measures.

KNEE PATHOLOGIES AND EVIDENCE FOR INTERVENTIONS

Knee pain and impairments require thorough and complete assessment in order to develop a plan of care. Mobility and motor control of the knee should be evaluated in conjunction with the hip and the foot due to their roles in ambulation.

Knee osteoarthritis

The diagnosis of knee osteoarthritis is used to describe a prevalent form of DJD and is a complex disease involving varied structural processes occurring at the knee joint. As the population of Americans ages, the incidence rate is expected to increase significantly, with current statistics revealing that 30% of adults over age 60 demonstrate functional difficulties with tasks such as rising from a chair and ambulating on stairs due to knee OA (Currier et al., 2007). Even though the incidence rate increases with age, OA is not thought to be simply a normal part of aging (Swagerty & Hellinger, 2001). Obesity and a history of traumatic knee injury (e.g., anterior cruciate ligament rupture and/or meniscal tear) are key risk factors for the accelerated development of knee OA. Hallmark signs include patient-reported pain and radiographic evidence of osteophyte formation on the joint surface. There has been significant discussion and research aimed at determining the link between the patient's report of pain and classical radiographic findings of OA of the knee, including articular cartilage degradation, joint-space narrowing, and osteophyte formation. Radiographic findings are considered the gold standard in diagnosing knee OA; however, the causal relationship between radiographic OA and its primary clinical signature (patient report of pain) remain poorly understood. This is mostly because in several large-scale studies of adults with knee pain, only about half demonstrated evidence of OA on radiographic films. On the other hand, of all subjects demonstrating radiographic evidence of OA, only half reported pain (Swagerty & Hellinger, 2001).

It is thought that there is a relationship between severity of knee OA and pain, as research subjects with severe OA were more likely to report pain than subjects with less severe OA. Similarly, MRI studies have identified relationships between pain and findings of synovial thickening, effusion, bone marrow lesions, and meniscal tears; however, converse studies demonstrated similar findings on MRI, yet no patient-reported pain or radiographic evidence of degeneration (Kittleson et al., 2014).

There has been a movement recently toward phenotyping pain in patients with knee OA, promoting the idea that tailoring pain care to each person's experience will result in better targeted pain therapy. Different phenotypes currently being analyzed for sub-categorization include pain, stiffness, knee instability, and functional deficits.

A new conceptual model for knee OA pain emphasizes the importance of contributing factors from three domains: (1) knee OA pathology, (2) psychological distress, and (3) neurophysiological changes in pain processing (Kittleson, 2014). Knee pathology includes structural abnormalities, joint loading and alignment, quadriceps dysfunctions, and joint inflammation. Quadriceps muscle weakness appears to be strongly related to presence of pain, which suggests that the inability to attenuate forces surrounding the knee joint could play a crucial role in the patient's experience of pain. Psychological distress includes fear and avoidance beliefs, pain catastrophizing, self-efficacy issues, and depression. There is evidence that high levels of self-efficacy and successful self-management strategies are associated with improved pain levels and better functional outcomes. Pain neurophysiology includes reduced pain thresholds, temporal summation, spreading sensitization, and impaired descending modulation. Descending modulation of nociception has been shown to be disrupted in people with OA (Kittleson et al., 2014).

Management of patients with knee OA should include a comprehensive program of manual therapy and supervised clinical exercise. Deyle et al. (2005) demonstrated that patients receiving manual therapy and clinical exercise vs. exercise alone showed two times greater improvement on the WOMAC outcome measure. Manual therapy should be tailored to the needs of the patient based on objective findings and may include passive physiological and accessory movements, muscle stretching, and soft-tissue mobilization. Specifically, mobilization Grades III and IV performed for 2 to 6 rounds of 30 seconds per technique may be performed for loss of knee extension or flexion. Grade IV patellar glides performed with the knee in 5 to 10° of flexion may be performed in the direction of determined restriction to promote knee flexion and extension, including medial, lateral, caudal, and cephalad. Graded joint mobilizations to the hip, lumbar spine, and ankle, depending on limitation in passive or active movement, should be provided as well (Deyle et al., 2005).

Cliborne et al. (2004) investigated the role of the hip in treatment of patients with knee OA. The investigators found that some patients benefit from mobilization of the hip joint to provide relief of knee OA pain and mechanical dysfunctions, while others did not. Further investigation was carried out by another research group, and a clinical prediction rule was created to identify patients with knee OA who would benefit from mobilization of the hip. Five variables were identified as indicators of patients likely to benefit from hip mobilization including:

- Hip or groin pain or paresthesia.
- Anterior thigh pain.
- Passive knee flexion <122°.
- Passive hip internal rotation <17°.
- Pain with hip distraction.

(Currier et al., 2007)

If two variables are present the likelihood ratio is 12.9 with a 97% probability of success with hip mobilization.

Exercises should consist of active range of motion stretches, muscle strengthening, stretching, and lower-extremity aerobic exercise such as working out on a stationary bicycle or elliptical machine. Home exercises may be prescribed by the supervising physical therapist to support progression of functional ability.

Prescribed strengthening exercises may include the quadriceps, hamstrings, gluteals, hip rotators, hip abductors, hip adductors,

and core- stabilizing muscles. Quadriceps strengthening should include (at a minimum) static quad sets and standing terminal knee extensions performed with a resistance band. Progression of closed-chain exercises should be performed to enhance functional activity tolerance. These may include partial squats, using upper-extremity support if needed, and step-ups with verbal and visual cuing to maintain proper knee alignment. Lower- extremity stretches may include the gastrocnemius, soleus, hamstrings, and quadriceps muscles.

A systematic review of the scientific literature reveals high-level evidence for exercise and patient education to reduce body weight, reduce pain, and improve functional abilities in patients with knee OA. There is mid-level quality evidence that acupuncture and transcutaneous electric stimulation is beneficial for pain reduction in patients with this impairment. Furthermore, there is moderate-level evidence that low-level laser and psycho-educational interventions are helpful in lowering pain levels (Jamtvedt et al., 2008).

A randomized trial of arthroscopic surgery for the treatment of knee OA revealed no additional benefit over physical or medical therapies. In this study, participants were randomized into either the surgical group, or an "optimized physical therapy and medical therapy group" in which they received one hour of physical therapy once per week for 12 weeks. These participants each received a home exercise program focusing on areas of impairment unique to them. Instruction was provided for activity modification including activities of daily living, stair use, and modalities for pain modulation. Surgical participants received synovectomy, debridement, excision of degenerative tears of menisci, fragments of articular cartilage, or osteophytes, depending on impairments unique to the patient. The surgical participants also received physical therapy and medication following their procedure. Post-treatment WOMAC scores were not significantly different between the two groups, demonstrating equal effectiveness of conservative management for the treatment of moderate knee OA (Kirkley et al., 2011).

Total knee arthroplasty

When conservative measures have been exhausted, a patient may be a candidate for total knee arthroplasty (TKA). Surgical techniques for TKA vary by surgeon. Most techniques involve complete removal of the femoral and tibial joint surfaces and resurfacing of the patella using cemented fixation. Immediate rehabilitation depends on surgical procedure and physician protocol, however most patients are administered a front wheel walker and given orders to weight bear as tolerated (OrthoInfo, n.d.d).

Rehabilitation efforts should focus on achieving 0 to 90° of knee range of motion within the first few weeks. Aggressive stretching and joint mobilization may be used if range of motion is progressing too slowly. Ultimately, if the patient does not achieve this range of motion, the surgeon may recommend surgical manipulation under anesthesia.

Open kinetic chain exercises such as quadriceps isometrics, heel slides, straight leg raises, and hip adductor squeezes into a pillow should be taught initially, with progression to standing closed kinetic chain exercises as tolerated by the patient. These may include standing partial squats, step-ups, and step-downs. Gait and functional activity training, as well as activity modification and instruction to avoid kneeling, should also be included in the rehabilitation program.

SOFT-TISSUE INJURIES OF THE KNEE

Hamstring strain

Hamstring strains are four times more likely to occur than quadriceps strains, with a rate of 12% to 16% of all athletic injuries (Schmitt, 2012). The most common mechanisms of injury are sprinting in track and field, football, baseball, and waterskiing. Risk factors for sustaining hamstring injury include decreased flexibility, muscle fatigue, decreased strength, poor core stability, poor warm-up, poor lumbar posture, and previous history of hamstring injury, with the latter being the most prevalent risk factor. The actual mechanism of injury is thought to be due to weakness of the muscle in its eccentric state. Biomechanically, high-speed running requires the hamstring to contract eccentrically when the hip is flexion, thus placing the hamstring in an elongated position, while the lower leg moves into flexion of the knee (Schmitt et al., 2012).

Hamstring strains are graded on a scale of I to III, where Grade I is the least involved with micro damage, Grade II is a partial tear, and Grade III is a complete tear of the muscle. Grade III lesions may require surgery, and the patient often presents with a significant limp. Swelling, ecchymosis, poor tolerance of knee motion, and pain are also common presentations (Schmitt et al., 2012; Medline Plus, n.d.).

There is evidence suggesting that incorporating lengthened state eccentric hamstring training may reduce the rate of re-injury. Other intervention strategies include avoiding stretches that cause pain and proceeding cautiously with progressive resistance exercises. Very light resistance isometrics should be the initial exercise program, with high repetition rate. Spica wrapping or splinting of the knee may be required for Grades II and III injuries initially to reduce inflammation and protect the joint. Extended phases of hamstring strain rehabilitation around 6 weeks post-injury may consist of more dynamic exercises and higher-resistance, lower-repetition exercises.

Quadriceps strain and contusion injury

Acute quadriceps strains most commonly occur in athletes including rugby, soccer, and football players due to the action of sudden, high-velocity running that requires eccentric contraction of the quadriceps muscle while regulating hip and knee extension. High forces placed across the muscle or passive stretching of the muscle during eccentric contraction results in strain. Factors placing the quadriceps at risk for injury include its inherent role as a predominantly Type II pennate muscle, its architecture across two joints, and muscular fatigue (Kary, 2010). A pennate muscle is one in which the fascicles attach obliquely (in a slanting position) to its tendon. This type of muscle generally allows higher force production.

Similar to the hamstring, quadriceps strains are classified into three grades. Grade I includes minor muscle tearing, limited loss of muscle function, and mild pain. Grade II includes more significant muscle damage and loss of muscle function with higher levels of pain reported by the patient. Grade III tears are complete, and include significant pain and complete loss of strength.

Quadriceps strain can be difficult to distinguish from iliopsoas or adductor strain. This injury most commonly involves the rectus femoris. Physical exam should include observation of swelling, ecchymosis, bulging or disruption of the muscle (as observed with more severe disruption), and mobility impairment. Palpation of the muscles are necessary along the entire length of the muscle, noting areas of disruption and maximal tenderness. Muscle testing of the rectus femoris should include knee extension, hip flexion, and testing of knee extension with the hip both flexed and extended (Kary, 2010).

As with any soft tissue injury, acute treatment should include rest, ice, compression, and elevation if possible. Patients may be directed to take NSAIDs by their physician. After 3 to 5 days, gentle stretching, pain-free progressive resistive strengthening, and range of motion can begin. Gentle warm-up, proprioceptive training, and functional exercises should also be implemented. At approximately 6 weeks, more dynamic activity can progress and, if applicable, a return to sport training may be acceptable.

Quadriceps contusion is the second most common injury reported to the quadriceps muscle. This injury is sustained by a direct blow to the quadriceps muscle resulting in significant pain to the anterior thigh. As with the quadriceps strain, the muscle should be observed for ecchymosis and obvious deformity, as well as palpated for areas of maximum pain. Gait should be assessed for aberrant movements and muscle strength should be tested, including knee extension and hip flexion. Measurement of knee range of motion should also be recorded.

Treatment for quadriceps contusion should begin with the knee braced into 120° of flexion immediately for the first 24 hours to prevent hematoma formation. Ice and NSAIDs may also be used. There is evidence suggesting that NSAIDs may prevent the formation of myositis ossificans (MO; consisting of ossification of muscle fibers) after severe contusions. After the acute phase, treatment will mirror that of quadriceps strain.

Progression of a severe quadriceps contusion to MO is evident on radiographic images in 9% to 17% of cases (Kary, 2010). Clinical indications of MO include continued pain for 2 to 3 weeks following injury, loss of knee flexion, and persistent swelling. In these cases, radiograph images commonly are taken within 3 weeks of injury, and reveal non-neoplastic bone formation in the area of the contusion (Kary, 2010).

Treatment for MO consists of stretching, knee mobilization and range of motion, and quadriceps strengthening. A case of MO may cause flare- ups in pain and swelling, and in severe cases require surgical removal (Kary, 2010).

LIGAMENT INJURIES

Anterior cruciate ligament

The anterior cruciate ligament (ACL) is a primary stabilizer of the knee. Approximately 60% of knee ligament injuries include the ACL, and occurs nine times more in women than men (Cimino, 2010). The most commonly reported mechanism of injury is twisting of the body with a planted foot, producing an audible "pop." It may occur with or without deceleration of the body in motion and produces a sudden onset of pain and instability of the knee. Tears of the ACL are frequently accompanied by medial collateral ligament (MCL) tears and meniscus tears in an injury referred to as "the unhappy triad" (Cimino et al., 2010).

Diagnosis of ACL tears include subjective history of mechanism of injury as described above. Objective examination includes performance of Lachman's test, which holds a sensitivity value of 60% to 100%, (mean 84%; Decary, 2017). Other objective tests specific to the ACL are the anterior drawer test (mean sensitivity 62%), and pivot-shift test (mean sensitivity also 62%; Makhmalbaf, 2013). The use of MRI is the gold standard in identifying ACL tears, with 95% specificity as confirmed by an arthroscopic procedure.

After identification of an ACL tear, initial management often includes immediate referral to physical therapy to address inflammation and of motion impairments. The decision must then be made by the patient and physician to manage the injury conservatively (often with physical therapy alone), or to surgically reconstruct the ACL. The decision to reconstruct the ACL is most often made when the patient anticipates continuing physical activities in which rapid acceleration and deceleration are required. Surgery may also be recommended for patients who experience recurrent episodes of the injured knee giving way, as well as patients with impaired collateral ligaments or meniscus damage.

Postoperative rehabilitation will vary by surgeon. Many protocols require the patient to begin physical therapy within 3 to 5 days of surgery. The patient often presents with significant amounts of pain, with a brace and crutches with weight-bearing status orders created by the physician and enforced by the physical therapist. Early achievement of terminal knee extension is critical. Perhaps the most debilitating complication of ACL reconstruction is arthrofibrosis with knee flexion contracture due to lack of early and consistent knee extension stretching. Low load, long-duration stretching and patella mobilization is recommended to achieve early knee terminal extension.

Muscular activation of the knee extensors is also important. This may be achieved by using neuromuscular electric stimulation (NMES), or electromyographic (EMG) biofeedback. Systematic review of the literature favors the use of NMES for patients post-ACL reconstruction, with improved muscle scores by approximately 6 weeks post-op (Kim et al., 2010).

Interestingly, the ACL graft is most often at its weakest at 6 weeks post-op. Special considerations and patient education should be made at that time to prevent graft rupture. Patients should be gradually progressed through the physician-determined rehabilitation protocol, with dynamic activities introduced generally around 6 months post-op. For athletes, a return to sport training often takes 1 year.

Posterior cruciate ligament

The posterior cruciate ligament (PCL) serves as stabilizing ligament to prevent excessive posterior translation of the tibia on the femur. Complete tear of this ligament is far less common than in the ACL, constituting 3.5% to 20% of knee ligament tear injuries (Peterson, 2017). The reported mechanism of injury is often falling on a flexed knee or a motor vehicle accident in which the knee struck the dashboard. The posterior drawer test assesses the intact nature of the PCL. Posterior translation during the test indicates impairment to the PCL. Many athletes return to sports with a PCL-deficient knee and isolated PCL reconstruction is rare.

Physical therapy treatment for PCL tears depends on primary treatment. Conservative care generally calls for immediate physical therapy, whereas post-op care is dictated by the operating surgeon. The immediate goal for non-operative PCL tears is to reduce pain and inflammation and restore range of motion, similar to ACL rehabilitation. Early progression of weight bearing and quadriceps strengthening is pertinent to ensure stability of the tibia on the femur (Peterson, 2017).

Medial collateral ligament

The MCL is the prime static stabilizer of the medial side of the knee joint, and is important for providing support against valgus stress, rotational forces, and anterior translational forces on the tibia (Andrews, 2017). The medial collateral ligament is also the most injured ligament of the knee. Injury is generally sustained in the athletic population as a result of valgus contact with or without tibial external rotation. The capacity of the medial collateral ligament to heal has been demonstrated, however it is noted that complete ruptures heal less consistently and may result in persistent instability of the knee joint (Logan, 2016).

Signs and symptoms of MCL injury include a history of the above-described mechanism of injury, coupled with a positive valgus test with the knee tested in 30° of flexion to isolate the MCL. Additionally, reported knee joint line pain and pain with resisted knee flexion suggest an MCL tear. Following a valgus test with the knee flexed to 30°, the test should be repeated in 0° of flexion (full extension). An increase in medial joint space during this valgus test indicates additional posterior oblique ligament injury, and possible PCL or ACL involvement (Logan, 2016).

Standard radiograph films may be ordered when there is high suspicion of an MCL tear due to the possibility of bony avulsion with tearing, as the presence of these or osteochondral fragment will significantly change the treatment plan. Furthermore, medial tibial plateau fractures can result from valgus force to the knee, and can imitate medial joint instability on physical exams. Stress views may help rule out physeal damage in skeletally immature patients.

Tears of the MCL are classified into three grades. Grades I and II are partial tears and most often medically managed conservatively with physical therapy, and most athletic patients with MCL tears across all grades can return to their pre-injury performance level without surgical intervention (Andrews, 2017). However, if the MCL is compromised in combination with other ligaments in the knee, especially the ACL, then surgical intervention may be warranted (Logan 2016).

The emphasis for rehabilitation of Grades I and II tears is protecting the knee from excessive valgus forces and loading. Early rehabilitation and ROM exercises with progressive strength training is advised (Andrews, 2017). Graded exposure to balance and proprioceptive activities is also pertinent.

Grade III rupture of the MCL ligament in isolation can be treated either conservatively or surgically. Rehabilitation will depend on the course of treatment taken, and will include promotion of range of motion, lower-extremity progressive resistive strengthening, proprioceptive training, and functional activity training. When operative intervention is deemed necessary, anatomical medial knee reconstruction may be recommended (Logan, 2016). Post-operative rehabilitation focuses on early motion and the return of normal neuromuscular control and coordination with progression based on attainment of specific phase criteria and goals that may vary according to the surgeon.

Lateral collateral ligament

The *lateral collateral ligament* (LCL), also known as the f*ibular ligament* serves as one of the key stabilizers of the knee joint. Originating on the lateral epicondyle of the femur and inserting on the fibular head, the lateral collateral ligament's primary purpose is to prevent varus stress and posterior-lateral rotation of the knee. Lateral collateral ligament injury is less common than other ligamentous injury due to mechanism of injury required to impair the ligament—a varus force occurring from inside the medial aspect of the leg is required to sustain this injury. The most common mechanism of injury is seen via a high impact blow to the anteromedial knee, combining hyperextension and extreme varus force. Noncontact hyperextension and noncontact varus stressors have also been reported to cause LCL injuries, though they are rare (Yaras, 2020).

LCL injury commonly occurs in tandem with injury to other structures including the PCL, ACL, or the knee capsule. Lateral capsular ligaments and fibular collateral ligaments may also be injured. More severe injury to the lateral aspect of the knee may involve the biceps femoris tendon and iliotibial band disruption at the attachment at the head of the fibula and Gerdy's tubercle. Due to proximity anatomically, the peroneal nerve and popliteal tendon may also be involved, as well as the knee menisci.

Signs and symptoms include a report of varus knee contact in a sport, with acute lateral knee pain and knee point swelling. Evaluation should include varus knee joint testing, and assessment of knee swelling. A comprehensive full range of motion knee exam is imperative for all patients. Palpation of the lateral knee should be performed with the most common exam finding being pain at palpation. This may also be evident along the infrapatellar bursa, Gerdy's tubercle, and the patellar tendon attachment (Yaras, 2020).

As it is rare for injury to occur to the LCL in isolation, treatment is heavily dependent upon what other structures were damaged. In more mild cases, the patient may be placed in a hinged brace and prescribed crutches with orders to weight bear as tolerated. Rest, ice, and compression are warranted in the acute phases. Physical therapy 3 to 5 days after injury to promote range of motion, decrease pain, and slowly implement progressive resistive training is beneficial. If the patient undergoes surgery, rehabilitation will be dependent on procedures provided and post-op protocol, which will vary by surgeon.

Rehabilitation for Grade I and II strains generally may include passive and active prone knee flexion, initiated in the immediate weeks following injury to help prevent stiffness or contracture.

Around 6 weeks post-injury, a hinged knee brace is removed, and the patient may begin physical therapy with focus on quadriceps strengthening, proprioceptive capabilities, and strengthening of the muscles of knee and hip. Patients may return to sports only when meeting the following criteria: full, painless knee motion, complete reduction of lateral knee tenderness, and complete resolution of ligamentous laxity. In general, return to sports is approximately 4 weeks for Grade I injuries, and 10 weeks for Grade II (Yaras, 2020).

For Grade III injury rehabilitation, patients should be non-weight bearing in a knee immobilizer for 6 weeks after surgical interventions if they are performed. As in Grades I and II injuries, quadriceps strengthening is imperative throughout recovery. Hamstring strengthening should be avoided for at least 4 months to prevent damage to the reconstruction. Sport-specific therapy may commence four months postoperatively (Yaras, 2020).

In 2013, a new lateral knee ligament was discovered: the anterolateral ligament (ALL). There had been controversy surrounding its true anatomical parameters and existence until the cadaveric study conducted by Claes et al. (2013) identified its true anatomic nature. The ALL bony attachments are the femur and tibia, and it is distinguished from the anterolateral joint capsule. The origination is the lateral aspect of the femoral epicondyle, anterior to the origin of the LCL. It takes an oblique course and inserts onto the anterolateral aspect of the proximal tibia and the lateral meniscus (Claes et al., 2013).

Meniscal tears

Menisci are critical for maintaining stability and force-absorption capabilities of the knee. It is estimated that menisci are responsible for 60% to 90% of loads transmitted across the joint space between the femoral condyles and tibial plateau, depending on the degree of knee flexion (Croutze, 2013). They are thought to play a crucial role in joint stability, proprioception, lubrication, and protection of joint surfaces. The medial meniscus is C-shaped and integrated within the joint capsule, while the lateral menisci is C-shaped and more mobile. The outer third of each meniscus is vascular and composed of fibroblast-like Type I collagen and is best able to heal following injury. Contrarily, the inner two-thirds is avascular by the age of 10, and heavily composed of chondrocyte-like Type II collagen and proteoglycans, and, therefore, does not heal well with injury (Croutze et al., 2013).

A likely mechanism of injury is twisting of the leg with the foot planted during weight bearing. Signs and symptoms include locking of the knee, swelling, pain with twisting, and report of pain at the middle and posterior third of the joint line. Physical exam for suspected menisci injury should include McMurray's test (specificity 94%), Apley's maneuver (specificity 80%), and palpation of the joint line with reported tenderness (sensitivity 85%; Meserve, 2008).

Meniscus injuries are classified by their direction.

Vertical tears include the following:

- **Longitudinal tear**: A tear along the longitudinal axis of the meniscus.
- **Radial tear**: A tear that is traverse to the circumferential fibers of the meniscus.
- **Bucket-handle tear**: A complete longitudinal tear resulting in a peripheral and inner fragment.

Horizontal tears include the following:

- **Transverse tear**: A tear at the horizontal axis of the meniscus
- **Cleavage tear**: A complete transverse tear that separates the meniscus into superior and inferior fragments.
- **Parrot's beak tear**: A combined incomplete radial and longitudinal tear, with a displaceable component that resembles a parrot's beak.
- **Root tear**: A tear in the anterior or posterior meniscal roots where the meniscus attaches to the central tibial plateau.

- **Degenerative tear**: May occur as a result of traumatic or degenerative arthritis.

There are many approaches to meniscus tear management ranging from conservative physical therapy to surgery. Non-operative physical therapy goals for meniscal tear include management of joint effusion, range of motion, gait normalization, stretching, education regarding activity modification, and lower-extremity strengthening. If the meniscus does not respond to physical therapy intervention, surgery is typically recommended (Baker, 2018).

Surgical procedures include meniscectomy and meniscal repair, though commonly the surgical goal is to spare as much of the meniscus as possible. Procedure type depends on the type of meniscal tear, age and activity level of the patient, and physician preference. Post-op rehabilitation will vary by physician and will include range of motion, gait normalization, lower-extremity strengthening, and functional activity training. Meniscal repair post-op protocols generally call for the patient to be non-weightbearing for 4 to 6 weeks following surgery with restricted ROM (Harput, 2020). Once the patients are cleared for physical therapy, the lower limb muscles tend to be quite atrophied and significant strengthening is required. Aggressive closed-kinetic chain activities are typically avoided (Baker, 2018).

Articular cartilage

Articular cartilage injury is caused by either acute or repetitive trauma to the hyaline cartilage layer of the bone surface. There are typically two types of articular cartilage injuries: isolated cartilage defects and general articular erosion, also known as *degenerative joint disease* (DJD). The isolated defects are managed according to the area and depth of the damage. Dime-sized or smaller areas tend to demonstrate chondrocyte regeneration, while larger areas require arthroscopic surgical debridement to stimulate fibrocartilage proliferation (Mayo Clinic, n.d.).

Degenerative joint disease (DJD) is said to be a natural byproduct of aging and is confirmed on radiographic films and diagnosed according to Fairbank's signs, which includes joint-space narrowing, presence of osteophytes, and flattening of the femoral condyles. Factors thought to be associated with DJD include activity level, amount of articular cartilage, biomechanical alignment, presence of menisci, level of instability, and obesity. An orthopedic dilemma is presented when patients demonstrate end-stage DJD, but are too young to be considered a candidate for a total knee arthroplasty (TKA).

This disease can be idiopathic or primary, with symptoms rarely occurring before age 50. Etiology is often unclear, although age-related changes are known to occur to menisci, joint lubrication, and articular cartilage. There is not always a clear association between radiographic evidence of joint disease and magnitude of symptomology.

Signs and symptoms include diffuse joint pain that increases with activity, possible joint effusion, radiographic changes including Fairbank's signs, increased stiffness associated with activity, altered gait, and joint line tenderness (Chen, 2017).

Physical therapy management depends on the extent of degeneration and includes patient education to avoid impact activities, manual therapy to improve osteokinematic and arthrokinematic motion of tibiofemoral joint, general conditioning, and specific knee muscle strengthening in a pain-free manner.

FRACTURES AFFECTING THE KNEE JOINT

Many lower-extremity fractures are surgically managed with open reduction internal fixation (ORIF), which allows for faster weight bearing. Following the acute phase, rehabilitation for fracture depends upon whether or not surgical intervention was necessary, and which procedure was performed. In general, assistive devices may be necessary, and gait training beneficial once the patient is released by their physician to begin physical therapy. Range of motion, progressive resistive strengthening exercises, proprioceptive training, and functional training are all fundamental parts of post-fracture rehabilitation.

Patellar, femoral shaft, and condylar fractures

Patellar fractures may result from a direct fall onto the knee and usually require surgery to heal. Fractures of the patella are classified based upon fracture type: stable fracture, displaced fracture, comminuted fracture, and open fracture. Stable fractures are a non-displaced form of fracture in which the pieces of bone are correctly matched, and tend to remain this way during healing, thus not usually requiring surgery. Displaced fractures present with separation of bone particles with loss of alignment and tend to require surgery. Comminuted fractures are a very unstable form of fracture in which the patella shatters into three or more pieces. This form of fracture requires surgical intervention. Open fractures are fractures in which the bone is exposed through the skin, often causing damage to surrounding muscles, tendons, and ligaments, and requires surgical intervention. These fractures are at higher risk for complications and often take longer to heal (OrthoInfo, n.d.b).

Rehabilitation after patella fracture is crucial and relies heavily upon the fracture type and procedure performed. Range of motion, quadriceps and hamstring strengthening, gait training, and functional training should be implemented.

Femoral shaft and condylar fractures also significantly affect the knee. Trauma is the most common mechanism of femoral shaft fractures, typically involving a direct hit to the thigh or an indirect force transmitted through the knee. Younger patients are often injured in high-energy mechanisms such as automobile accidents (Denisiuk, 2020). Depending on fracture type, the medical treatment may or may not involve surgery. Assistive devices are recommended as needed, with range of motion, strengthening, and functional training implemented according to prescribing physician protocol.

Epiphyseal fractures

Epiphyseal fractures of the proximal tibia and distal femur are relatively rare and most commonly seen in the pediatric population. They may result from strains and sprains, and involve disruption in the cartilaginous physis of long bones. They are commonly classified by the five-part Salter-Harris Classification (SH). SH I fractures typically traverse the hypertrophic zone of the physis, splitting it longitudinally, thus separating the epiphysis from the metaphysis. When these fractures are nondisplaced, they may not be apparent on radiograph. Mild to moderate soft tissue swelling may be visible on radiographic film, and clinical signs may evident by swelling at the location of the epiphysis. Generally, closed reduction is necessary for displaced fractures, but open reduction with internal fixation may be required. Outcomes for this fracture are generally good.

SH II fractures split partially through the physis and include a triangular bone fragment of the metaphysis. Surgical intervention is required and prognosis is variable. SH III fractures involve both physeal injury and articular discontinuity, involving the physis and extending through the epiphysis joint, with potential to disrupt the joint surface. This injury is less common and often requires open reduction and internal fixation to promote proper alignment of the physis and joint surface. SH IV fractures run obliquely through the metaphysis, traverse the physis and epiphysis, and enter the joint itself. Surgical reduction is required. SH V fractures result from compression or crush injuries to the physis. This form of fracture is rare and can be disruptive

to bone growth. SH V fractures include injury to the peripheral portion of the physis resulting in angular deformity with damage to the periosteum. These are seen in burn injuries or significant trauma to the surface of the limb such as crushing injuries (Rabin, 2019).

Tibial plateau fractures

Tibial plateau fractures must be managed with extreme care, as the tibial plateau is one of the most crucial load-bearing anatomical structures in the body. Fractures of the tibial plateau can have detrimental effects on the alignment of the knee, stability, and motion. More than 50% of tibial plateau fracture sufferers are females over the age of 50, which is most likely attributed to postmenopausal osteoporosis (Vidyadhara, 2020). The second most prevalent population to sustain this injury is highly active youth where the mechanism of injury is high-energy trauma. The most common mechanism of injury resulting in a tibial plateau fracture is a valgus force with axial loading. Of these injuries, 80% are motor vehicle– related injuries and the remainder are sports-related injuries. A bumper- or fender-related injury from a vehicle-pedestrian collision constitutes more than 25% of tibial plateau fractures (Vidyadhara, 2020). Tibial plateau fractures presenting with fracture displacement ranging from 4 to 10 mm can be treated non-operatively; however, a fragment with gapping >5 mm should be elevated and grafted, most commonly with ORIF technique (Vidyadhara, 2020).

Tibial spinal fractures

Tibial spinal fractures are most prevalent in active youth who are not fully skeletally mature. The mechanism of injury tends to be forceful knee extension with twisting, or high-energy excessive flexion of the knee. Generally, this force is enough to disrupt the ACL from its fixture on the tibia, resulting in ACL tear as well. Signs and symptoms of this injury tend to mimic ACL tear with resulting knee swelling, pain, and patient report of an audible "pop" at the mechanism of injury. Well-aligned fractures can be medically managed without surgery, and may involve use of a full- length cast with the knee in extension. Displaced fractures, or fractures with fragmentation, require surgical intervention.

Avulsion fractures

Avulsion fracture at the proximal tibia may occur at the tibial tubercle or proximal tibial epiphysis. These are uncommon injuries that typically affect the insertion of the anterior cruciate ligament on the tibia. They typically occur in skeletally immature patients aged 8 to 14 years and result from hyperextension of the knee with a valgus or rotational force. Diagnosis is based on history, physical examination, and standard radiographs. MRI imaging can identify problematic areas that require surgical intervention. Open or arthroscopic repair is indicated in patients with partially displaced fractures. Surgical intervention may be required in patients who have undergone unsuccessful nonsurgical reduction and long leg casting or bracing, and in patients with completely displaced fractures. Arthroscopy offers reduced invasiveness and decreased morbidity (Strauss, 2018).

Patellofemoral disorders

There are several conditions that affect the patellofemoral joint, including general patellofemoral pain, patellar instability and subluxation, and patellar tendinosis. To understand the patellofemoral joint under impaired conditions, it is important to remember the ideal mechanics of the knee. The patella is a sesamoid bone. The posterior surface articulates with the femur and varies in thickness from approximately 2 mm to 5.5mm. This posterior surface is composed of medial and lateral facets, which are subdivided into thirds, with an additional medial portion referred to as the "odd facet" resulting in seven facets. The patella itself increases the mechanical advantage of the quadriceps muscle and reduces friction between the quadriceps tendon and the femoral condyles. During knee extension, there is little patella contact with the femoral condyles because the quadriceps tendon and patellar tendon are on slack, thus suspending the patella. In 10 to 20° of knee flexion, the inferior portion of the lateral and medial facets makes contact with the femur. As knee flexion increases, the contact area of the patella changes from distal to proximal. By 90°of flexion, all aspects of the medial and lateral facets have made contact with the femoral condyles. Knee flexion beyond 90° includes contact of the odd facet with the femur (Levangie & Norkin, 2011).

Patient exams are heavily reliant on gait observation and deductive reasoning, as often many impairments are found and grouped together through deductive reasoning to diagnose this condition. The patella should be observed and palpated during knee flexion and extension both in weight-bearing and non-weight–bearing conditions. This is especially important because during weight bearing, as the knee flexes the joint reaction forces increase and the medial facet accepts the majority of this compressive force. In non-weightbearing phase, as knee flexion decreases (during knee extension phase), the joint reaction forces increase. Important characteristics to observe include excessive medial or lateral gliding during the extension to flexion motion. Furthermore, knee alignment itself should be observed during these conditions. Generally, hip abductor weakness, particularly gluteus medius, is attributed to poor knee mechanics and anterior knee pain (Lee et al., 2003). Foot involvement in knee mechanics cannot be discounted. Subtalar joint, navicular height, and forefoot position should be observed in standing position, and assessed for mobility in non-weightbearing conditions.

Patellofemoral pain is most prevalent in adolescents and young adults. Patients generally present clinically with reports of anterior knee pain, retropatellar pain, or peripatellar pain while ascending or descending stairs, squatting, or sitting with knees flexed. The exact etiology is still debated; however, this condition is generally attributed to muscular weakness, imbalance between tight and weak muscles around the knee, or restrictions in the iliotibial band or lateral retinaculum. Bony alignment issues such as genu valgum, tibial torsions, femoral anteversion, bony abnormalities of the patella or trochlear groove, and foot pronation are also attributed to poor knee mechanics resulting in patellofemoral disorder (Heintjes et al., 2003).

Anterior knee pain in the absence of instability includes patellar tendinosis, also referred to as "jumper's knee." Exam findings include tenderness at the inferior pole of the patella and the belly of the patellar tendon. It is primarily seen in running and jumping athletes who cyclically load the knee. Management for this impairment should include NSAIDs, modalities to minimize inflammation such as pulsed ultrasound or iontophoresis, and exercises to improve quadriceps flexibility.

A review of the literature for general patellofemoral pain concludes that interventions supported by evidence include acupuncture, knee strengthening, resistive bracing, and hip strengthening exercise combined with patellar taping and biofeedback, and neuromuscular electric stimulation (Bizzini et al., 2003; Logan, 2017; Saltychev, 2018). Evidence for manual therapy is noted as well (Espi-Lopez, 2017).

Patellofemoral instability involving patellar subluxation generally occurs secondary to a laterally biased patella position. The patient may report a history of catching or giving way of the knee, generally with pain. The need for external support via bracing or taping should be assessed and will be based on the degree of passive mobility of the patella. Quadriceps strength is largely associated with the outcome of this impairment. Treatment should focus on quadriceps muscle activation during progressive ranges of knee motion, especially during functional tasks (Malanga, 2017).

Ninety percent of patella dislocations occur laterally. This has the possibility to become a chronic condition in some patients with frequent reports of patella displacement. These patients

are often surgical candidates. Acute management for patella dislocation includes splinting for approximately 3 weeks with use of ice, NSAIDs, and rest to manage pain. Gentle quadriceps strengthening should be performed as tolerated. Misalignment issues should be treated according to objective measures, including hip abductor weakness and foot positioning. At week 4, the patient may be prescribed a hinged knee brace with lateral patella support. Continued strengthening of the quadriceps muscles should be a priority, with increased loading of the joint under pain-free conditions.

Surgical management for chronic subluxation and dislocation may involve either a lateral retinaculum release or patellar realignment procedure. The lateral retinaculum release involves arthroscopic resection of the lateral retinaculum with possible tightening of the medial retinaculum. Patellar realignment typically involves moving the tibial tubercle medially to attempt to normalize patellar alignment issues. Recovery from this procedure is very slow, and post-op rehabilitation will vary by surgeon, but will inevitably include range of motion, quadriceps strengthening, and functional activity training. A study conducted on adolescents who underwent this procedure shows less frequent repeat subluxation and a 93% improvement in knee function and pain scores (Luhmann et al., 2011).

Conclusion

The functional connection between the hip and knee joints commonly warrants assessment and treatment of both when a patient presents with impairments of one. Due to shared musculature and the reliance of both for ambulation and activities of daily living, patients require adequate strength, range of motion, and coordination. Treatment of each may depend on their surgical status and comorbidities to create a unique yet evidence-informed plan of care.

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AN OVERVIEW OF HIP AND KNEE REHABILITATION FOR THE PHYSICAL THERAPIST, UPDATED

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 81 or complete your test online at **EliteLearning.com/Book**

31. Differential diagnosis requires the physical therapist to discern between _____ pain versus _____ pain.
    a. Acute; chronic.
    b. Sharp; dull.
    c. Localized; referred.
    d. None of the above.

32. Which outcome measure assesses the measure of activity developed for the lower extremities and has been shown to be a valid tool in the measurement of lower-extremity function in a population of patients with orthopedic problems?
    a. Lower-extremity Function Scale (LEFS).
    b. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).
    c. Harris hip score.
    d. Patient-specific Functional Scale.

33. What is caused by friction or inflammation of the bursa lying lateral to the greater trochanter and medial to the iliotibial band?
    a. Tendinitis.
    b. Arthritis.
    c. Greater trochanteric bursitis.
    d. Iliopsoas bursitis.

34. The primary purpose of the acetabulum of the hip is to:
    a. Provide balance.
    b. Provide stability to the joint and decrease forces transmitted to the articular cartilage.
    c. Allow increased mobility of the hip joint.
    d. Allow rotation.

35. For individuals with hip fractures, improved pain levels, survival rates, and functional levels are associated with which physical therapy intervention?
    a. Early passive range of motion to the hip joint.
    b. Isometric exercises for the quadriceps and gluteals.
    c. Early assisted ambulation in the hospital.
    d. Supine active range of motion exercises.

36. The outcome measure for the knee that is a 10-point questionnaire covering pain and symptoms including swelling, locking, ambulatory device, stair climbing and squatting is called the:
    a. Knee injury and osteoarthritis outcome score (KOOS).
    b. Lower-extremity functional score (LEFS).
    c. Rheumatoid and arthritis outcome score for the lower extremity (RAOS).
    d. Lysholm knee scale.

37. Current statistics revealing that _____ percent of adults over age 60 have knee osteoarthritis and demonstrate functional difficulties with tasks such as rising from a chair and ambulating on stairs.
    a. 10.
    b. 20.
    c. 30.
    d. 40.

38. Quadriceps strains are classified into three grades. Which grade of tear is described as "complete and includes significant pain and complete loss of strength?"
    a. Grade I.
    b. Grade II.
    c. Grade III.
    d. Both Grade II and Grade II include these symptoms.

39. Meniscus injuries are classified by their:
    a. Pain.
    b. Healing factors.
    c. Location.
    d. Direction.

40. Patellofemoral disorder is most prevalent in which age group?
    a. Adolescents and young adults.
    b. Middle age.
    c. Elderly.
    d. Young children.

Course Code: PTIL04HK

Chapter 5: An Overview of Oncology Rehabilitation, Updated

2 CE Hours

By: Bud Ward, PT, MPT,

Learning objectives

- Summarize the types of cancer, the means and the methods of diagnosing cancer, and the information compiled in order to determine the staging of cancer.
- Describe the various treatment options for cancer.
- Discuss the side effects and complications that can result from cancer treatments;.
- Identify the phases, goals, and components of a rehabilitation plan for an oncology patient.
- Explain the role of exercise and exercise prescription recommendations in cancer rehabilitation and survivorship.
- Identify assessment tools used in cancer rehabilitation.

Course overview

Cancer results when cells within the body begin to divide uncontrollably and reproduce in a way that is abnormal. This type of errant cell production can occur in nearly any tissue and results in significant health problems for millions of individuals each year. The abnormal cell production often produces masses, or tumors; this can also occur within blood cells (leukemia). Tumors can either be malignant (cancerous) or benign (not cancerous). Cancer cells sometimes spread out to other areas of the body through the blood and the body's lymphatic systems; when this happens, it is said that the cancer has "metastasized." Metastasis can occur at different rates, and often determines what treatment approaches will be utilized.

Cancer can be caused by both external and internal factors, some of which can be controlled. Examples of external factors include tobacco usage, infectious organisms, and an unhealthy diet; internal factors often refer to inherited genetic mutations, hormones, and immune conditions. According to the American Cancer Society, approximately 30% of all U.S. cancer deaths are caused by cigarette smoking (American Cancer Society, 2020). In addition, the Centers for Disease Control and Prevention (CDC) reports that 40% of all diagnosed cancers are associated with being overweight or obesity (CDC, 2020).

Although some individuals presumably do everything right, cancer may still occur. About 25% of lung cancers worldwide occur in people who have never smoked. Environmental factors that are entirely out of our control have a direct effect on health, as does one's gender or being born with a "faulty" cancer gene. A mother's diet can even affect her child's future health while in utero.

Patients who survive cancer often have reduced function and quality of life related to preexisting medical conditions, side effects from cancer treatments, or the cancer itself (American Cancer Society, 2020). Their impairments can include weakness, decreased endurance, swelling, and restricted mobility. Although there is a high occurrence of cancer-related disability, rehabilitation continues to be underutilized with only 1-2% of patients receiving treatment (American Cancer Society, 2020).

As more patients participate in oncology rehabilitation, it is important for physical therapists to understand the precautions, contraindications, and appropriate treatment methods for this population. This intermediate-level course will familiarize the physical therapist with the different forms of cancer, as well as the risk factors and rehabilitation protocols for the care of the oncology patient. The target audience for this education program is physical therapists and physical therapist assistants who are interested in oncology rehabilitation.

TYPES OF CANCER

There are more than 100 types of cancer according to the National Cancer Institute at the National Institute of Health (National Cancer Institute, 2015). The types of cancer are classified by specific types of cells in which the cancer begins: carcinoma, sarcoma, leukemia, lymphoma, multiple myeloma, melanoma, and brain/spinal cord tumors. Some cancers are named after whoever discovered them, such as Hodgkin's lymphoma, Wilms' tumor, and Ewing's sarcoma. Others, such as prostate cancer and colon cancer, are referred to by the body site.

Carcinomas

Carcinoma is formed by epithelial cells that cover the inside and outside surfaces of the body. It is the most common type of cancer. Carcinomas are named by the types of originating cells as in the following examples:

- **Adenocarcinoma**: Begins in glandular tissues, including breast, colon, and prostate.
- **Basal cell carcinoma**: Begins in the basal level of the epidermis (outer layer of skin).
- **Squamous cell carcinoma**: Forms in squamous cells that lie just beneath the outer layer of the skin surface; they also line other organs like the stomach, intestines, lungs, bladder, and kidneys.
- **Transitional cell carcinoma**: Is found in cells that can change size, including those in the bladder, ureters, part of the kidneys, and other organs.

Sarcomas

Sarcomas are cancers that form in bones and soft tissues, including muscle, fat, blood vessels, lymph vessels, tendons, and ligaments. They are less common than carcinoma, but they can be found in any part of the body. Sarcomas that start in bone tissue are called *osteosarcomas*. There are approximately fifty different types of sarcomas, including:

- **Adult fibrosarcoma**: Affects fibrous tissue in the legs, arms, or trunk; it is most common in people ages 20 to 60 years.
- **Angiosarcoma**: Can develop from lymph vessels or blood vessels; it can start in a part of the body that has been treated with radiation therapy.
- **Liposarcomas**: Are malignant tumors that forms in fat tissue; they are most common in the thigh, behind the knee, or inside the back of the abdomen.

- **Malignant peripheral nerve sheath tumors**: Develop from cells that surround nerves; these include neurogenic sarcomas, malignant schwannomas, and neurofibrosarcomas.
- **Synovial sarcoma**: Develops in the synovial tissue around joints; it is more common in children but can also occur in adults.

Leukemia

Leukemias are a group of cancers that affect blood and bone marrow. They do not form solid tumors, but instead, they create a large number of abnormal white blood cells that are unable to fight infection. These cells also limit the ability of bone marrow to produce platelets and red blood cells. They crowd out the normal red blood cells, making it difficult for the body to get oxygen to the tissues or control bleeding. There are four primary types of leukemia: acute myeloid (or myelogenous) leukemia (AML), chronic myeloid (or myelogenous) leukemia (CML), acute lymphocytic (or lymphoblastic) leukemia (ALL), and chronic lymphocytic leukemia (CLL). The differences between the four types of leukemia are the rates of progression and location.

The first factor in classifying leukemia is whether it is acute or chronic. Acute leukemias are fast-growing and start in immature blood cells. They worsen quickly, as these cells divide faster than mature cells. Leukemia does not change the rate of division, but the affected cells do not stop dividing when normal cells would. Patients who do not receive treatment usually live only a few months. Some forms of acute leukemia respond well to treatments and patients can be cured. Chronic leukemias occur in mature cells that are not completely normal and do not fight infection as well as normal white blood cells. These cells accumulate over time and crowd out the normal cells. Patients can live for many years with this form of leukemia, but it is more difficult to treat than acute leukemia.

The other main factor in classifying leukemia is the location – myeloid cells versus lymphoid cells. Myeloid cells include monocytes, macrophages, neutrophils, basophils, eosinophils, erythrocytes, platelets, and dendritic cells. Lymphoid cells include T cells, B cells, and natural killer cells. Myeloid leukemias begin in immature myeloid cells, but lymphocytic leukemias start in immature forms of lymphocytes.

Lymphoma

Lymphomas are cancers that develop from abnormal lymphocyte cells in lymph nodes, lymph vessels, and other organs. There are two main types of lymphoma: Hodgkin lymphoma and Non-Hodgkin lymphoma. Hodgkin lymphoma usually forms from large B cells called Reed- Sternberg cells. Non-Hodgkin lymphoma can form from B cells or T cells and may grow quickly or slowly.

- **Hodgkin lymphoma**: Hodgkin disease is classified by its appearance under a microscope, but there are two main types, classic Hodgkin disease, and nodular lymphocyte-predominant Hodgkin disease. According to the American Cancer Society (2018), classic Hodgkin disease accounts for 90% of all cases of Hodgkin disease. There are four subtypes of Hodgkin disease (American Cancer Society, 2018):
  - **Nodular sclerosis Hodgkin disease:** The most common form of Hodgkin disease, accounts for 70% of cases (American Cancer Society, 2018). It usually starts in the lymph nodes of the neck or chest and is most common in younger people (teens and young adults).
  - **Mixed-cellularity Hodgkin disease**: Is seen mostly in older adults and it accounts for 4% of cases. This subtype usually begins in lymph nodes in the upper half of the body.
  - **Lymphocyte-rich Hodgkin disease**: Usually occurs in only a few lymph nodes in the upper half of the body and accounts for 5% of Hodgkin disease cases.
  - **Lymphocyte-depleted Hodgkin disease**: Accounts for less than 1% of cases and is the least common. It is found in lymph nodes of the abdomen but also can be found in the liver, bone marrow, and spleen. This form is usually more advanced when it is diagnosed.
  - **Nodular lymphocyte predominant Hodgkin disease**: Usually starts in lymph nodes in the neck and axilla, but it accounts for only about 5% of all cases of Hodgkin disease. The cells involved are a variant of Reed-Sternberg cells called "popcorn cells" because of their appearance.
- **Non-Hodgkin lymphoma**: Non-Hodgkin lymphoma (NHL) is more common that Hodgkin lymphoma. Like, Hodgkin lymphoma it has two major subtypes: B-cell lymphoma and T-cell/natural killer cell lymphoma, where B-cell lymphoma makes up 85% of the cases. Non-Hodgkin lymphoma is also classified into categories, aggressive or indolent NHL, based on the speed of disease progression.

Aggressive NHL makes up 60% of the cases in the United States (Leukemia & Lymphoma Society, n.d.). It is also called high-grade or fast- growing NHL. Diffuse large B-cell lymphoma is the most common aggressive subtype. Indolent NHL is also called low-grade or slow-growing and it accounts for the remaining 40% of NHL cases. There are some cases where the disease progresses at an intermediate speed between fast and slow growing. In other cases, indolent NHL has also been shown to transform into aggressive NHL.

Multiple myeloma, melanoma, and brain/spinal cord tumors

Multiple myeloma is a form of cancer that develops in another type of immune cell called plasma cells. The abnormal plasma cells, myeloma cells, make M proteins that build up in the bone marrow and cause the blood to thicken. These cells also create tumors in soft tissues and bones throughout the body. Myeloma bone tumors weaken the bones and leak excessive calcium into the blood. The extra calcium in the bloodstream damages the kidneys and other organs. Patients with multiple myeloma may not show signs or symptoms until advanced stages.

Melanoma is cancer that forms in cells (melanocytes) of pigmented tissue such as the skin and the eye. The National Cancer Institute states that melanoma of the skin is the fifth most common type of new cancer diagnosed in American men and sixth most common in American women. It is the deadliest form of skin cancer (American Society of Clinical Oncology, 2020). The incidence of skin melanoma has increased by more than 60% over the last 25 years. Intraocular melanoma is a rare form of cancer that forms in the melanocytes in the eye. It may have no early signs or symptoms, but it is sometimes found during an eye exam.

Brain and spinal cord tumors that originate in the central nervous system are named based on the type of cell and location. They are different from cancers that start in other areas of the body and metastasize to the brain and spine. The cause of most brain and spinal cord tumors is unknown, but some genetic syndromes may increase the risk. Malignant tumors tend to grow quickly and spread into other areas of the brain or spine. As the tumors grow, they may stop parts of the brain or spinal cord from working. Signs and symptoms may be different for every person.

There are many different types of brain and spinal cord tumors, including:

- Oligodendroglial tumors.
- Astrocytic tumors.
- Mixed gliomas.
- Ependymal tumors.
- Pineal parenchymal tumor.
- Meningeal tumors.

- Medulloblastomas
- Germ-cell tumors.
- Craniopharyngiomas.

Secondary tumors from other metastatic types of cancer can spread to the brain and spine. Examples of this include:

- Breast cancer.
- Colon cancer.
- Kidney cancer.
- Melanoma.
- Nasopharyngeal cancer.
- Lung cancer.
- Lymphoma (Hodgkin and non-Hodgkin lymphoma).
- Leukemia.

TOOLS FOR DIAGNOSING AND STAGING CANCER

Cancer is always described by the stage that it was diagnosed, even if it metastasizes or the tumors grow larger. Once diagnosed, staging cancer helps physicians determine the severity of cancer and the best course of treatment. The stage of cancer is determined using patient history, lab tests, imaging, and biopsy (National Cancer Institute, 2019).

Lab tests of blood, urine, and other fluids can be used to measure the levels of certain substances in the body. Abnormally high or low levels of these substances can signal cancer, but they are not a definitive answer. Lab tests are important tools, but physicians must use them together with imaging and other assessment methods to diagnose cancer.

Imaging procedures are another important tool in the diagnosis of cancer. In addition to the screening and diagnosis of cancer, imaging studies can help in staging, guiding cancer treatments, determining whether treatments are working, and monitoring for recurrence. Screening for cancer is usually recommended for people who have increased risk, for example, family history of a particular form of cancer. Imaging can be used to determine the stage of cancer by finding the location in the body, the amount present, and whether it has spread to other areas.

There are several types of imaging that use different technologies to produce pictures of areas inside of the body:

- **X-ray imaging**: Uses low-level radiation to produce pictures of the body based on the different absorption rates of various tissues. A common use is to detect bone fractures, because bones have a high absorption rate and appear white on film. X-rays can also be used for early cancer detection as in chest radiographs and mammograms.
- **CT scans, or computed tomography scans**: Use computer-controlled X-rays to take a series of detailed images of the organs. The image is produced using three-dimensional slices of the body to give more information about the location, size, and depth of tumors. Contrast agents can be injected or taken by mouth to show boundaries between different tissues.
- **Nuclear imaging**: Including positron emission tomography (PET) and single positron emission computed tomography (SPECT) scans, use low doses of radioactive substances that attach to tumor cells. Once the tumor cells are marked with these substances, specialized detection equipment is used to create images. PET scans show chemical changes that take place in the tissue. They are usually more accurate in detecting large tumors than tumors smaller than 8 mm. PET scans may be helpful in determining whether the mass is cancerous and staging recurrent cancer. SPECT scans are similar to PET scans; however, they use computer modeling to create two- and three-dimensional images of the body. They can give information about metabolic changes and blood flow.
- **Ultrasound**: Uses a transducer to produce soundwaves with frequencies higher than those detected by human ears. The soundwaves penetrate tissue in the body and reflect back to the device where a computer uses the echoes to create an image of the organs and tissues. This image is called a *sonogram*.
- **MRI (magnetic resonance imaging)**: Uses strong magnetic fields and radio waves to create images of organs and other tissues. It is similar to a CT scan because it can produce three-dimensional images of different sections of the body; however, it is more sensitive for assessing soft tissues. The intensity of the signal produced depends on the chemical makeup of the structures being assessed. MRI can be used with or without contrast to target different tissues.

A biopsy is an examination that a pathologist performs on a sample of tissue collected from a patient with suspected cancer. The tissue is viewed under a microscope to determine whether the cells are malignant. Samples can be collected with a needle, an endoscope, or with surgery. For a needle biopsy, the needle penetrates the area of interest and tissue or fluid is drawn into it. If the target tissue is deeper and can be reached through a natural body opening, an endoscope can be used to remove the cells or tissue. Surgical biopsies can be either incisional or excisional. The surgeon removes only part of the tumor during incisional biopsies; however, the entire tumor is removed with excisional biopsies. A biopsy is necessary to diagnose cancer in most cases.

Stages of cancer

Cancer staging helps physicians to determine the extent of cancer and the patient's potential for survival. It also assists in identifying the appropriate treatment plan and possible clinical trials for new treatment options. The cancer stage is always named by the stage at diagnosis, even if it worsens and spreads to other areas of the body.

Several systems are used to stage cancer, including the TNM staging system. The TNM system can describe cancer in detail and it is the most widely-used system among most medical centers. TNM is an acronym that refers to the main tumor (T), the number of nearby lymph nodes (N), and whether it has metastasized (M). In describing the main tumor, the T describes the size and extent of the primary tumor. The N refers to the number of surrounding lymph nodes shown to be cancerous. M indicates whether the cancer has metastasized from the primary tumor to other areas of the body. Using the TNM system, each letter is followed by a number that gives more detail about cancer, for example, **T1N1M0**. See Tables 1-3 which further explain these designations.

Table 1: Descriptions of the T Category in the TNM System

The T category describes the primary tumor using a second digit to indicate more detail.	
TX	Primary tumor cannot be evaluated or measured.
T0	No evidence of the primary tumor.
Tis	Cancer in situ (early cancer that has not spread to surrounding tissue).
T1, T2, T3, T4	Size and extent of primary tumor; higher number indicates larger tumor or spread into nearby tissue.

Table 2: Descriptions of the N Category in the TNM System	
The N category describes whether or not cancer has spread to nearby lymph nodes.	
NX	Cancer in nearby lymph nodes cannot be evaluated or measured.
N0	No cancer found in the nearby lymph nodes.
N1, N2, N3	Refers to the number and location of involved lymph nodes; higher number indicates more lymph nodes that have cancer.

Table 3: Descriptions of the M Category in the TNM System	
The M category describes whether there is distant metastasis present in other areas of the body.	
MX	Metastasis cannot be measured.
M0	Cancer has not metastasized to other areas of the body.
M1	Cancer has metastasized to other areas of the body.

While the TNM system offers significant detail, physicians often group cancers into five less-detailed, basic stages when discussing the conditions with patients (Stage 0 – IV):

- **Stage 0**: Means that abnormal cells have been found, but they have not spread into nearby tissue. This is also called *carcinoma in situ (CIS)*. Some controversy exists regarding whether CIS is cancer, but the cells may become cancerous.
- **Stages I, II, & III**: Mean that cancer is present; higher numbers indicate larger tumors that have spread to surrounding tissues.
- **Stage IV**: Means that cancer has spread from the primary tumor to distant areas of the body.

According to the National Cancer Institute, there are a few other terms that healthcare providers may use to describe cancer:

- **In situ**: Abnormal cells are present, but they have not spread into surrounding tissue.
- **Localized**: The cancer is limited to the area around the primary tumor with no sign that it has spread to other areas.
- **Regional**: Cancer has spread to lymph nodes, tissues, or organs near the primary tumor.
- **Distant**: Cancer has spread to distant areas of the body.
- **Unknown**: Not enough information is available to determine the stage of cancer.

The stages of non-Hodgkin lymphoma (NHL) are slightly different from those of other types of cancer. They describe the area of the lymphatic system that is affected and whether organs are involved:

- **Stage I**: Is the early stage of the disease where the cancer is found in only one lymph node region or in one organ.
- **Stage II**: Is a slightly more advanced cancer that is localized to two or more lymph node regions on one side of the diaphragm.
- **Stage III**: Is an advanced form of the disease and it involves lymph nodes both above and below the diaphragm.
- **Stage IV**: Describes NHL that has advanced beyond the lymph nodes and spleen, as well as into one or more organs, including the skin, liver, bones, or bone marrow.

TREATMENT OPTIONS FOR CANCER

Treatment options depend on the type of cancer and the stage of advancement. They include radiation therapy, surgery, chemotherapy (non- specific and targeted), immunotherapy, and hormone therapy. Some patients receive only one type of treatment, but others may receive combinations of treatments, for example, surgery with chemotherapy. Clinical trials of new treatment protocols may be available to some patients, but it is important that they understand the possible risks before participating.

Radiation therapy

Radiation therapy employs ionizing radiation to kill cancer cells, prevent it from recurring, or to slow its growth. It is used as part of the treatment plan for most solid tumors, but it can also be combined with other treatment strategies.

The two main types of radiation therapy are external beam radiation therapy and internal radiation therapy. In external beam radiation therapy, a beam of radiation is emitted from a machine that aims it at the tumor. This method treats specific parts of the body, such as the lungs, instead of treating the whole body. Internal radiation therapy involves putting a radioactive material in the body in the form of a solid or liquid. Taking internal radiation therapy as a solid, called brachytherapy, usually takes the form of capsules, seeds, or ribbons. It is used to treat cancers of the head, neck, breast, prostate, cervix, and eye. When internal radiation therapy is given as a liquid, it is delivered through an IV line. Liquid internal radiation treatments are most often used to treat thyroid cancer.

Radiation therapy can be implemented as the only treatment for some patients, but it can also be used to augment other treatments. It may be used to shrink a tumor before surgery or to kill any remaining cancer cells after surgery. A technique called intraoperative radiation allows physicians to deliver radiation therapy directly to the tumor without passing through the skin.

Surgery

Surgery is performed on many patients diagnosed with cancer, but it is most effective for removing solid tumors. The type of surgery depends on the type of tumor, its location in the body, the amount of tissue to be removed, and the purpose of the surgery. Surgical procedures may be open or minimally invasive. The open procedures are similar to other types of open surgeries where the surgeon must cut through healthy tissue to get to the tumor. The surgeon will usually remove a sample of lymph nodes near the tumor for testing. Minimally invasive surgeries allow the surgeon to use a laparoscope to find and remove cancerous tissue. The advantages of minimally invasive procedures are smaller incisions and faster recovery time.

The goal of surgery is often to remove the entire tumor, but there are cases when this is not possible. Debulking is the technique used to remove as much of the tumor as possible, when removing the entire tumor could damage organs or other healthy tissues. Surgery can also be used to ease symptoms by removing tumors that are causing pain or pressure on healthy structures including nerves. As with any surgery, patients could be at risk for increased pain or infection after the procedure.

Chemotherapy

Chemotherapy is the use of drugs to treat disease. In the case of cancer, the goal is to stop or slow the growth of cancer cells. There are more than 100 chemotherapy drugs in use either alone or in combination with other treatments. These drugs vary in their usefulness, side effects, and chemical composition. They can be used to cure certain forms of cancer and to lessen the probability that it will return. For other types of cancer, chemotherapy can shrink tumors that may be causing pain or pressure on surrounding tissues. Many chemotherapy agents work by interrupting the cell cycle, but they are not able to differentiate between normal reproducing cells and cancer cells.

The American Cancer Society (2019) states that chemotherapy drugs can be divided into groups based on their chemical structure, how they work, and their interactions with other drugs. The latter is particularly important if more than one drug is needed for treatment. Some drugs belong to more than one group because they may act differently under certain circumstances. The two broad categories of chemotherapy drugs are non-specific agents and targeted therapies. Non-specific agents damage cells and limit their ability to reproduce; these agents often impact non-cancerous cells as well. Targeted therapies are tailored treatments that attack unique molecular characteristics of a tumor cell. Chemotherapy treatments are often delivered in six to eight cycles given every three weeks.

Non-specific chemotherapy agents

Alkylating agents work in all phases of the cell cycle by directly damaging the DNA of the cell to prevent it from reproducing. They are used to treat a variety of cancers, including sarcoma, multiple myeloma, leukemia, lymphoma, and Hodgkin disease. Their effect on the DNA can cause long-term damage to bone marrow and, in rare cases, lead to acute leukemia. Alkylating agents are divided into the following classes:

- **Nitrogen mustards**: Mechlorethamine, chlorambucil, cyclophosphamide, melphalan, and ifosfamide.
- **Nitrosoureas**: Streptozocin, lomustine, and carmustine.
- **Alkyl sulfonates**: Busulfan.
- **Ethylenimines**: Altretamine and thiotepa.
- **Triazines**: Dacarbazine and temozolomide.

Antimetabolites disrupt both DNA and RNA growth by substituting during the cell cycle when the cell's chromosomes are replicating. These agents are often used to treat forms of breast cancer, leukemia, ovarian cancer, and intestinal cancers.

Examples of *antimetabolites* include the following:

- Capecitabine.
- Cytarabine.
- 5-flouroouracil.
- 6-mercaptopurine.
- Fludarabine.
- Floxuridine.
- Hydroxyurea.
- Methotrexate.
- Pemetrexed.
- Gemcitabine.

Anti-tumor antibiotics alter the DNA inside of cancer cells, preventing them from growing and replicating. A widely used type of anti-tumor antibiotic are anthracyclines. These drugs work in all phases of the cell cycle and they interfere with enzymes involved in the replication of DNA. There are lifetime dose limits for anthracyclines because permanent heart damage can result from high doses.

Examples of *anthracyclines* include:

- Epirubicin.
- Doxorubicin.
- Daunorubicin.
- Idarubicin.

Examples of *anti-tumor antibiotics* that are not anthracyclines include:

- Mitomycin-C.
- Bleomycin.
- Mitoxantrone.
- Actinomycin-D.

Mitotic inhibitors interrupt cell reproduction primarily by stopping mitosis in the M phase of the cell cycle. However, they can cause cell damage in all phases by preventing enzymes from making necessary proteins.

Examples of *mitotic inhibitors* include:

- Epothilones.
- Vinca alkaloids (vinblastine, vincristine, and vinorelbine).
- Estramustine.
- Taxanes.

Topoisomerase inhibitors interfere with topoisomerases, enzymes that separate DNA strands before they are copied in S phase of the cell cycle. These drugs are used in the treatment of some forms of leukemia, lung, ovarian, gastrointestinal, and other cancers. There are two categories of topoisomerase inhibitors determined by the type of enzyme they impact:

- *Topoisomerase I* inhibitors:
  - Topotecan.
  - Irinotecan.
- *Topoisomerase II* inhibitors:
  - Teniposide.
  - Etoposide.
  - Mitoxantrone.

Corticosteroids are naturally-occurring hormones and hormone-like drugs that are used in several types of conditions. They are considered to be chemotherapy drugs when used in the treatment of cancer. Corticosteroids can help prevent severe allergic reactions when used before other chemotherapy agents. They may also help prevent nausea and vomiting caused by some forms of chemotherapy.

Examples of *corticosteroids* include:

- Dexamethasone.
- Prednisone.
- Methylprednisolone.

Targeted chemotherapy agents

Targeted chemotherapy agents are a newer class of drugs with more specific methods for attacking cancer cells. They can attack cells that have an abnormal number of a certain gene or cells that have altered versions of certain genes. Differentiating agents can cause premature cancer cells to mature into normal cells. These agents are the focus of many research studies looking for new ways to treat cancer and prevent recurrence.

Examples of *targeted agents* include:

- Bortezomib.
- Gefitinib.
- Imatinib.
- Sunitinib.

Examples of *differentiating agents* include:

- Tretinoin.
- Bexarotene.
- Retinoids.
- Arsenic trioxide.

Immunotherapy

Immunotherapy is treatment with drugs that help the immune system recognize and attack cancer cells. Active immunotherapy agents activate the patient's immune system to fight the disease. Passive immunotherapies provide the components of the immune system to attack cancer. These passive agents (i.e., antibodies) are created outside of the body, and then given back to fight the disease.

Active immunotherapies include:

- Monoclonal antibody therapy (i.e., alemtuzumab, and rituximab).
- Immunomodulating drugs (i.e., thalidomide and lenalidomide).
- Non-specific immunotherapies and agents that boost the immune response (i.e., BCG, interferon-alfa, and interleukin-2).
- Cancer vaccines, an active immunotherapy, exist for certain forms of cancer.

Hormone therapy

Hormone therapy uses sex hormones and hormone-like drugs to impact the function or production of male or female hormones. They work differently than standard chemotherapy agents, but they can slow the growth of cancers that depend on natural sex hormones in the body (i.e., breast, uterine, and prostate cancers). Hormone therapy works by preventing the body from making certain hormones or by keeping cancer cells from using the hormones needed to grow.

Examples of hormone therapy include:

- Aromatase inhibitors (anastrozole, letrozole, and exemestane).
- Progestins (megestrol acetate).
- Anti-estrogens (fulvestrant, toremifene, and tamoxifen).
- Anti-androgens (flutamide, nilutamide, and bicalutamide).
- Estrogens.
- Gonadotropin-releasing hormone (GnRH), also called *luteinizing hormone-releasing hormone (LHRH).*

SIDE EFFECTS FROM CANCER TREATMENTS

Cancer treatments can be effective in attacking cancer cells, but they can also create problems that affect healthy tissues or organs. These side effects can be mild or severe and they vary from patient to patient. Common side effects can include nausea, fatigue, appetite loss, diarrhea, edema, and risk for infection. However, the type and severity of symptoms depends on factors such as the type of treatment, frequency of treatment, patient's age, and presence of other health conditions.

The National Cancer Institute posted a comprehensive list of all possible side effects:

- Anemia.
- Appetite loss.
- Bleeding and bruising (thrombocytopenia).
- Constipation.
- Delirium.
- Diarrhea.
- Edema.
- Fatigue.
- Fertility issues in boys & men.
- Fertility issues in girls & women.
- Flu-like symptoms.
- Hair loss (alopecia).
- Immunotherapy & organ-related inflammation.
- Infection and neutropenia.
- Lymphedema.
- Memory or concentration problems.
- Mouth and throat problems.
- Nausea and vomiting.
- Nerve problems (peripheral neuropathy).
- Pain.
- Sexual health issues in men & women.
- Skin and nail changes.
- Sleep problems & insomnia.
- Urinary and bladder problems.

(National Cancer Institute. n.d.)

The following sections will describe the side effects and complications specific to each type of cancer treatment.

Radiation therapy

Fatigue is the most universal side effect from radiation therapy. It usually begins approximately three weeks into treatment, but it gradually resolves when the treatment is finished. Several other side effects can occur in the tissues that are subjected to the radiation field. They can be grouped as early side effects and late side effects.

Early side effects include changes in the skin, gastrointestinal system, bone marrow, respiratory system, and central/peripheral nervous system. Patients may report itching, dryness, erythema, or skin peeling in the treatment area. Gastrointestinal effects include diarrhea, nausea, vomiting, and anorexia. The bone marrow might decrease the production of leukocytes, erythrocytes, and thrombocytes. Patients may report thickening of sputum or develop inflammation of the walls of the alveoli in the lungs (pneumonitis). Inflammation and edema can occur around the nerves in the central and peripheral nervous systems.

The late side effects from radiation therapy can impact the same systems and tissues as the early side effects; however, the impact is more significant also involving the muscles and soft tissues. The skin may change color, heal slower, or become fibrotic (or even necrotic in some cases). Malabsorption, obstruction, or ulceration of the gastrointestinal tract are possible. The effect on the bone marrow can cause chronic low blood counts. Central and peripheral nervous systems may develop atrophy, plexopathy, occlusion, or infarction. Respiratory and cardiovascular risks include pulmonary fibrosis and, less frequently, cardiomyopathy or pericardial fibrosis. Bone growth may slow and osteoporosis or osteonecrosis can develop. Fibrosis is the primary effect on the muscles and soft tissues.

Surgery

Cancer surgery, as with any other surgery, has benefits, risks, and possible side effects. These depend on the type of cancer, location of the tumor, type of surgery, and other treatments received. Patients who have less invasive procedures typically recover faster and have milder side effects. Side effects after cancer surgery can include pain, fatigue, appetite loss, localized swelling, drainage, bruising, numbness, bleeding, infection, lymphedema, and possible organ dysfunction.

Pain is the most common side effect from cancer surgery. The intensity and location of pain is affected by the size of the incision, amount of tissue removed, location on the body, and degree of preoperative pain. As with radiation therapy, patients often experience fatigue after surgery. It can be caused by anesthesia, loss of appetite, stress, baseline nutrition, and the healing process using energy. Appetite loss is common after most surgeries, especially when anesthesia is used. This generally resolves within a few days to a week.

Localized swelling is part of the body's natural response to injury; however, lymphedema may develop when lymph nodes are removed during surgery. Lymph node removal can lead to pooling of lymph fluid in the surrounding tissues because it is unable to drain through the lymphatic system. As the area becomes swollen and tight, patients may complain of significant pain, limited movement, and limited use of the affected area, such as the arm or leg. If lymphedema is left untreated, it can result in more serious health problems.

Bleeding and drainage can occur after any surgical procedure and will usually resolve after a few days. However, the surgeon should be notified if either is excessive. Localized bruising can be expected, but it could indicate a bleeding problem if it does not improve. Redness, fever, and drainage that becomes cloudy (white or yellow) or has a strong odor are signs of infection. The surgeon should also be notified immediately if there are signs of infection to prevent cellulitis or sepsis.

Chemotherapy

Chemotherapy is effective in treating cancer, but it also has a variety of potential side effects depending on the type of cancer, location, patient's general health, and drugs/dose used. Side effects are caused when chemotherapy agents damage healthy cells. These drugs work on active cells that are growing and reproducing. Therefore, they can affect healthy cells in addition to attacking cancer cells. Cells in the mouth, hair, blood, and digestive system are particularly vulnerable. Side effects can be treated with other drugs, combinations of drugs, or adjusting the chemotherapy treatment schedule. Preventing and treating side effects is an important part of the treatment plan.

Fatigue is the most common side effect from chemotherapy, especially in the treatment of breast cancer. It can appear suddenly and last until several months after treatment has ended. Rest does not usually ease this type of fatigue. The symptoms can include lack of energy, increased sleep time, lack of interest in normal activities, feeling tired even after sleeping, difficulty concentrating, and difficulty finding words. One potential cause of fatigue is anemia. Anemia can occur in patients who receive chemotherapy, if the drugs damage red blood cell production or the actual cells. The symptoms of anemia are fatigue, dizziness, irritability, weakness, and feeling cold.

Chemotherapy drugs can lower white blood cell and platelet counts, but the symptoms are not always obvious. Low white blood cell increases the risk for infection and illness. Patients with weakened immune systems need to take precautions to reduce exposure to viruses, bacteria, and other germs. Low platelet counts (thrombocytopenia) can lead to bruising, frequent nosebleeds, heavier menstruation, and blood in vomit or stools.

Patients may have difficulty eating due to tongue, mouth, or throat sores that can develop as a result of chemotherapy. The condition, called mucositis, can appear as red and swollen areas like ulcers. It leads to difficulty swallowing, pain, impaired sense of taste, potential bleeding, and risk for infection. Dental problems, including bleeding gums and tooth damage, are possible. Oral yeast infections can occur if a patient's immune system is compromised. Patients often develop gastrointestinal distress such as nausea, vomiting, diarrhea, constipation, or appetite loss. Nausea is the most common of these symptoms, but it can be treated with anti-nausea medications.

Some chemotherapy drugs cause problems with the hair, skin, and nails. Hair loss (alopecia) is a common side effect that can occur within a few weeks of the first treatment. The loss affects hair on the head, eyebrows, eyelashes, and body, but it is generally temporary. Patients may experience skin irritations such as rash, dryness, and itching. Changes in fingernails and toenails can include slow growth, yellow or brown appearance, and weakening where nails become brittle and break easily.

The endocrine system can be disrupted by certain chemotherapy agents. Some patients may experience depression, anxiety, and stress due to hormone changes. Female patients can have symptoms of menopause or problems with menstruation. Male patients can have difficulty regulating hormones and experience decreased sex drive. Both men and women can be at risk for infertility. Some patients may begin to have problems regulating blood glucose that can lead to diabetes.

Neurological side effects can occur depending on the type of cancer, location, and type of chemotherapy agent. These symptoms include memory loss, headaches, peripheral neuropathy, and "chemo brain" (difficulty concentrating or thinking clearly). Patients may also experience respiratory symptoms such as shortness of breath and excessive coughing. Chemotherapy can have a significant impact on the musculoskeletal system. Patients often experience muscle/joint pain, swelling/edema, weakness, decreased muscle mass, bone loss (osteopenia/osteoporosis), and peripheral neuropathy (numbness, tingling, and pain). These deficits often directly relate to functional limitations that can be addressed by an appropriate oncology rehabilitation program.

OVERVIEW OF ONCOLOGY REHABILITATION

Oncology rehabilitation focuses on the treatment of impairments and functional limitations that result from the medical treatment of cancer. A paper by J.K. Silver, et al. (2013) defines it as:

> *Medical care that should be integrated throughout the oncology care continuum and delivered by trained rehabilitation professionals who have it within their scope of practice to diagnose and treat patients' physical, psychological, and cognitive impairments in an effort to maintain or restore function, reduce symptom burden, maximize independence and improve quality of life in this medically complex population.*

As cancer survivorship increases, so does the need for oncology rehabilitation programs. Research from the American Cancer Society indicates that the five-year survival rate of all cancers diagnosed during 2009-2015 was 67% (American Cancer Society, 2020). The improvement in survival rate reflects improvements in cancer treatments and earlier diagnosis.

Oncology rehabilitation is similar to other types, including orthopedic and neurological rehabilitation. The most effective programs are those delivered by an interdisciplinary team of skilled professionals who specialize in cancer rehabilitation. Table 4 below, adapted from Livestrong.org, demonstrates the comprehensive nature of these teams and the role of each provider.

Table 4: Provider Roles in Oncology Rehabilitation

Professional	What They Do
Physician (physiatrist or other type of medical or osteopathic doctor)	The doctor who leads the team will decide what diagnostic tests should be done and what treatment should be prescribed.
Physical therapist	The physical therapist is primarily involved in helping someone recover strength, flexibility, endurance, and mobility. They also treat pain and some can manage conditions such as lymphedema. Many physical therapists specialize in certain types of medical problems such as orthopedic or neurological conditions.
Occupational therapist	The primary goal of occupational therapy is to help someone resume daily activities such as bathing, dressing, and working. Occupational therapists devote considerable efforts to improving the functional use of the arm including, helping to improve arm strength, coordination, and range of motion. They can also treat pain, and some are certified in lymphedema therapy.

Table 4: Provider Roles in Oncology Rehabilitation	
Professional	**What They Do**
Speech and language pathologist	This type of therapist concentrates on problems that have to do with language comprehension or expression as well as swallowing issues.
Rehabilitation nurse	These healthcare specialists are always available in inpatient rehabilitation settings, but they often work in outpatient settings as well. Rehabilitation nurses perform all of the usual nursing functions but also focus on helping patients with bowel and bladder function, addressing sexuality issues, and providing education and support for the family. Rehabilitation nurses also can help patients regain the ability to move, speak, and swallow by reinforcing what the therapy team is working on.
Vocational rehabilitation specialist	This professional evaluates whether a patient can return to work, and if so how best to accomplish this. This may involve the use of special equipment such as a one-handed computer keyboard. If it is necessary for a cancer survivor to work in an entirely new occupation, vocational retraining may be offered.
Therapeutic recreational therapist	These therapists are not always found in rehabilitation settings, but many hospitals have at least one therapeutic recreational therapist on staff. This specialist helps people to embrace leisure and educational activities that are part of having a good quality of life. These activities may include cooking, gardening, and playing sports.
Mental health counselor	Most rehabilitation settings will have some type of mental health counseling available. This might include a consultation with a doctor who specializes in psychiatry or an evaluation with a psychologist or clinical social worker. These specialists have a lot of experience in helping people psychologically adjust to a life that may be different from what they had previously experienced.
Neuropsychologist	This is a specific type of mental health specialist who is responsible for conducting testing to determine cognitive problems in people who are experiencing issues with memory, concentration, and other brain functions.
Registered dietician	A registered dietician helps to figure out the best diet for someone going through cancer treatment and/or rehabilitation. A dietician can offer guidance on how to gain or lose weight and improve energy through nutrition.
Orthotist	This professional has training in how to fit and make braces. Braces are sometimes necessary for people who have some weakness or paralysis.
Prosthetist	This rehabilitation professional is an expert at making and fitting artificial limbs—usually after an amputation.
Case manager	This person acts as a liaison between the rehabilitation team, the insurance company, the patient, and the family. Case managers can answer questions related to insurance and assist patient with getting the best possible care. Case managers may be found in both inpatient and outpatient settings.
Note. Livestrong.org, n.d.)	

Oncology rehabilitation programs address both disease-related and treatment-related impairments and functional limitations. They focus on reducing the severity of symptoms and long-term problems. The goals of an oncology rehabilitation program are to control pain, manage swelling/lymphedema, increase flexibility, improve strength, increase endurance, improve mobility, restore function, and minimize disability. According to the American Society of Clinical Oncology (2019), comprehensive rehabilitation programs can address the following impairments:

General physical impairments:

- Joint pain, diffuse (e.g., arthralgias).
- Musculoskeletal pain (e.g., myalgias).
- Neuropathic pain.
- Weakness.
- Fatigue.
- Deconditioning.
- Somatic pain.
- Difficulty returning to premorbid activities.
- Visceral pain.

Specific physical impairments:

- Autonomic dysfunction.
- Back pain.
- Balance dysfunction.
- Bowel dysfunction.
- Cervical range of motion limitations.
- Chemotherapy-induced peripheral neuropathy.
- Chest/thoracic pain.
- Cognitive impairment.
- Compression neuropathy.
- Dystonia.
- Gait dysfunction.
- Headache.
- History of fall.
- Jaw excursion, limited.
- Joint pain, localized.
- Joint range of motion limitations.
- Lymphedema.
- Muscular asymmetry.
- Neck pain.
- Osteopenia/osteoporosis.
- Paralysis.
- Radiation fibrosis syndrome.
- Radiculopathy.
- Scapular winging.
- Scar adhesions.
- Sensory deficits.
- Sexual dysfunction.
- Shoulder pain.
- Speech impairment.
- Swallowing impairment.
- Urinary dysfunction.
- Visuospatial and/or proprioception dysfunction.

Functional limitations:

- Inability to return to work.
- Difficulty caring for children/grandchildren.
- Limited mobility due to safety concerns (walking, driving, etc.).
- Inability to travel and take vacations.
- Difficulty with activities of daily living, or ADLs (e.g., dressing, bathing).
- Difficulty with instrumental activities of daily living, or IADLs (e.g., chores, shopping).

THE FOUR PHASES OF ONCOLOGY REHABILITATION

J. Herbert Dietz, MD authored one of the first groundbreaking cancer rehabilitation textbooks, *Rehabilitation Oncology*, while he was an attending surgeon at Memorial-Sloan Kettering Cancer Center (Dietz, 1981). In his book, he described cancer rehabilitation according to four distinct phases. His classification system pioneered the idea of integrating rehabilitation interventions into the palliative phase of the disease. Since that time, research has supported this concept. Dr. Julie Silver and a team of researchers (2015) determined that cancer rehabilitation is medical care that should be integrated throughout the continuum of oncology care to diagnose physical, psychological, and cognitive impairments. Dietz described the use of rehabilitation in the early stages of cancer to prevent impairments and disabilities. Today, this is called *pre-habilitation* and it has become a growing area of interest and research. Dr. Silver and colleagues have defined *pre-habilitation* as:

> *A process on the continuum of care that occurs between the time of diagnosis and the beginning of acute treatment and includes physical and psychological assessments that establish a baseline functional level, identify impairments, and provide targeted interventions that promote physical and psychological health to reduce the incidence and/or severity of future impairments (Silver et al., 2015).*

The four phases of oncology rehabilitation, as described by Dietz (1981) are:

1. **Preventative phase**: Interventions that will lessen the effect of expected disabilities.

   The preventative phase starts soon after cancer has been diagnosed. It is performed before or immediately after radiation therapy, surgery, or chemotherapy. No impairments of function present yet. The purpose of rehabilitation interventions is preventing impairments.

2. **Restorative phase**: Interventions that attempt to return patients to previous levels of physical, psychological, social, and vocational functioning.

   The restorative phase strives for the maximal recovery of function in patients with remaining function and ability. It attempts to achieve maximal functional recovery in patients who have impairments of function and decreased abilities.

3. **Supportive phase**: Interventions designed to teach patients to accommodate their disabilities and to minimize debilitating changes from ongoing disease.

   The supportive phase increases the patient's ability for self-care and improves mobility. It uses methods that are effective for patients whose cancer has been growing and whose impairments of function and declining abilities have been progressing. Examples of these interventions include training with assistive devices, self-care, and more skillful ways of performing ADLs. It also focuses on preventing disuse impairments, such as contractures, muscle atrophy, loss of muscle strength and decubitus.

4. **Palliative phase**: Interventions focused on minimizing or eliminating complications and providing comfort and support.

   The palliative phase enables patients in the terminal stage to lead a high quality of life physically, psychologically, and socially, while respecting their wishes. It is designed to relieve symptoms such as pain, dyspnea, and edema. These interventions also help prevent contractures and decubitus using heat, low-frequency therapy, positioning, breathing assistance, relaxation, or the use of assistive devices.

Contributions of rehabilitation in each phase of cancer

1. **Treatment (preventative phase)**:
   - Evaluating the effects of rehabilitation treatments on function.
   - Preserving and restoring function through exercise, increased activity, and edema management.
   - Controlling pain using thermal modalities (heat or cold) and transcutaneous electrical nerve stimulation.
2. **Post-treatment (restorative phase)**:
   - Developing and supporting a program to help restore daily routines and promote a healthy lifestyle.
   - Educating the patient about self-monitoring.
   - Supervising a maintenance program of exercise, mobility management, edema management, and mobility.
3. **Recurrence (supportive phase):**
   - Educating the patient about the impact of recurrence and its effect on function.
   - Educating the patient about monitoring in the context of the new clinical status.
   - Supervising the patient in an appropriate program to restore function or prevent its decline.
4. **End of life (palliative phase)**:
   - Educating patient/family regarding mobility training, good body mechanics, and assistive devices.
   - Pain management (non-pharmacologic treatment) and symptom control.
   - Maintaining independence and quality of life.

Components of oncology rehabilitation programs

Oncology rehabilitation programs can follow different models depending on the complexity and severity of the condition; however, they should generally follow a stroke rehab model. This is an interdisciplinary model that combines physical therapists, occupational therapists, speech/language therapists, and nurses with physicians. It allows patients to receive care from skilled and highly educated rehabilitation professionals instead of extenders. Even complex rehabilitation issues, such as cognitive dysfunction, musculoskeletal diagnoses, and speech/swallowing, can be addressed appropriately.

Physical therapy interventions focus on reducing pain, managing swelling/lymphedema, improving flexibility, increasing strength, improving endurance, and restoring function. Pain management can be accomplished with modalities including heat, cold, and electrical stimulation when indicated. Swelling and lymphedema management is best performed by specially trained therapists who have advanced knowledge of the anatomy and function of the lymphatic system. They may use manual lymph drainage techniques or mechanical devices (Aldrich et al., 2017), that provide sequential compression to the affected limb. Patients who are treated for lymphedema can use compression garments to control swelling between treatment sessions.

Some patients experience joint stiffness, muscle or soft tissue tightness, and overall decreased flexibility during and after cancer treatment. These symptoms can be caused by disuse and side effects from radiation therapy, surgery, or chemotherapy. Patients can benefit from manual therapy techniques, including

manual stretching, myofascial release, and joint mobilizations to improve motion and increase soft tissue length.

Fatigue related to cancer treatment can be challenging to overcome because there are so many factors that can potentially cause this symptom. It can be a side effect of chemotherapy, radiation treatment, or disuse. Physical therapists can educate patients about adjusting their schedules to include rest periods to allow recovery time. Medications may be indicated depending on the suspected cause of fatigue.

Therapeutic exercise can help patients not only improve their strength, endurance, flexibility, but also improve sleep and reduce fatigue. Some patients are able to reduce depression and relieve stress through exercise.

EXERCISE AND CANCER

Research has shown the benefits of structured exercise training for a variety of physiological and psychosocial outcomes among patients diagnosed with cancer. Improvements have been shown in quality of life, aerobic capacity, muscular strength, fatigue, and function. Studies have shown patients achieving strength gains, as well as decreased resting heart rate, improved pulmonary function, and decreased lactate concentration (Kestling et al., 2020). Patients report over 21% improvement in self-reported quality of life. Other benefits from exercise training along the cancer continuum include improved immune system function, decreased hospitalization, increased joint range of motion, improved soft tissue extensibility, reduced episodes of nausea, decreased fatigue, and reduction in depression. Exercise training is safe for most medically stable patients, but they should be cleared by their oncologist before beginning any program.

According to a study by Blanchard et al. (2003), 30% of patients diagnosed with cancer reduced their activity level immediately after diagnosis. They found that 15% actually increased their activity level without negative consequences; however, only 16% of patients remained active during their treatments. A study by Adamsen et al. (2009) found that a supervised multimodal exercise program including high- and low-intensity components was safe and appropriate for patients with various cancers. Their results showed that patients had reduced fatigue, improved aerobic capacity, increased muscular strength, improved tolerance for physical activity, greater emotional wellbeing, and improved functional ability.

Exercise can reduce cancer-related fatigue. Schwartz et al. (2017) found that the majority of patients who continued to exercise during their cancer treatments (with modifications) reported less fatigue. These subjects averaged 9 hours of exercise per week and only 52% reported fatigue that "affected the whole body." Exercise and rest were the most commonly used strategies for managing their symptoms.

Studies that examined the impact of exercise and the safety of patients' participation in these programs concluded the following:

- Oncology patients can adapt to exercise.
- Oncology patients can exercise through the spectrum of oncology care.
- Exercise can prevent or reduce the negative effects from cancer treatments including fatigue, decreased cardiovascular function, muscle weakness, and function.
- Exercise during and following treatment has been associated with decreased recurrence and mortality.
- Mechanisms may exist that link inactivity with carcinogenic processes.

(Schwartz et al., 2017)

Exercise prescription

As the research shows, exercise can have a significant impact on the lives of patients before, during, and after cancer treatment. However, exercise prescription requires careful planning to ensure that the appropriate exercises are given and safe parameters are used. The FITT (frequency, intensity, time [duration], and type [mode]) Principle is a frequently used method to prescribe and monitor exercise programs. It is a threshold model that allows patients to achieve sufficient physiological challenge to create adaptive changes, training effects, and reconditioning.

Frequency is the first component and it refers to the number of times per week that a patient participates in exercise. It can be informed by the intensity of the exercises performed – higher-intensity exercises would require longer recovery time, and, therefore, would be performed fewer times per week. Frequency is treatment-dependent and may be modified if fatigue is present. Patients can exercise more than once per day for short periods of time if they are deconditioned. Exercises may be combined with the performance of usual ADLs, as appropriate, and they should be consistent with the patient's goals. Progressing an exercise program should start with duration first, then frequency as patients become more conditioned.

Intensity can be described as a percentage of VO2 Max, estimated VO2 Max, estimated maximum heart rate, estimated maximum heart rate reserve, the six-minute walk test, or a 1-RM (rep maximum). Considerations when setting exercise intensity include a patient's safety issues, treatment status, and functional status. Therapists should use caution when determining intensity. The American College of Sports Medicine recommends an intensity of 40-60% of heart rate reserve (HRR); however, some studies recommend 30-75% of HRR (Mayo Clinic, 2019). The heart rate maximum (HRmax) is generally calculated using the formula HRmax = 220 - age. See Table 5 below for the American College of Sports Medicine's intensity recommendations.

Table 5: American College of Sports Medicine Intensity Comparison

Intensity	% VO_2 Peak	% HRmax	RPE
Very light	< 20	< 35	< 10
Light	20-39	35-54	10-11
Moderate	40-59	55-69	12-13
Hard	60-84	70-89	14-16
Very hard	≥85	≥90	17-19
Maximal	100	100	20

Time, or duration, is the total amount of time spent exercising or the total caloric expenditure. Shorter exercise periods require a larger number of sessions, or increased frequency. When progressing the program, time should be increased before frequency. Type, or mode, is the type of exercise that is performed. This may depend on what equipment or facilities are available. Patient preference is another consideration, since they are more likely to be compliant with the program if they enjoy the activity. Exercise safety is also an important consideration when choosing the mode. The types of exercises could include aerobic, strength training, stretching, and core stabilization activities.

One of the key benefits of using the FITT model is using the metrics of frequency, intensity, time, and type to determine progression of the program. Frequency, intensity, and time can be increased, but initially duration should be considered. The general recommendation is to increase the duration of the exercise by 5 to 10 minutes per week. After progressing the duration, frequency is the next component to increase.

Intensity is the last component that should be increased to be progressed. Any progression should be gradual, and possible setbacks should be anticipated.

Patients may have many motivations for participating in an exercise program during cancer treatment. It can help them feel "normal," help them to cope with the treatment, give them control over their life, reduce stress, help them feel better, improve immune function, and improve their energy level. However, barriers such as fatigue, nausea, vomiting, lack of time, pain, medical procedures, chemotherapy sessions, diarrhea, and visitors may prevent patients from participating in exercise programs during treatment. Similar motivations and barriers exist in the survivorship phase. The motives include recovering from the treatment, reduced risk of recurrence, improved strength, improved fitness level, reduced stress, improved weight control, and feeling better. Barriers include lack to time, fatigue, deconditioning, poor health, poor weather, lack of motivation, joint pain, lack of equipment, or recurrence of cancer.

The structure of the exercise program should contain the following components: Warm-up for 5 to 10 minutes, stretching for 5 to 10 minutes, conditioning (variable time), and a cool down for 5 to 10 minutes. Recommendations for physical activity and exercise for cancer survivors are 30 to 60 minutes per day of moderate to vigorous activity at least 5 days per week (American College of Sports Medicine, 2019).

The Centers for Disease Control and Prevention recommendations

The Centers for Disease Control and Prevention (CDC) defines moderate-intensity exercise as sufficient to raise the heart rate and allow someone to talk, but not sing, while performing the activity (Centers for Disease Control & Prevention, 2020). Walking fast, water aerobics, pushing a lawn mower, and riding a bike are acceptable exercises for this purpose. The CDC describes vigorous exercise as breathing hard and fast with a marked increase in heart rate. The patient should not be able to speak more than a few words without breathing. Jogging, running, playing singles tennis, playing basketball, and riding a bike fast would qualify as vigorous exercises.

Tables 6 and 7 below detail the CDC's recommendations on various levels of exertion to receive health benefits.

Table 6: CDC Recommendations – Health Benefits

Intensity	Aerobic	Strengthening
Moderate	150 min/week.	2 days/week large muscle groups.
Vigorous	75 min/week.	2 days/week large muscle groups.
Combination (aerobic + strengthening)	50 mod & 50 vigorous. 90 mod & 30 vigorous.	2 days/week large muscle groups.

Table 7: CDC Recommendations – Greater Health Benefits

Intensity	Aerobic	Strengthening
Moderate	300 min/week.	≥ 2 days/week large muscle groups.
Vigorous	150 min/week.	≥ 2 days/week large muscle groups.
Combination (aerobic + strengthening)	100 mod & 100 vigorous. 150 mod & 75 vigorous.	≥ 2 days/week large muscle groups.

The CDC recommends weight training, working with resistance bands, and body weight exercises for strength training (i.e., pushups, pullups, sit-ups). Some daily activities may also qualify as strengthening exercises such as heavy gardening and digging with a shovel. They advise strengthening of the large muscle groups of the legs, hips, back, chest, abdomen, shoulders, and arms.

The American College of Sports Medicine recommendations

The American College of Sports Medicine (ACSM) offers its own recommendations similar to the CDC, outlined in Tables 8 and 9 below. The ACSM states that light to moderate exercise may be beneficial for deconditioned patients. They recommend a daily step count of at least 7,000 steps at a moderate intensity and expending more than 2,000 kcal per week (American College of Sports Medicine, 2019).

Exercise volume below these levels may still be beneficial if a patient is unwilling or unable to achieve the recommended exercise volume. The ACSM recommends a gradual progression of exercise volume by increasing duration, frequency, and/or intensity until the goals are reached.

Table 8: ACSM Guidelines for Resistance Exercise

Intensity (% of 1-RM estimation)	
20-50%:	Older adults to improve power.
< 50%:	To improve muscle endurance.
40-50%:	To improve strength in sedentary individuals beginning a problem.
40-50%:	To improve muscular strength in older adults.
60-70%:	To improve strength in novice to intermediate exercisers.
> 80%:	Experienced strength trainers to improve strength.

Table 9: ACSM Guidelines for Flexibility

Frequency	>2-3 days / week; greatest gains with daily stretching.
Intensity	Stretch to the point of feeling tightness.
Time	Hold a stretch for 10-30 sec; older people holding for 30-60 seconds may be better.
Type	Each of the major muscle-tendon units.
Volume	Perform 60 sec of total stretching time for each exercise.
Pattern	2-4 reps.
Progression	Unknown.

The ACSM recommends that cancer survivors avoid inactivity and return to normal daily activities as soon as possible after surgery (American College of Sports Medicine, 2020). They should be evaluated for peripheral neuropathies and musculoskeletal dysfunctions that could result from cancer treatment. Patients should continue with their normal daily activities and exercise as often as possible. If there is known metastatic bone cancer, exercise should be modified to avoid fractures. The presence of cardiac conditions may also require exercise modification to maintain safety. Any abnormal changes in pain or swelling during an exercise program should be considered warning signs that require caution and follow up with the physician. (American College of Sports Medicine, 2019).

The Clinical Oncology Society of Australia recommendations

The Clinical Oncology Society of Australia (COSA), published a position paper with three core recommendations (Cormie et al., 2018). They name exercise as a key component of cancer care that should be viewed as an adjunct treatment embedded in standard practice to reduce the adverse effects of cancer and its treatments. The second recommendation is that all members of the multidisciplinary care team promote physical activity and patient compliance with exercise guidelines. Lastly, COSA states that best practice cancer care should include referral to an accredited physical therapist and/or exercise physiologist with training and experience in cancer care.

The COSA position statement also includes guidelines for changes in case management. They encourage all health professionals working with cancer patients to discuss the role of exercise in cancer recovery early in the plan of care. The plan should ensure that patients are compliant with exercises guidelines and avoid inactivity. Patients should progress toward at least 150 minutes of moderate intensity aerobic exercise and two to three moderate intensity resistance exercise sessions per week. Healthcare providers should also refer patients to other health professionals who specialize in exercise prescription and deliver exercise-based treatments such as physical therapists.

ASSESSMENT TOOLS

Oncology rehabilitation programs are designed to address impairments and functional limitations of patients diagnosed with cancer. The ultimate goals of oncology rehabilitation programs are to reduce disability and restore patients' ability to resume their usual daily activities. Monitoring their physical responses and exercise progression, quality of life, self-reported health status, and general wellbeing is important. The following are a sampling of the many tools that can be used to assess function and patient outcomes over time.

General health assessment

The 36-Item Short Form Health Survey (SF-36) was developed by the RAND Corporation as part of a multi-site, multi-year Medical Outcomes Study (MOS) that examined variations in patient outcomes. It assesses eight health areas including physical functioning, pain, role limitations due to physical health problems, role limitations due to personal/emotional problems, emotional well-being, social functioning, fatigue, and general health perceptions. The details of the scoring rules for the SF-36 are beyond the scope of this course; however, it includes a two-step process. The first step scores the items using pre-coded numeric values, and the second step converts each item into a percentage of the total possible score achieved.

The SF-36 can be used in cancer rehabilitation as a self-reported tool to monitor patient outcomes. Each patient completes the survey at the start of the program, then again at different intervals during the program. In a study published by Samuel et al. (2019), the researchers examined the effectiveness of exercise-based cancer rehabilitation on functional capacity and quality of life. They evaluated patient-reported quality of life using the SF-36, primarily focusing on the Physical Component Score (PCS), the Mental Component Score (MCS), and the fatigue score. The researchers found that not only were exercise-based interventions effective in improving functional capacity, but they were also related to improvements in self-reported quality of life scores using the SF-36. The tool can be found in Appendix A.

Pain

Pain is a common complaint in cancer survivors, particularly after surgery, and can be one of the complaints that physical therapists address with their patients. Therefore, it is important to be able to reliably track changes in pain over time. The American Physical Therapy Associations (APTA)'s Oncology Section EDGE Task Force performed a systematic review on clinical measures for pain and their relevance for use with patients with cancer. Based on psychometric properties, clinical utility, and relevance to adults with cancer, they highly recommend the McGill Pain Questionnaire-Short Form, the Numeric Rating Scale, and the Visual Analog Scale (Harrington, et al., 2018). See the Resources section for more information.

Cancer-related fatigue

As stated above, cancer-related fatigue (CRF) is one of the common side effects of cancer treatment. In order to effectively screen for its presence and thoroughly assess factors related to CRF, sound measurement tools must be used. Another APTA Oncology Section EDGE Task Force performed a systematic review of tools to measure fatigue in people with cancer. They found that the 10-point Numeric Rating Scale for Fatigue is the best for screening for CRF, while the Multidimensional Fatigue Symptom Inventory is the most comprehensive, multidimensional tool for assessment of CRF (Fisher et al., 2018). Physical therapists working with individuals with cancer should familiarize themselves with these tools. See the Resources section for more information.

Conclusion

Cancer is a devastating disease, but many patients can be successfully treated and resume their normal lives. Unfortunately, many of these patients are left with significant impairments and functional limitations such as pain, decreased flexibility, weakness, and difficulty performing their usual daily activities. As cancer survivorship increases, so does the need for comprehensive programs that help patients overcome the side effects and aftereffects from both the disease and its treatments. Oncology rehabilitation programs are designed to assist patients in regaining function and preventing disability. These programs are provided by an interdisciplinary team that includes, among others, physical therapists, occupational therapists, and speech therapists. In these programs, each specialist assesses the patient to determine the impairments and functional limitations, then designs a personalized treatment plan to meet the patient's needs. Oncology rehabilitation can be effective throughout the continuum of care for patients diagnosed with cancer.

Resources

APTA Oncology EDGE Task Force Articles

- Fisher, M. I., Davies, C., Lacy, H., Doherty, D. (2018). Oncology Section EDGE Task Force on Cancer: Measures of Cancer-Related Fatigue—A Systematic Review. R*ehabilitation Oncology*, 36(2), 93-105.
- Harrington, S. E., Gilchrist, L., Lee, J., Westlake, F. L., Baker, A. (2018). Oncology Section EDGE Task Force on Cancer: A Systematic Review of Clinical Measures for Pain. *Rehabilitation Oncology*, 36(2), 83-92.

Websites

- **APTA Oncology**
  https://oncologypt.org/
  An academy of the American Physical Therapy Association
- **American Cancer Society**
  www.cancer.org
- **Livestrong**
  https://www.livestrong.org/
  A non-profit organization dedicated to supporting people affected by cancer

APPENDIX A

Standard Form – 36 (SF-36)

Patient Name:	**Date:**

Standard Form 36 Survey: The SF-36 Form is one of many outcomes assessments designed by the Medical Outcomes Trust in Boston, MA. It is designed to approximate the improvement in health status from a medical intervention.

INSTRUCTIONS: This survey asks for views about your health. This information will help keep track of how you feel and how well you are able to do your usual daily activities. Answer every question marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

1. In general, would you say your health is (circle one):	○ 1 - Excellent ○ 2 - Very good ○ 3 - Good ○ 4 - Fair ○ 5 - Poor
2. Compared to one year ago, how would you rate your health in general **at this time (circle one)?**	○ 1 - Much better now than one year ago ○ 2 - Somewhat better now than one year ago ○ 3 - About the same as one year ago ○ 4 - Somewhat worse than one year ago ○ 5 - Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much? (Circle the appropriate number for each question.)	**Yes, Limited a Lot**	**Yes, Limited a Little**	**No, Not Limited**
▪ **Vigorous activities**, such as running, lifting heavy objects, or participation in strenuous sports.	○ 1	○ 2	○ 3
▪ **Moderate activities**, such as moving a table, vacuuming, bowling or golfing.	○ 1	○ 2	○ 3
▪ Lifting or carrying groceries.	○ 1	○ 2	○ 3
▪ Climbing **several** flights of stairs.	○ 1	○ 2	○ 3
▪ Climbing **one** flight of stairs.	○ 1	○ 2	○ 3
▪ Bending, kneeling, or stooping.	○ 1	○ 2	○ 3
▪ Walking **more than a mile**.	○ 1	○ 2	○ 3
▪ Walking **several blocks**.	○ 1	○ 2	○ 3
▪ Walking **one block**.	○ 1	○ 2	○ 3
▪ Bathing or dressing yourself.	○ 1	○ 2	○ 3

4. During the **past 4 weeks**, have you had any of the following problems with your work or other regular activities **as a result of your physical health** (circle the appropriate number for each question)?	**Yes**	**No**
▪ Cut down on the **amount of time** you spent on work or other activities.	○ 1	○ 2
▪ **Accomplished less** than you would like.	○ 1	○ 2
▪ Were limited in the **kind** of work or other activities.	○ 1	○ 2
▪ Had **difficulty** performing the work or other activities (for example, requiring an extra effort)?	○ 1	○ 2

5. During the **past four weeks**, have you had any of the following problems with your work or other regular daily activities **as result of any emotional problems** (such as feeling depressed or anxious) (circle the appropriate number for each question)?	**Yes**	**No**
▪ Cut down on the **amount of time** you spent on work or other activities.	○ 1	○ 2
▪ **Accomplished less** than you would like.	○ 1	○ 2
▪ Didn't do work or other activities as **carefully** as usual.	○ 1	○ 2

6. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors or groups (circle one)?	○ 1 - Not at all ○ 2 - Slightly ○ 3 - Moderately ○ 4 - Quite a bit ○ 5 - Extremely

7. How much **bodily** pain have you had during the **past 4 weeks** (circle one)?	○ 1 - None ○ 2 - Very mild ○ 3 - Mild ○ 4 - Moderate ○ 5 - Severe ○ 6 - Very severe
8. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework) (circle one)?	○ 1 - Not at all ○ 2 - A little bit ○ 3 - Moderately ○ 4 - Quite a bit ○ 5 - Extremely

9. These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the **past 4 weeks** (circle one number on each line):

	All of the Time	Most of the Time	A good Bit of the Time	Some of the Time	A little of the Time	None of the Time
▪ Did you feel full of pep?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Have you been a very nervous person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Have you felt so down in the dumps that nothing could cheer you up?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Have you felt calm and peaceful?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Did you have a lot of energy?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Have you felt downhearted and blue?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Did you feel worn out?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Have you been a happy person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
▪ Did you feel tired?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

10. During the **past 4 weeks,** how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting friends, relatives etc.) (circle one)?	○ 1 - All of the time. ○ 2 - Most of the time. ○ 3 - Some of the time. ○ 4 - A little of the time. ○ 5 - None of the time.

11. How TRUE or FALSE is **each** of the following statements to you? (Circle one for each line.)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
▪ I seem to get sick easier than other people.	○ 1	○ 2	○ 3	○ 4	○ 5
▪ I am as healthy as anybody I know.	○ 1	○ 2	○ 3	○ 4	○ 5
▪ I expect my health to get worse.	○ 1	○ 2	○ 3	○ 4	○ 5
▪ My health is excellent.	○ 1	○ 2	○ 3	○ 4	○ 5

FACT-G (Version 4)

Below is a list of statements that other people with your illness have said are important.

Please circle or mark one number per line to indicate your response as it applies to the PAST 7 DAYS.

	PHYSICAL WELL-BEING	Not at all	A little bit	Somewhat	Quite a bit	Very much
GP1	I have a lack of energy.	0	1	2	3	4
GP2	I have nausea.	0	1	2	3	4
GP3	Because of my physical condition, I have trouble meeting the needs of my family.	0	1	2	3	4
GP4	I have pain.	0	1	2	3	4
GP5	I am bothered by side effects of treatment.	0	1	2	3	4
GP6	I feel ill.	0	1	2	3	4
GP7	I am forced to spend time in bed.	0	1	2	3	4
	SOCIAL/FAMILY WELL-BEING	**Not at all**	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**
GP1	I feel close to my friends.	0	1	2	3	4
GP2	I get emotional support from my family.	0	1	2	3	4
GP3	I get support from my friends.	0	1	2	3	4
GP4	My family has accepted my illness.	0	1	2	3	4
GP5	I am satisfied with family communication about my illness.	0	1	2	3	4
GP6	I feel close to my partner (or the person who is my main support).	0	1	2	3	4
Q1	Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box ☐ and go to the next section.	0	1	2	3	4
GP7	I am satisfied with my sex life.	0	1	2	3	4

Please circle or mark one number per line to indicate your response as it applies to the PAST 7 DAYS.

	EMOTIONAL WELL-BEING	Not at all	A little bit	Somewhat	Quite a bit	Very much
GP1	I feel sad.	0	1	2	3	4
GP2	I am satisfied with how I am coping with my illness.	0	1	2	3	4
GP3	I am losing hope in the fight against my illness.	0	1	2	3	4
GP4	I feel nervous.	0	1	2	3	4
GP5	I worry about dying.	0	1	2	3	4
GP6	I worry that my condition will get worse.	0	1	2	3	4
	FUNCTIONAL WELL-BEING	**Not at all**	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**
GP1	I am able to work (include work at home).	0	1	2	3	4
GP2	My work (include work at home) is fulfilling.	0	1	2	3	4
GP3	I am able to enjoy life.	0	1	2	3	4
GP4	I have accepted my illness.	0	1	2	3	4
GP5	I am sleeping well.	0	1	2	3	4
GP6	I am enjoying the things I usually do for fun.	0	1	2	3	4
GP7	I am content with the quality of my life right now.	0	1	2	3	4

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AN OVERVIEW OF ONCOLOGY REHABILITATION, UPDATED

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 81 or complete your test online at **EliteLearning.com/Book**

41. The type of cancer that forms in bones and soft tissues, including muscle, fat blood vessels, lymph vessels, tendons and ligaments is called:
    a. Sarcoma.
    b. Carcinoma.
    c. Leukemia.
    d. Lymphoma.

42. What group of cancer affects blood and bone marrow?
    a. Sarcoma.
    b. Lymphoma.
    c. Myeloma.
    d. Leukemia.

43. Cancer staging is important information because it helps physicians determine the extent of the cancer and:
    a. What physical symptoms a patient will experience.
    b. The most appropriate treatment plan.
    c. How long cancer has been present in the body.
    d. Whether the patient has a family history of cancer.

44. Surgical procedures are most effective for removing:
    a. Necrotic tissue.
    b. Solid tumors.
    c. Small tumors.
    d. Lymph nodes.

45. The most common side effect of both radiation and chemo therapy is:
    a. Shortness of breath.
    b. Fatigue.
    c. Joint contracture.
    d. Cardiac arrhythmia.

46. The rehabilitation that specifically focuses on the treatment of impairments and functional limitations that result from the medical treatment of cancer is:
    a. Functional rehabilitation.
    b. Orthopedic rehabilitation.
    c. Oncology rehabilitation.
    d. Vestibular rehabilitation.

47. The phase of oncology rehabilitation that enables patients in the terminal stage to lead a high quality of life physically, psychologically, and socially, while respecting their wishes is the:
    a. Treatment phase.
    b. Supportive phase.
    c. Palliative phase.
    d. Restorative phase.

48. Patients can benefit from _____ techniques including manual stretching, myofascial release, and joint mobilizations to improve motion and increase soft tissue length.
    a. Exercise.
    b. Active therapy.
    c. Manual therapy.
    d. Aquatic therapy.

49. Research shows that in patients undergoing cancer treatment, exercise can reduce:
    a. Vomiting.
    b. Nausea.
    c. Skin disorders.
    d. Fatigue.

50. The best tool to screen for the presence of cancer-related fatigue is the:
    a. SF-36.
    b. McGill Pain Questionnaire.
    c. 10-point Numeric Rating Scale for Fatigue.
    d. Visual Analog Scale.

Course Code: PTIL02OR

Chapter 6: Osteoarthritis of the Hip: Rehabilitation and Treatment Strategies, 2nd Edition

4 CE Hours

By: Keelan Enseki, MS, PT, OCS, SCS, ATC, CSCS

Learning objectives

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

- Describe the pathoanatomical changes typical of the progression of osteoarthritis of the hip joint.
- Identify risk factors in the development of hip joint osteoarthritis.
- Describe the findings for diagnosing osteoarthritis of the hip, including patient presentation, clinical examination, and diagnostic imaging.
- List appropriate outcome measures used with individuals with osteoarthritis of the hip joint.
- Describe physical therapy, pharmacological, and surgical interventions that can be used in treating hip joint osteoarthritis.

Course overview

Osteoarthritis (OA) of the hip joint is the most common cause of hip pain in older adults (Chen, Piggot, & Klatt, 2013). Despite the relatively high prevalence rate of hip OA, only limited literature focuses on conservative treatment of the condition. The Orthopaedic Section of the American Physical Therapy Association (APTA) has developed evidence-based practice guidelines for the management of patients with hip osteoarthritis (Cibulka et al., 2017). Physical therapists and physical therapist assistants possess the clinical expertise to provide a comprehensive approach to the treatment of individuals with hip OA. However, current practice patterns do not consistently follow recommendations from the published guidelines. Intervention strategies are often based on anecdotal evidence as opposed to scientific evidence. Passive treatment strategies and physical modalities are often overused when graded exercise and patient education should be emphasized. For treating individuals with hip OA, there is a need for structured and progressive rehabilitation strategies rooted in evidence-based practice.

The socioeconomic costs of hip OA are substantial, and cases that progress to total hip arthroplasty (THA) impose a large financial burden on society. In 2011, the primary costs of THA procedures in the United States alone exceeded $4 billion (Cibulka & Woehrle, 2013). Moreover, this figure fails to take into account the potential for considerable indirect costs arising from medical complications and revision procedures. These costs must be absorbed by third-party payers, healthcare systems, and often by the patients and their families. Quality of life is negatively affected as individuals with hip OA become less mobile and less able to participate in the social and recreational activities that they once enjoyed.

Diagnosis of hip OA requires a structured approach involving identifying clinical impairments, interpreting clinical tests, and identifying functional limitations. The presence of known risk factors may help in determining the diagnosis. Clinicians must rule out competing diagnoses when evaluating individuals presenting with hip pain. Diagnostic imaging may be useful during the evaluation process.

Treatment for hip OA should be based on a multidisciplinary approach. Clinicians should address clinical impairments and functional limitations. Changes in patient status should be monitored through evidence-supported measures of physical function and patient-reported outcome instruments.

This intermediate-level course is designed to provide physical therapists and physical therapist assistants with a comprehensive overview of current evidence-based treatment strategies for patients with hip OA. The course reviews the pathomechanical changes that are associated with hip OA and discusses nonmodifiable and modifiable risk factors. To give the practitioner a "clinical picture" of patients with hip OA, the course also presents the components required to make an accurate clinical diagnosis. Common physical function and patient-reported outcome measures are discussed so that the reader can effectively determine whether progress is being made during treatment. The course describes treatment options, along with their associated strength of support in the literature. Finally, the course reviews surgical procedures and common pharmacological agents that are used to treat hip OA. With this knowledge, physical therapists should be able to effectively evaluate and provide a physical therapy diagnosis for patients with hip OA. Physical therapists and physical therapist assistants should be able to implement effective treatment strategies as well as determine the effectiveness of prescribed treatment.

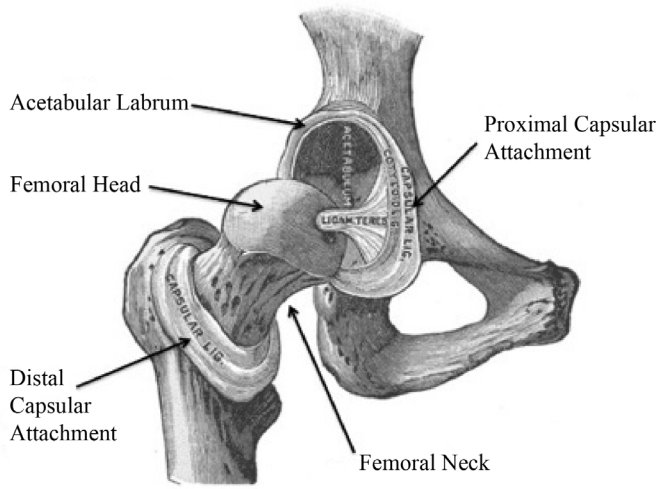
As the general population ages, hip OA will no doubt become an ever more prevalent health issue. Physical therapists can play a crucial role in the treatment of this nonreversible disease. Appropriate evaluation and rehabilitation have the potential to decrease the use of medication and surgical procedures while maximizing patients' quality of life.

NORMAL HIP JOINT ANATOMY

The hip joint (Figure 1) is formed by the articulation of the femoral head with the acetabulum of the innominate bone. The femoral head is considered a convex surface (two-thirds of a sphere), and the acetabulum is a deeply recessed concave surface. The hip is considered a "ball-and-socket" synovial joint. The femoral head is covered in hyaline cartilage, except for a small central portion known as the *fovea capitus*. The articular cartilage lining the acetabulum exists as a horseshoe-shaped structure. The articular cartilage of both the femoral head and acetabulum is thickest in the superior region, which coincides with the regions of the joint that are subject to the greatest forces during weight-bearing activities (Nakanishi et al., 2001). The articular cartilage of the hip joint is avascular and not innervated. This tissue characteristic is relevant when considering both the symptom presentation and healing potential that are associated with degenerative changes of the joint.

The deeply recessed concavity of the acetabulum and significant capsular and ligamentous reinforcement make the hip an inherently stable joint. The capsuloligamentous structures supporting the joint help achieve this stability. The thick, fibrous joint capsule originates proximally from the acetabular rim and inserts along the intertrochanteric line of the proximal femur.

Figure 1: Hip Joint Anatomy



Note. Adapted from Gray, H. (1918). Anatomy of the Human Body. Philadelphia, PA: Lea & Febiger. Bartleby.com, 2000. Retrieved from http://commons.wikimedia.org/wiki/File:Gray342.png.

A substantial portion of the femoral neck is actually contained within the joint capsule. Three relatively strong structures – the iliofemoral, pubofemoral, and ischio-femoral ligaments – reinforce the joint capsule (Martin et al., 2008). The ligamentum teres spans from the acetabular notch and transverse acetabular ligament to the fovea capitus of the femoral head. Although the ligamentum teres has traditionally been thought to play a minor role in joint function, recent evidence has implied that it may play a bigger part (Kivlan, Clemente, Martin, & Martin, 2013; Rao, Zhou, & Villar, 2001).

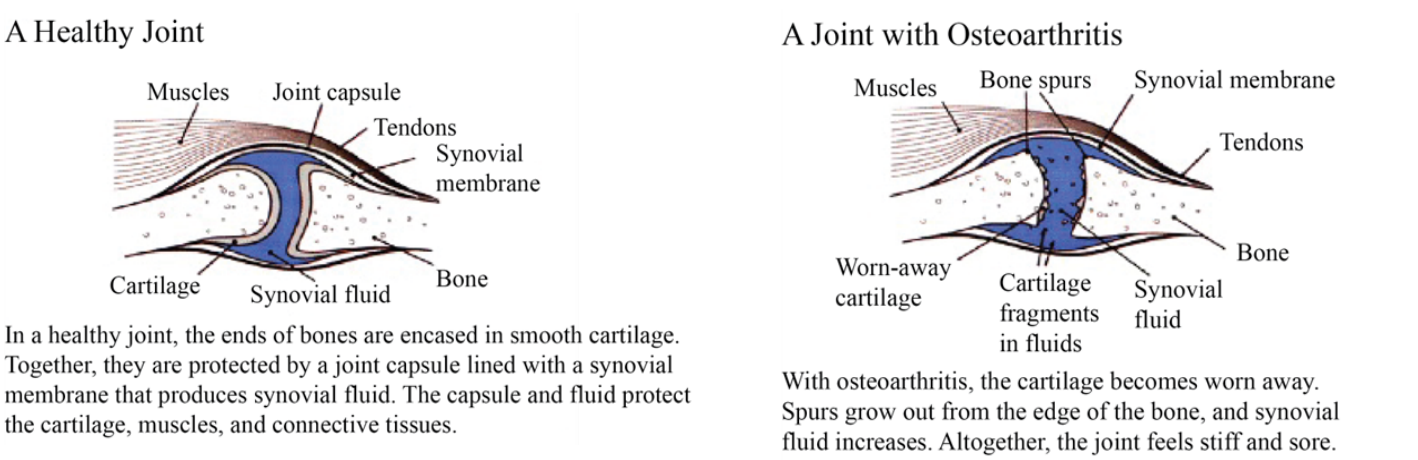
An additional component of stability in the hip joint is the acetabular labrum. Composed of fibrocartilage, the acetabular labrum deepens the socket, creates a seal through negative intra-articular pressure, and disperses forces more evenly across the articular surfaces (Ferguson, Bryant, Ganz, & Ito, 2003; Tan et al., 2001). Recently, the potential role of acetabular labral tears as a potential precursor to OA of the hip joint has been examined (Parmar & Parvizi, 2010).

The musculature surrounding the hip joint complex provides active movement as well as dynamic stability in all planes of motion (Neumann, 2010). The gluteus medius muscle is often of primary interest in rehabilitation due to the muscle's role in stabilization in the frontal plane (Al- Hayani, 2009). Due to the bony architecture of the joint, many muscles crossing the hip can produce movement in more than one plane of motion, depending on the position of the joint when muscular contraction occurs.

Joint structure changes with hip osteoarthritis

Hip OA affects the structural characteristics and overall function of the entire joint (Figure 2). Universal processes are recognized with the occurrence of OA of any joint. The key characteristic of OA is progressive loss of cartilage. The subchondral plate becomes thicker, followed by the formation of osteophytes and subchondral cysts (Goldring & Goldring, 2006). An early presymptomatic change is shortening of the capsular tissue. In a classic study that is frequently referenced in current literature, Lloyd-Roberts (1953) demonstrated that this shortening of the capsular tissue results in capsular hypomobilityand the characteristic loss of range of motion (ROM) that is observed with the disease. As a result of these structural changes, the weight-bearing characteristics of the joint are disrupted, resulting in focal overload of the articular surfaces (Bombelli, Santore, & Poss, 1984). Over time, the articular cartilage degenerates, and joint space between the femoral and acetabular surfaces is diminished (Altman et al., 2005). Late-stage changes include osteophyte, spur, and cyst formation, along with sclerotic changes of the subchondral bone (Karachalios, Karantanas, & Malizos, 2007; Salaffi, Carotti, Stancati, & Grassi, 2003).

Figure 2: Normal Joint vs. Joint with Osteoarthritic Change



Note. From National Institutes of Health. (n.d.). Osteoarthritis. Retrieved from https://www.niams.nih.gov/health- topics/osteoarthritis#pic_2.

Natural history

The clinical progression of disability that is associated with OA processes affecting the hip joint is not exclusively the result of articular changes. Instead, the disability experienced by patients with hip OA results from the combination of joint-specific and related changes of other proximal tissues. The rate and extent of clinical changes and functional limitations are dependent on many factors and therefore are not completely predictable. Progressive weakness of lower-extremity musculature is often observed. However, it is not definitively known whether weakness is more a cause or result of the disease (Valderrabano & Steiger, 2011). The loss of frontal stability due to abductor weakness is a common issue (Steultjens, Dekker, van Baar, Oostendorp, & Bijlsma, 2001). Muscle weakness may result in abnormal joint loading patterns and gait disturbance (Arokoski et al., 2002; Lievense et al., 2003). The loss of joint ROM often affects ambulation and activities of daily living (ADLs; Cibulka

& Woehrle, 2013). The clinical changes and related disability associated with hip OA typically progress slowly, but the possibility of rapid decline (>2 mm or 50% of joint space lost in less than 1 year) does exist (Boutry et al., 2002; Cibulka & Woehrle, 2013; Kuo, Ezzet, Patil, & Colwell, 2009).

RISK FACTORS FOR HIP OSTEOARTHRITIS

A thorough review of a patient's history may reveal various risk factors associated with an increased possibility of hip OA. Identifying these risk factors allows a clinician to offer a diagnosis of hip OA with the confidence of increased probability. When imaging and other diagnostic tests are not available or are cost-prohibitive, a clear sense of the patient's risk factors is of particular importance. Furthermore, a number of these factors are modifiable and should be considered when providing patient education as part of a complete plan of care. Among risk factors, age, developmental disorders of the hip joint, and previous injuries currently have the strongest level of support in the literature for a positive correlation with the development of hip OA (Tepper & Hochberg, 1993; Wright, Cook, & Abbot, 2009). The evidence provided for these factors is derived from randomized controlled trials, prospective studies, and diagnostic studies (Cibulka et al., 2017).

Nonmodifiable risk factors

Numerous intrinsic, patient-specific risk factors are associated with the development of hip OA and are therefore not modifiable. They are important considerations when evaluating and treating patients with hip OA. Knowledge of these influences helps the clinician during the diagnostic process and in determining the prognosis for this population of patients.

A commonly held belief is that hip OA is a disease of the geriatric population, and the available evidence supports this notion. The majority of individuals who have developed hip OA are age 45 or older (Wright et al., 2009). The association of age and hip OA becomes significantly greater every 5 years after age 60, with adjusted odds ratios of 1.30, 1.69, and 2.38 for individuals in the age brackets of 60 through 64, 65 through 69, and 70 through 74 years, respectively (Tepper & Hochberg, 1993). Older age at the time of developing primary hip OA has also been positively associated with patients' progression to joint replacement surgery.

Developmental disorders of the hip may be an important component of the patient's medical history. Relatively early development of hip OA has been associated with a number of developmental hip disorders. Such conditions include Legg-Calve-Perthes disease, slipped capital femoral epiphysis (SCFE), and congenital hip dislocation (Abraham et al., 2007; Jacobsen, 2006; Kim, 2012; Novais & Millis, 2012).

In addition to these potentially contributory disorders, hip dysplasia has been implicated in the development of hip OA (Jacobsen & Sonne-Holm, 2005). Dysplasia is defined as any change in orientation of the acetabulum or the proximal femur, which creates a change in the way the femur and the acetabulum articulate with each other (Jacobsen, Romer, & Soballe, 2005). Variations of hip dysplasia that have been described include coxa vara, coxa valga, femoral anteversion, femoral retroversion, acetabular anteversion, acetabular retroversion, coxa plana, and coxa profundus (Jacobsen, 2006; Jacobsen, Sonne-Holm, Soballe, Gebuhr, & Lund, 2004). Although a few studies argue to the contrary (Gosvig, Jacobsen, Sonne-Holm, Palm, & Troelsen, 2010), the majority of studies show a notable association between hip joint dysplasia and hip OA (Ezoe, Naito, & Inoue, 2006; Jacobsen & Sonne-Holm, 2005). Hip dysplasia has been identified as the primary cause of hip OA in a large proportion of patients under the age of 50 years who are undergoing total hip arthroplasty (Clohisy et al., 2011; Pun, 2016).

Beyond anecdotal reports that often note a higher prevalence in women, there has been little in the way of formal investigation regarding the role of gender as an isolated factor in the occurrence of hip OA (Quintana et al., 2008). The small body of available literature reports slight and contrasting differences between males and females (Quintana et al., 2008; Tepper & Hochberg, 1993). Although no definitive consensus is available for gender differences in hip OA prevalence, the pattern of pathomechanical changes that occur does seem to vary by gender (Cibulka & Woehrle, 2013). Males tend to demonstrate a more superio-lateral migration of the femoral head, which has been shown to accelerate the rate of progression of hip OA (Bierma-Zeinstra & Koes, 2007). In comparison, females tend to experience superio-medial migration (Ledingham, Dawson, Preston, Milligan, & Doherty, 1993). It has been suggested that the combination of being female and having a higher-than-ideal body weight could be correlated to a higher risk for the development of hip OA (Marks, 2010).

Race has not been conclusively proven as a factor in the development of hip OA, although the potential for a correlation has been suggested. Non-Caucasian populations appear to have a lower incidence of hip OA when compared with populations with European ancestry (Hoaglund & Steinbach, 2001). Further investigation is necessary to more clearly identify the role of race in the occurrence of hip OA.

Clinicians often hear anecdotal reports from patients concerning hip OA trends that occur in families. However, at this time, the evidence is insufficient to fully explain the role of genetics in the development of the disease (Cibulka et al., 2017). Studies that aggregate data within families have noted that the risk ratio for an individual to develop OA when a relative is affected by the disorder is between 2 and 8 (Valdes & Spector, 2010). Box 1 defines risk ratios and explains how to calculate and interpret them. It has been suggested that the genetic influence on the development of radiographic (not necessarily symptomatic) hip OA may be as high as 60% (Valdes & Spector, 2010). Although genetic factors have been examined (MacGregor, Antoniades, Matson, Andrew, & Spector, 2000), further studies are required to substantiate this lin.

Box 1: Risk Ratios: Definition, Calculation, and Interpretation

- **Definition**: The ratio of the probability of an event occurring in an exposed group to the probability of the event occurring in a matched, nonexposed group.
- **Calculation**: Risk ratio (RR) = probability of event when exposed/probability of event when nonexposed.
- **Interpretation**: A risk ratio of 1 means that there is no difference in risk between the two groups, a risk ratio of < 1 means that the event is less likely to occur in the exposed group than in the nonexposed or control group, and a risk ratio of > 1 means that the event is more likely to occur in the exposed group than in the nonexposed group.

Note: From Western Schools, 2018.

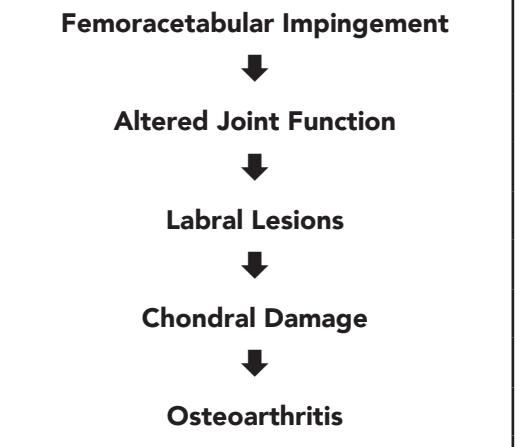
Research examining the presence of a leg-length discrepancy as a contributing factor in the development of hip OA has yielded mixed results (Gofton & Trueman, 1971; Golightly et al., 2007). Although only a few studies suggest that leg-length discrepancy contributes to the development of hip OA, there is a biomechanical basis to support the hypothesis. In the standing position, the presence of a leg-length discrepancy could create a frontal-plane pelvic obliquity and subsequent asymmetrical loading between the hip joints. Further investigation is warranted to confirm this suggestion.

Femoroacetabular impingement (FAI) of the hip has become an intensely debated topic in the orthopedic literature (Clohisy et al., 2011; Peelle, Della Rocca, Maloney, Curry, & Clohisy, 2005). FAI occurs when there is premature contact between the femoral and acetabular joint components at end ranges of motion. Two variations of FAI have been described in the literature: cam and pincer deformity (Leunig, Beaule, & Ganz, 2009). Cam deformity occurs when there is an excessive amount of bone in the area of the femoral head-neck junction that results in a deviation of the normal spherical shape of the femoral head. Pincer deformity occurs when there is excessive acetabular coverage over the femoral head (Lavigne et al., 2004). The role of FAI in the development of acetabular labral tears and further progression to hip OA has been described (Felson, 2013; Ganz, Leunig, & Harris, 2008; Leunig et al., 2009). With repetitive end-range motions in which premature contact between the femur and acetabulum occurs, the acetabular labrum becomes impinged and eventually damaged (Harris-Hayes & Royer, 2011). Over time, the joint cartilage becomes lesioned, and eventually, degenerative changes take place within the hip joint. Cam deformity characteristics have shown a stronger association with hip OA compared with pincer deformities (Kowalczuk, Yeung, Simunovic, & Ayeni, 2015). Castañeda, Ponce, Villareal, and Vidal (2013) examined 121 patients with a previous SCFE diagnosis at least 20 years prior. All subjects showed radiographic signs of hip OA. The investigators found that 96 subjects demonstrated radiographic cam deformity findings. Additionally, the degree of cam deformity was correlated with more severe degenerative changes of the hip joint. These findings suggest that the increased incidence of cam FAI found in young adults with a previous SCFE may be a particular concern when considering the potential for development of OA.

Figure 3 illustrates the series of changes believed to occur with FAI and hip OA. Recently, biomarkers indicating elevated cartilage turnover and systemic inflammation were noted in athletes with FAI (Bedi et al., 2013). These biomarkers are associated with the development of hip OA. At this time, very little is known about the specific etiology of FAI or the time frame for progression to hip OA.

Previous injuries to the bony components of the hip joint are known to increase the likelihood of hip OA (Cibulka & Woehrle, 2013; Cooper et al., 1998). Of particular concern are previous fractures of the proximal femur. A fracture of the proximal femur has the potential to alter the load- bearing characteristics of the hip joint. This change in joint function has been associated with the development of hip OA (Gelber et al., 2000). Patients with previous injury to the hip joint are noted to be 4.3 times more likely to develop hip OA than those who have not been exposed to such injury (Cooper et al., 1998).

Figure 3: Femoracetabular Impingement Osteoarthritis Spectrum



Note. From Western Schools, 2018.

Modifiable risk factors

Of particular interest to clinicians are risk factors that have the potential to be modified. A number of these variables play a suggested role in the development of hip OA. These variables may be revealed as part of the patient's history, so they can be modified only prospectively. When possible, clinicians should inform patients about the advantages of minimizing continued exposure to these controllable risk factors for hip OA.

Innominate/pelvic bone obliquity may contribute to abnormal mechanics that predispose an individual to the development of hip OA (Cibulka & Woehrle, 2013). An obliquity occurs when the hemipelvis is rotated away from the normal anatomical position. This position change can result in acetabular retroversion or anteversion. Acetabular retroversion causes a decrease of weight-bearing surface area for the articular surfaces and increases the probability of developing FAI. Pelvic obliquity is often associated with the clinical presentation of leg-length discrepancy or sacroiliac joint dysfunction (Cibulka & Woehrle, 2013).

The nature of an individual's current or past occupation(s) should be investigated during evaluation of the painful hip region. A number of case- controlled and retrospective studies have shown a weak association between various occupations and an increased incidence of hip OA (Cibulka et al., 2017). The majority of these studies examined occupational trends in Europe and the United States. An increased incidence of hip OA has been noted in male workers who engage in occupations that require repetitive lifting of heavy loads over extended periods of time (Maetzel, Makela, Hawker, & Bombardier, 1997). In other studies, farming has been associated with an increased risk for the development of hip OA (Sulsky et al., 2012; Thelin & Holmberg, 2007; Thelin, Vingard, & Holmberg, 2004). Although no single aspect of farming has been identified to explain the increased risk, suggested tasks include heavy lifting, walking on uneven ground, and tractor driving. These tasks are thought to potentially result in cumulative loading of the joint structures to the point of cartilage failure and eventual degenerative changes within the joint.

Participation in various levels of current or past athletic activity is commonly reported by individuals with suspected hip OA. A number of epidemiological studies have shown an association between competitive athletic activities and the development of hip OA (Lievense et al., 2003; Buckwalter & Martin, 2004). American football, hockey, and other direct-impact activities may increase the risk for OA occurrence(Buckwalter & Lane, 1997; Buckwalter & Martin, 2004). Conversely, in a 5-year longitudinal study, Lane and colleagues (1993) found only a low risk for hip OA resulting from running activities.

When interacting with patients, some clinicians suggest that body mass index (BMI) is a factor in the development of hip OA. However, the literature examining this association has actually yielded mixed results. Although a number of case-controlled and retrospective studies have suggested BMI as a risk factor (Cooper et al., 1998; Vingard, 1991), the most current evidence suggests little or no relationship between BMI and the development of hip OA (Jacobsen et al., 2004; Reijman et al., 2007). Although a strong association between BMI and the development of hip

OA has not been established, BMI appears to be positively associated with progression of the disease (Marks & Allegrante, 2002). A 5-unit increase in BMI has been suggested as a clinically significant difference for increased risk of OA progression (Jiang et al., 2011). This relationship supports clinicians' common recommendations for proper body mass maintenance as a measure to prevent more rapid progression of hip OA.

DIAGNOSIS OF HIP OSTEOARTHRITIS

The accurate clinical diagnosis of hip OA is crucial for providing appropriate treatment for this condition. The wide spectrum of involvement for the condition can make the diagnostic process a challenging task, however. The clinician must also consider a wide range of differential diagnoses. These competing diagnoses may be musculoskeletal or nonmusculoskeletal in origin (Martin & Kivlan, 2013). The potentially catastrophic consequences of failing to recognize systemic conditions such as tumors, sepsis, and so on necessitate a structured examination process. When presented with signs and symptoms inconsistent with a localized mechanical origin, clinicians should use appropriate screening techniques and refer patients appropriately. The diagnosis of hip OA should be ascertained through a complete history and physical examination (Bierma-Zeinstra & Koes, 2007). Diagnostic imaging (typically plain radiography) is considered confirmatory for the diagnosis of hip OA (Croft, Cooper, Wickham, & Coggon, 1990).

Patient presentation

Specific trends in symptoms and functional limitations are observed in patients with hip OA. Pain is most often the primary complaint of hip OA. Although the location of pain may vary, the most commonly reported sites are in the anterior (groin) and/or lateral regions of the hip. As hip OA progresses, pain may be reported in the anterior thigh and knee region. Pain often increases with weight-bearing activities such as ambulation or after prolonged periods of sitting (Altman et al., 1991). Stiffness is another common complaint of patients with hip OA. A temporal pattern is often recognized, with the complaint of stiffness being greatest in the morning and typically decreasing within an hour (Holla et al., 2010). Joint crepitus is a common complaint, although there are no specific studies examining the characteristics of this specific symptom. Typically, the onset of symptoms for hip OA cases is gradual in nature. There may be a history of a gradual increase in symptoms along with acute, intermittent times of increased symptoms.

Functional limitations associated with hip OA vary depending on the stage of the condition and numerous patient-specific factors. Basic mobility may be affected for ambulation, stair negotiation, and transfers. Gait abnormalities may include asymmetry in weight bearing and step length (Cichy & Wilk, 2006). A decrease in general endurance is often noted as well. A reduced ability to participate in fitness routines or athletic endeavors may be reported. Judd, Thomas, Dayton, and Stevens-Lapsley (2013) found that patients with hip OA were slower in stair negotiation and repetitive sit-to-stand tasks. The same authors also noted a reduced walking distance and a general decrease in physical activity among this population when compared with their healthy counterparts. A number of factors associated with hip OA may result in a higher risk for falls for older individuals (Sturnieks et al., 2004). Although not considered routine for patients with hip OA, falls screening may be performed with patients who have a concerning history or indicators of other comorbidities that affect balance. When falls are a concern for patients with hip OA, clinicians can refer to the published recommendations from the Academy of Geriatric Physical Therapy of the APTA. Impairments such as pain, decreased ROM and flexibility, reduced strength, limited endurance, and balance deficits may all produce the functional impairments associated with hip OA.

Clinical examination

Despite the relatively high incidence of hip OA, few studies have investigated the pure clinical diagnosis of the condition (Cibulka & Woehrle, 2013). More often, investigation has focused on the use of radiographic evidence, with or without the inclusion of clinical examination. A structured approach to clinical examination should include the assessment of impairments (ROM, strength, flexibility, and endurance) as well as the use of specific clinical tests for hip OA.

A number of recommendations suggest clusters of clinical indicators that are more useful for identifying hip OA compared with singular examination findings. Sutlive and colleagues (2008) described a clinical prediction rule for diagnosing hip OA. Five predictors of diagnosis were identified: pain with squatting, reproduction of anterior or lateral hip pain with the scour test, lateral hip pain with active hip flexion, pain with active hip extension, and passive ROM for internal rotation less than 25°. If at least four out of five variables were present, the probability of hip OA was 91%. The most recent version of clinical practice guidelines for hip OA published by the Orthopaedic Section of the APTA suggest a combination of clinical findings that are associated with hip OA: moderate anterior and lateral hip pain with weight bearing, morning stiffness of the hip that lasts less than 1 hour, and a hip internal rotation deficit defined by a difference in total hip internal rotation of less than 24° or greater than 15° in both internal rotation and flexion when compared with the uninvolved joint (Cibulka et al., 2017).

Impairments

Loss of joint ROM is a characteristic impairment in patients with hip OA. Patients with radiographic evidence of hip OA typically demonstrate a ROM deficit in two of six possible planes of motion (Altman et al., 1991; Bierma-Zeinstra et al., 2002). A loss of motion (compared with the contralateral side) in three or more planes has shown a sensitivity of 0.88 in predicting OA of the hip joint (Birrell et al., 2001). The clinical loss of ROM in a capsular pattern may apply. However, a capsular pattern of the hip has not been well defined and may limit the application of this concept (Martin & Kivlan, 2013). Loss of internal rotation has been emphasized as predictive for hip OA. Birrell and colleagues (2001) found a restriction in internal rotation to be the most predictive ROM factor for the presence of hip OA. When examination reveals both internal rotation less than 15° and hip flexion less than 115°, a sensitivity of 0.86 and specificity of 0.75 for identifying hip OA have been noted (Altman et al., 1991). Box 2 discusses sensitivity and specificity.

Strength deficits are commonly observed in patients with hip OA. There is currently no consensus on the exact mechanism of muscle weakness in patients with hip OA. Judd and colleagues (2013) examined strength characteristics of the lower extremity, comparing patients with hip OA (n = 26) to a sample of healthy individuals (n = 18). Strength deficits were noted in the hip OA sample for knee extension (30%), knee flexion (38%), hip extension (23%), hip flexion (10%), and hip abduction (17%). Previous literature has reported consistent findings of weakness in the hip abductors, flexors, and adductors in this population (Arokoski et al., 2002; Steultjens et al., 2001). The decreased functional status observed in individuals with hip OA may be due in part to the decreased strength of the lower-extremity musculature.

Box 2: Clinical Tip: Sensitivity and Specificity*

- **Sensitivity**: Probability of testing positive for a condition when the condition is truly present.
- **Specificity**: Probability of testing negative for a condition when the condition is truly absent.

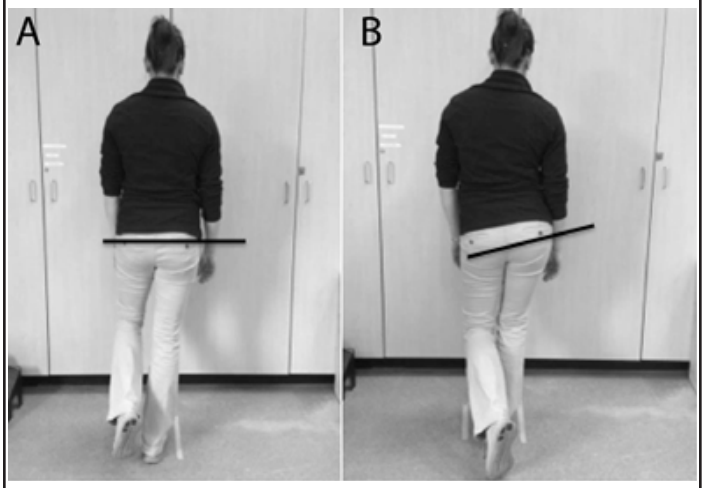
* Ideal value = 1.0 (100% probability).

Note: From Western Schools, 2018.

As an alternative to traditional manual muscle testing of the abductors, single-limb stance may be used to assess for the presence of a Trendelenburg sign (Hardcastle & Nade, 1985).

From standing, the patient performs a single-limb stance by flexing the opposite hip to 30° and holding for 30 seconds. Once balanced, the patient is asked to raise the non-stance pelvis as high as possible. From the posterior view, the examiner observes the angle formed by a line that connects the iliac crest and a line vertical to the testing surface. The test is positive for a Trendelenburg sign if the patient cannot maintain the level position for 30 seconds, the hip does not elevate to neutral on the non-stance leg, or the pelvis drops on the opposite side of the stance leg (Figure 4). Any of these observations may indicate functional weakness of the hip abductors.

Figure 4: Normal Single-Leg Stance (A) Versus Trendelenburg Sign (B)



Note: From Western Schools, 2018.

Along with strength, lower-extremity muscle flexibility assessment is a routine component of the clinical examination for patients suspected of having hip OA. The assessment of muscle flexibility is crucial for helping to determine whether an observed loss of ROM is caused by restrictions in joint-capsule mobility or muscular tightness. Distinguishing between these potential causes helps clinicians determine the most appropriate form of treatment (joint-mobilization techniques or muscle-stretching activities). Muscle structures to consider include hamstrings, quadriceps, iliopsoas, hip adductors, tensor fasciae latae/iliotibial band, and gastrocnemius-soleus complex (Oostendorp, vanden Heuvel, Dekker, & van Baar, 1998). Decreased flexibility in any of the lower-extremity muscle groups could result in abnormal movement patterns during physical tasks. Over time, abnormal movement patterns may result in excessive force throughout the hip joint.

Balance should be assessed in patients with hip OA. No formal algorithm for balance assessment in patients with hip OA has been described in the literature. Clinical judgment should be exercised when determining appropriate tasks for patients, depending on their initial presentation (tandem stance, single-leg stance, etc.). Balance testing should be performed bilaterally. When a deficit is observed, the clinician must take into account other examination findings (strength, endurance, etc.) to determine the cause or causes of decreased balance.

A reduced aerobic capacity has been noted in patients with hip OA (Judd et al., 2013; Minor, Hewett, Webel, Dreisinger, & Kay, 1988). Minor and colleagues (1988) found that endurance was more limited in women compared with men with hip OA. This decreased overall conditioning among patients with hip OA may have a substantial negative impact on their independence with ADLs (Escalante, García-Hermoso, & Saavedra, 2011).

Special tests

Special tests of the hip joint may help to confirm the clinical diagnosis of hip OA (Cibulka et al., 2017). These tests include the flexion-abduction- external rotation (FABER) test, scour test, flexion-adduction-internal rotation (FADIR) test, and long-axis distraction for joint mobility. Unless contraindicated, special tests for the hip joint should be performed and compared bilaterally.

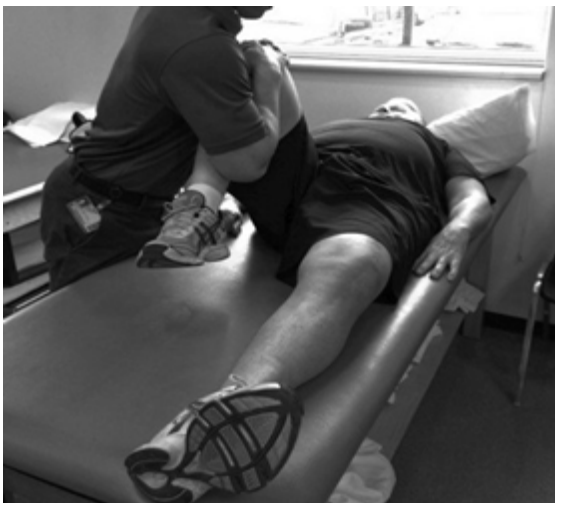
The FABER test (Figure 5) is intended to determine the irritability and estimated general mobility of the hip joint. The FABER test is performed with the patient in the supine position. The heel of the test leg is passively placed just above the knee on the opposite side. The resulting position resembles a numeral 4 as the hip falls out into abduction and external rotation. Groin pain elicited in this position indicates the potential for hip joint pathology. The examiner must be careful to discern the specific location of symptom reproduction. Pain elicited in the posterior pelvic or thigh region may be indicative of sacroiliac joint irritability as opposed to intra-articular hip involvement. The vertical distance of the lateral knee to the treatment surface may be measured as a general estimate of joint mobility. Overpressure can be applied at the medial aspect of the knee in an anterior-to-posterior direction to further assess the pain response and joint mobility. Interrater reliability has been reported in the range of 0.47 to 0.96 for the FABER test (Cliborne et al., 2004; Sutlive et al., 2008). The FABER test has a reported sensitivity ranging from 0.44 to 0.82 and a specificity ranging from 0.25 to 1.0 (Maslowski et al., 2010; Sutlive et al., 2008; Troelsen et al., 2009).

The scour test (Figure 6) is another maneuver intended to determine hip joint irritability and mechanical disruption. The scour test is performed with the patient in the supine position. The test hip is passively flexed to 90°, and an axial compressive load is placed through the femur. The axial load is maintained as the examiner moves the hip into further flexion and adduction until resistance is noted. The examiner maintains compression while the hip is moved into abduction. The patient is asked to report any pain, and any occurrence of joint crepitus is noted. Pain in the groin region indicates the potential presence of hip joint pathology. Caution should be exercised when attempting this test during episodes of acute pain because it does have the potential to significantly increase joint irritation (Cliborne et al., 2004). The scour test was found to have good intrarater reliability (Cliborne et al., 2004). The scour test has a reported sensitivity of 0.62 and a specificity of 0.75 (Sutlive et al., 2008).

Figure 5: Faber Test

Note: From Western Schools, 2018.

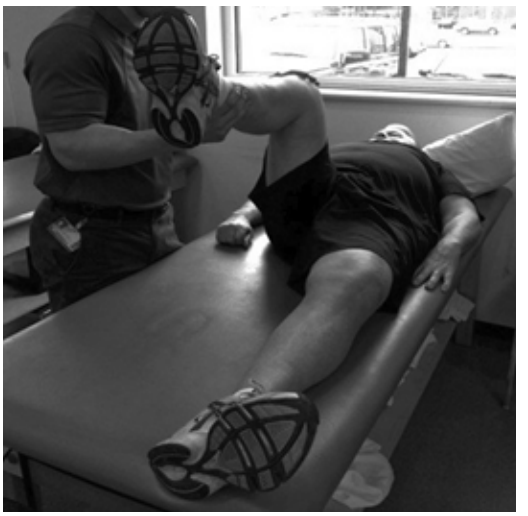
Figure 6: Scour Test



Note: From Western Schools, 2018.

The FADIR test (Figure 7) is intended to identify painful FAI of the hip joint. FAI has been identified as a precursor to hip OA, and detection of this condition may be useful in treating cases that are not yet showing degenerative findings on radiographs or are in the early stages of the OA spectrum (Leunig et al., 2009). The FADIR test is performed with the patient in the supine position. The test hip is passively flexed to 90°. The examiner then applies overpressure into the horizontal adduction and internal rotation. The test is positive if the patient's primary symptom (most often groin pain) is reproduced. When using this test, clinicians should be careful not to interpret pain that occurs secondary to stretching of the piriformis muscle as positive for joint involvement. In such a case, pain would occur in the gluteal region following the anatomical location of the piriformis muscle as opposed to the groin region. Martin and Sekiya (2008) assessed the interrater reliability of the FADIR test in people presenting with intra-articular, nonarthritic hip joint pain and found 91% agreement. It should be noted that there was a high proportion of positive to negative test agreements in this study, thus indicating only moderate reliability (Enseki et al., 2014). When compared with diagnostic injection, the FADIR test demonstrated a sensitivity of 0.78 and a specificity of 0.10 (Martin & Sekiya, 2008). When compared with magnetic resonance arthrography (MRA) findings of a labral injury, the FADIR test demonstrated a sensitivity of 0.75 and a specificity of 0.43 (Narvani, Tsiridis, Kendall, Chaudhuri, & Thomas, 2003). The pooled values for sensitivity and specificity of the FADIR test have been reported in the ranges of 0.94 to 0.97 and 0.02 to 0.23, respectively (Reiman, Goode, Hegedus, Cook, & Wright, 2013).

Figure 7: Fadir Test



Note: From Western Schools, 2018.

A long-axis distraction technique at the hip can be used to estimate the general capsular mobility of the hip (Figure 8). As previously mentioned, capsular shortening, and therefore hypomobility, of the joint is expected with hip OA. There is scant literature examining the reliability of joint mobility testing. Long-axis distraction is assessed with the patient fully relaxed in the supine position. The tester grasps the test leg above the ankle and places the hip in a position of 30° flexion, 30° abduction, and slight external rotation (which is the loose-pack position of the hip joint). A distraction force is then slowly applied parallel to the shaft of the femur. A diminished amount of joint surface separation may indicate capsular hypomobility. Anecdotally, patients may report a decrease of pain with application of joint distraction as well. Although the mechanism of pain reduction is not fully understood, there may be stimulation of mechanoreceptors and an inhibitory effect on muscle spasm. The previous findings, combined with the clinical finding of decreased joint ROM, may indicate use of manual joint mobilization techniques as part of the intervention plan.

Figure 8: Long-Axis Distraction

Note: From Western Schools, 2018.

Diagnostic imaging

Depending on the clinical setting, clinicians may have access to diagnostic imaging. In many cases, imaging is not considered necessary to make an accurate diagnosis. However, when a cluster of other risk factors is not present and for purposes of staging severity, imaging may be useful.

Plain radiographs are the most common form of imaging used to diagnose hip OA. Figure 9 shows a plain radiograph that is normal and a plain radiograph that reveals arthritic changes. Plain radiographs are confirmatory and most useful for cases of moderate to severe hip OA. Early changes are less likely to be identified by this imaging modality (Karachalios et al., 2007). Of

primary interest is the quantification of joint space. The normal joint space value is 3 to 5 mm. A clinically significant change in joint space is defined by a loss equal to or greater than 0.5 mm (Altman et al., 2004). Moderate hip OA is radiographically defined as less than 2.5 mm of joint space, whereas OA is considered severe when the joint space is less than 1.5 mm (Bierma-Zeinstra et al., 2002). Other OA-specific findings may include osteophytes, spurs, and subchondral sclerosis.

Figure 9: Normal (A) Versus Arthritic (B) Hip Radiograph Showing Loss of Joint Space

Note: From Western Schools, 2018.

The Kellgren-Lawrence scale (Table 1) was developed to classify degenerative findings associated with hip OA, quantifying the changes in joint space along with other findings such as spurs or osteophytes (Kellgren & Lawrence, 1957). The scale is graded from 0 (no radiographic changes indicating OA) to 4 (severe loss of joint space, large osteophytes, subchondral sclerosis, and loss of bone contour). Plain radiography is also useful for identifying and quantifying risk factors such as dysplasia and FAI (Leunig et al., 2009).

Magnetic resonance imaging (MRI) is not routinely used to evaluate patients suspected of having hip OA. However, MRI may be used when early changes are suspected or when the potential effects of FAI or dysplasia are of clinical interest (Sankar et al., 2013). MRI may eventually be used more routinely as the precursors to hip OA become better understood and greater emphasis is placed on avoiding the progression from preclinical to moderate or greater levels of hip OA.

Table 1: Kellgren-Lawrence Radiographic Criteria for Grading Osteoarthritis

Grade O:	No radiographic features of osteoarthritis are present.
Grade 1:	Doubtful narrowing of joint space and possible osteophytic lipping.
Grade 2:	Definite osteophytes, definite narrowing of joint space.
Grade 3:	Moderate multiple osteophytes, definite narrowing of joint space, some sclerosis, and possible deformity of bone contour.
Grade 4:	Large osteophytes, marked narrowing of joint space, severe sclerosis, and definite deformity of bone contour.

Note. From Kellgren, J., & Lawrence, J. (1957). Radiological assessment of osteoarthritis. *Annals of the Rheumatic Diseases, 16*(4), 494-502.

Clinical staging of hip osteoarthritis

Clinical staging of hip OA can be useful in determining the optimal treatment approach as well as a prognosis. Patients can be placed into stages based on their presentation, physical examination findings, and radiographic evidence (when available). Table 2 provides a summary of the clinical stages of osteoarthritis.

The earliest stage is considered the pre-OA stage. These patients present with pain of intra-articular origin in the hip region, tend to be younger (< 50 years), and have no radiographic evidence of hip OA (Cibulka & Woehrle, 2013). Although their daily activities may not be significantly limited, they may report discomfort with specific activities. These patients tend to have a high number of risk factors present, increasing their chance for development of hip OA in the future. The majority of these patients have FAI characteristics on plain radiographs. They may also have developed acetabular labral tears associated with FAI. The FABER and FADIR tests are often positive for these patients. Evaluation should focus on clinical impairments and identification of activities that may expedite the progression of hip OA. A long-term therapeutic exercise program and reasonable activity modification may be the most effective treatment approach for patients in this category.

Patients in the moderate stage of hip OA show many of the previously discussed disease-specific clinical signs. Weight-bearing activities and prolonged sitting (hips flexed 90° or more) are highly likely to produce symptoms of pain and stiffness. The characteristic symptom of morning joint stiffness will likely be noted. Multiple planes of motion, particularly internal rotation, start to become limited. Related changes in flexibility, strength, and endurance may become noticeable. The application of the FABER and scour tests often produces positive results. Use of the long- axis distraction maneuver may reveal slight to moderate joint hypomobility and possibly cause a decrease in joint pain. At this clinical stage, as activities start to become limited by symptoms, patients often seek formal treatment. Treatment for patients in this stage of hip OA should be both preventive (minimizing further joint degeneration) and secondary (addressing early degenerative changes and minimizing impairments).

Late-stage hip OA occurs when the joint has become largely nonfunctional. ROM limitations now prevent a large portion of normal activities. Activities that are performed regularly are accomplished through significant compensation of other body regions. Pain and stiffness are consistent and significant. All the findings for the moderate stage of hip OA are present but more prominent. During this stage, tertiary care options (intra-articular injections and hip arthroplasty procedures) are considered. A large proportion of these patients will undergo THA procedures.

Table 2: Clinical Staging of Hip Osteoarthritis		
Stage	**Clinical Findings**	**Radiographic Findings**
Pre-OA	• Intermittent groin pain. • <50 years old. • May observe positive FABER or FADIR test. • Pain with repetitive end-range movements or prolonged positioning (sitting). • Motion typically well preserved. • May observe impairments in strength and flexibility of hip and pelvic muscles.	• Progressive groin pain. • May see signs of FAI. • MRA may show acetabular labral tear or focal cartilage damage. • No loss of joint space.
Moderate OA	• Progressive groin pain. • Pain increases with prolonged weight bearing. • Increasing joint stiffness, often worse in the morning. • Progressive loss of motion, with internal rotation being most notable. • May observe positive FABER or scour test. • Hypomobility and potential decrease of pain with long-axis distraction. • Progressive loss of strength and flexibility.	• <2.5 mm of joint space. • Irregularities of joint surfaces start to develop.
Late-stage OA	• Increasing severity of pain. • Severe limitation of activities of daily living. • Significant compensation from other body regions during physical activity. • Severe loss of motion in multiple planes. • Loss of strength and flexibility may be noted in other regions secondary to compensation patterns.	• <1.5 mm of joint space. • Prominent development of osteophytes and spurs on joint surfaces.
FABER = flexion-abduction-external rotation; FADIR = flexion-adduction-internal rotation; FAI = femoroacetabular impingement. **MRA** = magnetic resonance arthrography; OA = osteoarthritis. Note: From Western Schools, 2018.		

Differential diagnoses

The presence of hip pain may indicate a large number of medical conditions. Table 3 lists potential differential diagnoses for patients presenting with hip pain. Initially, emphasis should be placed on determining whether a patient's symptoms are within the scope of physical therapy practice. This is of particular importance for clinicians practicing in a direct-access environment. A thorough patient interview and patient presentation should help clinicians determine whether the patient's symptoms are of musculoskeletal or nonmusculoskeletal origin.

Table 3: Differential Diagnoses for Patients Presenting with Hip Pain				
Nonmusculoskeletal/ Systemic	**Osseous**	**Neurovascular**	**Capsular and Labral**	**Musculotendinous and Other Soft Tissue**
• Tumor/metastatic. • Infection/septic causes. • Osteomyelitis. • Chronic inflammatory conditions. • Endometriosis. • Joint subluxation. • Rheumatoid arthritis.	• Degenerative changes. • Femoroacetabular impingement. • Dysplasia. • Avascular necrosis. • Fracture. • Intra-articular loose bodies. • Abnormalities of femoral neck and acetabulum orientation.	• Peripheral nerve entrapment. • Spinal radicular involvement. • Claudication.	• Acetabular labral tear. • Ligamentous lesion. • Synovial pathology. • Capsular contracture. • Paralabral cyst. • Connective tissue disorder.	• Muscular strain. • Tendinitis. • Heterotrophic ossification. • Bursitis. • Snapping hip syndrome (coxa saltans).
Note: From Western Schools, 2018.				

To provide safe and efficient treatment, it is crucial that physical therapists be able to screen for potential nonmusculoskeletal causes of reported symptoms. When "red flags" are identified, appropriate referral to the patient's primary care physician is crucial. Numerous systemic conditions should be considered, including tumors, infection, osteomyelitis, septic arthritis, and chronic inflammatory conditions (Martin & Kivlan, 2013). Indicators of possible systemic involvement include the following:

- High fever.
- Night sweats.
- Malaise.
- Rapid weight loss.
- Unrelenting pain at night or in the absence of movement.

(Christmas et al., 2002)

The therapist should be particularly aware when the patient's past medical history includes the following:

- Cancer.
- Alcohol abuse.
- Prolonged corticosteroid use.
- Prolonged anticonvulsant medication use.

These factors may predispose a patient to developing conditions that manifest as hip pain similar to that experienced with hip OA. For example, avascular necrosis of the femoral head occurs more frequently in individuals with a history of alcohol abuse and/or prolonged corticosteroid use (Guerra & Steinberg, 1995). Although primary cancer in the hip joint is rare, metastatic disease of the proximal femur and hip area has been more commonly reported (Riccio, Wodajo, & Malawer, 2007). The hip joint is a common location for infection, second only to the knee (Geipel, 2009). Recent surgery or injection into the hip joint should raise suspicion if other findings consistent with infection are present. Infections that have gone untreated for prolonged periods of time may result in a destructive septic arthritis condition.

Even when symptoms appear localized and mechanical in nature, the clinician must consider other musculoskeletal sources of pain in addition to the hip joint. The lumbosacral spine complex should always be considered when evaluating a patient reporting hip or flank pain. Numerous conditions of the spine, such as degenerative disc disease and sacroiliac joint dysfunction, can produce symptoms in the region of the hip joint. Radicular pain can occur in the groin (L1-L2), lateral thigh (L3-L5), and buttock regions (S1-S2; Dutton, 2012). When involvement of the lumbosacral complex is suspected, a screening examination that includes ROM assessment, palpation, dermatome and myotome assessment, and provocation tests should be used. Patients often present with a combination of findings indicating the involvement of both the hip and the lumbosacral complex. In such cases, the clinician must prioritize the findings that are most limiting to the patient and initiate a rehabilitation program that takes both regions into consideration.

An organized approach to assessment helps the clinician determine whether a patient is presenting with issues that are primarily caused by osteoarthritis or whether other conditions are present. A summary of a hierarchical approach to assessment includes the following:

- Determine if pain is musculoskeletal or nonmusculoskeletal in origin:
  - Screen for "red flags."
  - Identify concerning aspects of the patient's medical history.
- Identify whether symptoms are most likely originating from the hip joint, lumbopelvic complex, or a combination of both structures:
  - Lumbosacral screening examination.
  - Localized hip examination.
- Determine whether the patient's localized hip symptoms are secondary to hip OA:
  - Presence of known risk factors (modifiable and nonmodifiable).
  - Patient presentation consistent with hip OA: pain, stiffness, and functional limitations.
  - Clinical examination consistent with hip OA: ROM loss, strength deficits, special tests indicating intra-articular involvement.

(Cibulka et al., 2017)

Given the wide scope of potential causes and related consequences for individuals presenting with hip pain, patients should be re-evaluated on a regular basis. When a patient does not respond to recommended interventions, clinicians should consider referral for further medical evaluation (Cibulka et al., 2017).

OUTCOME MEASURES

Measures of physical function

Various physical performance measures are available to assess baseline levels and changes in activity limitations and participation restrictions that occur in patients with hip OA. Measures should be chosen based on patient presentation and the clinician's ability to perform the tests in the clinical environment. The following physical performance measures have been validated for use with patients with hip OA. It is important to note that literature validating these measures focuses on individuals older than 60 years of age (Bennell, Dobson, & Hinman, 2011; Kennedy, Stratford, Wessel, Gollish, & Penney, 2005). The updated clinical practice guidelines from the Orthopaedic Section of the APTA recommend clinicians should perform the following measures, at baseline and at one or more follow-up time points, in order to improve standardization of clinical care and research: 6-minute walk test, 30-second chair stand test, timed up-and-go test, and stair measure test (Cibulka et al., 2017).

The timed up-and-go (TUG) test involves the subject rising from a chair (with armrests) and then walking 3 meters as quickly and safely as possible (Mathias, Nayak, & Isaacs, 1986). The patient then turns around and walks back to the chair, returning to a seated position. The patient is allowed to use an assistive device. The duration of the entire task is timed in seconds. The TUG test has shown good interrater and intrarater reliability (Podsiadlo & Richardson, 1991). The minimal detectable change (MDC; discussed in Box 3) for the TUG has been estimated at 2.5 seconds in individuals with arthritis (Kennedy et al., 2005).

The 6-minute walk test (6MWT) quantifies functional status as the distance in meters walked during a 6-minute interval. The subject is given standardized verbal encouragement and allowed to use a self-selected walking aid. He or she is allowed to stop and rest as needed. Initially conceived as an outcome measure for persons with cardiovascular problems, the standardized 6MWT has become a popular measure of lower-extremity functional limitation for patients with osteoarthritis of the lower extremity and those progressing to joint replacement (Kennedy et al., 2005). The 6MWT has both speed and endurance components that facilitate observation of the patient's gait pattern and how it changes over time. The MDC in distance for the 6MWT has been estimated at 61 meters (Kennedy et al., 2005). Bennell and colleagues (2011) suggest that the 6MWT may be useful in early and end-stage OA.

Box 3: Clinical Tip: Minimal Detectable Change and Minimal Clinically Important Difference

- **Minimal Detectable Change (MDC)**: The smallest detectable change that can be considered above the measurement error with a given level of confidence.
- **Minimal Clinically Important Difference (MCID)**: The smallest amount of change in an outcome that might be considered important by the patient or clinician.

The self-paced walk test (SPWT) is a physical performance test that examines how fast an individual can walk for 40 meters. Patients are instructed to walk as quickly as they can without overexertion. They may use their usual assistive device if applicable. The duration of the entire task is timed in seconds. The MDC for the SPWT has been estimated at 4.04 seconds (Kennedy et al., 2005). In a systematic review by Dobson and colleagues (2012), the SPWT was rated as the best walking test for patients with hip and knee OA. The SPWT demonstrated excellent test- retest reliability in patients with hip OA, with an intraclass correlation coefficient (ICC) of 0.91 (Bennell et al., 2011).

The stair measure (SM) examines a patient's ability to negotiate stairs. Subjects are asked to ascend and descend nine steps (20 cm step height) in the manner in which they would typically negotiate stairs. The duration of the entire task is timed in seconds. The MDC for the SM has been estimated at 5.5 seconds (Kennedy et al., 2005). The SM demonstrated excellent test-retest reliability in patients with hip OA, with an intraclass correlation coefficient (ICC) of 0.90 (Kennedy et al., 2005).

The 30-second chair stand test assesses the number of full sit-to-stand repetitions completed in 30 seconds. A standard chair is placed with the back against the wall. After instructions are given, the patient is allowed to complete a practice trial. The patient starts the test with his or her arms crossed at the chest, seated on the chair, with feet shoulder-width apart and flat on the floor. The patient rises to a full stance and repeats as many stands as possible in the time allotted. The examiner records the total number of completed chair stands achieved in 30 seconds. In a cohort of 37 adults with hip OA, the MDC for the 30-second chair stand test was observed to be 3.5 repetitions. Additionally, the test demonstrated good test-retest reliability, with an ICC of 0.90 (Bieler, Magnusson, Kjaer, & Beyer, 2014).

Patient-reported outcome instruments

Numerous patient-reported outcome instruments are available to assess levels of functioning for a patient with hip OA. When selecting an outcome instrument, clinicians should consider the instrument's validity for this patient population, its ease of administration, and the time needed to complete it. The patient-reported outcome instruments discussed in this section have been validated in the hip OA population. These instruments enable clinicians to assess patients' progress within specific domains in an objective manner. They not only assist in measuring response to treatment but also provide justification of services. The Resources section provides links to the patient-reported outcome instruments discussed in this section.

- **The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)** is the most commonly used outcome measure in hip OA research (Cibulka et al., 2017). With the objective of defining the dimensionality of pain and disability in osteoarthritis of the hip and/or knee, the WOMAC has 24 items, each scored on a scale from 0 (none) to 4 (extreme). A raw score ranging from 0 (best) to 96 (worst) is calculated. Raw scores are multiplied by 100/96, resulting in a score between 0% (best) and 100% (worst). The MCID for the WOMAC (as percentage change from baseline) ranges from 12% to 22% (Enseki & Berliner, 2013).
- **The Lower Extremity Functional Scale (LEFS)** is a self-report, 20-item, unidimensional, region-specific instrument that measures the perceived difficulty of a variety of activities. The LEFS is commonly administered to patients with hip OA (Binkley, Stratford, Lott, & Riddle, 1999). Each item is based on a 5-point scale, with each item being scored 0 (extreme difficulty or unable to perform) to 4 (no difficulty). Item scores are summed to a total score ranging from 0 to 80, with higher scores representing better functional status. The MDC and MCID have been estimated at 9 LEFS scale points (Binkley et al., 1999).
- **The Harris Hip Score (HHS)** is a disease-specific health-status scale frequently used to measure functional outcomes in patients with hip OA (Harris, 1969). It was developed with a rating scale of 100 points (the optimum score is 100) and with domains of pain, function, activity, deformity, and motion. The HHS has been found to be valid and reliable for those patients who progress to THA procedures (Söderman & Malchau, 2001).
- **The Hip Disability and Osteoarthritis Outcome Score (HOOS)** was developed to assess patients' opinions of their hip and associated problems. It includes five subscales to assess pain, other symptoms, functioning in ADLs, functioning in sports and recreation, and hip-related quality of life (40 total items; Nilsdotter, Lohmander, Klassbo, & Roos, 2003). Each subscale is separately scored and transformed into a score of 0 (extreme problems) to 100 (no problems). Internal consistency has been reported in the range of 0.82 to 0.98. The MDC for the HOOS has been reported in the range of 9.6 to 16.2 points (Nilsdotter & Bremander, 2011).

PHYSICAL THERAPY INTERVENTIONS

Conservative treatment for patients with hip OA depends on numerous factors. Clinical staging of the condition often dictates the aggressiveness and dosage of therapeutic interventions. The presence of comorbidities may also affect or limit the treatment techniques that are used for this population of patients. Because OA is a nonreversible disease, intervention is focused on reducing pain, addressing impairments and current functional limitations, and attempting to slow the progression of the condition when possible.

The clinical practice guidelines for hip OA, published by the Orthopaedic Section of the APTA, use a modified grading system based on the guidelines originally described by Guyatt and colleagues (1995) to assess the evidence supporting treatment recommendations. Six grades of evidence are used, ranging from expert opinion (based on clinical experience of field experts) to strong evidence (based on a preponderance of high-quality randomized controlled, prospective, and diagnostic studies; Cibulka et al., 2017).

Impairment-based treatment activities

Support in the literature for therapeutic exercise in the management of hip OA is variable and sometimes conflicting. A recent meta-analysis (Hernandez-Molina, Reichenbach, Zhang, Lavalley, & Felson, 2008) indicated that rehabilitation programs with strengthening exercises resulted in improvements in pain ratings, observed physical function, and self-reported physical function in patients with hip OA. However, a recent systematic review (McNair, Simmonds, Boocock, & Larmer, 2009) noted that insufficient evidence was available to suggest that exercise therapy alone is an effective short-term management approach for reducing pain levels, improving function, and improving quality of life. Fransen, McConnell, Hernandez-Molina, and Reichenbach (2009) noted that there was a small effect for pain and no effect in self-reported function when comparing randomized clinical trials examining land-based exercise for treating hip OA. Another systematic review found that the positive effects of exercise therapy on pain and physical function in patients with hip and/or knee OA are not sustained in the long term (Pisters et al., 2007). The clinical practice guidelines published by the Orthopaedic Section of the APTA state that there is moderate evidence to support the use of strengthening, flexibility, and endurance activities for moderate or less involved stages of hip OA. (Moderate evidence is defined by APTA as evidence based on a single high-quality randomized controlled trial or numerous lesser-quality randomized controlled, prospective, or diagnostic studies; Cibulka et al., 2017.) Current literature recommends an exercise frequency of one to five times per week with duration ranging from 6 to 12 weeks for patients with mild to moderate hip OA (Cibulka et al., 2017).

Strengthening activities are routinely recommended for patients with hip OA. Exercises should target muscle groups that are commonly weak in hip OA patients. Emphasis should be placed on strengthening the hip abductor, flexor, and adductor muscle groups (Arokoski et al., 2002; Steultjens et al., 2001). Patient tolerance and joint-loading principles should be taken into consideration when prescribing progressive resistance exercises. Weight-bearing exercises tend to create greater joint reaction forces and may increase pain and inflammation in some patients. Patients with a low tolerance for physical activity or experiencing an acute episode of pain may be limited to gentle non-weight-bearing exercises until tolerance to strength activities improves. Progression to weight-bearing and functional-strength exercises should be emphasized to maximize the benefits of a strengthening program. Although strength activities targeting the abductor muscles for frontal-plane stabilization are often

the most emphasized, all planes of motion should be examined and addressed as indicated. Although there is no uniform agreement as to the specific type of strengthening exercises, the overall goal of maximizing strength through a graduated progression and limiting inflammation and tissue injury should be emphasized. Fukumoto and colleagues (2014) examined the differences in the effects of high-velocity and low- velocity resistance training on muscle function, muscle properties, and physical performance in patients with hip OA. Results of the study indicated that those subjects receiving high-velocity training for patients with hip OA experienced a greater effect on properties of the gluteus maximus muscle and performance on the TUG.

Activities to restore or optimize flexibility should be used when indicated by clinical examination. Programs that emphasize stretching the iliopsoas, rectus femoris, and hip adductor muscles have shown positive clinical results (less pain, decreased nonsteroidal anti-inflammatory drug [NSAID] use, and decreased observed disability; Oostendorp et al., 1998). Flexibility exercises should focus on low-intensity, controlled movements that are pain-free (Felson et al., 2000). Oostendorp and colleagues (1998) recommended that stretching programs be performed at least three times per week. When improvements in ROM are not observed with flexibility activities, further examination of joint mobility should be considered to rule out capsular hypomobility as the primary cause of limited motion.

Current evidence supports using aerobic activities as part of a complete rehabilitation program for patients with hip OA (Cibulka & Woehrle, 2013). Aerobic activity should provide a cardiovascular workload from 60% to 80% of an individual's maximal workload for a minimum period of 20 minutes at least three times per week (Cibulka & Woehrle, 2013). Although numerous methods exist to determine an individual's maximal workload, the following formula, which uses an individual's age, is most commonly used in the clinical environment (Tanaka, Monahan, & Seals, 2001):

220 – Age = Estimated maximal heart rate.

Including aerobic exercise as part of rehabilitation programs has been shown to be more effective than strengthening and stretching alone(Zhang et al., 2007). In a study examining arthritic conditions of the lower extremity, Minor and colleagues (1988) found improvements in aerobic capacity, flexibility, reported ADLs, and self-reported health status for patients employing either walking or aquatic activities for endurance. When recommending endurance exercises, clinicians should consider the impact on joints produced by specific activities. Activities such as cycling, swimming, water-based aerobic exercises, and using the elliptical machine should be considered because of their low impact on joints. If a patient is unwilling to stop running as a regular form of exercise, the concept of cross-training should be discussed. Using a cross-training approach to exercise enables the patient to maintain a consistent level of activity without the risk of joint irritation associated with the repetitive impact associated with running.

Manual therapy

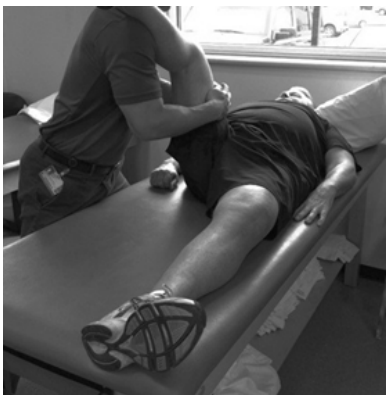
It has long been recognized that capsular hypomobility may be the cause of limited joint ROM and a contributor to functional limitations in many cases of hip OA (Lloyd-Roberts, 1953). The clinical practice guidelines published by the Orthopaedic Section of the APTA state that there is moderate evidence supporting the use of manual therapy techniques to provide pain relief and function in patients with mild hip OA(Cibulka et al., 2017). The benefit may not be as pronounced in patients with characteristics of later-stage hip OA such as osteophytes and significant loss of joint space (Hoeksma et al., 2004). Overall, the general consensus is that there is fair evidence for short-term benefit and limited evidence for long-term benefit in terms of improved pain and function as a result of manual therapy treatments in the hip OA patient population (Brantingham et al., 2012).

The use of manual therapy in isolation or in combination with exercise has been debated. In a randomized clinical trial by Hoeksma and colleagues (2004), manual therapy and therapeutic exercises were compared as part of a rehabilitation program. The study defined manual therapy as stretching, low-grade joint mobilization, and high-thrust velocity techniques applied at the end range of the joint. After 5 weeks, the manual therapy group achieved a significantly higher success rate (81%) when compared with the exercise program alone (50%). The primary outcomes measured were pain, ROM, and function (measured by the HHS). Hando, Gill, Walker, and Garber (2012) found significant improvements in pain, ROM, and self-reported functional status after an 8-week program using a standardized manual therapy and therapeutic exercise protocol. Similar clinical improvements were reported in a case series examining the outcomes of patients with hip OA who were treated with manual therapy techniques and exercises to improve ROM and strength (MacDonald, Whitman, Cleland, Smith, & Hoeksma, 2006). Abbott and colleagues (2013) found that manual therapy and exercise both provided sustained benefits for up to 1 year when compared with non- physical therapy treatment. However, they found no benefit in combining both intervention approaches. French and colleagues (2013) found that self-reported function, hip ROM, and patient-perceived improvement occurred after an 8-week program of exercise therapy for patients with hip OA. They also found that adding manual therapy provided no additional benefit, except for higher patient satisfaction with outcomes. The need for more high-quality randomized clinical trials examining the benefit of manual therapy for patients with hip OA has been recognized (French, Brennan, White, & Cusack, 2011).

No significant evidence exists concerning the effectiveness of specific manual therapy techniques in the treatment of hip OA. Subjectively, many patients note optimal tolerance of joint-distraction techniques, which create articular surface separation and tend to apply tension to the entire joint capsule. In comparison, joint mobilization techniques in specific directions create translation of articular surfaces in parallel with each other, with the potential to create increased tension in specific regions of the joint capsule. These biomechanical differences may be responsible for the often-reported better tolerance to joint-distraction techniques.

The potential to place tension through the entire capsule (distraction techniques) compared with specific regions of the joint capsule (direction- specific techniques) may also affect the technique chosen for specific ROM deficits. Theoretically, distraction techniques could be used to improve joint movement in any direction, whereas posterior femoral mobilization may increase flexion and internal rotation, and anterior femoral mobilization may increase extension and external rotation. However, the stable nature of the hip joint may limit this rationale for technique selection. In a cadaveric study assessing the movement of the hip joint with various directions of force, researchers found that posterior-anterior mobilization produced approximately 1 mm of movement (365 N force), whereas distal distraction produced up to 7 mm of movement (89 to 356 N force; Harding et al., 2003). With the small movement potential for anterior and posterior mobilization, distraction may be the preferred manual therapy technique for increasing capsular mobility of the hip joint. (Long-axis distraction was described earlier in the section on special tests.) With lateral hip distraction (Figure 10), the clinician places the hip joint in 90° of flexion and then creates a distraction force parallel to the femoral neck.

Figure 10: Lateral Hip Distraction



Note: From Western Schools, 2018.

Although the biomechanical effect of joint mobilization and other manual therapy techniques may be debatable, other mechanisms have been described to justify the use of such techniques. It has been suggested that the mechanical force applied may initiate a neurophysiological response. These neurophysiological changes may be responsible for the clinical improvements observed with manual therapy intervention (Bialosky, Bishop, Price, Robinson, & George, 2009).

Gait, balance, and functional training

Although not as strongly supported as the previously discussed interventions, there is support in the literature to incorporate gait, balance, and functional training activities into the rehabilitation program for patients with hip OA. Various forms of gait deviation may be observed in patients with hip OA (Cichy & Wilk, 2006). The presence of gait deviations may result in abnormal loading of the hip and other lower-extremity joints. Over time, it may result in accelerated damage and injury to the hip, other lower-extremity joints, and the lumbosacral complex. Patients reporting significant pain and limitations with weight bearing may benefit from assistive devices such as canes, crutches, or walkers. When prescribing such devices, clinicians should emphasize the goal of providing enough support to promote normal movement patterns and energy efficiency while maintaining the maximal amount of independence possible. In some cases, assistive devices may be necessary only when traveling beyond specific distances or during periods of symptom exacerbation. A goal may be to normalize gait patterns while using an assistive device and then to discharge the device once the goal is achieved. To reduce joint pressure and minimize joint reaction forces that occur due to hip abductor muscle activity, using a cane in the hand opposite to the affected extremity is typically recommended (McGibbon, Krebs, & Mann, 1997).

Balance and proprioception deficits have been observed in lower-extremity OA. These issues have been linked to a higher risk for falls (Sturnieks et al., 2004). Balance activities should be initiated in a manner that maximizes clinical improvements while ensuring safety and a minimal potential for joint inflammation. An appropriate progression includes the following:

- Double-leg static balance.
- Double-leg balance on variable surfaces and with application of perturbation forces.
- Tandem stance.
- Tandem stance on variable surfaces and with application of perturbation forces.
- Single-leg balance.
- Single-leg balance on variable surfaces and with application of perturbation forces.

Additionally, to increase the difficulty of balance tasks, patients can close their eyes and add upper-extremity movements while maintaining balance.

McGibbon, Krebs, and Scarborough (2003) reported improvements in lower-extremity strength and gait stability with a functional training program. Patients participated in a program that included exercises to simulate activities of daily living. These activities were performed at varying speed levels and were systematically increased in difficulty. Clinicians should attempt to use functional exercises that re-create the demands of common daily activities that the patient performs. Examples may include transitional movement tasks (sit to stand, in and out of car, etc.), stairs, side-stepping activities, and reaching for objects while maintaining balance. To minimize the risk of reinjury or injury to other lower- extremity joints, patients should be monitored to ensure that they are performing functional exercises with the correct form to minimize joint reaction forces and excessive compensation.

Aquatic therapy

Exercises performed in the aquatic environment may improve the effectiveness of a rehabilitation program for patients with hip OA. Despite the popularity of this form of intervention, only short-term reductions in pain and functional deficits have been confirmed (Bartels et al., 2007). Because long-term improvement has yet to be proven, this form of intervention is best prescribed in cases where the acuity or severity of symptoms does not allow for sufficient participation in a program consisting of traditional, land-based ROM, stretching, strengthening, and endurance activities (Hinman, Heywood, & Day, 2007). An appropriate goal may be to use aquatic activities to increase exercise tolerance, with an eventual transition to land-based exercises.

Physical modalities

Although commonly a part of treatment guidelines for arthritic conditions, only limited evidence supports the use of physical modalities for the treatment of hip OA. The American College of Rheumatology (ACR) has made a conditional recommendation for thermal agents (Hochberg et al., 2012). A conditional recommendation for using a modality is based on the absence of high-quality evidence and/or evidence of only a small gradient of difference between desirable and undesirable effects of the treatment (Hochberg et al., 2012). The Osteoarthritis Research Society International (OARSI) Treatment Guidelines Committee performed a critical appraisal of existing treatment guidelines and a systematic review of the evidence for treatment of hip and knee osteoarthritis (Zhang et al., 2007). The authors found insufficient evidence to support the efficacy of ultrasound, massage, or heat and ice modalities as intervention choices. More recently, in a study with 45 patients with hip OA, Köybasi, Borman, Kocaoglu, and Ceceli (2010) found that the addition of therapeutic ultrasound to traditional physical therapy activities had a positive effect on pain, functional status, and physical quality of life. Although transcutaneous electrical nerve stimulation (TENS) has been shown to provide short- term pain relief in patients with knee OA, there is minimal evidence to suggest the use of TENS specifically for hip OA (Bjordal et al., 2007). Additionally, the use of acupuncture, electromagnetic

field therapy, and low-level laser therapy has not been substantiated as effective in treating hip OA (Peter et al., 2011). A number of recently developed or more recently used physical modalities are not necessarily contraindicated by current studies but instead lack high-quality evidence examining their use in patients with hip OA. Such modalities may receive stronger recommendations in future clinical guidelines. When considering components of a treatment program for patients with hip OA, physical modalities should be considered based on the latest reliable evidence available and individual patient presentation. Physical agents should most likely be used only when they allow the clinician to more effectively implement interventions that have been more strongly substantiated.

Patient education

Hip OA is at present an irreversible process. Education to slow the rate of disease progression and minimize the effects of symptoms and functional limitations should routinely be incorporated into any treatment plan. Moderately strong evidence supports the use of patient education when treating patients with hip OA (Cibulka et al., 2017). Research has shown that self-management education programs can reduce pain and stiffness, improve function, and decrease the use of medication (Callahan et al., 2008; Hughes et al., 2006; Zhang et al., 2007). When compared with the isolated use of NSAIDs, patient education programs have been shown to result in an average of 20% greater pain relief (Superio- Cabuslay, Ward, & Lorig, 1996). Clinicians should consider providing education for activity modification, exercise, weight reduction/maintenance, postural advice, and joint-loading principles. The combination of exercise and weight loss has been shown to have a positive effect on physical function in overweight people diagnosed with hip OA (Paans et al., 2013).

Postural education should be provided to patients with hip OA. The patient should be advised to avoid placing the hip in prolonged end-range positions (particularly external and internal rotation; Cibulka & Woehrle, 2013). When standing, an attempt should be made to maintain even weight distribution between the lower extremities. If weight is consistently deviated to one side, the joint reaction forces become excessive on the side bearing the greater load, and the tension placed on the muscles is not symmetrical. Sitting with the legs crossed for prolonged periods of time may increase the forces experienced at the hip joint as well. The patient should be taught to avoid sitting on surfaces that place the hips in excessive flexion. Sitting with the hips at greater than 90° of flexion may also increase joint compression and places the hip flexors in a shortened position, increasing the chance of developing tightness in these muscles.

PROGNOSIS

The majority of hip OA cases progress slowly (van Dijk et al., 2008). It is extremely difficult to give a standard prognosis for hip OA due to the numerous risk factors involved. Clinicians should be able to give a qualitative prognosis based on the number of risk factors involved with a particular case and the known evidence supporting various proposed forms of treatment. The clinical endpoint for most individuals with severe hip OA is to undergo a THA procedure (Gossec et al., 2005). Age may be a significant factor in the prognosis that is discussed with patients. In relatively younger patients, the time to a probable THA procedure may be the emphasis of discussion. The potential for using rehabilitation activities to delay the need for a THA procedure should be recognized. In comparison, the same goal (delay of disease progression) is applicable to the relatively older population but with a potential to avoid having to endure THA surgery altogether. Factors that are correlated with a positive response to physical therapy have been identified. Wright, Cook, Flynn, Baxter, and Abbott (2011) identified five factors that were predictive of a positive response to physical therapy in patients with primary hip OA: unilateral hip pain, age of 58 years or less, pain rated greater than 6/10, 40 meter self-paced walk test less than 25.9 seconds, and duration of symptoms less than 1 year. If a patient demonstrated none of these factors, the posttest probability of responding positively to physical therapy dropped to less than 1%. If the patient demonstrated at least two of these factors, the posttest probability for a positive response increased to 65%. Demonstrating three or more factors increased the posttest probability of success to greater than 99% (Wright et al., 2011).

There is more definitive evidence regarding the diagnosis of hip OA and the prognosis of actually progressing to a THA procedure: Radiographic findings have shown a relationship with the end result of THA. Patients with an initial score that is relatively higher on the Kellgren-Lawrence scale (grade 3 or higher) are more likely to undergo a THA procedure (Vinciguerra et al., 1995). Other factors positively linked to the prognosis of eventual THA are relatively high pain levels and previous use of NSAIDs (Gossec et al., 2005).

Pharmacological treatment

Although prescribing or dispensing medication is not within the scope of practice for most physical therapists, recognizing the implications of pharmacological agents is a necessary component of rehabilitative care for patients with hip OA. Clinicians encounter patients using various prescription and over-the-counter medications. Table 4 lists common medications used by patients with hip OA. The most commonly prescribed medications are NSAIDs, including cyclooxygenase 2 (COX-2) inhibitors, and corticosteroid injections (Zhang et al., 2007).

NSAIDs have conventionally been part of a multidisciplinary treatment program for patients with hip OA. Randomized clinical trials have shown that using NSAIDs can result in a short-term decrease of pain and improvement of function for hip OA patients (Towheed & Hochberg, 1997). Clinicians should educate patients to monitor for the potential negative effects associated with prolonged use of NSAIDs. Negative effects include gastrointestinal complications (irritation, ulcers), kidney damage, elevated blood pressure, drug interactions, and medication allergies (Goldkind & Simons, 2006).

COX-2 inhibitors are a newer line of NSAIDs that specifically target the body's COX-2 enzyme and are currently available in the United States by prescription only. The COX-2 enzyme plays a major role in the inflammatory process. One notable advantage of the drug's selectivity is a decreased risk for gastrointestinal side effects. Although the efficacy of COX-2 inhibitors has been proven (Schnitzer et al., 2011), a particular concern with these drugs is vascular complications such as atherothrombosis and myocardial infarction (Kearney et al., 2006).

Evidence derived from randomized controlled trials demonstrates that corticosteroid injections can provide short-term pain relief (Qvistgaard, Christensen, Torp-Pedersen, & Bliddal, 2006). Lambert and colleagues (2007) noted clinical benefits of up to 3 months. They observed a 49.2% decrease on the WOMAC pain scale (Lambert et al., 2007). Corticosteroid injections may allow a patient to exercise and address clinical impairments with a lower level of pain. Use of corticosteroid injections should be thought of as a component of the rehabilitation plan of care instead of an isolated solution. Disadvantages and complications of corticosteroid injections include complications at the injection site, increased joint inflammation, elevated blood sugar concerns in the diabetic population, and tendon weakening. Although there is no

universal agreement in the literature as to how often and how many corticosteroid injections can be used in patients with hip OA, a minimum interval of 3 months between injections is commonly suggested (Stephens, Beutler, & O'Connor, 2008).

Recently, joint-specific supplementation has become a more popular treatment option. Oral glucosamine, chondroitin, injectable hyaluronic acid, and other similar supplements are often prescribed to treat hip OA (Reichenbach et al., 2007). Varying results in pain and functional improvement have been reported from randomized clinical trials evaluating the use of oral glucosamine for OA (Vlad, LaValley, McAlindon, & Felson, 2007). Chondroitin has not been shown to provide any significant benefits in the reduction of symptoms associated with hip OA (Reichenbach et al., 2007). However, injection of hyaluronic acid into the hip joint in patients with OA has been shown to help relieve symptoms. Benefits have been shown to persist up to 3 years (van den Bekerom, Lamme, Sermon, & Mulier, 2008). The benefits are most notable in patients with mild to moderate hip OA (Dagenais, 2007). There are minimal negative side effects associated with hyaluronic acid injection; those cited include injection site irritation or infection, increased joint pain and swelling, and rare allergic reactions (van den Bekerom et al., 2008).

Table 4: Common Pharacological Agents Used in the Hip Osteoarthritis Population

Nonsteroidal anti-inflammatory drugs (NSAIDs):
- Acetylsalicylic acid (aspirin).
- Ibuprofen.
- Naproxen.
- Ketoprofen.
- Flurbiprofen.
- Indomethacin.
- Diclofenac.
- Cyclooxygenase-2 (COX-2) inhibitors.

Intra-articular/injectable:
- Glucocorticoids.
- Hyaluronic acid.

Opioid analgesics:
- Hydrocodone.
- Oxycodone.
- Codeine.

Topical analgesics:
- Diclofenac.
- Capsaicin.

Note. From Western Schools, 2018.

Surgical options

When patients with end-stage hip OA do not improve with conservative treatment, they are often designated as surgical candidates. THA is the most commonly recommended procedure for end-stage hip OA. The American Academy of Orthopaedic Surgeons (AOS) estimates that approximately 120,000 THA procedures are performed annually, with an estimated annual cost of about $4 billion. Patients diagnosed at 70 years of age or older are more likely to undergo THA procedures compared with those diagnosed at 55 years of age or younger (Karlson et al., 2003). The reason for this association is not fully understood, although it could be speculated that the older cohort tends to be in a more advanced stage of hip OA. Although THA is a relatively common procedure with generally favorable results, the criteria used to determine appropriate candidates are not universally agreed upon (Altman et al., 2005). Typically, patients are considered candidates based on radiographic findings indicative of advanced degeneration, along with pain and functional limitations that are consistent with hip OA. The majority of THA procedures are elective in nature, so the patient's subjective pain experience and perceived functional limitations heavily affect the decision for surgery.

Despite variations in THA systems and surgical approaches, they all consist of replacing the femoral head and resurfacing the acetabulum (Chen et al., 2013). Surgical approaches vary and are described based on the location of incisions and direction of dislocation required to expose the joint components. Surgical approaches include posterior (most common in the United States), lateral, anterior, anterolateral, and transtrochanteric (Chen et al., 2013). The choice of approach and fixation does have rehabilitation implications. For example, if a posterior approach is chosen, the patient often has to avoid flexion beyond 90°, adduction past midline, and end-range internal rotation to avoid a potential joint dislocation (Enseki & Berliner, 2013). Various materials are used in the production of prosthetic components, including combinations of metal, ceramic, and polyethylene (Chen et al., 2013). The choice of approach and materials is highly dependent on surgeon preference. Prosthetic components may be implanted with cement, rely on bony ingrowth, or incorporate both methods of fixation. Weight-bearing precautions may range from immediate weight bearing as tolerated to using an assistive device for a month, and they are dependent on implant materials, the method of fixation, and the patient's bone quality.

Postoperative rehabilitation guidelines following THA procedures vary by surgical approach, method of implant fixation, individual patient characteristics, and surgeon preference. Goals for postoperative rehabilitation are controlling pain; regaining functional ROM and flexibility; reestablishing strength and endurance; and returning to ambulation, daily activities, and recreational activities (as appropriate). In the absence of complications, patients often return to independent ambulation by 6 weeks and occupations or activities that require lifting and bending by 3 months after surgery (Enseki & Berliner, 2013). THA complications are rare and include thromboembolic disease, implant failure or loosening, joint dislocation, infection, and femoral fracture (Enseki & Berliner, 2013).

Another option that has been the topic of considerable debate is the use of hip resurfacing arthroplasty (HRA) to treat end-stage hip OA (Cheatham, 2013). HRA procedures involve sparing the femoral neck and using a hemi-cap prosthetic to replace the femoral head. The proposed advantages are bone preservation, less chance of dislocation, improved mechanics, and better outcomes for revision to THA (Corten, Ganz, Chosa, & Leunig, 2011). Nunley, Della Valle, and Barrack (2009) found that of those individuals who underwent hip resurfacing, men under the age of 65 years and women under the age of 55 years were less likely to require an eventual THA procedure than individuals above those ages. For this reason, hip resurfacing is typically recommended for relatively younger patients with no other comorbidities. It is also performed more often for males because they tend to have a larger femoral neck diameter, which is necessary for the prosthetic femoral head used with resurfacing procedures. Recently, HRA has come under scrutiny because of claims that the metal-on-metal design may result in elevated ion levels in the blood, with potential health effects (Hailer, Bengtsson, Lundberg, & Milbrink, 2013). For this reason, the procedure is not routinely used in women of childbearing age.

CASE STUDIES

Case study 1

Patient history

A 51-year-old man presented to an outpatient physical therapy clinic complaining of right groin pain. The patient was self-referred in a state that allows direct access for physical therapy treatment. He noted a 5-week history of groin pain that was associated with his increased participation in recreational softball. The patient played as a catcher in games up to three times per week. The pain was most noticeable when he was squatting behind the plate or running to bases. Pain levels reached 4/10 during activity. Occasional crepitus did randomly occur and at times was associated with residual groin pain. Once symptomatic, pain usually persisted for the remainder of the day. Ambulation and ADLs were minimally affected, with the exception of sitting longer than 2 hours and deep-squatting

activities. He also noted stiffness when awakening the day after playing in a softball game. He was not taking any medications at the time of evaluation.

The patient reported a history of undergoing a lumbar fusion procedure 3 years ago in the region of L2-L3. He participated in a full regimen of postoperative physical therapy, returning to all ADLs and recreational activities. Otherwise, he did not note any significant medical history.

Other than participation in softball approximately 3 months per year, the patient led a relatively sedentary lifestyle. He worked as a cashier at a local hardware store and did not participate in any other regular fitness activities. He lived in a two-story home with his wife and two young children.

Systems review

Observation yielded a 51-year-old, 6'1?, 225-pound man in minimal distress. His standing posture showed a relative anterior tilt of the pelvis in static standing. He was unremarkable for any other deviations of the spine or lower extremities. The patient's gait pattern was symmetrical, and velocity was within normal limits.

Tests and measures

The LEFS scale was issued to assess the patient's functional limitations associated with his current hip pain. The LEFS scale was chosen for its ease of administration and because the questionnaire contains items that ask the patient about sports/ recreational activities, squatting, running, and making sharp turns while running. The patient reported a raw score of 63 points (80 points is optimal).

Because the patient presented in a direct access situation and had a history of lumbar spine involvement, a lower-quarter screening examination was performed. Assessment of myotomes, dermatomes, and reflexes was completed. Additionally, active range of motion (AROM) of the lumbar spine, assessment of pelvic landmark position, and tests to evaluate potential sacroiliac joint involvement were implemented. All lower-quarter screening tests and measures were negative.

Next, physical examination specific to the hip region was completed. Passive ROM was symmetrical and within normal limits (WNL) for both hips. The patient did note that groin pain and the feeling of stiffness were increased both when the hip was placed at end-range extension and when it was placed at end-range internal rotation with the hip flexed to 90°. He demonstrated weakness on the involved side, with abduction and extension of the right hip measuring 4/5. Pain (2/10) was noted with manual muscle testing (MMT) for abduction. Flexibility tests showed tightness for the hamstrings, piriformis, and iliopsoas on the left side. The FABER test resulted in minor groin soreness when overpressure was applied by the clinician. Groin pain was increased when the scour and FADIR tests were performed on the involved side. Additionally, with long- axis distraction of the left hip, baseline pain decreased (0/10). No difference in joint mobility was noted when comparing long-axis distraction bilaterally.

Questions

1. If considering the diagnosis of hip osteoarthritis, what stage of severity would you assign to this patient?
2. Given the suspected diagnosis and results of clinical examination, what would be an appropriate treatment progression for this patient?

Responses

1. The patient presentation is consistent with preclinical or early-stage hip OA. The patient also shows signs that are consistent with femoroacetabular impingement. However, clinicians should realize that current literature suggests FAI and hip OA likely occur on a spectrum as opposed to being separate entities. This patient exhibits the clinical characteristics of groin pain, stiffness, and relief of symptoms with joint distraction that are consistent with hip OA. Additionally, the patient is in the age range that is typical for early changes related to hip OA to occur.
2. The treatment plan of care for this patient should be consistent with current evidence-based recommendations for patients with hip OA. An appropriate exercise progression should be initiated, including strength activities for the hip abductors and extensor muscles. Stretching techniques for the left hamstrings, iliopsoas, and piriformis muscles should be utilized. Manual distraction may be considered for the purpose of pain relief because joint mobility was not noted as significantly limited when tested. Patient education discussing the patient's home exercise program, weight management, and activity modification may be useful. Additionally, the clinician should provide the patient information pertaining to common clinical disease characteristics associated with hip OA, the long-term plan of care, and treatment options that are indicated for patients during various stages of the disease.

Case study 2

Patient history

A 62-year-old woman was referred to physical therapy with a history of progressive left hip pain. The patient started to notice pain in the left groin region approximately 6 months ago. Initially, she experienced a dull ache after walking for prolonged distances or time. Two months ago, she started to notice sharper pains when entering and exiting her car as well as ascending and descending stairs. She was originally using over-the- counter NSAIDs to help moderate her symptoms. Although initially very effective, the relief provided by these medications has diminished over time. The patient decided to consult her primary care physician after friends and family members noted that she was walking with a limp. At the time of evaluation, the patient noted pain levels to increase substantially within 20 minutes of ambulation or other weight-bearing activities. Her pain levels at evaluation ranged from 2/10 at rest to 6/10 with symptom-provoking activities. The patient noted that pain levels would decrease to baseline within 1 hour of ceasing symptom-provoking activities. Additionally, she noted a feeling of joint stiffness upon awakening that typically would last for less than 45 minutes.

The patient was able to provide a thorough medical history. She reported hypertension and high cholesterol, which were medically controlled at the time of evaluation. She reported no other major identifiable risk factors such as developmental disorders or previous injuries to the hip region. Over the past 6 months, the patient did gain approximately 18 pounds. She felt this weight gain was primarily a result of decreased physical activity.

Before the onset of progressive pain, the patient led an independent and physically active lifestyle. She lived in a two-story home with her husband and held a full-time job as a secretary at an accounting firm. During summer months, the patient would participate in golf once or twice per week. She also would walk 3 times per week for approximately 3 miles. At the time of evaluation, the patient reported that her physical activity had been limited for the past 2 months to walking 1 mile twice per week. The patient's goals included returning to independent ambulation and ADLs without pain, as well as returning to golf and a regular walking schedule.

Systems review

The patient provided the plain radiographs ordered by her referring physician, and the radiologist's report for the radiographs was available. Diminished joint space was noted for the left hip joint. The radiologist's report noted the joint space of the left hip to be 2 mm (moderate loss of joint space). No previous radiographs were available to examine the change of joint space over time. All other bony architecture was within normal limits.

Observation yielded a 62-year-old, 5'3?, 158-pound woman in minimal distress. Her standing posture was unremarkable for asymmetry or deviations of the spine or lower extremities. During gait observation, the patient was noted to demonstrate a drop of her right pelvis during stance phase on the left extremity. Additionally, a shortened stride length and decreased time in stance phase was noted on the left side. She reported moderate groin pain (3/10) during ambulation. She currently walked without any additional assistance. Visual examination and palpation also confirmed atrophy of the left gluteal and quadriceps muscle groups when compared with the right side.

Tests and measures

The WOMAC questionnaire was issued to assess the patient's reports of pain, stiffness, and functional limitations. The patient scored 40% (0% is optimal) at the time of evaluation.

A standard physical examination of the hip region was performed. Significant passive ROM deficits of the left hip included measurements of internal rotation of 6° (compared with 22° on the right) and flexion of 94° (compared with 105° on the right). Passive motion in all other planes was symmetrical and WNL. Groin pain was reproduced at end-range internal rotation with the hip flexed to 90°. Strength was assessed through MMT, yielding measures of 4/5 for flexion, extension, and abduction of the left hip. Additionally, left knee flexion and extension was recorded at 4/5. Groin and lateral thigh pain was reproduced with strength testing of the hip flexor group. Flexibility testing revealed tightness of the left iliopsoas and iliotibial band structures. Pain was noted with the FABER and scour tests when performed at the left hip joint. Additionally, with long-axis distraction of the left hip, baseline pain decreased (1/10), and decreased joint mobility was noted when compared with the uninvolved side. When attempting to maintain single-leg stance on the left side, the patient showed a drop of the right pelvis (Trendelenburg sign) and reported pain (4/10) after 15 seconds. All lumbar spine ROM was within normal limits, with no pain reproduction.

Questions

1. If considering the diagnosis of hip osteoarthritis, what stage of severity would you assign to this patient?
2. Given the suspected diagnosis and results of clinical examination, what would be an appropriate treatment progression for this patient?

Responses

1. Based on the patient's history, observation, and physical examination, the patient presentation is consistent with moderate-stage hip OA. The patient's age and the gradual nature of onset are common for patients with hip OA. She also demonstrated other characteristics common to the condition, including groin pain, muscle weakness, decreased ROM, and flexibility deficits. The proportional loss of motion in specific directions (internal rotation deficit greater than flexion deficit) and weakness of specific muscle groups are consistent with impairment patterns reported for hip OA. The observed and self-reported functional limitations could be explained by the physical impairments identified during the physical examination. In this case, the radiographs provided by the patient were confirmatory for the clinical diagnosis of moderate hip OA.
2. The goals of rehabilitation for this patient would be to minimize the acuity of the current episode, address physical impairments as possible, maximize functional capacity, and enact preventive measures to slow the progression of the condition. A multistaged, multifaceted treatment approach should be used for this patient. Clinicians should consider prescribing a cane to assist with obtaining gait symmetry. The patient should be instructed to hold the cane in the right hand when ambulating, in an attempt to decrease joint reaction forces occurring at the left hip joint. Gentle long-axis distraction can be used to provide pain relief and attempt to improve joint mobility. The patient should be instructed in muscle stretching techniques (iliopsoas and iliotibial band) and isometric exercises (hip extensors and abductors, quadriceps) to be performed within pain-free limits. Joint-protection and activity-modification strategies should be reviewed. The following topics should be discussed as a component of patient education: proper cane use, relative rest, and timing and dosage of exercise.

Conclusion

Hip OA is a common orthopedic disorder encountered in the rehabilitation setting. Clinicians may encounter patients with hip OA at various stages of the disease. Numerous risk factors, both modifiable and nonmodifiable, have been identified in the literature. Identifying risk factors such as FAI may allow clinicians to initiate more effective treatment strategies to delay the progression of hip OA. The diagnosis of hip OA should be determined based on a combination of patient presentation, history, and clinical examination. Diagnostic imaging, particularly plain radiographs, may be useful for confirming the diagnosis or determining the stage of involvement. When evaluating patients with hip pain, numerous other diagnoses (musculoskeletal and nonmusculoskeletal) must be considered. Appropriate staging of hip OA patients allows clinicians to more effectively determine a course of rehabilitation.

Rehabilitation is a significant part of a multidisciplinary plan of care for patients in this population. Clinicians should prioritize using interventions that are supported in the literature. Clinicians should understand the role of other forms of treatment, such as pharmacological agents and surgery, in the management of hip OA. Appropriate outcome measures should be chosen to accurately measure clinical and functional improvement in patients with hip OA. As the evidence relating to the diagnosis and treatment of hip OA changes, clinicians need to modify their method of practice to reflect these advances in knowledge.

Resources

- **Academy of Geriatric Physical Therapy**
  https://geriatricspt.org
- **American Academy of Orthopaedic Surgeons (AAOS)**
  http://orthoinfo.aaos.org/topic.cfm?topic=a00213
- **Arthritis Foundation**
  https://www.arthritis.org/
- **The European League Against Rheumatism (EULAR)**
  http://www.eular.org/
- **Osteoarthritis Research Society International (OARSI)**
  http://www.oarsi.org/

Outcome measures

- **Hip Disability and Osteoarthritis Outcome Score (HOOS)**
  http://www.koos.nu/
- **Harris Hip Score (HHS)**
  http://www.orthopaedicscore.com/
- **Lower Extremity Functional Scale (LEFS)**
  http://www.physio-pedia.com/Lower_Extremity_Functional_Scale_(LEFS)
- **Western Ontario McMaster Universities Osteoarthritis Index (WOMAC)**
  https://www.rheumatology.org/Practice/Clinical/Clinicianresearchers/Outcomes_Instrumentation/Western_Ontario_and_McMaster_Universiti

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OSTEOARTHRITIS OF THE HIP: REHABILITATION AND TREATMENT STRATEGIES, 2ND EDITION

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 81 or complete your test online at **EliteLearning.com/Book**

51. In his classic study, Lloyd-Roberts demonstrated that the shortening of the capsular tissue characteristic of osteoarthritis leads to:
    a. Capsular hypermobility.
    b. Capsular hypomobility.
    c. Increased cartilage formation.
    d. Increased tendon vascularity.

52. A recognized nonmodifiable risk factor for the development of hip osteoarthritis is:
    a. Hip dysplasia.
    b. Smoking.
    c. High-impact athletic activity.
    d. A family history of rheumatic disease.

53. One risk factor that is considered to be a modifiable cause of hip osteoarthritis is:
    a. Femoroacetabular impingement.
    b. Uninterrupted sitting for more than 6 hours daily.
    c. Prolonged use of nonsteroidal anti-inflammatory drugs.
    d. Participation in direct-impact athletic activity.

54. The symptom that is most indicative of hip OA is:
    a. Paresthesia in the groin region.
    b. Shooting pain in the posterior thigh.
    c. Joint stiffness in the morning.
    d. Buttock pain that decreases after jogging slowly.

55. Patients with osteoarthritis of the hip are most likely to show marked restriction of:
    a. Extension.
    b. Adduction.
    c. External rotation.
    d. Internal rotation.

56. The clinical test most useful to screen for femoroacetabular impingement is the:
    a. Compression test.
    b. FABER test.
    c. Long-axis joint-distraction technique.
    d. FADIR test.

57. The imaging modality most useful to diagnose cases of moderate to severe hip osteoarthritis is:
    a. Plain radiography.
    b. Magnetic resonance imaging.
    c. Ultrasound imaging.
    d. Bone scan.

58. When using radiographic imaging to diagnose osteoarthritis, a clinically significant change in joint space is evidenced by:
    a. A joint space value of 4 mm.
    b. A loss in joint space of 0.5 mm or more.
    c. An excess of acetabulum in the femoral head.
    d. Loss of bone density in the femoral neck. (Remediation)

59. When a patient complains of hip pain, a structured examination process is necessary to avoid the potential catastrophic consequences of failing to recognize systemic conditions such as:
    a. T7 radiculopathy.
    b. Peroneal nerve entrapment.
    c. Septic arthritis.
    d. Coccyx fracture.

60. The measure of lower-extremity functional limitation for patients with osteoarthritis that has both speed and endurance components is the:
    a. Timed up-and-go (TUG) test.
    b. 6-minute walk test (6MWT).
    c. Self-paced walk test (SPWT).
    d. Stair measure (SM).

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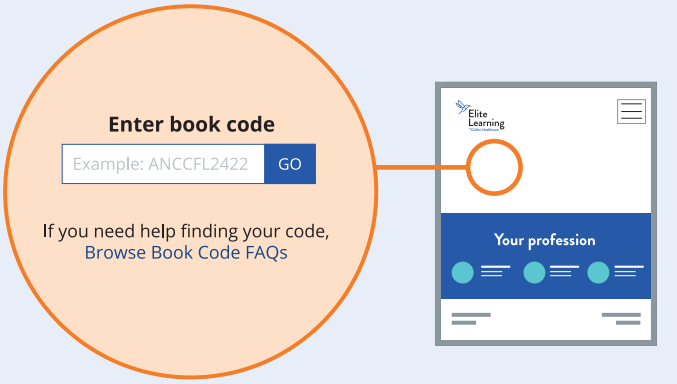

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Final exam questions are located at the end of each chapter.

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1	○	○	○	○	13	○	○	○	○	25	○	○	○	○	37	○	○	○	○	49	○	○	○	○
2	○	○	○	○	14	○	○	○	○	26	○	○	○	○	38	○	○	○	○	50	○	○	○	○
3	○	○	○	○	15	○	○	○	○	27	○	○	○	○	39	○	○	○	○	51	○	○	○	○
4	○	○	○	○	16	○	○	○	○	28	○	○	○	○	40	○	○	○	○	52	○	○	○	○
5	○	○	○	○	17	○	○	○	○	29	○	○	○	○	41	○	○	○	○	53	○	○	○	○
6	○	○	○	○	18	○	○	○	○	30	○	○	○	○	42	○	○	○	○	54	○	○	○	○
7	○	○	○	○	19	○	○	○	○	31	○	○	○	○	43	○	○	○	○	55	○	○	○	○
8	○	○	○	○	20	○	○	○	○	32	○	○	○	○	44	○	○	○	○	56	○	○	○	○
9	○	○	○	○	21	○	○	○	○	33	○	○	○	○	45	○	○	○	○	57	○	○	○	○
10	○	○	○	○	22	○	○	○	○	34	○	○	○	○	46	○	○	○	○	58	○	○	○	○
11	○	○	○	○	23	○	○	○	○	35	○	○	○	○	47	○	○	○	○	59	○	○	○	○
12	○	○	○	○	24	○	○	○	○	36	○	○	○	○	48	○	○	○	○	60	○	○	○	○

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Test Expiration Date: 9/30/2024					
Chapter 1: PTIL03ET (Questions 1-10)	**Chapter 2**:PTIL01EB (Questions 11-20)	**Chapter 3**: PTIL01SH (Questions 21-30)	**Chapter 4**: PTIL04HK (Questions 31-40)	**Chapter 5**: PTIL02OR (Questions 41-50)	**Chapter 6**: PTIL04OA (Questions 51-60)

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Fill in the circles below the numbers with 0 being the worst and 10 being the best.	EXCELLENT										POOR
How likely is it that you would recommend Elite Learning	10 ○	9 ○	8 ○	7 ○	6 ○	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
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Please circle yes or no for the following questions.		
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Please list any recommendations that you may have for this course: _____

_____

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Comments: _____

_____

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