CALIFORNIA

Dental Hygienist Continuing Education

Elite Learning
by Colibri Healthcare

Inside:

California Dental Practice Act, 6th Edition

Infection Control Standards for California Dental Health Care Workers, 6th Edition

12-hour Continuing Education Package

$72.00

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WHAT'S INSIDE

FREQUENTLY ASKED QUESTIONS

What are the requirements for license renewal?

License Expires	CE Hours Required	Mandatory Subjects
Licenses expire every two years on the last day of licensee's birth month	25 No more than 12 hours are allowed through home-study. **You cannot receive credit for more than 8 hours per day.**	2 hours of California Infection Control 2 hours of California Dental Practice Act 4 hours of Basic Life Support (must be live; online courses do not satisfy this requirement)

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COURSE TITLE	HOURS	PRICE	COURSE CODE
Chapter 1: California Dental Practice Act, 6th Edition (Mandatory)	2	$19.95	DCA02DP
Chapter 2: Infection Control Standards for California Dental Health Care Workers, 6th Edition (Mandatory)	2	$19.95	DCA02IC23
Chapter 3: Dental Ethics and the Digital Age, 2nd Edition	3	$29.95	DCA03DE
Chapter 4: Herbal-Drug Interactions Important in Dentistry, 3rd Edition	2	$19.95	DCA02HD
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Licensing board contact information:

Dental Hygiene Board of California
2005 Evergreen Street, Suite 1350
Sacramento, CA 95815

Phone: (916)-263-1978
Fax: (916) 263-2688
Website: https://www.dhbc.ca.gov/

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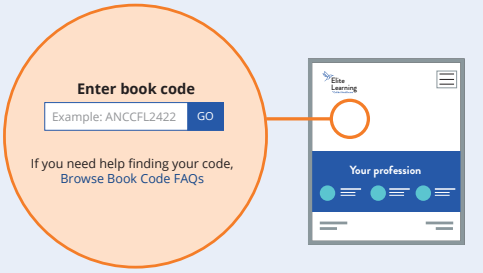

Course Name	Course Code
California Dental Practice Act, 6th Edition (Mandatory)	DCA02DP
Infection Control Standards for California Dental Health Care Workers, 6th Edition (Mandatory)	DCA02IC23
Dental Ethics and the Digital Age, 2nd Edition	DCA03DE
Herbal-Drug Interactions Important in Dentistry, 3rd Edition	DCA02HD
Maintaining Dental Implants, 2nd Edition	DCA01MD
Oral Health Issues for the Female Patient, 3rd Edition	DCA02OH

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- 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.

Course 1: California Dental Practice Act, 6th Edition (Mandatory)

2 CE Hours

Release Date: September 1, 2021 **Expiration Date:** September 1, 2024

Faculty

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Arthur W. Curley has disclosed that he has no significant financial or other conflicts of interest pertaining to this course book

Dental planner: **Karen D. Hallisey, DMD**

The planner has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

AGD Subject Code - 563

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- Provide required personal information and payment information.
- Complete the mandatory Course Evaluation.
- Print your Certificate of Completion.

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INTRODUCTION

Learning objectives

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

- List the agencies regulating dental practice in California.
- Describe the scope of practice and initial licensing requirements of dentists and dental auxiliaries in California.
- Describe the requirements for licensing renewal of dental professionals in California.
- Outline the prescription privileges of dental professionals in California.
- Describe the citations, fines, revocations, and suspensions that may be imposed on dental professionals.
- Describe malpractice claims arising from violations of laws and codes of ethics.
- Identify the regulations on dental advertising.
- Describe dental professionals' mandatory reporter obligations and their role in identifying abuse.
- Explain the poster requirements for California dental practices.

Course overview

The profession of dentistry in California is regulated by the California Department of Consumer Affairs, the Dental Board of California, and the Dental Hygiene Board of California. The Dental Practice Act (part of the California Business and Professions Code) is the set of regulations that governs dentists, dental hygienists, and dental assistants. The Dental Board of California, the Dental Hygiene Board of California, and the California Department of Consumer Affairs have the power to amend or revoke these laws as needed, subject to approval by the California Legislature. This course provides an overview of these governmental entities and outlines the content of the Dental Practice Act, its attending regulations, and other statutes relating to dental practice.

The content of this basic-level course was derived primarily from the State of California Department of Consumer Affairs Dental

Practice Act, California Code of Regulations, California Dental Association Code of Ethics, and American Dental Association Principles of Ethics and Code of Professional Conduct. With a more complete understanding of the California Dental Practice Act, dentists, dental hygienists, and dental assistants will be better able to practice within its guidelines.

CALIFORNIA LAWS AND AGENCIES

California Dental Practice Act

The California Dental Practice Act consists of the basic body of laws governing dentistry found in the California Business and Professions Code (B&P): Division 2, Chapter 4 (beginning with Section 1600), and the California Code of Regulations (CCR): Title 16, Division 10 (beginning with Section 1000). California law requires every dental professional to have a grasp of this basic body of law and related portions of other selected California statutes.

Throughout this course, regulations of the California Dental Practice Act will be identified or cited by their section number in either the B&P or the CCR, but will be referred to collectively as the *Dental Practice Act*. Appendix A outlines the pertinent contents of each of these laws by section. Relevant sections of the B&P can be read in their entirety at https://www.dbc.ca.gov/lawsregs/laws.shtml; relevant sections of the CCR can be read in their entirety at https://www.dir.ca.gov/dlse/CCR.htm.

California Department of Consumer Affairs

The California Department of Consumer Affairs includes 39 regulatory entities that protect public health and safety through licensing and oversight of various professions. These boards and bureaus establish minimum qualifications and levels of competency for licensure in more than 280 business and professional categories, including all health professions (Department of Consumer Affairs, S. of C., 2021). The Dental Board of California is one such board falling within the purview of the California Department of Consumer Affairs, which provides a variety of key administrative services to these semi-autonomous boards.

Board members collectively are the leaders of these licensing agencies, and make important decisions on agency policies and disciplinary actions against professionals who violate state consumer protection laws. Board members approve regulations and help guide licensing, enforcement, public education, and consumer protection activities. Some board members are licensed professionals, whereas others are public members. The governor appoints many board members, but the legislature makes appointments as well. State law requires board members within the California Department of Consumer Affairs to complete orientation and training in several important areas, including ethics, conflict of interest laws, and sexual harassment prevention.

Dental Board of California

The Dental Board of California (the Board) is part of the California Department of Consumer Affairs. The stated mission of the Board is to "protect and promote the health and safety of consumers in the State of California" (Dental Board of California, 2021g). The Board licenses qualified dental healthcare professionals, takes actions to enforce compliance with the Dental Practice Act and other laws of the State of California, and strives to enhance the education of consumers and licensees.

The Board regulates licensed dentists, registered dental assistants (RDAs), and registered dental assistants in extended functions (RDAEFs). It also delineates each group's scope of practice, including any required levels of supervision or any restrictions on the settings in which they may work. Other areas of the Board's concern include licensing, examinations, and continuing education (CE) requirements. The Board also sets fees for dentists and for all dental auxiliaries, including fees in connection with initial licensure and license renewal, permits and permit renewals, and examinations. These regulations are set forth for dentists and dental auxiliaries in the CCR (Sections 1021 and 1022, respectively).

Section 1601.2 of the California Dental Practice Act states that "protection of the public shall be the highest priority for the Dental Board of California in exercising its licensing, regulatory, and disciplinary functions. Whenever the protection of the public is inconsistent with other interests sought to be promoted, the protection of the public shall be paramount" (California Dental Practice Act, 2003). According to its vision statement, the Board strives to "be the leader in public protection, promotion of oral health, and access to care" (Dental Board of California, 2021g).

The Board consists of 15 members:

- Eight practicing dentists.
- One registered dental hygienist (RDH).
- One RDA.
- Five members of the public.

(California Dental Practice Act, 2020a)

To ensure that all Board functions are conducted with optimum efficiency, selecting qualified Board members is essential. The governor, Senate Committee on Rules, and speaker of the assembly appoint public members. Because experience is a critical component in the decision-making process, all members of the Board, except public members, must have at least five years of clinical practice in the State of California, preceding the date of their appointments. No more than one member may be on the faculty of any dental college or department, and no members may have financial interests in any dental academic institution. Members are appointed for a four-year term, and no member can remain on the Board for more than 2 terms (California Dental Practice Act, 2020b). Of the eight practicing dentists on the Board, one must be a member of a California dental college, and one must be practicing in a nonprofit community clinic (California Dental Practice Act, 2020a).

The Board may inspect the books, records, and premises of any licensed dentist, as well as the licensing documents, records, and premises of any dental assistant in response to a complaint that either entity has violated a law or regulation constituting grounds for disciplinary action. The Board may employ inspectors for this purpose (California Dental Practice Act, 2019a).

To assist California licensed dentists, RDAs, and RDAEFs whose ability to practice dentistry has been impaired by alcohol or drug abuse, the Board has established a diversion program that provides access to appropriate intervention and treatment programs. The diversion program offers these practitioners a means to recover from substance abuse without the added hardship of losing their professional license. The dual purpose of the program is to protect the public and rehabilitate the licensee. The program also provides a voluntary alternative approach to traditional disciplinary actions. Participants must meet the diversion program's eligibility requirements and agree to comply with the terms of the program. Involvement in the program is kept confidential. Upon successfully completing treatment, the licensee may return to practice, and all records pertaining to the licensee's participation in the diversion program are purged and destroyed (California Dental Practice Act, 2016b).

All licensees must register with the Board. According to the California Dental Practice Act, Section 1650.1, all applicants and licensees who have electronic mail addresses must report the address to the Board, which will send a notice annually to confirm that the address is still current (California Dental Practice Act, 2016a).

Dental Hygiene Board of California

Whereas the Board regulates licensed dentists, RDAs, and RDAEFs, the Dental Hygiene Board of California (formerly the Dental Hygiene Committee of California) now oversees all functions and requirements of all categories of RDHs (California Dental Practice Act, 2019c).

The Dental Hygiene Board of California consists of nine members, seven of whom are appointed by the governor: two public members, one licensed practicing general or public health dentist, and four RDHs. Of the four RDHs, one must be licensed either in alternative practice or in extended functions and one must be a dental hygiene educator. The Senate Committee on Rules appoints one public member, and the Speaker of the Assembly appoints another public member. Members serve for no more than two consecutive four-year terms, and the governor has the power to remove any member for neglect of duty, incompetence, or unprofessional or dishonorable conduct (California Dental Practice Act, 2020h).

The responsibilities of the Dental Hygiene Board include determining the scope of practice for all dental hygienists; issuing, reviewing, and revoking licenses; and developing and administering examinations. Additional functions include adopting regulations and determining fees and CE requirements for all hygiene licensure categories.

Section 1966 mandates that the Dental Hygiene Board establish a diversion program for licensees whose competency may be impaired due to drug or alcohol abuse, as well as one or more diversion evaluation committees to further the goals of the diversion program (California Dental Practice Act, 2020L).

SCOPE OF PRACTICE AND INITIAL LICENSURE

Dentists

Scope of practice

The Dental Practice Act defines the practice of dentistry and permits dentists licensed in California to engage in the diagnosis or treatment, by surgery or other method, of diseases and lesions and the correction of malpositions of the human teeth, alveolar process, gums, jaws, or associated structures; and such diagnosis or treatment may include all necessary related procedures as well as the use of drugs, anesthetic agents, and physical evaluation (California Dental Practice Act, 2020c).

Concerning oral and maxillofacial surgery, please see Section 1638 of the Dental Practice Act, which discusses the treatment of the "functional and esthetic aspects of the hard and soft tissues of the oral and maxillofacial region."

Initial licensure

In California there are three basic pathways to licensure for dentists, including licensure by examination, licensure by credential, and licensure by residency (Dental Board of California, 2021d).

One pathway is to apply following successful completion of the Western Regional Examining Board (WREB) examination, and another is to successfully complete the American Board of Dental Examiners (ADEX) examination. Applicants must provide satisfactory evidence of having passed the California Restorative Technique (RT) examination. If licensed in another state or country, the applicant must submit a completed Out of State/Country Licensure Certification form. Applicants must also provide fingerprints, submit to a criminal background check, and successfully complete the Law and Ethics examination (Dental Board of California, 2021d).

Applicants enrolled in a Board-approved dental school may apply for licensure by portfolio. (See https://dbc.ca.gov/applicants/licensure_by_portfolio.shtml (Dental Board of California, 2021d. Applicants must have (a) graduated from a Board-approved dental school in good academic standing and with no pending ethical issues, (b) have passed Parts I and II of the National Board Written Examinations, (c) submit a completed portfolio to the Board within 90 days of graduation, and (d) successfully complete the Law and Ethics examination.

Dentists with a current valid license in another state may pursue licensure by credential. (See https://dbc.ca.gov/applicants/licensure_by_credential.shtml.) Section 1635.5 of the Dental Practice Act requires the applicant to show that he or she has either been in active clinical practice or has been a full-time faculty member in an accredited dental education program, and in active clinical practice for a total of at least 5,000 hours in five of the seven consecutive years immediately preceding the date of his or her application. With two years of clinical practice or completion of an accredited residency training program, the remainder of the five-year requirement may be fulfilled with a contract to teach or to practice in certain specified settings.

The applicant must submit a letter from WREB to the effect that he or she has not failed the WREB examination within the past five years. The applicant also must not have failed the ADEX examination after November 15, 2019. The applicant must have completed 50 units of continuing education in the past two years, including current mandatory courses (Dental Board of California, 2021d). In 2008, in response to a shortage of dentists (Pourat & Nicholson, 2009), the Board implemented a program allowing *licensure by residency*. Under this program, individuals are allowed to qualify for dental licensure based on proof of (a) graduation from a CODA-approved or Board-approved dental school, (b) the completion of a minimum of 12 months of a general practice residency or advanced education in a CODA-approved general dentistry program, (c) not having failed the WREB examination within the past five years, (d) not having failed the ADEX examination after November 15, 2019, (e) successful completion of the California Law and Ethics examination, and (f) fulfilling the requisite fingerprinting requirements. (See https://dbc.ca.gov/applicants/licensure_by_residency.shtml) (Dental Board of California, 2021d).

In 2008, California had 233 dental professional shortage areas (Pourat & Nicholson, 2009). Today, geographic areas throughout California continue to experience shortages of dental health providers (State of California, 2021). This situation is likely to persist because the percentage of dentists who may be nearing retirement age is greater than the percentage of dentists who are newly licensed. According to a report from the UCLA Center for Health Policy Research, the dentist shortage in California is further exacerbated by the growing percentage of newly licensed dentists who are opting to reside or work out of state (Pourat & Choi, 2014).

The Board regulates more than 100,000 licensees, including dentists, RDAs, and RDAEFs (Dental Board of California, 2021c). The U.S. Census Bureau has estimated that, as of July 1, 2019, 39,512,223 individuals resided in the State of California (U.S. Census Bureau, n.d.).

The California Dental Association and the Board continue to seek cooperative dialogue with the dental schools and with one another to implement changes that will advance the oral health of all Californians, help eliminate barriers to care, and enable dentists to better serve their patients and the public (California Dental Association, 2021).

Special permits

Special permits are required for dentists who want to administer general anesthesia or conscious sedation (to be called "moderate sedation" as of January 1, 2022) in the dental office. Offices providing these services are required to maintain specialized equipment, and to have such equipment inspected. Dentists must meet certain initial requirements to obtain these permits and other ongoing requirements to renew these permits every two years (Dental Board of California, 2021h).

General anesthesia permit
A dentist may not administer general anesthesia on an outpatient basis for dental patients, unless he or she possesses a current license in good standing and holds a Board-issued valid general anesthesia permit, or possesses a current permit under Section 1638 (a physician or surgeon with a license to practice dentistry in another state) or 1640 (having a pending contract as a professor in a California dental college; having graduated from a Board-approved dental college, or having completed an advanced education program accredited by either the Commission on Dental Accreditation of the ADA or a Board-approved national accrediting body; and being a diplomate of a specialty board, or being qualified to take a specialty board examination, or having completed an advanced educational program from a Board-approved dental college) and holds a Board-issued valid general anesthesia permit (California Dental Practice Act, 2019b).

To obtain such a permit, the dentist must supply documentation of the successful completion of a residency program in anesthesia – approved by the Board of Directors of the American Dental Society of Anesthesiology for eligibility for fellowship in general anesthesia – of not less than one calendar year, documentation of the successful completion of a graduate program in oral and maxillofacial surgery that has been approved by the Commission on Accreditation of the ADA, and have a fellowship in anesthesia approved by the Board of Directors of the American Dental Society of Anesthesiology.

In order to renew a general anesthesia permit, the dentist must complete, at least once every two years, 24 hours of approved courses of study related to general anesthesia, and successful completion of an advanced cardiac life support (ACLS) course. Units earned in the ACLS course may be used toward fulfillment of the general anesthesia course requirement (Dental Board of California, 2021f).

Conscious sedation permit
A dentist who wants to administer or order the administration of conscious (moderate) sedation must hold a conscious sedation permit. To obtain this permit, the dentist must show proof of successful completion of a course of study in conscious sedation consisting of at least 60 hours of instruction and satisfactory completion of at least 20 cases of the administration of conscious sedation for a variety of dental procedures. The course must comply with the requirements of the ADA's Guidelines for Teaching the Comprehensive Control of Pain and Anxiety in Dentistry. To renew this permit, the dentist must complete at least once every two years a minimum of 15 hours of coursework related to the administration of conscious sedation and to medical emergencies (Dental Board of California, 2021a).

Oral conscious sedation for minors
Similarly, permits must be obtained in order for a dentist to administer oral conscious sedation for minors younger than the age of 13. Renewal of this permit requires a minimum of seven hours of approved courses of study related to oral conscious sedation of minors (Dental Board of California, 2021i). Along with an application fee and the form, the dentist needs to submit evidence that he or she has (a) satisfactorily completed a postgraduate program in oral and maxillofacial surgery or pediatric dentistry approved by the Commission on Dental Accreditation or a comparable Board-approved organization, (b) satisfactorily completed a periodontics or general practice residency or other advanced education in a Board-approved general dentistry program, and (c) satisfactorily completed a Board-approved program on oral medications and sedation. A dentist who has already been using oral sedation for adult patients should submit documentation of 10 such cases in any three-year period (California Dental Practice Act, 2006).

Informed consent, complications, and future legislation
When the treatment involves general anesthesia or intravenous conscious sedation, the dentist must obtain written informed consent from the patient or from the parent or guardian (California Dental Practice Act, 2020f). In the case of a minor, the written consent must include the wording:

> *The administration and monitoring of deep sedation or general anesthesia may vary depending on the type of procedure, the type of practitioner, the age and health of the patient, and the setting in which anesthesia is provided. Risks may vary with each specific situation. You are encouraged to explore all the options available for your child's anesthesia for their dental treatment and consult with your dentist, family physician, or pediatrician as needed* (California Dental Practice Act, 2020f).

In 2015, the death of a six-year-old child named Caleb Sears inspired legislation concerning the administration and monitoring of dental anesthesia and sedation. The first law, AB 2235, requiring the Board to review laws and regulations, was known as *Caleb's Law Part I*. The next legislation, Caleb's Law Part II, was introduced to codify the recommendations in Part I. Yet another piece of legislation, SB 501, on the same subject was introduced at the same time. Governor Brown signed SB 501 into law in 2018 (Senate Bill No. 501, 2018). According to the California Society of Pediatric Dentistry, this law:

> *Scheduled to become effective January 1, 2022, requires significant change to permitting of General Anesthesia, Conscious Sedation, and Oral Conscious Sedation for Minors in the dental setting. These changes include the introduction of a pediatric endorsement and additional patient monitoring requirements when administering general anesthesia or sedation to a minor dental patient, and the creation a new Pediatric Minimal Sedation (PMS) permit. The PMS permit will be required to administer or order the administration of minimal sedation to a patient under 13 years of age* (Niethamer, 2021).

However, it is unlikely that the Dental Board of California will be able to complete its rule making by the date the law is to go into effect, and the enactment date may be extended (Niethamer, 2021).

The dentist must report within seven days in writing the death of a patient that takes place during any dental or dental hygiene procedure. The dentist must also report any death discovered to be the result of such treatment. Also, unless previously planned, the removal of a patient to a hospital or emergency center for treatment for problems resulting from a dental or dental hygiene procedure must be reported. A report is also necessary in the case of such a removal when the patient has received conscious sedation, oral conscious sedation, or general anesthesia. With the exception of patients to whom oral conscious sedation, conscious sedation, or general anesthesia was administered, removal to a hospital or emergency center that is the normal or expected treatment for the underlying dental condition is not required to be reported. Reports must be submitted to the Board on forms approved by the Board, with copies sent to the Dental Hygiene Board of California if an RDH was involved in the treatment (California Dental Practice Act, 2020e). The report, in cases in which the patient received anesthesia, must contain at least the following information:

- Procedure date.
- Patient's age in years and months, as well as weight and sex.
- Patient's American Society of Anesthesiologists (ASA) physical status.
- Patient's primary diagnosis.
- Any other diagnoses.
- Procedures performed.
- Setting in which sedation was performed.
- Medications employed.
- Monitoring equipment employed.
- Category of provider responsible for supervising sedation.
- Category of provider delivering sedation.
- Category of provider monitoring patient during sedation.
- Whether the person supervising sedation performed any of the procedures.

- What airway management was planned.
- What depth of sedation was planned.
- Complications.
- Description of unexpected occurrences in airway management.
- Whether the patient was sedated at any time during transportation.
- Category of provider performing resuscitation.
- Resuscitation equipment employed. (California Dental Practice Act, 2020e)

Disclosure of individually identifiable patient information must be consistent with applicable law, and the required report cannot be admissible in any action brought by a patient against the licensee. The form must state that the information is not an admission of guilt, but is to be used for educational, data, or investigative purposes (California Dental Practice Act, 2020e).

It should be noted that the death of a patient must be reported even in cases in which the dentist comes to believe well after the event that it was related to treatment by the dentist or the RDH.

Other permits

Special permits also are required to be a full-time professor, an associate professor, or an assistant professor for a California dental college (Dental Board of California, 2021j). Sections 1640 and 1640.3 of the Dental Practice Act set forth the requirements to qualify for, apply for, and renew such a permit, as well as the causes for revocation of this specialty permit. Other special permits include operating a mobile dental clinic, using a fictitious business name, or having an additional dental office.

Dental auxiliaries

There are different categories of dental assistants and dental hygienists, each with specific requirements regarding training and skills. Laws specifically define the duties that each category of auxiliary is allowed to perform, the level of dentist supervision required, and the settings in which the duties may be performed (Cal. Code Regs., 2002). It is a criminal offense to perform illegal functions, as well as grounds for license discipline of both the person performing the illegal function and any person who aids or abets such illegal activity.

According to the Dental Practice Act, Section 1684.5(d):

> *"A dentist shall not concurrently supervise more than a total of five registered dental assistants in extended functions, registered dental hygienists, or registered dental hygienists in alternative practice providing services pursuant to Sections 1753.55, 1910.5, and 1926.05."* (California Dental Practice Act, 2015)

Dental assistants

Scope of practice

A dental assistant is an individual who, without a license, may perform basic supportive dental procedures, as authorized by law and by regulations adopted by the Board, under the supervision of a licensed dentist. "Basic supportive dental procedures" are defined in Section 1750 of the Dental Practice Act as procedures that have technically elementary characteristics, are completely reversible, and are unlikely to precipitate potentially hazardous conditions for the patient being treated.

Since January 1, 2010, the scope of practice for dental assistants has included new and expanded duties and two new "add-on" specialty permits in orthodontics and dental sedation. All categories of dental assistants are eligible to obtain these specialty permits after completing the required instruction. In addition, licensure and license renewal requirements have changed for RDAs and RDAEFs. The Dental Board of California publishes a duty table available at https://www.dbc.ca.gov/formspubs/pub_permitted_duties.pdf, and it is shown in Appendix B.

Levels of supervision

For all categories of dental assistants, dentists retain the authority to determine which new duties their staff members can perform and on which patients these procedures are performed. The level of required supervision is determined by statute for the dental assistant and the RDAEF. For RDAs, the supervising dentist determines on an individual basis which allowable procedures may be completed under general supervision, and which must be completed under direct supervision.

In addition to documenting the permitted and prohibited duties of all licensed dental auxiliaries and dental assistants, the table shown in Appendix B designates four basic levels of supervision, using the letters **D**, **C**, **G**, and **DD**:

- **Direct** supervision, designated in Appendix B by the letter **D**, refers to supervision of dental procedures based on instructions given by a licensed dentist who must be physically present in the treatment facility during the performance of those procedures.
- Another type of supervision **(C)** allows the assistant to perform in a designated setting under the supervision of a dentist, RDH, or registered dental hygienist in alternate practice (RDHAP).
- **General** supervision, designated by the letter **G**, means that a duty is permitted based on instructions given by a licensed dentist, but does not require the physical presence of the supervising dentist during its performance.
- Finally, in the category designated **DD**, the dentist determines whether each procedure can be performed under general supervision, or whether direct supervision of the RDA is required. Exceptions to this category are found in Section 1777 of the Dental Practice Act, which states that direct supervision by the dentist or an RDH or RDHAP is necessary for an RDA or RDAEF engaging in (a) coronal polishing, (b) the application of topical fluoride, or (c) the application of sealants (after having completed a Board-approved course on the procedure) (California Dental Practice Act, 2009c).

There is another level of supervision that is not defined but is specified in the description of the actual duty by statute. In those cases, the patient must be seen by the supervising dentist after the duty is performed and before the patient is dismissed. Proof of that compliance requires that the supervising dentist sign off the chart note made by the dental auxiliary. It is a requirement that all supervising dentists be familiar with the permitted and prohibited duties of dental auxiliaries. Therefore, it is essential that supervising dentists review the dental duty tables.

Section 1753.7 of the Dental Practice Act also stipulates that a dentist may not simultaneously supervise more than three extended function dental assistants or extended function dental hygienists.

Unlicensed dental assistants

Although the dental assistant is an unlicensed dental professional, the employer of a dental assistant is responsible for ensuring that any dental assistant hired and in continuous employment for 120 days or more has already successfully completed, or successfully completes within a year of the date of employment, all of the following:

- A Board-approved two-hour course in the Dental Practice Act.
- A Board-approved eight-hour course in infection control.
- A course in basic life support (BLS) offered by an instructor approved by the American Red Cross (ARC) or the American Heart Association (AHA), or any other course approved by the Board as equivalent and that provides the student with the opportunity to engage in hands-on simulated clinical scenarios. Dental assistants must keep their BLS certifications current (The DALE Foundation, 2021).

Initial licensure: Registered dental assistants
Section 1752.1 of the Dental Practice Act states that a registered dental assistant applying for initial licensure must submit written evidence to the Board of one of the following eligibility requirements:

- Graduation from an educational program in registered dental assisting approved by the Board, and satisfactory performance on the Registered Dental Assistant Combined Written and Law and Ethics Examination administered by the Board.
- Evidence of completion of at least 15 months of satisfactory work experience as a dental assistant in California or another state, and satisfactory performance on the Registered Dental Assistant Combined Written and Law and Ethics Examination administered by the Board. "Satisfactory work experience" means the performance of the duties of a dental assistant in a competent manner as determined by the employing dentist, who shall certify to such satisfactory work experience in the application. The Board shall give credit toward the work experience referred to in this section to persons who have graduated from a dental assisting program in a postsecondary institution approved by the Department of Education or in a secondary institution, regional occupational center, or regional occupational program, even if it is not specifically approved by the Board. The credit shall equal the total weeks spent in classroom training and internship on a week-for-week basis. Graduates of programs not meeting established minimum criteria shall not qualify for satisfactory work experience as defined by this section.

Each applicant for RDA licensure must provide evidence of having successfully completed Board-approved courses in radiation safety and coronal polishing as a condition of licensure. The length and content of the courses is governed by applicable board regulations. In addition, individuals applying for RDA licensure must demonstrate satisfactory performance on the Registered Dental Assistant Combined Written and Law and Ethics Examination administered by the Board, and provide written evidence of successful completion within five years prior to application of all of the following:

- A Board-approved course in the Dental Practice Act.
- A Board-approved course in infection control (eight-hours).
- A course in BLS offered by an instructor approved by the ARC or the AHA, or any other course approved by the Board as equivalent.

(California Dental Practice Act, 2020g)

In 2017, the practical examination for dental assistants was suspended pending further study of several issues (Dental Board of California, 2017).

Initial licensure: Registered dental assistants in extended functions
Section 1753 of the Dental Practice Act states that an RDAEF must submit written evidence to the Board of all the following eligibility requirements:

- Current licensure as an RDA or completion of the requirements for licensure as an RDA.
- Successful completion of a Board-approved course in the application of pit and fissure sealants.
- Successful completion of either of the following:
  - An extended functions postsecondary program approved by the Board.
  - An extended functions postsecondary program approved by the Board to teach the duties that RDAEFs were allowed to perform prior to January 1, 2010, and a course approved by the Board in the procedures numbered (1), (2), (5), and (7) to (11) of the RDAEF duties specified in Section 1753.5.
- Passage of a written examination and a clinical or practical examination administered by the Board. The Board designates whether the written examination will be administered by the Board or by the Board-approved extended functions program.

(California Dental Practice Act, 2009b)

Registered dental hygienists

Scope of practice
Statutes and regulations specifically define the duties that each category of hygienist is allowed to perform, the level of dentist supervision required, and the settings in which the duties may be performed. The Dental Board of California does not provide a duty table for dental hygienists.

The practice of dental hygiene is defined as including "dental hygiene assessment and development, planning, and implementation of a dental hygiene care plan. It also includes oral health education, counseling, and health screenings" (California Dental Practice Act, 2009d).

The practice of dental hygiene *does not* include:

- Diagnosis and comprehensive treatment planning.
- Placing, condensing, carving, or removing permanent restorations.
- Surgery or cutting on hard and soft tissue – including, but not limited to, the removal of teeth.
- Cutting and suturing soft tissue.
- Prescribing medication.
- Administering local or general anesthesia or oral or parenteral conscious sedation; however, nitrous oxide and oxygen (whether administered alone or in combination with each other) or local anesthesia may be administered by a dental hygienist if he or she has been trained in these procedures and performs such procedures under the direct supervision of a licensed dentist after submitting evidence of satisfactory completion of an approved course of study to the Dental Hygiene Board.

(California Dental Practice Act, 2009d; California Dental Practice Act, 2020i)

An RDH may provide, without supervision, educational services, oral health training programs, and oral health screenings (California Dental Practice Act, 2021b). Unless otherwise specified by law, an RDH may perform any procedure or provide any service within the scope of his or her practice in any setting, as long as the procedure is performed or the service is provided under the appropriate level of supervision required. He or she must refer any screened patients with possible oral abnormalities to a dentist for a comprehensive examination, diagnosis, and treatment plan. An RDH who practices in a public health program may also apply fluoride and pit and fissure sealants without supervision (California Dental Practice Act, 2021b).

Sections 1909 and 1910 of the Dental Practice Act delineate the procedures that an RDH may perform under direct versus general supervision of a licensed dentist. An RDH may perform the following procedures under direct supervision of a licensed dentist after submitting evidence to the Dental Hygiene Board of California of satisfactory completion of an approved course of instruction in the procedure: (a) soft-tissue curettage; (b) administration of local anesthesia; and (c) administration of nitrous oxide and oxygen, whether administered alone or in combination with each other. General supervision is required for (a) preventive and therapeutic interventions, including oral prophylaxis, scaling, and root planing; (b) application of topical, therapeutic, and subgingival agents used for the control of caries and periodontal disease; (c) taking impressions for bleaching trays and application and activation of agents with nonlaser, light-curing devices; and (d) taking impressions for bleaching trays and placement of in-office tooth-whitening devices (California Dental Practice Act, 2020i; California Dental Practice Act, 2009e).

Initial licensure
According to Section 1917 of the Dental Practice Act, the Dental Hygiene Board of California grants initial licensure as a

registered dental hygienist to a person who satisfies all of the following requirements:

- Completion of an educational program for RDHs, approved by the Dental Hygiene Board, accredited by CODA, and conducted by a degree-granting, postsecondary institution.
- Within the preceding three years, satisfactory completion of the dental hygiene examination given by WREB or any other clinical or dental hygiene examination approved by the Dental Hygiene Board.
- Satisfactory completion of the National Dental Hygiene Board examination.
- Satisfactory completion of the California Law and Ethics examination as prescribed by the Dental Hygiene Board.
- Submission of a completed application form and all fees required by the Dental Hygiene Board.
- Satisfactory completion of Dental Hygiene Board-approved instruction in gingival soft-tissue curettage, nitrous oxide-oxygen analgesia, and local anesthesia.

An RDH who has not taken a clinical examination before the Dental Hygiene Board may obtain licensure by submitting to the Board of Dental Hygiene all of the following:

- Proof of a current license as an RDH issued by another state that is not revoked, suspended, or otherwise restricted.
- Proof that the applicant has been in clinical practice as an RDH or has been a full-time faculty member in an accredited dental hygiene education program for a minimum of 750 hours per year for at least five years preceding the date of his or her application under this section. The clinical practice requirement shall be deemed met if the applicant provides proof of at least three years of clinical practice and commits to completing the remaining two years of clinical practice by filing with the Dental Hygiene Board a copy of a pending contract to practice dental hygiene in any of the following facilities: (a) a licensed primary care facility or a primary care facility deemed exempt from licensure by Section 1206 of the Health and Safety Code, or (b) a clinic owned or operated by a public hospital or health system or a clinic owned by a hospital that maintains the primary contract with a county government to fill the county's role under Section 17000 of the Welfare and Institutions Code.
- Satisfactory performance on a California law and ethics examination and any examination that may be required by the Dental Hygiene Board.
- Proof that the applicant has not been subject to disciplinary action by any state in which he or she is or has been previously licensed. If an applicant has been subject to disciplinary action, the Dental Hygiene Board will review the action to determine if it warrants refusal to issue a license.
- Proof of graduation from a school of dental hygiene accredited by CODA.
- Proof of satisfactory completion of the National Board Dental Hygiene Examination and of a state or regional clinical licensure examination or any other dental hygiene examination approved by the Dental Hygiene Board.
- Proof that the applicant has not failed the state clinical examination, the WREB examination, or any other clinical dental hygiene examination approved by the Dental Hygiene Board for licensure to practice dental hygiene under this chapter more than once or once within five years prior to the date of his or her application for a license under this section.
- Documentation of completion of a minimum of 25 units of CE earned in the two years preceding application, including completion of any CE requirements imposed by the Dental Hygiene Board on RDHs licensed in this state at the time of application.
- Any other information as specified by the Dental Hygiene Board to the extent that it is required of applicants for licensure by examination under this article.

(California Dental Practice Act, 2021c)

The Dental Hygiene Board may periodically request verification of compliance with the clinical practice requirement, and may revoke a license if the requirement has not been met (California Dental Practice Act, 2021c).

The Dental Hygiene Board provides in the application packet to each out-of-state dental hygienist pursuant to this section the location of dental manpower shortage areas in the state, and any nonprofit clinics, public hospitals, and accredited dental hygiene education programs seeking to contract with licensees for dental hygiene service delivery or training purposes (California Dental Practice Act, 2021c).

Registered dental hygienists in alternative practice

Scope of practice

Unless specifically so provided by regulation, an RDHAP may not perform any activity that represents the practice of dentistry or requires the knowledge, skill, and training of a licensed dentist. Under the supervision of a licensed dentist, an RDHAP may perform the duties assigned to RDHs under the same levels of supervision and in the same settings. In addition, an RDHAP may perform these same RDH duties independently and without the supervision of a licensed dentist upon a written prescription for dental hygiene services issued by a dentist or physician and surgeon licensed to practice in California (Cal. Code Regs., 2000b).

Under Section 1925 of the Dental Practice Act, an RDHAP may practice as:

- An employee of a dentist.
- An employee of another RDHAP.
- An independent contractor.
- A sole proprietor of an alternative dental hygiene practice.
- An employee of a primary care clinic or specialty clinic that is licensed pursuant to Section 1204 of the Health and Safety Code.
- An employee of a clinic owned or operated by a public hospital or health system.
- An employee of a clinic owned and operated by a hospital that maintains the primary contract with a county government to fill the county's role under Section 17000 of the Welfare and Institutions code.
- An employee of a professional corporation under the Moscone-Knox Professional Corporation Act.

(California Dental Practice Act, 2021e)

An RDHAP may perform his or her duties in residences of the homebound; in schools; residential facilities and other institutions and medical settings to which a residential facility patient has been transferred for outpatient services; and in dental health professional shortage areas, as certified by the Office of Statewide Health Planning and Development (California Dental Practice Act, 2021f).

An individual licensed as an RDH, RDHAP, or RDHEF as of December 31, 2005, is authorized to perform the duties of an RDA. However, an individual licensed as an RDH, RDHAP, or RDHEF on or after January 1, 2006, must qualify for and receive licensure as an RDA in order to perform the duties of an RDA (California Dental Practice Act, 2010).

Initial licensure

Increasing the number of licensed RDHAPs in the state was intended to improve the quality of health care for the citizens of California.

Under Section 1922 of the Dental Practice Act, applicants for RDHAP licensure are generally required to demonstrate satisfactory performance on an examination in California law and ethics required by the Dental Hygiene Board.

The applicant must also meet either of the following requirements:

a. Holding a current California RDH license and having been engaged in clinical practice as a dental hygienist (in California or another state) for a minimum of 2,000 hours during the immediately preceding 36 months, and possessing a bachelor's degree or its equivalent. This degree

is recognized as a minimum of 120 semester credit hours or 180 quarter credit hours in postsecondary education, from a college or institution of higher education that is accredited by a national or regional accrediting agency recognized by the U.S. Department of Education. The applicant must also have completed a minimum of 150 hours of approved educational requirements, as prescribed by the Dental Hygiene Board, that are consistent with good dental and dental hygiene practice, including, but not limited to, dental hygiene technique and theory, including gerontology, medical emergencies, and business administration and practice management.

b. Having received a letter of acceptance into the employment utilization phase of the Health Workforce Pilot Project No. 155, established by the Office of Statewide Health Planning and Development (Health and Safety Code, Division 107, Chapter 3, Article 1) (California Dental Practice Act, 2021d).

However, any RDH who completed the required RDHAP coursework under the Health Manpower Pilot Project and established an independent practice by June 30, 1997, does not need to comply with the preceding requirements; such an RDH is deemed to have satisfied the licensing requirements as an RDHAP and may continue to operate his or her present practice under certain conditions set forth in Section 1924 of the Dental Practice Act (California Dental Practice Act, 2009f).

Documentation of dentist relationship

Prior to establishing an independent practice, an RDHAP is required to provide to the Dental Hygiene Board documentation of an existing relationship with at least one dentist for referral, consultation, and emergency services (California Dental Practice Act, 2020j).

Permit for a dental sedation assistant

The Board may issue a dental sedation assistant permit upon receipt of a fee and a completed application as well as evidence of:

- At least 12 months of dental assistant work experience.
- Successful completion of one Board-approved course each in the Dental Practice Act and infection control.
- Successful completion of a basic life support course offered by an instructor approved by either the ARC or the AHA, or of another course approved as an equivalent by the Board.
- After six months experience working as a dental assistant, successful completion of a dental sedation assistant course approved by the Board.
- After completing all other requirements, passing a Board-administered written examination.
- Fingerprint clearance.

(Dental Board of California, 2021e)

The Dental Board of California provides a Web page with complete information on this process at https://dbc.ca.gov/applicants/become_licensed_dsa_oa.shtml.

Permit for an orthodontic assistant

The Board may issue an orthodontic assistant permit upon receipt of a fee and a completed application, as well as evidence of:

- At least 12 months of dental assistant work experience.
- Successful completion of one Board-approved course each in the Dental Practice Act and infection control.
- Successful completion of a basic life support course offered by an instructor approved by either the ARC or the AHA, or of another course approved as an equivalent by the Board.
- After six months experience working as a dental assistant, successful completion of an orthodontic assistant course approved by the Board.
- After completion of all other requirements, passing a Board-administered written examination.
- Fingerprint clearance.

(Dental Board of California, 2021e)

The Dental Board of California provides a Web page with complete information on this process at https://dbc.ca.gov/applicants/become_licensed_dsa_oa.shtml.

LICENSE RENEWAL

The licenses of all California dental professionals expire every two years, on the last day of the licensee's birth month (California Dental Practice Act, 1976). To renew their license(s), dental professionals must meet the requirements for license renewal imposed by the Board, which now include reporting (a) the completion of any CODA-accredited advanced educational programs in a dental specialty recognized by the ADA and (b) information on their practice or employment status (California Dental Practice Act, 2013b). The Board regulations on license renewals also address situations in which a license has already expired, is inactive, or has been revoked or suspended (California Dental Practice Act, 2020k).

Continuing education requirements

According to Section 5 of the California Dental Association Code of Ethics, dentists have the obligation to advance their knowledge and keep their skills freshened by CE throughout their professional lives (California Dental Association, 2017). In order to renew his or her license in California, a dental professional must maintain a high level of clinical skills and remain knowledgeable of advances in techniques and technology through CE programs and workshops.

The Board governs the license renewal and CE requirements of dentists and dental assistants, whereas the Dental Hygiene Board of California governs this area for dental hygienists. All licensees in California must complete a specified number of CE units every renewal cycle, based on the type of license held. On the renewal form, the licensee must certify having completed the required number of hours of CE.

Each dentist must complete 50 CE hours, RDAs and RDHs must complete 25 CE hours, and RDHAPs must complete 35 CE hours. Continuing education units are not required for the very first renewal after a license is first issued (Cal. Code Regs., 2010b).

It should be noted that certain waivers of renewals were temporarily applied during the COVID-19 public health emergency. For details, see the Dental Board of California Web page at https://www.dbc.ca.gov/licensees/covid19.shtml.

Table 1 shows the number of units of CE required for different licensees.

In addition to stipulating the total number of hours of CE required for license renewal, the Dental Practice Act imposes various requirements or restrictions on course content. Subject matter should be designed to enhance clinical practice. Coursework must be "designed and delivered in a manner that serves to directly enhance the licensee's knowledge, skill, and competence in the provision of service to patients or the community" (Cal. Code Regs., 2010a). Licensees holding a special permit are required to include a specified number of CE units related to their permit area as part of (not in addition to) their total CE units. For licensees holding more than one license or permit, fulfilling the license or permit that requires the largest number of CE units will satisfy all of the licensee's renewal requirements (Cal. Code Regs., 2010b).

Section 1016 defines a "course of study" to mean:

> *An orderly learning experience in an area of study pertaining to dental and medical health, preventive dental services, diagnosis and treatment planning, clinical procedures, basic health sciences, dental practice management and administration, communication, ethics, patient management, or the Dental Practice Act and other laws specifically related to dental practice* (Cal. Code Regs., 2010a).

Table 1: Continuing Education Hours Required		
Type of Licensee and/or Permit Holder	**CE Units Required***	**Distribution of Total CE Units**
Dentist	50 units	All licensees must complete (a) two units of CE in infection control specific to California regulations, (b) two units of CE in the California Dental Practice Act and related regulations, and (c) a maximum of four units of a course in BLS. Up to 50% of a licensee's total required units may be obtained through nonlive, noninteractive courses.** All licensees must retain certificates of CE course completion for a period of three renewal periods (6 years) and provide certifications to the Board only upon request for audit purposes.
RDA	25 units	
Dental sedation assistant permit holder	25 units	
Orthodontic assistant permit holder	25 units	
RDAEF	25 units	
RDH	25 units	
Registered dental hygienist in extended functions (RDHEF)	25 units	
RDHAP	35 units	
Additionally Required as Part of Total CE Units		
Dentist who holds a general anesthesia permit.	(a) An advanced cardiac life support course that is approved by the AHA; or (b) any other advanced cardiac life support course that is identical in all respects, except for the omission of materials that relate solely to hospital emergencies or neonatology to the "2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care."	
Dentist who holds a conscious sedation permit.	A minimum of 15 total units of CE related to the administration of conscious sedation and to medical emergencies.	
Dentist who holds an oral conscious sedation permit for minors.	A minimum of seven total units of CE related to the subject area.	
Dentist who holds an oral conscious sedation permit for adults.	A minimum of seven total units of CE related to the subject area.	
* Per biennial or permit renewal period **On February 17, 2012, the Director waived the 50% maximum under certain circumstances, pursuant to the governor's Executive Order N-39-20, which was issued in response to the COVID-19 emergency. The order was effective immediately but may be amended as circumstances require. Under this order, the 50% maximum does not apply if the nonlive instruction consists of courses that allow participants to interact concurrently with instructors or presenters who are observing the courses.		

Although the earlier dichotomy of Category I and Category II courses has been eliminated, the CE regulations that became effective on April 8, 2010, continue to restrict or prohibit certain types of CE courses. Under the current regulations, courses are treated differently depending on their allocation into one of four groups:

- Mandatory courses.
- Courses in the actual delivery of dental services.
- Courses primarily for the benefit of the licensee.
- Courses of direct benefit to the licensee or outside the scope of practice.

(Cal. Code Regs., 2010a)

Mandatory courses

All licensees must complete certain mandatory courses. These courses count toward the total number of units required to renew a license or permit. However, if a licensee fails to complete all the mandatory courses, he or she will not be allowed to renew a license or permit, regardless of the number of total units of CE obtained.

Courses required by the Board for license renewal for all dentists and dental auxiliaries are:

- Two units of CE in a Board-approved course on infection control (including all content of Section 1005 and the application of the regulations in the dental environment).
- Two units of CE in a Board-approved course on the California Dental Practice Act.
- Certification in basic life support met by completion of a maximum of four units of a course approved by the AHA or ARC, or offered by a provider approved by the ADA or the Academy of General Dentistry (AGD).

(Cal. Code Regs., 2010a; Cal. Code Regs., 2010b)

Courses in the actual delivery of dental services

Courses in the actual delivery of dental services to the patient or the community, which the Board considers to be the main focus of CE, are referred to as core courses. These courses include a wide range of topics as detailed in Appendix C.

Courses primarily of benefit to the licensee

Courses that are primarily of benefit to the licensee may not exceed 20% of the licensee's total units in any given license or permit renewal period. These courses deal with business administration, operations, and management, as outlined in Appendix C.

Courses ineligible for credit

Courses considered to be ineligible for CE credit are those courses of direct benefit to the licensee or outside of the scope of dental practice. Examples of these courses are also listed in Appendix C.

Meeting continuing education requirements

- The regulations that took effect in 2010 now allow licensees to take courses for CE credit, *other than the mandatory courses*, from any provider approved by the ADA Continuing Education Recognition Program (CERP) or the AGD Program Approval for Continuing Education (PACE) (Cal. Code Regs., 2010a).

Continuing education requirements may be met in a number of ways. All CE hours may be obtained through courses, with the following caveat: Under normal circumstances, tape-recorded courses, home study materials, video courses, and computer courses are considered correspondence courses and, if from approved providers, are accepted for credit for only up to 50% of the total required hours. However, on February 17, 2021, effective immediately, this maximum was waived for courses for which the participants were able to concurrently interact with observing instructors or presenters. (See https://www.dbc.ca.gov/licensees/covid19.shtml for details.) In contrast, interactive instruction courses, such as live lectures, live telephone conferencing, live video conferencing, or live classroom study from registered providers, are accepted for full credit. Up to 20% of a licensee's total CE units may be obtained through other approved activities, including certain types of examinations, site visits, trainings, or evaluations (Cal. Code Regs., 2010b).

Any licensees who do not adhere to the CE provisions of the Dental Practice Act will be denied renewal of their licenses. A licensee who has not practiced in California for more than one year because he or she is disabled is not required to comply with the CE requirements during the renewal period within which such disability falls. However, the licensee must pay the required renewal fee. The licensee must certify in writing that he or she is eligible for a waiver of the CE requirements due to a disability. All CE requirements resume when the dental professional is no longer eligible for the waiver (Cal. Code Regs., 2010b).

A licensee must retain, for a period of three renewal periods, the certificates of course completion issued to him or her at the time of completing the course, and must forward these certificates to the Board only upon request by the Board for audit purposes (Cal. Code Regs., 2010b). A licensee who fails to retain a certification must contact the provider to obtain a duplicate certification.

Other conditions for licensing and renewal

Fingerprinting

As a condition of renewal of a license, all licensees who were first licensed prior to January 1, 1999, are required under CCR Section 1008 to have a full set of fingerprints on file with the Department of Justice for the purpose of conducting a criminal history record check. A licensee must disclose whether, in the prior renewal cycle, he or she has been convicted of any violation of the law in any state or country, omitting traffic infractions under $1,000 not involving alcohol, dangerous drugs, or controlled substances (Cal. Code Regs., 2011b). If requested by the Board, the licensee must provide a criminal history report within 30 days. In addition, a licensee must disclose any disciplinary actions against any other license he or she may hold (Cal. Code Regs., 2011a) Use of electronic fingerprinting has been a required component of license renewal since 2011. Fingerprints must be recorded using the Live Scan service in California. Paper fingerprint cards no longer fulfill this legal requirement. (Please see https://dhbc.ca.gov/licensees/fingerprint_req.shtml for more details.)

Failure to pay taxes

The Board is required to deny an application for licensure or to suspend a license/certificate/registration if a licensee or applicant has outstanding tax obligations owed to the California Franchise Tax Board (FTB) or the State Board of Equalization (BOE), and appears on either the FTB or BOE's certified lists of top 500 tax delinquents over $100,000. The applicant or licensee will have 90 days from the issuance of a preliminary notice of suspension to either satisfy all outstanding tax obligations or enter into a payment installment program with the FTB or BOE. Any person who fails to come into compliance will have his or her license denied or suspended until the Board receives a release from the FTB or BOE. The Board is prohibited from refunding any money paid for the issuance or renewal of a license when the license is denied or suspended as required for failure to pay taxes (California Department of Consumer Affairs, 2021).

PRESCRIPTIVE PRIVILEGES

According to the Dental Practice Act, dentistry includes the diagnosis or treatment of "diseases and lesions and the correction of malpositions of the human teeth, alveolar process, gums, jaws, or associated structures; and such diagnosis or treatment may include all necessary related procedures *as well as the use of drugs, anesthetic agents,* and physical evaluation …" (California Dental Practice Act, 2020c) (italics added).

A dentist may legally use, prescribe, or provide a controlled substance only:

- In the ordinary course of his or her professional practice.
- For an individual under his or her treatment.

A dentist may use any legally prescribed drug (or prescribe such drug) to treat patients as long as the treatment is within this delineated scope of practice. For example, a licensed California dentist who holds a valid permit to perform elective facial cosmetic surgery may administer Botox and similar drugs purely for cosmetic purposes as long as they are legally prescribed and within the scope of practice for the permit that he or she holds. The anatomical scope of practice limitations imposed by B&P Section 1625 mean that a dentist cannot prescribe drugs for a non-dental purpose, even though the dentist is allowed by statute to prescribe that drug.

To write prescriptions for controlled substances, a dentist must have a Drug Enforcement Administration (DEA) number issued by the U.S. Department of Justice. Division 10 of the California Health and Safety Code governs the form and content of prescriptions (Cal. Health & Safety, 2021). All written prescriptions for Schedule II through V controlled substances must be written on tamper-resistant prescription forms that contain a number of features designed to prevent fraud. Starting on January 1, 2021, California state law has required 15 elements to appear on California Security Prescription Forms. These forms must be produced by printers licensed by the California Department of Justice. (For details, see https://www.dbc.ca.gov/licensees/prescription_pads_101.shtml.) Dental assistants and RDHs cannot prescribe drugs.

It is a violation of the Dental Practice Act for a dentist to self-prescribe any controlled substances as defined in Division 10 (commencing with Section 11000) of the Health and Safety Code, or any dangerous drug as defined in Article 8 (commencing with Section 4211) of Chapter 9 (B&P 1681[a]).

According to Health and Safety Code 11190, prescribers of Schedule II medications must document not only the basic information concerning type, quantity, and dose, but also the pathology and purpose for which the drug is being prescribed (Cal. Health & Safety, 2007).

In California, all healthcare practitioners, including dentists, who are authorized to prescribe Schedule II through IV controlled substances, are required to register to use the Controlled Substance Utilization Review and Evaluation System, CURES 2.0 (Dental Board of California, n.d.a), California's prescription drug monitoring program. This program allows prescribers and dispensers to view patient reports, send peer-to-peer communications, and receive patient alerts (Dental Board of California, 2021b).

CITATIONS, FINES, REVOCATION, AND SUSPENSION

When exercising its licensing, regulatory, and disciplinary functions, the Board holds as its highest priority the protection of the public. To achieve this goal, the Board investigates complaints against licensees and disciplines and monitors those licensees found to be in violation of the Dental Practice Act. Any licensee may have his or her license revoked or suspended, or may be reprimanded or placed on probation by the Board for unprofessional conduct, incompetence, gross negligence, or repeated acts of negligence in his or her profession (California Dental Practice Act, 2009a). The Board may also revoke or suspend a license, or reprimand or place a licensee on probation, for violations of the Dental Practice Act and for conviction of a crime substantially related to that licensee's qualifications, functions, or duties. The Board has the power to impose certain terms and conditions on a licensee's probationary status, including obtaining additional training or passing an examination, submitting to diagnostic examination, limiting a licensee's scope or type of practice, and requiring restitution of fees or completion of community service (California Dental Practice Act, 2009a).

The term *unprofessional conduct* includes a long list of actions punishable by fines and/or imprisonment, such as fraud; misrepresentation; aiding or abetting the unlicensed or unlawful practice of dentistry; practicing outside the scope of practice; sexual abuse, sexual misconduct, or sexual relations with a patient (unless the licensee is married to, or in a recognized domestic relationship with, the patient [B&P 726]); fee kickbacks; false or misleading advertising (which includes guaranteeing a result or painless treatment [B&P 1680h,l]); employing or making use of solicitors (B&P 1680j); altering patient records with intent to deceive; violations of laws regulating the procurement, dispensing, or administration of dangerous drugs or controlled substances and prescribing excessive medications (typically the failure to document the pathology and purpose of a prescription of a Schedule II or Schedule III medication); and any violation of the Dental Practice Act (B&P 1680n).

For a full list of the acts and omissions that constitute unprofessional conduct, see Sections 726, 1680, 1681, 1682, and 1700 through 1706 of the Dental Practice Act. As a result of amendments adopted by the California Legislature in 2012, unprofessional conduct is further defined in the CCR under Section 1018.05 and the Board is given power to require a prospective licensee to submit to a mental or physical examination under Section 1020.

Concerning sexual misconduct, if a dentist or licensed staff person is convicted of such a crime, California Code of Regulations Section 1018 indicates that the Board may refuse to renew the individual's license.

California Code of Regulations section 1005 sets forth the minimum standards for infection control in the dental office. Failure to abide by these well-recognized standards is a violation of the Dental Practice Act and subjects the owner of the practice to sanctions. Therefore, failure to maintain the standards for infection control is more typically sanctioned by the Dental Board of California rather than by Cal/OSHA. The most common reason for an audit of infection control performance of an office is a complaint by an employee, or less frequently, by a patient. Because infection control is a required course for every licensee, ignorance of the requirements and appropriate implementation are inexcusable in most cases.

In October of 2017, Governor Brown signed Assembly Bill No. 1277, adding Section 1601.6 to the Business and Professions Code. This new law ordered the Board to amend the minimum standards of infection control to require that "water or other methods used for irrigation … be sterile or contain recognized disinfecting or antibacterial properties when performing dental procedures that expose dental pulp." The law ordered that final regulations be adopted on or before the end of December 2018 (California Legislative Information, 2017). However, the law was repealed by the passage of Senate Bill 1491, which instead made "using water, or other methods used for irrigation, that are not sterile or that do not contain recognized disinfecting or antibacterial properties when performing dental procedures on exposed dental pulp unprofessional conduct by a person licensed pursuant to the Dental Practice Act" (Birschbach, 2019).

Business and Professions Code 1706 provides that:

- Every complete upper or lower denture fabricated by a licensed dentist, or fabricated pursuant to the dentist's work order, shall be marked with the patient's name, unless the patient objects. The patient's initials may be shown alone, if use of the patient's name is not practical. The markings shall be done during fabrication and shall be permanent, legible, and cosmetically acceptable. The exact location of the markings and the methods used to implant or apply them shall be determined by the dentist or dental laboratory fabricating the denture.
- The dentist shall inform the patient that the markings are to be used for identification only and that the patient shall have the option to decide whether or not the dentures shall be marked.
- The dentist shall retain the records of those marked dentures and shall not release the records to any person except to enforcement officers, in the event of an emergency requiring personal identification by means of dental records, or to anyone authorized by the patient. The primary purposes of the statute have to do with management of patients in nursing homes and for forensic identification.

Section 1700(c) of the Dental Practice Act stipulates that a person may be guilty of a misdemeanor and subject to disciplinary action if he or she "engages in the practice of dentistry without causing to be displayed in a conspicuous place in his or her office the name of each and every person employed there in the practice of dentistry." Elsewhere the law provides that, while working, a healthcare professional must display his or her name and license status printed on a nametag in type that is at least 18-point or display his or her license prominently in a practice or office (California Dental Practice Act, 2013a).

Dental healthcare providers who violate the California Dental Practice Act may be subject to fines or imprisonment or both, depending on the nature and seriousness of the violation. Such violations may also result in temporary suspension of licenses, required educational programs, or permanent license revocation (California Dental Practice Act, 2020d).

As of July 1, 2020, per Section 1673, in the case of certain violations, the Board requires a licensee to provide patients or patients' guardians or healthcare surrogates with a separate disclosure that includes the licensee's probation status, along with details and the Board's telephone number, and an explanation of how patients can find further information on the licensee's profile page on the Board's online license information website. The information must be provided before a patient's first visit following the probationary order while the licensee is on probation pursuant to a probationary order made on or after July 1, 2020. Section 1673 lists several situations in which this information need not be presented.

JURISPRUDENCE, ETHICS, AND MALPRACTICE

Every state board of dental examiners has developed a set of individualized laws that govern the practice of dental professionals operating within their respective states. These strictly enforced laws are not considered ethics; they are considered *dental jurisprudence*. Problems with recordkeeping and communication are frequently the basis for dental

malpractice claims. Professional liability issues most frequently raised in lawsuits against dentists involve prosthodontics, endodontics, restorative dentistry, diagnosis, and oral surgery (Hapcook, 2006).

Charges filed against dental healthcare workers can stem from events ranging from mundane acts or omissions to wrongful death. But not all charges result from breaching laws. Sometimes charges are filed as the result of ethically inappropriate actions. Understanding the difference between what is ethical and what is legal is sometimes difficult. Sometimes malpractice claims involve both ethical and legal violations.

The ADA Code of Ethics is a document that reflects the unwritten contract between the dental profession and society. The ADA defines *ethics* as the principles of the moral code under which the dental profession operates. One example of an ethical violation involves a situation in which a patient is not informed of the available treatment options and therefore cannot make an informed decision. The California Dental Association's "Code of Ethics" specifically states:

> *Fully informed consent is essential to the ethical practice of dentistry and reflects the patient's right of self-decision. Except as exempted by state law, a dentist has the obligation to obtain the fully informed consent of the patient or the patient's legal guardian prior to treatment, or the use of any identifiable artifacts (such as photographs, X-rays, study models, etc.) for any purpose other than treatment. Informed consent is also required when using a human subject for research* (California Dental Association, 2017).

If the patient is not fluent in a language that the dentist speaks, however, it is not possible for the dentist to obtain fully informed consent. In their Legal Reference Guide, the California Dental Association offers some ideas on how to handle such a situation (Chapter 5, 121: https://www.cda.org/Home/Practice/Practice-Support/Resource-Library/legal-resources-legal-reference-guide-chapter-5-patient-considerations).

The dentist is also required to provide a full explanation of treatment. The California Code goes on to state:

> *A dentist has the obligation to fully explain proposed treatment, reasonable alternatives, and the risks of not performing treatment to the patient. The dentist shall explain treatment in a manner that is accurate, easily understood, and allows patients to be involved in decisions affecting their oral health or their participation in a research project* (California Dental Association, 2017).

The ethical principle of autonomy is also relevant in situations in which the dentist's ability to comprehend the patient's request is hindered by a language barrier. In these circumstances, the dentist may be inclined to make unilateral decisions regarding the delivery of care, being unable to completely understand the patient's communication. Autonomy dictates that the patient has the right to determine what treatment he or she wants to receive. Respect for the patient's autonomy affirms the doctor-patient relationship and forms the foundation for informed consent. The patient's right to self-determination is not absolute, however, and it must be weighed against contemporary standards of oral health care (California Dental Association, 2017).

Those who violate the California Dental Association Code of Ethics are subject to examination by their local and constituent societies, typically the peer-reviewed committee of their local society (California Dental Association, 2017). If a satisfactory decision cannot be reached, an appeal is made, and the violation is referred to a higher authority: the Council on Ethics, Bylaws, and Judicial Affairs of the ADA. This procedure was established to ensure that all dentists carry out their professional lives and practices in accordance with the highest standards to which dentistry is held.

The internal workings, documentation, and decision of a peer review committee of the California Dental Association are not subject to discovery in civil litigation (Evidence Code 1157.5). This means that if a patient sues a dentist for malpractice after filing a claim with a peer-reviewed committee, the results of peer review are not admissible in that lawsuit.

Privacy

Electronic communication (email) to patients and other healthcare providers must be secure, and any breaches must be reported according to California Civil Code Section 1798.82 as well as federal law (the Health Insurance Portability and Accountability Act of 1996 [HIPAA] and the Health Information Technology for Economic and Clinical Health [HITECH] Act of 2009). The HITECH Act requires that emails between patients and healthcare providers (including dentists) be encrypted.

Advertising

With new developments in dentistry and the evolution of both dental and communications technology, dental practices are competing in ever-expanding arenas. Advertising the myriad services that dentists provide can become complex and may confuse the general population. Advertising is defined to include "any written or printed communication for the purpose of soliciting, describing, or promoting a dentist's licensed activities" (Cal. Code Regs., 2000a). Advertising includes radio, television, and computer network or other electronic transmission, as well as printing on any dental-care or novelty item used to promote a dental practice.

The fees for dental procedures may be included in advertising, but the fee schedule must be explicit. The cost for each service must be clearly explained, and any additional service that is not included in the cost must also be disclosed. When a discount is being offered, all terms must be covered, including the amount of time the discount will be available and all the criteria for obtaining it. Any advertisement must be capable of substantiation – in particular, the services offered must actually be delivered, and at the fees advertised. If a dentist chooses to include patients in the advertisement, the patients cannot make claims of the dentist's professional superiority or discuss any dental condition or their recovery from it. A dental practice that includes the fabrication of dentures in its advertisement must disclose whether the dentures are preformed, custom-made, or immediate, and must include all costs, including the costs of any later-needed services such as relining. Prices may be included for various grades of dentures, provided they are not misleading. If a practitioner claims to be a specialist, his or her credentials must conform to the Board-certified specialties recognized by the ADA and the State of California. These specialties include those overseen by the American Boards of Pediatric Dentistry, Orthodontics, Prosthodontics, Oral Pathology, Periodontology, Endodontics, Oral and Maxillofacial Surgery, and Dental Public Health (Cal. Code Regs., 2016). It is unprofessional conduct and a violation of the Dental Practice Act for a licensee to advertise professional superiority or to advertise the performance of professional services in a superior manner (B&P 1680i). To guarantee a result or to promise that the dentistry will be completely painless is always considered to be deceptive advertising (B&P 1680l).

Providing services on credit

According to California Dental Code Section 654.3, a dentist must, before arranging or establishing a loan or credit for dental services, present to the patient for signature a document that contains specific, mandated wording. The document needs to be on one page or one screen, and it must appear in type that is at least 14 points in size (California Dental Practice Act, 2021a). Appendix D of this course reproduces the required document as it appears in the California Dental Code.

Mandatory reporter obligations and identifying abuse

Originally passed in 1980, California Penal Code Sections 11164 through 11174.3, known collectively as the Child Abuse and Neglect Reporting Act, were instituted to protect children from abuse and neglect, and to consider the physical and psychological needs of the child victim. Under Section 11166 of this code, certain healthcare professionals are mandated to report known or suspected child abuse or neglect. Such professionals include dentists and dental hygienists, and any other person who is currently licensed under Division 2 (commencing with Section 500) of the B&P (Child Abuse and Neglect Reporting Act, 2021).

Any such dental professional who "has knowledge of or observes a child, in his or her professional capacity or within the scope of his or her employment whom the mandated reporter knows or reasonably suspects has been the victim of child abuse or neglect" must report the known or suspected abuse to certain specified agencies (including any police department or sheriff's department or the county welfare department) immediately or as soon as practically possibly by telephone and prepare and send a written report within 36 hours of receiving the information concerning the abuse (Child Abuse and Neglect Reporting Act, 2019).

For purposes of reporting, "reasonable suspicion" is defined to mean that "it is objectively reasonable for a person to entertain a suspicion, based upon facts that could cause a reasonable person in a like position, drawing, when appropriate, on the person's training and experience, to suspect child abuse or neglect." Reasonable suspicion does not require certainty of the abuse or neglect, nor does it require a specific medical indication of such abuse or neglect (Child Abuse and Neglect Reporting Act, 2019).

Signs of child abuse may include:

- Withdrawal from friends or activities.
- New behaviors such as aggression, anger, hostility, or hyperactivity.
- Changes in school performance.
- Depression, anxiety, or unusual fears.
- A sudden loss of self-confidence.
- A seeming lack of supervision.
- Frequent absences from school.
- Reluctance to leave school activities, which may be a reluctance to go home.
- Trying to run away.
- Rebelliousness or defiance.
- Self-harm or suicide attempts.

(Mayo Clinic, 2018)

One sign of abuse that a dentist might find is evidence of sexually transmitted disease in the oral cavity of a minor below the age of consent. According to California Penal Code Section 11171.2(a), a dentist may take X-rays of suspected abuse of the oral cavity without the consent of a parent or guardian.

Any mandated reporter who fails to report an incident of known or reasonably suspected child abuse or neglect as required by law is guilty of a misdemeanor punishable by up to 6 months in jail, or a fine of one thousand dollars ($1,000), or both (Child Abuse and Neglect Reporting Act, 2009). As cited above, conviction of a crime is unprofessional conduct and subjects a licensee to sanctions. Furthermore, violation of reporter mandates can subject a healthcare provider to civil liability.

Under the Welfare and Institutions Code (Section 15600 et seq.), the State of California recognizes that elders and dependent adults may be subjected to abuse, neglect, or abandonment, and that this state has a responsibility to protect these persons. Section 15630 of that code extends mandatory reporter status to health practitioners in cases of known or suspected instances of elder abuse or neglect. Broadly defined, elder abuse may include:

- **Physical abuse**: Which is defined as inflicting physical pain or injury, can involve restraining through physical or chemical means, in addition to actual physical violence.
- **Sexual abuse**: Which is non-consensual sexual contact of any kind.
- **Neglect**: Which can involve the failure by those responsible to provide a vulnerable older adult with food, shelter, health care, or protection.
- **Exploitation**: Which is the illegal taking, misuse, or concealment of funds, property, or assets of an older adult, not for the benefit of the older adult.
- **Emotional abuse**: Which involves inflicting mental pain, anguish, or distress on an older adult through verbal or nonverbal acts such as humiliation, intimidation, or making threats.
- **Abandonment**: Which is the desertion of a vulnerable elder by anyone who has assumed the responsibility for the person's care or custody.
- **Self-neglect**: Which is the failure of a vulnerable older person to perform essential self-care tasks to the extent that his or her health or safety are in danger

(U.S. Department of Health and Human Services, 2019)

Telltale signs of elder abuse may include:

- Bruises, pressure marks, broken bones, abrasions, or burns.
- Unexplained withdrawal from normal activities, a sudden change in alertness, and unusual depression.
- Bruises around the breasts or genital area (sexual abuse).
- Sudden changes in financial situations (exploitation).
- Bedsores, unattended medical needs, poor hygiene, and unusual weight loss (neglect).
- Spouse's belittling, threatening, or other controlling behaviors.
- Strained or tense relationships and frequent arguments between the caregiver and the older adult.

(U.S. Department of Health and Human Services, 2019)

Reports must be made to an adult protective services agency or the local law enforcement agency. Failure of a mandated reporter to report suspected elder abuse and/or neglect is a misdemeanor. Any mandated reporter who willfully fails to report physical abuse, abandonment, isolation, financial abuse, or neglect of an elder or dependent adult, in violation of this section, where that abuse results in death or great bodily injury, will be punished by not more than 1 year in a county jail or by a fine of not more than five thousand dollars ($5,000), or by both a fine and imprisonment (Elder Abuse and Dependent Adult Civil Protection Act, 2014).

In the event that the licensee makes a good-faith and confidential report of suspicion of child abuse to the appropriate agency, such as child protective services or the police department, and such suspicions prove to be false, the reporter is immune from claims of defamation (Penal Code section 11172). This same holds true for mandated reporters of elder abuse, per Welfare and Institutions Code Section 15634.

Poster requirements

The Dental Practice Act requires that the dentist place in various locations within the dental office or place of practice a variety of posters providing patient information and information from the Dental Practice Act. An authorized poster of the Dental Practice Act must be placed in a common area, such as a lunchroom or break room, attended by staff. This would generally be the same location as other posters required by the labor laws of the State of California (CCR 1068). In addition, at entrances to offices with more than 10 employees, the licensee dentist employer who uses mercury-based filling material, nitrous oxide, or bisphenol A must place a poster warning of the effects of such materials or gas (California Dental Association, 2018). (See Appendix E.)

All dental offices must also display a poster in the waiting room advising patients that dental services provided at that location

are subject to regulation of the Dental Board of California (California Code of Regulations 1065), and the poster must provide the Board's contact information. (See Appendix F) (Dental Board of California, n.d.b). If the office employs the services of dental hygienists, a poster must be placed in the waiting room indicating that the hygienists are subject to regulation by the Dental Hygiene Board of California (Business and Professions Code, Section 138) and provide the contact information of that board (Dental Hygiene Board of California, n.d). (See Appendix G.)

Failure to have placed the aforementioned posters in the waiting room of a dental office or a hospital waiting area, if the dentist provides services at that hospital, is a violation of the Dental Practice Act and subjects the dental office owner(s) to sanctions.

Conclusion

This course has provided an overview of the agencies and laws governing dentists, dental assistants, and dental hygienists who are licensed or seeking licensure to practice in the State of California. The composition and functions of the governing organizations were explained, and the laws and regulations governing the practice of the various dental professionals were outlined, along with the consequences of noncompliance. The responsibilities of licensed dental professionals as mandatory reporters of both child and elder abuse were discussed.

Dental professionals need to be knowledgeable about the ethical and legal parameters within which they operate. The citizens of California will be treated with the highest standard of care possible by dental healthcare workers who incorporate these regulations and guidelines into their clinical practices. From time to time, new regulations and legislative updates are issued. By regularly checking the website of the Dental Board of California (https://www.dbc.ca.gov) all licensees can remain abreast of changes that affect the practice of dentistry.

APPENDIX A

California Business & Professions Code

Division 2, Chapter 4: Dentistry Sections 1600–1976

Article 1. Administration §§ 1600–1621
Article 2. Admission and Practice §§ 1625–1636.6
Article 2.4. Oral and Maxillofacial Surgery §§ 1638–1638.7
Article 2.5. Special Permits §§ 1640–1642
Article 2.6. Continuing Education §§ 1645–1645.1
Article 2.7. Use of General Anesthesia §§ 1646–1646.9
Article 2.8. Use of Conscious Sedation §§ 1647–1647.9
Article 2.85. Use of Oral Conscious Sedation for Pediatric Patients §§ 1647.10–1647.17
Article 2.86. Use of Oral Conscious Sedation for Adult Patients §§ 1647.18–1647.26
Article 2.9. Dental Restorative Materials §§ 1648.10–1648.20
Article 3. Registration § 1650
Article 3.5. Additional Offices §§ 1658–1658.8
Article 4. Suspension and Revocation of Licenses §§ 1670–1687
Article 4.7. Diversion Program §§ 1695–1699
Article 5. Offenses Against This Chapter §§ 1700–1706
Article 6. Fees §§ 1715–1725
Article 7. Dental Assistants §§ 1740–1777
Article 8. Dental Corporations §§ 1800–1808
Article 9. Dental Hygienists §§ 1900–1966.6
Article 9.5. California Dental Corps Loan Repayment Program §§ 1970–1976

California Code of Regulations

Title 16. Professional and Vocational Regulations Division 10, Dental Board of California

Chapter 1. General Provisions Applicable to All Licensees

Article 1. General Provisions §§ 1000–1005
Article 2. General Rules Regarding Fingerprint Requirement §§ 1007–1008
Article 3. Issuance of Substitute Licenses §§ 1012–1013
Article 3.1. Radiation Safety Courses §§ 1014–1014.1
Article 4. Continuing Education §§ 1015–1017.2
Article 4.5. Disciplinary Guidelines and Uniform Standards for Substance-Abusing Licensees §§ 1018–1018.01
Article 4.6 Unprofessional Conduct § 1018.05
Article 5. Criteria for Evaluating Rehabilitation/Substantial Relationship §§ 1018.1–1020
Article 5.5. Impaired Licentiates Program §§ 1020.1–1020.8
Article 6. Fees §§ 1021–1022
Article 7. Citations and Fines §§ 1023–1023.8

Chapter 2. Dentists

Article 1. Dental Schools §§ 1024–1027.1
Article 2. Application for Licensure §§ 1028–1030
Article 3. Examinations §§ 1031–1039
Article 4. Graduates of Foreign Dental Schools §§ 1040–1041
Article 4.5. California Dental Corps Loan Repayment Program §§ 1042–1042.6
Article 5. General Anesthesia and (Moderate) Conscious Sedation §§ 1043–1043.8
Article 5.5. Oral Conscious Sedation §§ 1044–1044.5
Article 6. Additional Offices §§ 1045–1049
Article 7. Advertising §§ 1050–1054.3
Article 8. Dental Corporations §§ 1055–1060
Article 9. Miscellaneous §§ 1061–1065

Chapter 3. Dental Auxiliaries

Article 1. General Provisions §§ 1067–1069
Article 2. Educational Programs §§ 1070–1075
Article 3. Application for Licensure §§ 1076–1079.3
Article 4. Examinations §§ 1080–1083
Article 5. Duties and Settings §§ 1085–1090.1

APPENDIX B - Table of Permitted Duties of Dental Auxiliaries

Dental Assisting Table of Permitted Duties (Rev 10/3/2018, from https://www.dbc.ca.gov/formspubs/pub_permitted_duties.pdf)

The following is a table of duties which Dental Assistants (DA), Orthodontic Assistants (OA), Dental Sedation Assistants (DSA), Registered Dental Assistants (RDA), and Registered Dental Assistants in Extended Functions (RDAEF) are allowed to perform in California.

This table is intended to provide summary information to interested parties. It is not intended to cover all aspects of applicable laws or provide a substitute for reviewing the laws that are cross-referenced below. It is highly recommended that applicants and licensees review the actual text of the laws cited at the link provided below. **If a duty is not listed in the sections of law cited below, assistants are NOT allowed to perform the duty**. Under each category of assistant is one of the following notations: "**D**," "**C**," "**G**," or "**DD**":

- **"D"** = The assistant may perform the duty under the Direct supervision of a dentist, which means supervision of dental procedures based on instructions given by a licensed dentist who must be physically present in the treatment facility during the performance of those procedures. The duty must be performed pursuant to the order, control, and full professional responsibility of the supervising dentist. Such procedures must be checked and approved by the

supervising dentist prior to dismissal of the patient from the office of said dentist.
Note: Dental Sedation Assistant permit holders may also perform the listed duty under a licensed healthcare professional authorized to administer conscious sedation or general anesthesia in the dental office.

- **"C"** = The assistant may perform the duty in the specified setting under the supervision of a dentist, Registered Dental Hygienist, or Registered Dental Hygienist in Alternative Practice.
- **"G"** = The assistant can perform the duty under the General supervision of a dentist, which means based on instructions given by a licensed dentist, but not requiring the physical presence of the supervising dentist during the performance of those procedures.
- **"DD"** = The supervising licensed dentist shall be responsible for determining whether each authorized procedure performed by a registered dental assistant should be performed under general or direct supervision, except as provided in Section 17777.

The sections of law noted below are contained in the Dental Practice Act located in Chapter 4 of Division 2 of the California Business and Professions Code (BPC). For the actual text of the laws, the following link will take you to the page on the Dental Board's web site:
https://www.dbc.ca.gov/about_us/lawsregs/laws.shtml

Allowable Duties	Section of Law (Statute or Regulation)	D	C	G	DD
DENTAL ASSISTANT (DA) BPC, SECTION 1750.1					
Extraoral duties or procedures specified by the supervising licensed dentist, provided that these duties or procedures meet the definition of a basic supportive procedure specified in Section 1750.	1750.1			X	
Operate dental radiography equipment for the purpose of oral radiography if the dental assistant has complied with the requirements of Section 1656.	1750.1			X	
Perform intraoral and extraoral photography.	1750.1			X	
Apply nonaerosol and noncaustic topical agents.	1750.1	X			
Apply topical fluoride.	1750.1	X			
Take intraoral impressions for all nonprosthodontic appliances.	1750.1	X			
Take facebow transfers and bite registrations.	1750.1	X			
Place and remove rubber dams and other isolation devices.	1750.1	X			
Place, wedge, and remove matrices for restorative procedures.	1750.1	X			
Remove postextraction dressings after inspection of the surgical site by the supervising licensed dentist.	1750.1	X			
Perform measurements for the purposes of orthodontic treatment.	1750.1	X			
Cure restorative or orthodontic materials in operative site with a light-curing device.	1750.1	X			
Examine orthodontic appliances.	1750.1	X			
Place and remove orthodontic separators.	1750.1	X			
Remove ligature ties and archwires.	1750.1	X			
After adjustment by the dentist, examine and seat removable orthodontic appliances and deliver care instructions to the patient.	1750.1	X			
Remove periodontal dressings.	1750.1	X			
Remove sutures after inspection of the site by the dentist.	1750.1	X			
Place patient monitoring sensors.	1750.1	X			
Monitor patient sedation, limited to reading and transmitting information from the monitor display during the intraoperative phase of surgery for electrocardiogram waveform, carbon dioxide and end tidal carbon dioxide concentrations, respiratory cycle data, continuous noninvasive blood pressure data, or pulse arterial oxygen saturation measurements, for the purpose of interpretation and evaluation by a supervising licensed dentist who shall be at the patient's chairside during this procedure.	1750.1	X			
Assist in the administration of nitrous oxide when used for analgesia or sedation. A dental assistant shall not start the administration of the gases and shall not adjust the flow of the gases unless instructed to do so by the supervising licensed dentist who shall be present at the patient's chairside during the implementation of these instructions. This paragraph shall not be construed to prevent any person from taking appropriate action in the event of a medical emergency.	1750.1	X			
Apply topical fluoride under the general direction of a licensed dentist or physician, when operating in a school-based setting or a public health program created or administered by a federal, state, county, or local governmental entity pursuant to Sections 104762 and 104830 of the Health and Safety Code.	1750.1			X	
Intraoral retraction and suctioning under the supervision of a registered dental hygienist in alternative practice.	1750.1		X		
ORTHODONTIC ASSISTANT PERMIT (OA) BPC, SECTION 1750.3					
All duties that a dental assistant is allowed to perform.	1750.3	X			
Prepare teeth for bonding, and select, preposition, and cure orthodontic brackets after their position has been approved by the supervising licensed dentist.	1750.3	X			

Allowable Duties	Section of Law (Statute or Regulation)	D	C	G	DD
Remove only orthodontic brackets and attachments with removal of the bonding material by the supervising licensed dentist.	1750.3	X			
Size, fit, and cement orthodontic bands.	1750.3	X			
Remove orthodontic bands and remove excess cement from supragingival surfaces of teeth with a hand instrument.	1750.3	X			
Place and ligate archwires.	1750.3	X			
Remove excess cement with an ultrasonic scaler from supragingival surfaces of teeth undergoing orthodontic treatment.	1750.3	X			
DENTAL SEDATION ASSISTANT PERMIT (DSA) BPC, SECTION 1750.5					
All duties that a dental assistant is allowed to perform.	1750.5	X			
Monitor patients undergoing conscious sedation or general anesthesia utilizing data from noninvasive instrumentation such as pulse oximeters, electrocardiograms, capnography, blood pressure, pulse, and respiration rate monitoring devices. Evaluation of the condition of a sedated patient shall remain the responsibility of the dentist or other licensed health care professional authorized to administer conscious sedation or general anesthesia, who shall be at the patient's chairside while conscious sedation or general anesthesia is being administered.	1750.5	X			
Drug identification and draw, limited to identification of appropriate medications, ampule and vial preparation, and withdrawing drugs of correct amount as verified by the supervising licensed dentist.	1750.5	X			
Add drugs, medications, and fluids to intravenous lines using a syringe, provided that a supervising licensed dentist is present at the patient's chairside, limited to determining patency of intravenous line, selection of injection port, syringe insertion into injection port, occlusion of intravenous line and blood aspiration, line release and injection of drugs for appropriate time interval. The exception to this duty is that the initial dose of a drug or medication shall be administered by the supervising licensed dentist.	1750.5	X			
Removal of intravenous lines.	1750.5	X			
REGISTERED DENTAL ASSISTANT (RDA) BPC, SECTION 1752.4					
All duties that a dental assistant is allowed to perform.	1752.4				X
Mouth-mirror inspections of the oral cavity, to include charting of obvious lesions, existing restorations, and missing teeth.	1752.4				X
Apply and activate bleaching agents using a non-laser light-curing device.	1752.4				X
Use of automated caries detection devices and materials to gather information for diagnosis by the dentist.	1752.4				X
Obtain intraoral images for computer-aided design (CAD), milled restorations.	1752.4				X
Pulp vitality testing and recording of findings.	1752.4				X
Place bases, liners, and bonding agents.	1752.4				X
Chemically prepare teeth for bonding.	1752.4				X
Place, adjust, and finish direct provisional restorations.	1752.4				X
Fabricate, adjust, cement, and remove indirect provisional restorations, including stainless steel crowns when used as a provisional restoration.	1752.4				X
Place post-extraction dressings after inspection of the surgical site by the supervising licensed dentist.	1752.4				X
Place periodontal dressings.	1752.4				X
Dry endodontically treated canals using absorbent paper points.	1752.4				X
Adjust dentures extra orally.	1752.4				X
Remove excess cement from surfaces of teeth with a hand instrument.	1752.4				X
Polish coronal surfaces of the teeth.	1752.4				X
Place ligature ties and archwires.	1752.4				X
Remove orthodontic bands.	1752.4				X
*A registered dental assistant may only perform the following additional duties if he or she has completed a board-approved registered dental assistant educational program in those duties, or if he or she has provided evidence, satisfactory to the board, of having completed a board-approved course in those duties.					
*Remove excess cement with an ultrasonic scaler from supragingival surfaces of teeth undergoing orthodontic treatment.	1752.4	X			
*The allowable duties of an orthodontic assistant permitholder as specified in Section 1750.3. A registered dental assistant shall not be required to complete further instruction in the duties of placing ligature ties and archwires, removing orthodontic bands, and removing excess cement from tooth surfaces with a hand instrument.	1752.4	X			

Allowable Duties	Section of Law (Statute or Regulation)	D	C	G	DD
*The allowable duties of a dental sedation assistant permitholder as specified in Section 1750.5.	1752.4	X			
*The application of pit and fissure sealants.	1752.4	X			
REGISTERED DENTAL ASSISTANT IN EXTENDED FUNCTIONS (RDAEF) BPC, SECTION 1753.5 Licensed on or after January 1, 2010					
All duties that a dental assistant is allowed to perform.	1753.5				X
All duties that a registered dental assistant is allowed to perform as specified in and limited by Section 1752.4.	1753.5				X
Conduct preliminary evaluation of the patient's oral health, including, but not limited to, charting, intraoral and extraoral evaluation of soft tissue, classifying occlusion, and myofunctional evaluation.	1753.5	X			
Perform oral health assessments in school-based, community health project settings under the direction of a dentist, registered dental hygienist, or registered dental hygienist in alternative practice.	1753.5		X		
Cord retraction of gingiva for impression procedures.	1753.5	X			
Size and fit endodontic master points and accessory points.	1753.5	X			
Cement endodontic master points and accessory points.	1753.5	X			
Take final impressions for permanent indirect restorations.	1753.5	X			
Take final impressions for tooth-borne removable prosthesis.	1753.5	X			
Polish and contour existing amalgam restorations.	1753.5	X			
Place, contour, finish, and adjust all direct restorations.	1753.5	X			
Adjust and cement permanent indirect restorations.	1753.5	X			
Additional authorized duties of a registered dental assistant in extended functions (RDAEF), BPC, Section 1753.55. A registered dental assistant in extended functions is authorized to perform the additional duties as set forth in subdivision (b) pursuant to the order, control, and full professional responsibility of a supervising dentist, if the licensee meets one of the following requirements: **(1) Is licensed on or after January 1, 2010.** **(2) Is licensed prior to January 1, 2010, has successfully completed a board-approved course in the additional procedures specified in paragraphs (1), (2), (5), and (7) to (11), inclusive, of subdivision (b) of Section 1753.5, and passed the examination as specified in Section 1753.4. The pocket license of the authorized licensee will state that the RDAEF may perform the duties per B&P 1753.5 and 1753.55.**					
Determine which radiographs to perform on a patient who has not received an initial examination by the supervising dentist for the specific purpose of the dentist making a diagnosis and treatment plan for the patient. In these circumstances, the dental assistant in extended functions shall follow protocols established by the supervising dentist. This paragraph only applies in the following settings: (A) In a dental office setting. (B) In public health settings, using telehealth, as defined by Section 2290.5, for the purpose of communication with the supervising dentist, including, but not limited to, schools, head start and preschool programs, and community clinics, under the general supervision of a dentist.	1753.55			X	
Place protective restorations in a dental office setting, under the direct or general supervision of a dentist as determined by the dentist.	1753.55				X
Place protective restorations after the diagnosis, treatment plan, and instruction to perform the procedure provided by a dentist in public health settings, using telehealth, as defined by Section 2290.5, for the purpose of communication with the supervising dentist, including, but not limited to, schools, head start and preschool programs, and community clinics, under the general supervision of a dentist.	1753.55			X	
REGISTERED DENTAL ASSISTANT IN EXTENDED FUNCTIONS (RDAEF) BPC, SECTION 1753.6 Licensed prior to January 1, 2010 and has not completed a Board-approved course in the additional procedures specified in paragraphs (1), (2), (5) and (7) to (11) inclusive, of Section 1753.5 (b) and an examination as specified in Section 1753.4.					
All duties that a registered dental assistant is allowed to perform as specified in and limited by Section 1752.4.	1753.6				X
Cord retraction of gingiva for impression procedures.	1753.6				X
Take final impressions for permanent indirect restorations.	1753.6	X			
Formulate indirect patterns for endodontic post and core castings.	1753.6	X			
Fit trial endodontic filling points.	1753.6	X			
Apply pit and fissure sealants.	1753.6	X			
Remove excess cement from subgingival tooth surfaces with a hand instrument.	1753.6	X			

APPENDIX C - Continuing Education Course Categories

Mandatory Courses

1. Board-approved course in Infection Control: 2 units:
   - Includes all content of Section 1005 and the application of the regulations in the dental environment.
2. Board-approved course in the California Dental Practice Act: 2 units:
   - Instructs on acts in violation of the Dental Practice Act (Division 2, Chapter 4 of the Code [beginning with §1600]) and attending regulations, and other statutory mandates relating to dental practice.
   - Includes utilization and scope of practice for auxiliaries and dentists; laws governing the prescribing of drugs; citations, fines, revocation and suspension of a license, and license renewal; and the mandatory reporter obligations set forth in the Child Abuse and Neglect Reporting Act (Penal Code Section 11164 et seq.) and the Elder Abuse and Dependent Adult Civil Protection Act (Welfare and Institutions Code Section 15600 et seq.) and the clinical signs to look for in identifying abuse.
3. Completion of certification in Basic Life Support: maximum of 4 units:
   - A live course, offered by the AHA or ARC, or by an ADA- or AGD-approved provider, which includes:
     - Instruction in both adult and pediatric CPR, including two-rescuer scenarios.
     - Instruction in foreign-body airway obstruction.
     - Instruction in relief of choking for adults, children, and infants.
     - Instruction in the use of automated external defibrillation with CPR.
     - A live, in-person skills practice session, a skills test, and a written examination.

Core Courses in the Actual Delivery of Dental Services to the Patient or the Community

- Courses in preventive services, diagnostic protocols and procedures (including physical evaluation, radiography, dental photography), comprehensive treatment planning, charting of the oral conditions, informed consent protocols, and recordkeeping.
- Courses dealing primarily with nutrition and nutrition counseling of the patient.
- Courses in aesthetic, corrective, and restorative oral health diagnosis and treatment.
- Courses in dentistry's role in individual and community health emergencies, disasters, and disaster recovery.
- Courses that pertain to the legal requirement governing the licensee in the areas of auxiliary employment and delegation of responsibilities; the Health Insurance Portability and Accountability Act (HIPAA); actual delivery of care.
- Courses pertaining to federal, state, and local regulations, guidelines or statutes regarding workplace safety, fire and emergency, environmental safety, waste disposal and management, general office safety, and all training requirements set forth by the California Division of Occupational Safety and Health (Cal-DOSH) including the Bloodborne Pathogens Standard.
- Courses pertaining to the administration of general anesthesia, conscious sedation, oral conscious sedation, or medical emergencies.
- Courses pertaining to the evaluation, selection, use, and care of dental instruments, sterilization equipment, operatory equipment, and personal protective attire.
- Courses in dependency issues and substance abuse, such as alcohol and drug use, as they relate to patient safety, professional misconduct, ethical considerations, or malpractice.
- Courses in behavioral sciences, behavior guidance, and patient management in the delivery of care to all populations including special needs, pediatric, and sedation patients when oriented specifically to the clinical care of the patient.
- Courses in the selection, incorporation, and use of current and emerging technologies.
- Courses in cultural competencies such as bilingual dental terminology, cross-cultural communication, provision of public health dentistry, and the dental professional's role in provision of care in nontraditional settings when oriented specifically to the needs of the dental patient and when it will serve to enhance the patient experience.
- Courses in dentistry's role in individual and community health programs.
- Courses pertaining to the legal and ethical aspects of the insurance industry, to include management of third-party payer issues, dental billing practices, patient and provider appeals of payment disputes, and patient management of billing matters.

Courses Considered to Be Primarily of Benefit to the Licensee and Limited to a Maximum of 20% of a Licensee's Total Required Course Unit Credits for Each License or Permit Renewal Period

- Courses to improve recall and scheduling systems, production flow, communication systems, and data management.
- Courses in organization and management of the dental practice, including office computerization and design, ergonomics, and the improvement of practice administration and office operations.
- Courses in leadership development and team development.
- Coursework in teaching methodology and curricula development.
- Coursework in peer evaluation and case studies that include reviewing clinical evaluation procedures, reviewing diagnostic methods, studying radiographic data, study models, and treatment-planning procedures.
- Courses in human resource management and employee benefits.

Courses of Direct Benefit to the Licensee or Outside the Scope of Dental Practice in California and Not Recognized for Continuing Education Credit

- Courses in money management; the licensee's personal finances; or personal business matters such as financial planning, estate planning, and personal investments.
- Courses in general physical fitness, weight management, or the licensee's personal health.
- Presentations by political or public figures or other persons who do not deal primarily with dental practice or issues impacting the dental profession.
- Courses designed to make the licensee a better businessperson or designed to improve licensee personal profitability, including motivation and marketing.
- Courses pertaining to the purchase or sale of a dental practice, business, or office; courses in transfer of practice ownership, acquisition of partners, and associates; practice valuation; practice transitions; or retirement.
- Courses pertaining to the provision of elective facial cosmetic surgery as defined by the Dental Practice Act in Section 1638.1, unless the licensee has a special permit obtained from the Board to perform such procedures pursuant to Section 1638.1 of the Code.

(California Code of Regulations. Title 16, Professional and Vocational Regulations. Division 10, Dental Board of California §1016.)

APPENDIX D - Notice Concerning Credit or Loan for Healthcare Services

California Dental Practice Act,
California Business and Professional Code, 654.3
Credit or Loan for Health Care Services

The attached application and information are for a credit card or loan to help you pay for your health care treatment.
You should know that:

You are applying for a _____ credit card or a _____ loan for $_____.

You do not have to apply for the credit card or the loan. You may request a different place and additional time to review, fill out, and sign the application. You may pay your health care provider for treatment in another manner.

This credit card or loan is not a payment plan with the provider's office. It is credit with, or a loan made by, [name of company issuing the credit card or loan]. Your health care provider does not work for this company.

Before applying for this credit card or loan, you have the right to a written treatment plan from your health care provider. This plan must include the expected treatment to be provided and the estimated costs of each service. If you have insurance, the treatment plan must tell you how much your insurance is expected to cover. If you are a Medi-Cal patient seeking services from a Medi-Cal provider, your treatment plan must tell you if Medi-Cal will cover a different service to treat your condition. If you only want services covered by Medi-Cal, you should not sign up for this credit card or loan.

Your health care provider cannot charge your credit card or loan account before you start treatment.

You have the right to have your credit card or loan account refunded for any charges for treatment you did not get. However, your provider does not have to refund the amount they spent to prepare for your treatment. Your health care provider must refund the amount of the charges to the lender within 15 business days of your request. The lender must take refunded charges off your account.

Please read carefully the terms and conditions of this credit card or loan.

You may be required to pay interest rates on the amount charged to the credit card or the amount of the loan. If you pay late, you may have to pay a penalty and a higher interest rate.

You may use this credit card or loan to pay for future health care services.

If you do not pay the money that you owe on the credit card or loan, your missed payments can be reported and could hurt your credit rating. You could also be sued.

_____

[Patient's Signature]

Note. From California Dental Practice Act, California Business and Professional Code, 654.3.
Note that the actual form needs to be set in 14-point type and fit on one page.

APPENDIX E - Notice to Patients Poster

WARNING

Certain dental procedures performed in this office can expose you to chemicals known to the State of California to cause cancer or birth defects or other reproductive harm or both. Those procedures can include sedation with nitrous oxide, root canals, placement or removal of crowns, bridges, and restorations such as mercury-containing fillings and use of dental appliances. Consult your dental care provider about these exposures and which materials are appropriate for your treatment. Additional information is also available at www.

P65Warnings.ca.gov/dental.

APPENDIX F - Notice to Patients Poster - Dentists

NOTICE

Dentists are licensed and regulated by the Dental Board of California

(877) 729-7789

www.dbc.ca.gov

APPENDIX G - Notice to Patients Poster - Hygienists

NOTIFICATION TO CONSUMERS

Dental hygienists are licensed and regulated by The Dental Hygiene Board of California

(916) 263-1978

www.dhbc.ca.gov

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CALIFORNIA DENTAL PRACTICE ACT, 6TH EDITION

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 100, or complete your test online at **EliteLearning.com/Book**

1. The Dental Board of California is one of the 39 regulatory entities that fall within the purview of the:
   a. California Occupational Safety and Health Program.
   b. California Department of Consumer Affairs.
   c. California Department of Professions.
   d. Health Care Board of California.
2. Composed of both dental health professionals and members of the public, the Dental Board of California has a total of:
   a. 5 members.
   b. 10 members.
   c. 15 members.
   d. 20 members.
3. Because experience is a critical component in the decision-making process, all members of the Board, except public members, must have:
   a. At least 5 years of clinical practice in the State of California.
   b. Certification in a specialty area such as oral and maxillofacial surgery.
   c. A faculty appointment at a dental academic institution.
   d. Previous experience on a legislative board in the State of California.
4. The diversion program established by the Board has a dual purpose of protecting the public and:
   a. Rehabilitating the licensee.
   b. Providing education about substance abuse issues.
   c. Disciplining the licensee.
   d. Creating permanent records of licensees with substance abuse issues.
5. The regulatory body that oversees all functions and requirements of all categories of registered dental hygienists in the state of California is the:
   a. Dental Hygiene Board of California.
   b. California Dental Hygiene Association.
   c. California Department of Professions.
   d. American Dental Association.
6. The three basic pathways to licensure for dentists in California are licensure by examination, licensure by credential, and licensure by:
   a. Reappointment.
   b. Residency.
   c. Rationale.
   d. Referral.
7. Dentists with an active license in another state seeking to become licensed in California by credential must have been in active clinical practice in five of the seven consecutive years immediately preceding the date of their application for a total of at least:
   a. 500 hours.
   b. 1,000 hours.
   c. 5,000 hours.
   d. 2,000 hours.
8. According to a report from the UCLA Center for Health Policy Research, the dentist shortage in California is further exacerbated by the growing number of newly licensed dentists who are:
   a. Opting to reside or work out of state.
   b. Going to work in group practices.
   c. Deciding to continue schooling and specialize.
   d. Failing their board examinations.
9. To obtain a permit for the administration of conscious sedation, a dentist must complete a course of study in conscious sedation consisting of instruction of at least:
   a. 20 hours.
   b. 45 hours.
   c. 10 hours.
   d. 60 hours.
10. According to the California Dental Practice Act, a dentist must report the death of a patient during any dental or dental hygiene procedure within:
    a. 24 hours.
    b. 5 days.
    c. 7 days.
    d. 2 weeks.
11. The "basic supportive dental procedures" that an unlicensed dental assistant may perform are defined as procedures that have technically elementary characteristics, are unlikely to precipitate potentially hazardous conditions for the patient being treated, and:
    a. Require no supervision by a dentist.
    b. Require an "add-on" specialty permit.
    c. Are provided at no charge.
    d. Are completely reversible.
12. Two of the four basic types of supervision for dental assistants in the State of California are general and:
    a. Direct.
    b. Indirect.
    c. On-site.
    d. Off-site.
13. The scope of practice for registered dental hygienists includes providing oral health education, counseling, performing health screenings, and:
    a. Prescribing medications as long as they are within the dental scope of practice.
    b. Diagnosing conditions of the oral cavity.
    c. Developing, planning and implementing a dental hygiene care plan.
    d. Cutting and suturing soft tissue.

14. The main difference between a registered dental hygienist (RDH) and a registered dental hygienist in alternative practice (RDHAP) is that an RDHAP can:
    a. Perform the RDH duties independently with a written prescription issued by a dentist or physician.
    b. Perform extended duties such as the administration of oral conscious sedation.
    c. Work without any supervision or written prescription from a dentist or physician.
    d. Routinely perform diagnosis and comprehensive treatment planning.
15. The licenses of all California dental professionals expire every 2 years, on the:
    a. First day of the licensee's birth month.
    b. Last day of the licensee's birth month.
    c. Last day of December.
    d. First day of January.
16. How many continuing education units must a registered dental hygienist in alternative practice complete each renewal cycle?
    a. 10 units.
    b. 25 units.
    c. 35 units.
    d. 50 units.
17. Courses in the actual delivery of dental services to the patient or the community are referred to as:
    a. Mandatory courses.
    b. Class A courses.
    c. Level 1 courses.
    d. Core courses.
18. Under normal circumstances, courses that are considered correspondence courses can account for up to what percentage of a licensee's required continuing education hours?
    a. 10%.
    b. 20%.
    c. 40%.
    d. 50%.
19. The form and content of prescriptions written by dental professionals are governed by:
    a. The American Dental Association.
    b. The Drug Enforcement Administration.
    c. Division 10 of the California Health and Safety Code.
    d. Section 1740 of the California Business and Professions Code.
20. All written prescriptions for Schedule II through V controlled substances must:
    a. Be written on tamper-resistant prescription forms.
    b. Gave a duplicate copy kept in the patient record.
    c. Be written on forms directly from the Drug Enforcement Administration.
    d. Have prior authorization by the patient's primary care physician.
21. All healthcare practitioners, including dentists, are required to register to use the Controlled Substance Utilization Review and Evaluation System if they prescribe:
    a. Any controlled substance.
    b. Schedule II-IV controlled substances.
    c. Schedule III-IV controlled substances.
    d. Schedule IV controlled substances.
22. When exercising its licensing, regulatory, and disciplinary functions, the Board holds as its highest priority the protection of:
    a. The legislative process.
    b. Its members.
    c. Its statutes.
    d. The public.
23. The most common reason for an infection control audit is:
    a. A routine check.
    b. A fire, natural disaster, or other emergency.
    c. A complaint from an employee or a patient.
    d. A history of past infractions
24. Which ethical principle is violated if a dentist fails to comprehend the patient's request if it is hindered by a language barrier?
    a. Autonomy.
    b. Beneficence.
    c. Nonmaleficence.
    d. Social justice.
25. Those who violate the California Dental Association's Code of Ethics are first subject to examination by:
    a. The California Department of Consumer Affairs.
    b. The U.S. Food and Drug Administration.
    c. Their local and constituent societies.
    d. The American Dental Association.
26. The 2009 HITECH Act requires that all emails between patients and healthcare providers must be:
    a. Confidential.
    b. Encrypted.
    c. Comprehensive.
    d. Free of charge.
27. If a practitioner claims in an advertisement to be a specialist, his or her credentials must conform to The Board-certified specialties recognized by the ADA and the State of California, such as the American Board of?
    a. Geriatric Dentistry.
    b. Pediatric Dentistry.
    c. Infection Control.
    d. Implantology.
28. Of the following dental advertising claims, which one would be considered deceptive advertising under California rules and regulations?
    a. A television commercial offering a limited-time discount for dental cleanings.
    b. A radio ad including a guarantee that services offered will be 100% painless.
    c. An ad in the newspaper listing the specialized credentials, such as orthodontics, for a local dentist office.
    d. An internet ad listing the prices of various denture services.
29. Any mandated reporter who fails to report an incident of known or reasonably suspected child abuse or neglect as required by law:
    a. May lose his or her professional license only.
    b. Is subject to a monetary fine of $500 only.
    c. Is guilty of a felony punishable by up to 1 year in jail or a fine of $10,000 or both.
    d. Is guilty of a misdemeanor punishable by up to 6 months in jail or a fine of $1,000 or both.
30. A licensee dentist employer who uses mercury-based filling material, nitrous oxide, or bisphenol A must place a poster warning of the effects of those materials or gas in offices with more than:
    a. 25 employees.
    b. 20 employees.
    c. 15 employees.
    d. 10 employees.

Course Code: DCA02DP

Chapter 2: Infection Control Standards for California Dental Health Care Workers, 6th Edition (Mandatory)

2 CE Hours

Release Date: February 14, 2023

Expiration Date: February 14, 2026

Faculty

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Eve Cuny has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

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The planner has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

AGD Subject Code - 148

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INTRODUCTION

Learning objectives

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

- Identify the agencies that regulate infection control in dental settings on a federal level and in California.
- Discuss the goals and minimum standards for infection control in a dental setting, including the defined terms used in the California Code of Regulations, Title 16, Section 1005.
- Cite requirements for use of personal protective equipment, and procedures for hand hygiene.
- Describe the protocol for sharps disposal and the management of occupational injuries and exposures.
- Identify protocols for sterilization and disinfection of instruments, facilities, and lab areas.

Course overview

This course is designed to familiarize dental healthcare personnel with the requirements for infection control in dental offices in the State of California related to the Dental Board of California's Minimum Standards for Infection Control (Cal. Code Regs., Title 16, Section 1005) as revised effective August 20, 2011. This basic-level course addresses terminology, reasons for infection control, minimum required standards, and procedures for preventing disease transmission in dental healthcare settings. Additional regulations and recommendations pertaining to worker safety, transmission-based precautions, and emerging infectious diseases should be considered in a dental practice comprehensive infection control program. State regulations are reviewed regularly to ensure that they reflect the current state of knowledge and to assure optimum levels of safety for both healthcare personnel and patients. California dental healthcare personnel (DHCP) should check the Dental Board of California website regularly for any changes or updates to these regulations. A thorough working knowledge of these regulations provides patient and DHCP safety, and assurance that the dental office is in compliance with the most current state dental board

mandates. It should be noted that, with the arrival of the SARS-CoV-2 (COVID-19) pandemic, infection control has expanded to the outer office, with the advent of initial patient screening and patient masking. In the operatory, use of N95 masks and face shields became more of a standard practice (Kane, 2021). As has always been the case, it is important to follow guidelines, prescribed practices, and legal requirements.

FEDERAL REGULATIONS

Occupational Safety and Health Administration

With the advent of the Bloodborne Pathogens Standard [29 C.F.R. §1910.1030 (1992)], OSHA began requiring healthcare employers, including those in the dental profession to limit occupational exposure of employees to blood and other potentially infectious materials. With the emergence of HIV and the documentation that this disease was efficiently spread by contact with blood and blood products, concern about the spread of this infection in all healthcare settings began to emerge. Toward the latter part of the 1980s, there was sufficient evidence to conclude that certain health risks were associated with exposure to body fluids containing pathogenic organisms, including HIV, HBV, and HCV (CDC, 2020; CDC 2016b). Before this time, little effort was directed at eliminating or even minimizing exposure from needle sticks and other sharps. (A sharp is any object that can penetrate the skin, including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and other objects.) With the introduction of the Bloodborne Pathogens Standard in 1992, OSHA required employers to reduce or eliminate the hazards for any employees with occupational exposure (i.e., exposure to blood or to other potentially infectious material [OPIM] while performing their jobs) (OSHA, 2001).

OSHA began to require each health care facility to have an exposure control plan that provides a detailed description of how to reduce or eliminate occupational hazards. Included in the exposure control plan is a requirement to implement engineering controls (devices that isolate or remove the BBP hazard) and work practice controls (practices that reduce the likelihood of exposure by changing the way a task is performed). The exposure control plan should also include identification of job categories that involve exposure to potentially infectious materials (e.g., blood and saliva); the type and indications for the use of personal protective equipment (PPE); BBP training; exposure prevention and post-exposure management strategies; and providing HBV vaccinations for all employees with occupational exposure. Separate OSHA regulations address other safety-related items such as signs on exits, fire extinguishers, and additional safety equipment; and labels on products and chemicals used in the dental office.

In April of 2001, the *Bloodborne Pathogens Standard* was revised to include the Needlestick Safety and Prevention Act. This revision by OSHA required employers to include provisions to eliminate or minimize employee exposure to sharps and occupational exposures in the exposure control plan. More specifically, each employer must review the latest technological changes (e.g., self-sheathing needles and scalpels) and decide whether to incorporate them into their practice. This review must be done on at least an annual basis and must include employee input. The decision to incorporate such devices into their practices is made by the clinicians using the specific devices. Decisions about whether to incorporate such devices into the practice cannot be based solely on the criterion of cost. One important aspect of the Bloodborne Pathogens Standard was the required use of universal precautions, which later evolved into the standard precautions that are practiced today. Standard precautions include major components of both universal precautions and body substance isolation precautions.

Standard precautions apply to all body fluids, excretions, and secretions (with the exception of sweat) and should be observed during all patient encounters, regardless of the health status of the patient (i.e., the same way, every day, for every patient). The basic elements of the standard precautions are listed in Table 1.

Table 1: Standard vs. Universal Precautions

Standard precautions combine the major features of universal precautions and body substance isolation.

Universal Precautions	Standard Precautions
• This is an approach to infection control in which blood and certain body fluids are treated as if known to be infectious for: ○ HIV. ○ HBV. ○ HCV. ○ Other BBPs. • Universal precautions were based on the concept that all blood (and body fluids that might be contaminated with blood) should be treated as infectious because patients with bloodborne infections are often asymptomatic or unaware that they are infected. **Body Substance Isolation** • Body substance isolation protects against pathogens that may exist in body substances and applies in all patient encounters regardless of the diagnosis (the same way, every day, for every patient).	• Standard precautions are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting in which healthcare is delivered. These practices are designed to both protect healthcare workers (HCWs) and prevent HCWs from spreading infections among patients. • Standard precautions apply to contact with: ○ Blood. ○ All body fluids, secretions, and excretions except sweat, regardless of whether they contain blood. ○ Non-intact skin. ○ Mucous membranes. • Standard precautions are employed in the care of all patients in the delivery of routine dental care and include: ○ Hand hygiene. ○ Use of PPE (e.g., gloves, gowns, masks, eye protection). ○ Safe injection practices. ○ Safe handling of potentially contaminated equipment or surfaces in the patient environment. ○ Respiratory hygiene/cough etiquette.

Note: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2003, Dec. 19). Guidelines for infection control in dental health-care settings. *Morbidity and Mortality Weekly Report, 52*(RR-17), 1-61.

U.S. Department of Labor, Occupational Safety and Health Administration (1992). *Bloodborne Pathogens Standard. 29* C.F.R. §1910.1030.

U.S. Department of Labor, Occupational Safety and Health Administration. *Occupational exposure to bloodborne pathogens; needlesticks and other sharps injuries; final rule.* Fed. Reg. 66:5317 (2001), 25. As amended from and includes Bloodborne Pathogens Standard. 29 CFR §1910.1030. *Occupational exposure to bloodborne pathogens; final rule.* Fed. Reg. 56:64174, 82.

The OSHA Bloodborne Pathogens Standard is enforceable in every state in the U.S., and significant penalties can be levied for lack of compliance. Roughly half the states in the country have state OSHA programs, which are independent agencies that adopt and enforce their own Bloodborne Pathogens Standard. The federal Bloodborne Pathogens Rule serves as the minimum standard, and some states have expanded the regulation to include requirements not found in the federal rule. Each dentist/employer must be compliant with all the elements of the Bloodborne Pathogens Standard, including:

- Establishing an exposure control plan designed to protect employees with occupational exposure from contacting blood and OPIM.
- BBP training on an annual basis for all employees with occupational exposure.
- Providing and maintaining appropriate PPE and training employees on how it is used properly.
- Establishing a mechanism for post exposure monitoring, follow-up, and post exposure prophylaxis.
- Providing HBV vaccination free of charge to all employees with occupational exposure.
- Monitoring employee work practices and behaviors to ensure compliance.
- Establishing and maintaining the appropriate training and medical records for each employee.
- Ensuring that all items in the office are properly labeled and indicated.

(CDC, 2016b)

Although originally published in 1992 and updated in 2001, the OSHA Bloodborne Pathogens Standard remains in effect today (OSHA, 2001). All dental personnel should be familiar with all the provisions of this standard. More information on this document can be found in the Resources section of this course.

Centers for Disease Control and Prevention

Although OSHA's mission is to protect employees in the workplace, the Centers for Disease Control and Prevention (CDC) is tasked with protecting the public health of the entire U.S. population. The CDC is not a regulatory agency, but it does recommend infection control precautions often used to form the basis for regulations set by state licensing boards and OSHA. As cases of HIV/AIDS began to increase in the 1980s, concern about transmission of HIV/AIDS in the dental office began to mount. At that time, infection control in dentistry was rudimentary, contact with blood was frequent, the number of percutaneous exposures was high, the use of barriers was almost nonexistent, and disinfection and sterilization practices were questionable.

Accordingly, the CDC published Recommended Infection Control Practices for Dentistry in 1986, but the recommendations were generally ignored by the profession as a whole. However, by the early 1990s and the publication of the Bloodborne Pathogens Standard, most dentists realized that infection control was important for their safety and for the safety of their patients and staff. In order to enable dental professionals to provide oral health care as safely as possible, the CDC published an updated Recommended Infection Control Practices for Dentistry in 1993 (which closely paralleled the Bloodborne Pathogens Standard). This document provided guidance to the dental profession until December 19, 2003, when the CDC published the new, evidence-based, Guidelines for Infection Control in Dental Health-Care Settings – 2003 (CDC, 2003). As new diseases and technologies emerge, new infection control practices must be introduced, and the 2003 CDC guidelines recommended significant modifications and updates in the infection control practices for the dental profession. All dental professionals should be familiar with the infection control principles contained in this document. More information on this document can be found in the Resources section of this course.

Although published almost two decades ago, the Guidelines for Infection Control in Dental Health-Care Settings – 2003 are still the most current dentistry-specific infection control guidelines from the CDC, and many state boards have adopted them as their infection control regulations. More recently, the increasing number of HAIs and the propagation of many drug-resistant infections occurring in outpatient settings, not to mention the COVID-19 pandemic, have caused the CDC to place more emphasis on infection control in these types of facilities. To help ensure better compliance with infection control recommendations, the CDC produced the Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care in May 2011 (updated in 2015 and 2016) (CDC, 2016b). This guide is targeted specifically at outpatient settings and stresses that all healthcare facilities, including dental offices, "must make infection prevention a priority and must be equipped to observe Standard Precautions" (CDC, 2016b). Furthermore, each facility must "ensure that sufficient fiscal and human resources are available to develop and maintain infection prevention and occupational health programs," inclusive of providing the necessary PPE, hand hygiene products, and other equipment/devices necessary for following the standard precautions shown in Table 1 (CDC, 2016b). Although the guide's main focus is on medical facilities, the great majority of its directives apply to dentistry as well, which is in fact considered an outpatient setting. Attached to this guide is a very straightforward checklist that can serve as an excellent resource for each dental office to evaluate its infection control compliance (CDC, 2016b). In 2016, the CDC published Summary of Infection Prevention Practices in Dental Settings, which did not replace the 2003 guidelines, but added some topics. The guide includes a checklist for dental offices to use in evaluation of their infection control and prevention practices (CDC, 2016c).

CALIFORNIA LAWS

California Dental Practice Act

The California Dental Practice Act consists of the basic body of laws governing dentistry found in the California Business and Professions Code (B&P): Division 2, Chapter 4 (beginning with Section 1600), and the California Code of Regulations (CCR): Title 16, Division 10 (beginning with Section 1000). California law requires every dental professional to have a grasp of this basic body of law and related portions of other selected California statutes.

California Department of Consumer Affairs

The California Department of Consumer Affairs includes 39 regulatory entities that protect public health and safety through licensing and oversight of various professions. These boards and bureaus establish minimum qualifications and levels of competency for licensure in more than 280 business and professional categories, including all health professions (Department of Consumer Affairs, S. of C., 2021). The Dental Board of California is one such board falling within the purview of the California Department of Consumer Affairs, which provides a variety of key administrative services to these semi-autonomous boards.

Board members collectively are the leaders of these licensing agencies, and make important decisions on agency policies and disciplinary actions against professionals who violate state consumer protection laws. Board members approve regulations and help guide licensing, enforcement, public education, and consumer protection activities. Some board members are licensed professionals, whereas others are public members. The

governor appoints many board members, but the legislature makes appointments as well. State law requires board members within the California Department of Consumer Affairs to complete orientation and training in several important areas, including ethics, conflict of interest laws, and sexual harassment prevention.

Dental Board of California

The Dental Board of California (the Board) is part of the California Department of Consumer Affairs. The stated mission of the Board is to "protect and promote the health and safety of consumers in the State of California" (Dental Board of California, 2021). The Board licenses qualified dental healthcare professionals, takes actions to enforce compliance with the Dental Practice Act and other laws of the State of California, and strives to enhance the education of consumers and licensees.

The Board regulates licensed dentists, registered dental assistants (RDAs), and registered dental assistants in extended functions (RDAEFs). It also delineates each group's scope of practice, including any required levels of supervision or any restrictions on the settings in which they may work. Other areas of the Board's concern include licensing, examinations, and continuing education (CE) requirements. The Board also sets fees for dentists and for all dental auxiliaries, including fees in connection with initial licensure and license renewal, permits and permit renewals, and examinations. These regulations are set forth for dentists and dental auxiliaries in the CCR (Sections 1021 and 1022, respectively).

The Board may inspect the books, records, and premises of any licensed dentist, as well as the licensing documents, records, and premises of any dental assistant in response to a complaint that either entity has violated a law or regulation constituting grounds for disciplinary action. The Board may employ inspectors for this purpose (California Dental Practice Act, 2019a).

Dental Hygiene Board of California

Whereas the Board regulates licensed dentists, RDAs, and RDAEFs, the Dental Hygiene Board of California (formerly the Dental Hygiene Committee of California) now oversees all functions and requirements of all categories of RDHs (California Dental Practice Act, 2019b). The responsibilities of the Dental Hygiene Board include determining the scope of practice for all dental hygienists; issuing, reviewing, and revoking licenses; and developing and administering examinations. Additional functions include adopting regulations and determining fees and CE requirements for all hygiene licensure categories.

California regulatory agencies

Currently, regulations exist that govern infection control in dentistry specific to the state of California. These regulations are contained within the California Code of Regulations (CCR), Title 16, Professional and Vocational Regulations: Division 10, Dental Board of California, Chapter 1, Article 1, Section 1005 Minimum Standards for Infection Control. Compliance is mandatory for all dental healthcare personnel (DHCP) in California (California Code of Regulations, 2011). DHCP include "all paid and non-paid personnel in the dental health care setting who might be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air. DHCP include dentists, dental hygienists, dental assistants, dental laboratory technicians (in-office and commercial), students and trainees, contractual personnel, and other persons not directly involved in patient care but potentially exposed to infectious agents (e.g., administrative, clerical, housekeeping, maintenance, or volunteer personnel)" (California Code of Regulations, 2011). These regulations are enforced by the Dental Board of California. California licensees must strictly adhere to the guidelines or they may be subject to penalties. In addition to the Minimum Standards for Infection Control mandated by the Dental Board of California, the California Division of Occupational Safety and Health (Cal/OSHA) enforces infection control requirements through the Bloodborne Pathogens Rule from Title 8, Section 5193 of the California Code of Regulations (California Code of Regulations, 2015). Another regulatory agency that impacts the dental healthcare setting is the California Department of Public Health (CDPH). CDPH regulates the collection, storage, transport, and disposal of contaminated solid waste (California Health and Safety Code, 2017). DHCP should familiarize themselves with all of the regulations that pertain to dental practice on the federal, state, and local level. This course is limited to the Dental Board of California Minimum Standards for Infection Control.

PATHOGENS OF CONCERN IN DENTAL SETTINGS AND STANDARD PRECAUTIONS

Infection control in the dental setting is a serious concern because patients may harbor drug-resistant infections, such as methicillin-resistant Staphylococcus aureus (MRSA), or infections that may not produce symptoms, such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), making clinical detection impossible through examination or medical history alone.

Hepatitis B among adults is largely an acute disease. Approximately 95% of all adults who are infected with HBV recover, and within a few months of initial infection no longer show signs of active infections and no longer pose a risk of transmission to others. However, the remaining 5% of those infected with HBV as adults develop chronic infection and can continue to pose a risk of transmission to others since the virus continues to replicate in the liver and circulate in body fluids, including blood and saliva (CDC, 2019). Estimates for the total number of persons living with chronic HBV in the United States range from 730,000 to 2.2 million people (CDC, 2019).

Hepatitis C virus (HCV) is nearly always a chronic infection, with 75% to 85% of those who are infected becoming chronic carriers. The CDC estimates that 2.4 million people in the United States have chronic HCV infections. Hepatitis C is transmitted through percutaneous contact with infected body fluids. This may occur through unsafe injections (such as sharing needles), needlestick-type injuries in healthcare settings, from an HCV-infected mother to her child during birth, and rarely, through donated blood, blood products, and organs (CDC, 2019). Fortunately, HCV today is a curable infection with medication taken daily for 2-6 months. However, many people with chronic HCV may not be aware of their infection or have not yet received treatment, making transmission risk in healthcare settings a continued concern.

Human immunodeficiency virus (HIV) is the virus that causes acquired immunodeficiency syndrome (AIDS). The CDC estimated that in 2019, an estimated that 1,189,700 people in the United States had HIV. Approximately 13% of people with HIV are unaware of their infection (CDC, 2021).

According to Section 1005, Minimum Standards for Infection Control, standard precautions (SP), "are a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which health care is delivered. These include: hand hygiene, use of gloves, gown, mask, eye protection, or face shield, depending on the anticipated exposure, and safe handling of sharps."

MINIMUM STANDARDS FOR INFECTION CONTROL: A WRITTEN PROTOCOL

The goal of an infection control program is to minimize the transmission of pathogens in the healthcare setting. This goal can be accomplished in a variety of ways. Compliance with the California Minimum Standards for Infection Control (Section 1005) (California Code of Regulations, 2011), Infection Control Recommendations by the Centers for Disease Control and Prevention (CDC), and CDPH provides the groundwork for achieving this goal (California Health and Safety Code, 2017). The California Minimum Standards for Infection Control, Section 1005, stipulate that all DHCP must comply with infection control precautions and enforce the following minimum precautions to protect patients and themselves:

1. Standard precautions "shall be practiced in the care of all patients."
2. A written protocol "shall be developed, maintained, and periodically updated for proper instrument processing, operatory cleanliness, and management of injuries. The protocol shall be made available to all DHCP at the dental office" (California Code of Regulations, 2011). Examples of proper instrument processing include instrument inspection, cleaning, packaging, maintenance, sterilization, sterilizer monitoring, and proper instrument storage. Examples of operatory cleanliness include cleaning and disinfection of clinical surfaces, barrier protection for high-touch surfaces, and routine cleaning of environmental surfaces. Examples of management of injuries include policies for reporting and referral for personnel suffering occupational injuries. These policies should be updated at least annually or more often if necessary.
3. "A copy of this regulation shall be conspicuously posted in each dental office" (California Code of Regulations, 2011).

PERSONAL PROTECTIVE EQUIPMENT

Because dental professionals work in close proximity to the oral cavity, blood or other potentially infectious material (OPIM) that may contain infectious organisms can present a risk of transmission to DHCP who are not utilizing appropriate personal protective equipment (PPE). Appropriate PPE is defined in Section 1005 as "specialized clothing or equipment worn or used for protection against a hazard. PPE items may include, but are not limited to, gloves, masks, respiratory devices, protective eyewear and protective attire which are intended to prevent exposure to blood, body fluids, OPIM, and chemicals used for infection control. General work attire such as uniforms, scrubs, pants, and shirts are not considered to be PPE" (California Code of Regulations, 2011). Section 1005 defines OPIM as "human body fluids such as saliva in dental procedures and any bodily fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids" (California Code of Regulations, 2011). Also included are "any unfixed tissue or organ (other than intact skin) from a human (living or dead)," as well as any cell, tissue, or organ cultures from humans or experimental animals; blood, organs, or other tissues from experimental animals; or culture medium or other solutions, that are known or reasonably likely to contain or be infected with human immunodeficiency virus (HIV), hepatitis B virus (HBV), or hepatitis C virus (HCV) (California Code of Regulations, 2011).

The California Minimum Standards for Infection Control, Section 1005, stipulate that in order to protect their skin and clothing from blood and OPIM, "all DHCP shall wear reusable or disposable protective attire whenever there is a potential for aerosol spray, splashing or spattering of blood, OPIM, or chemicals and germicidal agents. Protective attire must be changed daily or between patients if they should become moist or visibly soiled" (California Code of Regulations, 2011). Protective attire used during patient care must be removed prior to leaving laboratories or areas of patient care activities. Reusable gowns must be laundered according to Cal/OSHA Bloodborne Pathogens Standard (California Code of Regulations, 2015). Protective attire must also be worn for disinfection, sterilization, and housekeeping procedures involving the use of germicides or handling contaminated items (California Code of Regulations, 2011).

All DHCP must wear surgical face masks with either chin-length plastic face shields or protective eyewear whenever there is potential for aerosol spray, splashing, or spattering of droplet nuclei, blood, chemical or germicidal agents, or OPIM. Masks must be changed and disposed of after each patient. However, if a face mask becomes contaminated or wet, it should be changed during treatment. Following each patient treatment, face shields and protective eyewear shall be cleaned, disinfected, or disposed of (California Code of Regulations, 2011).

Hands must be protected by wearing single-use (nonwashable), disposable, medical examination gloves whenever there is contact with mucous membranes, blood, or OPIM and during all pre-clinical, clinical, post-clinical, and laboratory procedures. Medical exam gloves must be discarded (a) when torn or punctured, (b) upon completion of treatment, and (c) before leaving laboratories or areas of patient care activities. All DHCP are required to perform hand hygiene procedures before donning gloves and after removing and discarding gloves. Gloves must not be washed before or after use (California Code of Regulations, 2011). Additionally, DHCP must wear heavy-duty utility gloves to prevent puncture wounds when processing contaminated sharp instruments, needles, and devices.

HAND HYGIENE

At the beginning and end of each workday, DHCP must thoroughly wash their hands with soap and water. DHCP must also perform hand hygiene and don new gloves before treating each patient. Between patients, if hands are not visibly soiled or contaminated, an alcohol- based hand rub may be used for hand hygiene as an alternative to soap and water. Hands must be thoroughly dried before donning gloves to prevent promotion of bacterial growth, and hand hygiene must be performed again immediately after glove removal. DHCP must refrain from providing direct patient care if hand conditions are present that may render DHCP or patients more susceptible to opportunistic infection or exposure. All DHCP who have exudative lesions or weeping dermatitis of the hand must refrain from all direct patient care and from handling patient care equipment until the condition resolves (California Code of Regulations, 2011).

Hand hygiene methods, agents, duration, and indicators include the following:

1. **For routine wash**: Use water and plain soap for 15 seconds before and after each patient.
2. **For antiseptic wash**: Use water and antiseptic soap for 15 seconds before and after each patient.
3. **For antiseptic hand rub**: Use alcohol-based hand rub and agitate hands until dry. Antiseptic hand rub is not to be used if the hands are visibly soiled.
4. **For surgical asepsis**: Use water and antimicrobial soap for 2 to 6 minutes, or water and non-antimicrobial soap for 2 to 6 minutes, followed by alcohol rub.

(CDC, 2016a)

Table 2: Hand Hygiene Methods and Indications				
Method	**Agent**	**Purpose**	**Duration (Minimum)**	**Indication**
Routine handwash	Water and nonantimicrobial soap.	Remove soil and transient microorganisms.	15 seconds.	Before and after treating each patient. After barehanded touching of inanimate objects likely to be contaminated by blood or saliva. Before leaving the dental operatory or the dental laboratory. When visibly soiled. Before regloving after removing gloves that are torn, cut, or punctured.
Antiseptic handwash	Water and antimicrobial soap.	Remove or destroy transient microorganisms and reduce resident flora.	15 seconds.	
Antiseptic hand run	Alcohol-based hand rub.	Remove or destroy transient microorganisms and reduce resident flora.	Rub hands until the agent is dry.	
Surgical antisepsis	Water and antimicrobial soap OR water and non- antimicrobial soap, followed by an alcohol-based surgical hand-scrub product with persistent activity.	Remove or destroy transient microorganisms and reduce resident flora (persistent effect).	2-6 minutes. Follow manufacturer instructions for surgical hand-scrub product.	Before donning sterile surgeon's gloves for surgical procedures.

Note. Adapted from Table 2 in "Guidelines for Infection Control in Dental Health-Care Settings – 2003," by W. G. Kohn, A. S. Collins, J. L. Cleveland, J. A. Harte, K. J. Eklund, and D. M. Malvitz, *MMWR Recommendations and Reports, 52*(RR-17), pp. 1-61.

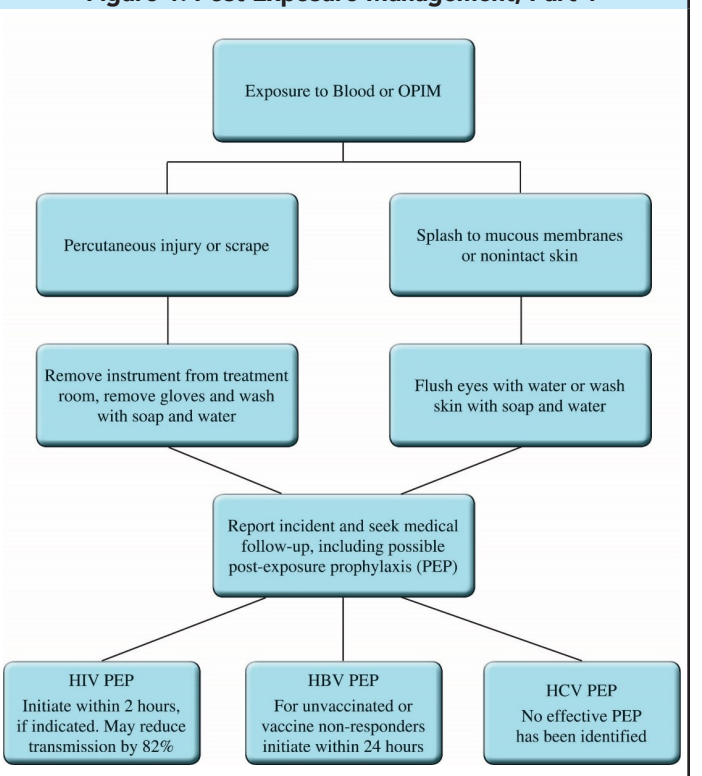
NEEDLES AND SHARPS SAFETY

Injuries with contaminated sharp instruments and needles pose a risk of bloodborne disease transmission to DHCP. In a review of national surveillance data collected between 1995 and 2004, researchers examined occupational exposures among DHCP in healthcare settings, including the types of injuries that occurred, the circumstances surrounding the injuries, and the individuals involved. General practice dentists sustained the greatest number of injuries during that time, followed by oral surgeons (Cleveland, et al., 2007). Attempts to reduce percutaneous or "sharps" injuries in dental settings have included reducing the use of needles, eliminating or isolating injury hazards by using sharps containers, needle-recapping devices, or self-sheathing needles, and instituting workplace controls (e.g., placing sharps containers closer to the point of use, recapping needles with one hand, and not passing unsheathed needles) (Cleveland, et al., 2007).

Because the majority of injuries involve needles, reducing or preventing these injuries is an important goal of an infection control program, and protocols for handling contaminated sharps are emphasized. Strict regulations by Cal/OSHA, the Dental Board of California, CDPH, and other agencies address the use, handling, and disposal of sharps. Section 1005 stipulates that "needles shall be recapped only by using the scoop technique or a protective device. Needles shall not be bent or broken for the purpose of disposal" (California Code of Regulations, 2011). And all instruments that have the potential for injury, such as "disposable needles, syringes, scalpel blades, or other sharp items or instruments shall be placed into the sharps containers for disposal as close as possible to the point of use according to all applicable local, state, and federal regulations" (California Code of Regulations, 2011). To avoid puncture wounds to operators, sharps containers must never be filled above the "filled" indicator line (California Dental Association, 2019).

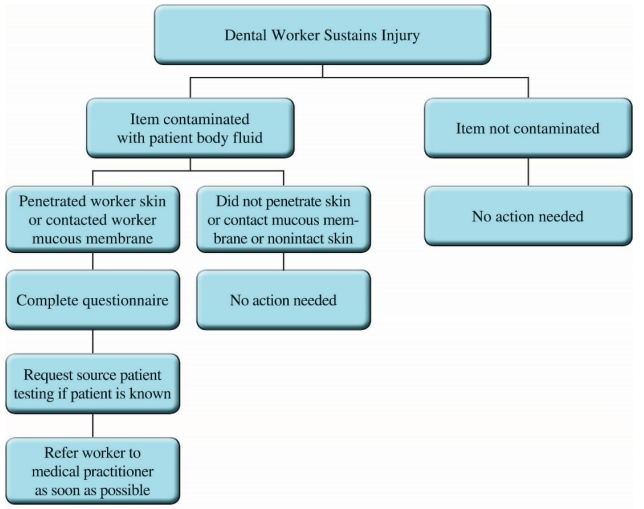
In the event that an injury does occur, a plan for managing occupational exposures must be in place and noted in the written protocol (California Code of Regulations, 2011). Figures 1 through 3 outline the current Cal/OSHA Bloodborne Pathogens Standard and CDC protocols for occupational exposure.
It should be noted that compressing a puncture wound to encourage bleeding is not recommended. Caustic agents such as bleach should not be used to cleanse a wound. Washing skin around an injury with soap and water or flushing mucous membranes with water is recommended to cleanse the area or remove debris.

Figure 1: Post-Exposure Management, Part 1



Note. Adapted from "Guidelines for Infection Control in Dental Settings – 2003," by the Centers for Disease Control and Prevention, 2003, MMWR Recommendations and Reports, 52(RR-17), 1-68; and "Updated US Public Health Service Guidelines for the Management of Occupational Exposures to Human Immunodeficiency Virus and Recommendations for Postexposure Prophylaxis," by D. T. Kuhar, D. K. Henderson, K. A. Struble, W. Heneine, V. Thomas, L. W. Cheever, … A. L. Panlilio, 2014, *Infection Control and Hospital Epidemiology, 34*(9), 875-892.

Figure 2: Post-Exposure Management, Part 2



Note. Adapted from "Guidelines for Infection Control in Dental Settings – 2003," by the Centers for Disease Control and Prevention, 2003, MMWR Recommendations and Reports, 52(RR-17), 1-68; and "Updated US Public Health Service Guidelines for the Management of Occupational Exposures to Human Immunodeficiency Virus and Recommendations for Postexposure Prophylaxis," by D. T. Kuhar, D. K. Henderson, K. A. Struble, W. Heneine, V. Thomas, L. W. Cheever, … A. L. Panlilio, 2014, *Infection Control and Hospital Epidemiology, 34*(9), 875-892.

The rates of seroconversions for bloodborne diseases following exposures is very low. On average, the risk after a percutaneous injury involving blood from a person infected with a bloodborne disease is 0.03% for HIV, 1.8% for HCV, and between 6% and 30% for HBV if the worker is unvaccinated (CDC, 2017). When new clinical employees are hired, they should receive training regarding the transmission of bloodborne pathogens, the wearing of PPE as protection, the tasks that place them at risk, and information on how to manage an occupational exposure. All training should be documented in the written protocol. Because HBV is the most easily transmitted of all the bloodborne pathogens (CDC, 2017; NIOSH, 2016), employees with occupational exposure to blood or OPIM should be offered HBV vaccination (Kuhar, et al., 2014).

Figure 3: Eye Exposures

Is this an acceptable method?

The OSHA Regulations state "a mechanism for flushing the eyes must be available to operators."

- It's hard to control the forces of the water with this method.
- Eyewash stations or sterile water in flush bottles are safer options.
- Irrigate the mucous membranes with sterile normal saline or water.

Treat occupational exposures as a medical emergency.

Note. Adapted from "Bloodborne Infectious Diseases: HIV/AIDS, Hepatitis B, Hepatitis C: Emergency Needlestick Information," by the National Institute for Occupational Safety and Health, 2014. Retrieved from http://www.cdc.gov/niosh/topics/bbp/emergnedl.html

STERILIZATION AND DISINFECTION

At the completion of the dental procedure, operators must safely process their reusable instruments and devices. Cleaning must precede any disinfection or sterilization process. Products and devices used to clean items or surfaces prior to disinfection or sterilization must be used in accordance with the manufacturer's instructions. Follow the manufacturer's instructions for cleaning solutions safe to use with the device, cycle times, and frequency of changing solutions. Contaminated instruments should not be wiped by hand prior to mechanical cleaning unless the item cannot be immersed, as is the case with a handpiece. Items that would be damaged by mechanical cleaning should be carefully cleaned by hand, wearing heavy-duty utility gloves, eye protection, and other appropriate PPE. Contaminated instruments should be thoroughly cleaned prior to sterilization, preferably using a mechanical device intended for that purpose, such as an ultrasonic cleaner or instrument washer/disinfector. Cycles on ultrasonic and instrument washers should not be interrupted. If it is necessary to interrupt a cycle or add an item after a cycle has been initiated, the entire process should be restarted. Heavy-duty utility gloves should always be worn when working with contaminated instruments. After removal from the ultrasonic solution, instruments are rinsed, inspected (any additional debris may be removed at this point), lubricated, and packaged or wrapped for sterilization. Section 1005 states that sterilization "is a validated process used to render a product free of all forms of viable microorganisms" (California Code of Regulations, 2011). The limiting requirement is the inactivation of high numbers of bacterial and mycotic endospores (often simply referred to as spores), which are produced asexually and tougher than ordinary spores (Cornell College of Agriculture and Life Sciences, 2022; Yoo, 2018).

Critical and semi-critical instruments

Instruments, items, and devices are categorized as critical, semi-critical, and non-critical. Critical items are all instruments, devices, and other items used to penetrate soft tissue or bone. Semi-critical items do not penetrate bone or soft tissue, but contact oral mucous membranes, nonintact skin, or OPIM. Non-critical items are instruments, devices, equipment, and surfaces that come in contact with soil, debris, saliva, blood, OPIM, and intact skin, but not oral mucous membranes (California Code of Regulations, 2011).

Examples of non-critical items include stethoscopes and blood pressure cuffs.

Critical items confer a high risk for infection if they are contaminated by any microorganism. Section 1005 states that critical instruments, items, and devices shall be discarded or pre-cleaned, packaged or wrapped, and sterilized after each use. Methods of sterilization shall include steam under pressure (autoclaving), chemical vapor, and dry heat. If a critical item is heat-sensitive, it shall, at minimum, be processed with high-level disinfection and packaged or wrapped upon completion of the disinfection process. These instruments, items, and devices shall remain sealed and stored in a manner so as to prevent contamination and shall be labeled with the date of sterilization and the specific sterilizer used if more than one sterilizer is

utilized in the facility (California Code of Regulations, 2011). Ink used to label packages should be non-toxic and markings should be on the non-porous side of plastic and paper pouches or written on indicator tape placed on the pouch (AAMI, 2017).

Section 1005 states that semi-critical instruments, items, and devices shall be pre-cleaned, packaged or wrapped, and sterilized after each use. Methods of sterilization include steam under pressure (autoclaving), chemical vapor, and dry heat. If a semi-critical item is heat sensitive, it shall, at minimum, be processed with high-level disinfection and packaged or wrapped upon completion of the disinfection process. These packages or containers shall remain sealed and shall be stored in a manner so as to prevent contamination, and shall be labeled with the date of sterilization and the specific sterilizer used if more than one sterilizer is utilized in the facility. If a sterile instrument package is torn, wet, or is otherwise damaged, the instrument should not be used and should be reprocessed and presterilized prior to use (California Code of Regulations, 2011).

All high-speed dental handpieces, low-speed handpieces, rotary components, and dental unit attachments such as reusable air/water syringe tips and ultrasonic scaler tips shall be packaged, labeled, and heat-sterilized in a manner consistent with the same sterilization practices as a semi-critical item.

Non-critical surfaces and patient-care items must be cleaned and disinfected with a Cal/EPA-registered hospital low-level disinfectant that is labeled effective against HBV and HIV. When the item is visibly contaminated with blood or OPIM, a Cal/EPA-registered hospital intermediate-level disinfectant with a tuberculocidal claim must be used (California Code of Regulations, 2011). Cleaning with a suitable product should always precede disinfection. Many disinfectants contain surfactants, making them suitable for both cleaning and disinfection. Always refer to the manufacturer's instructions to determine if the product can be used as a cleaner, the correct contact time, necessary PPE, disposal, and any other important information.

Single-use disposable items such as prophylaxis angles, prophylaxis cups and brushes, tips for high-speed evacuators, saliva ejectors, air/water syringe tips, and gloves shall be used for one patient only and discarded.

Special dental protocols exist for surgical procedures involving bone or soft tissues; in these instances, Section 1005 stipulates that sterile coolants/irritants must be used and must be delivered using a sterile delivery system (California Code of Regulations, 2011). At the completion of surgery, all contaminated solid waste shall be disposed of according to applicable local, state, and federal environmental standards (California Health and Safety Code, 2017).

Sterilizer monitoring

Proper functioning of the sterilization cycle of all sterilization devices is essential. Although section 1005 only requires the use of weekly biological indicators, sterilizers should be monitored by additional methods, including observations of mechanical indicators and chemical indicators (CDC, 2003; AAMI, 2017). Chemical indicators measure parameters of sterilization such as heat and length of time, and mechanical indicators are the gauges and digital indicators on the sterilizer that will alert a user to an equipment malfunction. DHCP should regularly evaluate the mechanical aspects of their sterilizers by observing the gauges or displays to assess the time cycle, temperature, and pressure.

Chemical indicators

Chemicals are used to assess physical conditions (e.g., time and temperature) during the sterilization process. Although chemical indicators do not prove that sterilization has been achieved, they confirm that certain essential parameters for sterilization have been met. External indicators applied to the outside of a package (e.g., chemical indicator tape or special markings) change color rapidly when a specific parameter (temperature) is reached, and they verify that the package has been through the sterilization process. Internal chemical indicators verify that the sterilizing agent has penetrated the packaging material and reached the instruments inside. A single-parameter internal chemical indicator provides information regarding only one sterilization parameter (e.g., time or temperature). Multi-parameter internal chemical indicators are designed to react to two or more parameters (e.g., time and temperature, or time, temperature, and the presence of steam) and can provide a more reliable indication that sterilization conditions have been met. The CDC recommends a chemical indicator be placed inside each pack of instruments to be sterilized. If the indicator cannot be seen from the outside, an additional indicator should be placed on the outside of the package (CDC, 2003).

The chemical indicator test results that are received when the sterilization cycle is complete can provide an early indication of a problem and when in the process the problem might exist. If the indicators demonstrate that the sterilization cycle was inadequate, the instruments in that load should not be used for patient care.

Biological indicators

Biological indicators (spore tests) are the most accurate method for evaluating whether sterilization was achieved. They work by determining if the highly resistant microorganisms (e.g., Geobacillus or Bacillus species) have been destroyed, rather than merely testing the physical and chemical conditions necessary for sterilization. Because these spores are more resistant and present in greater numbers than the other contaminants found on instruments and equipment, an inactivated biological indicator suggests that other potential pathogens in the load have been inactivated.

The California Minimum Standards for Infection Control, Section 1005, state, "Proper functioning of the sterilization cycle of all sterilization devices shall be verified at least weekly through the use of a biological indicator (such as a spore test). Test results shall be documented and maintained for 12 months" (California Code of Regulations, 2011). The test must be conducted for each sterilizer in the office, either by sending the test to a commercial lab or testing with an in-office system. The California Code of Regulations requires that these results be available upon inspection if requested. A combination of biological indicators, chemical indicators, and review of the mechanical indicators on the sterilizer should be used by DHCP to closely monitor the effectiveness of their sterilizing systems (CDC, 2003).

Low-, intermediate-, and high-level disinfection

Disinfection is a process that is required for specific clinical surfaces, equipment, prosthetic devices, and other items used in patient care that cannot be heat sterilized. Unlike sterilization, disinfection does not destroy all forms of microbial life, but instead kills various microbes dependent on the concentration and combination of active chemicals. Disinfectants must be mixed, stored, and used exactly as directed or their effectiveness may be altered. Disinfectants are categorized as high-, intermediate-, and low-level products, according to the germicidal resistance of the organisms the product is able to inactivate. High-level disinfectants are those that kill viruses, bacteria, fungi, Mycobacterium tuberculosis var. bovis

(a difficult pathogen to inactivate), and some, but not all, bacterial spores. High-level disinfectants are intended for use with heat-sensitive semi-critical items and may only be used as an immersion disinfectant. High-level disinfectants should never be used on clinical surfaces. An intermediate-level product kills Mycobacterium tuberculosis var. bovis and many other pathogens; however, it does not necessarily kill spores. Low-level disinfectants are the least effective. They kill some bacteria, some viruses, and some fungi, but do not kill bacterial spores or Mycobacterium tuberculosis var. bovis (California Code of Regulations, 2011).

Facilities

Environmental surfaces fall into two categories: clinical contact surfaces and housekeeping surfaces. Section 1005 states, "If non-critical items or surfaces likely to be contaminated are manufactured in a manner preventing cleaning and disinfection, they shall be protected with disposable impervious barriers. Disposable barriers shall be changed when visibly soiled or damaged and between patients. Clean and disinfect all clinical contact surfaces that are not protected by impervious barriers using a California Environmental Protection Agency (Cal/EPA) registered, hospital grade low- to intermediate-level germicide after each patient. The low-level disinfectants used shall be labeled effective against HBV and HIV" (California Code of Regulations, 2011). To ensure that disinfection is effective, all surfaces must be cleaned as the first step, and disinfectants must be used in accordance with the manufacturer's instructions. Surfaces must be thoroughly cleaned to remove the bioburden (blood, saliva, OPIM). When these substances exist on the surface, they act as a barrier, preventing penetration of the disinfectant.

For patient care, use of impervious barriers or surface disinfectants, or a combination of both, is acceptable. Barrier protection of surfaces and equipment can prevent contamination of clinical contact surfaces but is particularly effective for those that are difficult to clean. Barrier protection also prevents discoloration, drying and cracking of materials, rusting, and corrosion. Because such coverings can become contaminated, they should be removed and discarded between patients, while DHCP are still gloved. A clean barrier should be placed prior to the next patient, after the contaminated gloves have been removed and the hands washed.

All housekeeping surfaces (e.g., floors, walls, and sinks) should be routinely cleaned with detergent and water or a Cal/EPA-registered - hospital-grade disinfectant. Products used to clean items or surfaces prior to disinfection procedures must be clearly labeled, and DCHP must follow all safety data sheet (SDS) handling and storage instructions (CDC, 2003). Schedules and methods vary according to the area and type of contamination. Protective eyewear, masks, and chemical- and puncture-resistant utility gloves must be worn when handling chemicals for disinfection.

CDPH and local, state, and federal regulations cover disposal of contaminated solid waste. Appropriate disposal of contaminated waste is also presented in Section 1005, which stipulates that "contaminated solid waste shall be disposed of according to applicable local, state, and federal standards" (California Code of Regulations, 2011).

Dental unit waterlines

Dental unit waterlines are also regulated by Section 1005, which stipulates that "dental unit water lines shall be anti-retractive. At the beginning of each workday, dental unit lines and devices shall be purged with air or flushed with water for at least two (2) minutes prior to attaching handpieces, scalers, air water syringe tips, or other devices. The dental unit lines and devices shall be flushed between each patient for a minimum of twenty (20) seconds" (California Code of Regulations, 2011). Additional methods that are utilized for waterline maintenance include independent reservoirs, chemical treatments (continuous or intermittent), sterile water delivery, filtration systems, anti-retraction valves, water quality tests, or combinations of several systems. These additional methods are not required by section 1005, but are recommended by the CDC (CDC, 2003).

Lab areas

A variety of laboratory procedures may be performed in dental offices, including taking impressions, adjusting prostheses, and adjusting and polishing crowns, among others. According to the California Minimum Standards for Infection Control, Section 1005, "all intraoral items such as impressions, bite registration, prosthetic and orthodontic appliances shall be cleaned and disinfected with an intermediate-level disinfectant before manipulation in the laboratory and before placement in the patient's mouth" (California Code of Regulations, 2011). Prosthetic devices should be rinsed with clear water prior to reinsertion in the oral cavity. Rinsing is a critical step because acrylic and other materials are very porous and capable of trapping chemicals, causing a chemical burn to the mucous membranes. "Splash shields and equipment guards shall be used on dental laboratory lathes. Fresh pumice and a sterilized or new rag-wheel shall be used for each patient. Devices used to polish, trim, or adjust contaminated intraoral devices shall be disinfected or sterilized, properly packaged or wrapped, and labeled with the date and the specific sterilizer used if more than one sterilizer is utilized in the facility. If packaging is compromised, the instruments shall be recleaned, packaged in new wrap, and sterilized again. Sterilized items will be stored in a manner so as to prevent contamination" (California Code of Regulations, 2011).

Conclusion

This course provided a review of the Dental Board of California Minimum Standards for Infection Control, Section 1005. Basic operational information was presented on instrument categories and their corresponding preparation and sterilization, including sterilizer monitoring. Also included were cleaning and disinfection recommendations for clinical and housekeeping surfaces, which contribute to a workplace that is free from occupational hazards, and waterline management, which reduces the probability of aerosol contamination. Laboratory safety, designed to prevent injury and cross-contamination, and management and disposal of contaminated waste were discussed. Management of occupational injuries and exposures, including reporting, testing, and treatment were outlined, including the use of primary protection – the HBV vaccine. Compliance with these and other regulations is the first step in ensuring the safe delivery of care to patients and protecting DHCP in the workplace. It is important to note that the precautions outlined in the Dental Board of California Infection Control Regulations are consider minimum standards. Additional precautions may be necessary to prevent the transmission of infectious diseases in the oral healthcare setting—particularly when confronted with pathogens of concerns such as has been experienced with the SARS-CoV-2 virus. DHCP should frequently review the CDC website for updated infection prevention and control guidelines and update their policies and procedures accordingly. All DHCP regulated under these requirements should regularly review the Dental Board of California website for changes or updates to the requirements.

APPENDIX A

Definition of terms from the California code of regulations title 16 § 1005. Minimum standards for infection control

1. "Standard precautions" are a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which health care is delivered. These include hand hygiene, use of gloves, gown, mask, eye protection, or face shield, depending on the anticipated exposure, and safe handling of sharps. Standard precautions shall be used for care of all patients regardless of their diagnoses or personal infectious status.
2. "Critical items" confer a high risk for infection if they are contaminated with any microorganism. These include all instruments, devices, and other items used to penetrate soft tissue or bone.
3. "Semi-critical items" are instruments, devices, and other items that are not used to penetrate soft tissue or bone, but contact oral mucous membranes, non-intact skin or other potentially infectious materials (OPIM).
4. "Non-critical items" are instruments, devices, equipment, and surfaces that come in contact with soil, debris, saliva, blood, OPIM, and intact skin, but not oral mucous membranes.
5. "Low-level disinfection" is the least effective disinfection process. It kills some bacteria, some viruses and fungi, but does not kill bacterial spores or Mycobacterium tuberculosis var. bovis, a laboratory test organism used to classify the strength of disinfectant chemicals.
6. "Intermediate-level disinfection" kills Mycobacterium tuberculosis var bovis indicating that many human pathogens are also killed. This process does not necessarily kill spores.
7. "High-level disinfection" kills some, but not necessarily all bacterial spores. This process kills Mycobacterium tuberculosis var. bovis, bacteria, fungi, and viruses.
8. "Germicide" is a chemical agent that can be used to disinfect items and surfaces based on the level of contamination.
9. Sterilization" is a validated process used to render a product free of all forms of viable microorganisms.
10. "Cleaning" is the removal of visible soil (e.g., organic and inorganic material) debris and OPIM from objects and surfaces and shall be accomplished manually or mechanically using water with detergents or enzymatic products.
11. "Personal Protective Equipment" (PPE) is specialized clothing or equipment worn or used for protection against a hazard. PPE items may include, but are not limited to, gloves, masks, respiratory devices, protective eyewear, and protective attire which are intended to prevent exposure to blood, body fluids, and OPIM, and chemicals used for infection control. General work attire, such as uniforms, scrubs, pants, and shirts, is not considered to be PPE.
12. "Other Potentially Infectious Materials" (OPIM) means any one of the following:
    A. Human body fluids such as saliva in dental procedures and any bodily fluid that is visibly contaminated with blood, and all bodily fluids in situations where it is difficult or impossible to differentiate between body fluids.
    B. Any unfixed tissue or organ (other than intact skin) from a human (living or dead).
    C. Any of the following, if known or reasonably likely to contain or be infected with HIV, HBV, or HCV:
        1. Cell, tissue, or organ cultures from humans or experimental animals;
        2. Blood, organs, or other tissues from experimental animals; or
        3. Culture medium or other solutions.
13. "Dental Healthcare Personnel" (DHCP) are all paid and non-paid personnel in the dental health-care setting who might be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air. DHCP includes dentists, dental hygienists, dental assistants, dental laboratory technicians (in-office and commercial), students and trainees, contractual personnel, and other persons not directly involved in patient care but potentially exposed to infectious agents (e.g., administrative, clerical, housekeeping, maintenance, or volunteer personnel).

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INFECTION CONTROL STANDARDS FOR CALIFORNIA DENTAL HEALTH CARE WORKERS, 6TH EDITION

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 100, or complete your test online at **EliteLearning.com/Book**

1. According to the California Code of Regulations, dental healthcare personnel (DHCP) include:
    a. All paid personnel who might be exposed to infectious materials.
    b. All paid and unpaid personnel who might be exposed to infectious materials.
    c. Only people directly involved in patient care.
    d. Only dentists, dental hygienists, and dental assistants.

2. The agency that enforces infection control requirements through the Bloodborne Pathogens Rule from Title 8, Section 5192 of the California Code of Regulations is:
    a. California Environmental Protection Agency (Cal/EPA).
    b. California Division of Occupational Safety and Health (Cal/OSHA).
    c. California Division of the Federal Drug Administration (CalFDA).
    d. Dental Board of California.

3. The agency responsible for the collection, storage, transport, and disposal of contaminated solid waste is the:
   a. California Environmental Protection Agency (Cal/EPA).
   b. California Division of Occupational Safety and Health (Cal/OSHA).
   c. California Division of the Federal Drug Administration (CalFDA).
   d. California Department of Public Health (CDPH).
4. The primary goal of an infection control program is to:
   a. Comply with governmental regulations.
   b. Completely eliminate the transmission of infections.
   c. Minimize the transmission of pathogens in the healthcare setting.
   d. Minimize the potential for litigation arising from improper infection control practices.
5. At a minimum, infection control policies in the dental office must be updated:
   a. Every 3 years.
   b. Every 2 years.
   c. Annually.
   d. Monthly.
6. A copy of which regulation must be posted conspicuously in each dental office?
   a. The California Minimum Standards for Infection Control, Section 1005.
   b. Infection Control Recommendations by the Centers for Disease Control and Prevention.
   c. The California Environmental Protection Agency, Section 2140.
   d. The ADA Code of Ethics and Statement on Infection Control.
7. The California Minimum Standards for Infection Control, Section 1005, stipulate that in order to protect their skin and clothing from blood and other potentially infectious material (OPIM), healthcare workers should:
   a. Wear masks only when using a dental handpiece.
   b. Wear disposable or reusable protective attire.
   c. Wear the designated uniforms of the office.
   d. Wear standard scrubs as part of their personal protective equipment.
8. Masks should routinely be changed:
   a. After each patient.
   b. After 3 hours of use.
   c. Only if they become contaminated.
   d. At the end of each workday.
9. To prevent puncture wounds when processing contaminated sharp instruments, needles, and devices, dental healthcare professionals must wear:
   a. Sterile surgical gloves.
   b. Light-duty utility gloves.
   c. Heavy-duty utility gloves.
   d. Single-use medical examination gloves.
10. Until the condition resolves, all dental healthcare professionals who have exudative lesions or weeping dermatitis of the hand should:
   a. Wear two pairs of medical examination gloves.
   b. Refrain from all direct patient care.
   c. Only handle patient care equipment.
   d. Wear heavy-duty utility gloves.
11. Hand hygiene for surgical asepsis involves washing with water and antimicrobial soap for:
   a. 10-45 seconds.
   b. 60-90 seconds.
   c. 2-6 minutes.
   d. 8-10 minutes.
12. Which group of dental professionals sustained the greatest number of occupational injuries according to a 9-year CDC study?
   a. General practice dentists.
   b. Oral surgeons.
   c. Dental assistants.
   d. Dental hygienists.
13. After experiencing a puncture wound, the dental healthcare worker should make certain that the wound is:
   a. Compressed to encourage bleeding.
   b. Washed with soap and water.
   c. Rinsed out with a solution of bleach.
   d. Washed with alcohol hand rub.
14. The rates of seroconversion are highest for which of the following bloodborne pathogens?
   a. HIV.
   b. HCV.
   c. HBV.
   d. HEV.
15. Section 1005 of the California Minimum Standards for Infection Control states that sterilization is a validated process used to:
   a. "Render a product free of all forms of viable microorganisms."
   b. "Ensure that the chain of infection is rendered unable to carry on."
   c. "Eliminate the transmission of all infections."
   d. "Kill all forms of microbial life."
16. Items that do not penetrate bone or soft tissue but contact oral mucous membranes are considered:
   a. Semi-critical.
   b. Critical.
   c. Non-critical.
   d. Semi-critical.
17. If a sterile instrument pack is torn, wet, or otherwise damaged, the instrument should be:
   a. Used as soon as possible.
   b. Reprocessed and resterilized prior to use.
   c. Placed in a clean, dry location until it is used.
   d. Carefully resealed with autoclave tape and placed in a clean, dry location.
18. According to Section 1005 of the California Minimum Standards for Infection Control, low-level disinfectants used to disinfect clinical contact surfaces should be labeled effective against HIV and:
   a. Influenza.
   b. TB.
   c. MRSA.
   d. HBV.
19. Which of the following statements is true regarding biological monitoring?
   a. It should be done on a monthly basis.
   b. It is the most accepted method for evaluating the sterilization process.
   c. It tests the physical and chemical conditions necessary for sterilization.
   d. The results should be documented and maintained for 3 months.
20. Dental unit waterlines should be flushed between patients for a minimum of:
   a. 20 seconds.
   b. 60 seconds.
   c. 90 seconds.
   d. 180 seconds.

Chapter 3: Dental Ethics and the Digital Age, 2nd Edition

3 CE Hours

Release Date: March 14, 2022

Expiration Date: March 13, 2025

Faculty

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AGD Subject Code - 555

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INTRODUCTION

Learning objectives

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

- Describe the evolution of healthcare ethics, including events that affected development of the principles of ethics that guide the dental profession.
- Describe how codes of ethics and concepts of professionalism guide the dental practitioner's relationships and obligations.
- Discuss the relationship of ethics to legal obligations.
- Identify current and emerging ethical challenges facing dental professionals.
- Describe how ethical decision-making models help dental professionals recognize and address ethical dilemmas in practice.

Course overview

The practice of dentistry is multifaceted. Not only must dental professionals possess the technical skills to treat patients appropriately and safely; they must also practice within a professional ethical framework that is sometimes more challenging than the dental procedures themselves. Dental ethics have deep roots in history, and this course will take an in-depth look at the events that forged the basis of modern-day ethics and professionalism in dentistry.

The electronic world is expanding exponentially, and all dental professionals face the challenge of keeping up with the rapid advances in technology. Dental professionals have the opportunity to use technology in their practices and private lives, but they must consider the ethical implications. This course will explore these issues, including the sensitive issue of cyberbullying and the dentist's obligation in such cases.

This basic-level course will help dental professionals gain a better understanding of dental ethics, professionalism, and current ethical challenges, with a particular emphasis on the impact of the digital age. A section of this course will address the ways that the law and ethics intersect. Through a systematic, case-based approach, this course will provide dentists, dental hygienists, and dental assistants with the tools to recognize and navigate the complex ethical issues that may arise in practice.

EVOLUTION OF HEALTHCARE ETHICS

Historical perspective

Although the earliest evidence of the practice of dentistry dates back to the Indus valley civilization (American Dental Education Association [ADEA], n.d.) and the Egyptian era (American Dental Association, n.d.a), dental education did not become formalized until the early part of the 19th century (ADEA, n.d.). At that time, both dental practitioners and the public began to recognize the importance of properly training those providing dental care and dentistry, and dentistry began its transition from a craft vocation to a learned profession (Taylor, 1922). An exploration of the history of medical and dental ethics is important to an understanding of the concept of professionalism as it relates to dentistry.

Medical ethics has its foundation in ancient Greece around the fifth century BCE (Muacevic and Adler, 2018). The physician Hippocrates, recognized as the founding father of medicine, espoused ethical ideals that still hold true in medical practice today.

From the time of Hippocrates to the third century in the Common Era, evidence can be found in literature regarding the incorporation of ethical standards into the practice of medicine. The earliest known document about medical ethics is an ancient text titled Epidemics I (Jonsen, 2000). Although this text, written in the time of Hippocrates and credited to him by scholars, is mostly clinical in nature, one statement stands out: "As to diseases, make a habit of two things – to help and not to harm" (Hippocrates, trans. 1923, p. 165).

Oath is another text from this time period. It is widely attributed to Hippocrates, although debate exists in contemporary historical literature concerning its authorship The Hippocratic Oath is a part of the collection of works known as the *Hippocratic Corpus* which was composed over hundreds of years so Hippocrates could not have authored them all (Bad Ancient, 2020). This famous document is commonly known as the *Hippocratic Oath*. Text Box 1 contains the classic version of this oath.

Text Box 1: The Hippocratic Oath: Classic Version

The Oath of Hippocrates

I SWEAR by Apollo the physician and Æsculapius, and Health, and All-heal, and all the gods and goddesses, that, according to my ability and judgment:

- I will keep this Oath and this stipulation – to reckon him who taught me this Art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring in the same footing as my own brothers, and to teach them this art, if they shall wish to learn it, without fee or stipulation; and that by precept, lecture, and every other mode of instruction.
- I will impart a knowledge of the Art to my own sons, and those of my teachers, and to disciples bound by a stipulation and oath according to the law of medicine, but to none others.
- I will follow that system of regimen which, according to my ability and judgement, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous.
- I will give no deadly medicine to any one if asked, nor suggest any such counsel; and in like manner I will not give to a woman a pessary to produce abortion. With purity and with holiness I will pass my life and practice my Art.
- I will not cut persons labouring under the stone, but will leave this to be done by men who are practitioners of this work. Into whatever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption; and, further, from the seduction of females or males, of freemen and slaves. Whatever, in connection with my professional service, or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad.
- I will not divulge, as reckoning that all such should be kept secret. While I continue to keep this Oath unviolated, may it be granted to me to enjoy life and the practice of the art, respected by all men, in all times. But should I trespass and violate this Oath, may the reverse be my lot.

Note. From Oath of Hippocrates. (1910). In Harvard classics (Vol. 38). Boston, MA: P.F. Collier and Son. Retrieved from http://www.cirp.org/library/ethics/hippocrates/.

The Hippocratic Oath provides medical practitioners with a framework for the ethical practice of medicine by professing a set of obligations to which physicians are bound. As is evident from the language of the oath, Hippocrates believed that the practice of medicine was both an art and a privilege and that patients had rights of their own.

Dentistry has adopted many of the ideals of the Hippocratic Oath into its current professional codes of ethics as well as the oaths that dental and hygiene students take upon their graduation from dental school. However, to fully understand the history of medical – and subsequently dental – ethics, it is necessary to explore other historical events.

The years between 1940 and 1985 mark an important period in the development of medical and dental ethics worldwide.

The atrocities that occurred in the concentration camps during World War II sparked this era of change. The Nazis designed a plethora of "research studies" that involved the torture and murder of concentration camp inmates. One such study placed subjects in frigid water to observe how long it would take them to die of hypothermia. In another experiment, researchers inflicted simulated battle wounds and treated some subjects with experimental techniques while neglecting the "control" group (Tapalaga, 2020). In Nuremberg, Germany, beginning in December of 1946, in a series of military tribunals that became known as the *Doctors' Trials*, prosecutors charged 20 Nazi physicians and three medical administrators who murdered and tortured concentration camp prisoners with horrific medical experiments. (Shuster, 2018).

Historians have thoroughly documented the complete disregard for basic human rights that characterized some of the "research studies" performed in the camps by Joseph Mengele and others. As a result of these trials, the Nuremberg Code emerged as the first document to state the moral obligation of researchers to conduct legitimate research and protect human subjects who participate. Before this time, there had been no written or widely accepted standards for protecting human subjects in research, even when they consented to take part. Text Box 2 lists the mandates of the Nuremberg Code.

In spite of recent memories of Nazi medical atrocities, dental investigators conducted what is now considered unethical research at Sweden's Vipeholm Mental Hospital from 1945 to 1953. In that series of studies, 436 patients were fed large quantities of sugars in an effort to observe the effect of carbohydrate type, frequency, and quantity of intake on the development of dental caries. The subjects of the study were residents of an institution for mentally challenged individuals who were never informed about their participation of the study and from whom informed consent was never sought. By the end of the study, subjects had 2,125 new dental cavities (Manjrekar, Do and Do, 2019).

While research atrocities were occurring in Europe, the United States was not immune to transgressions of its own. For 40 years, from 1932 to 1972, the U.S. Public Health Service conducted the Tuskegee Syphilis Study, enrolling approximately 600 African-American men in the program. Because no cure for syphilis existed at the inception of the study, the purpose of the Tuskegee research was to observe the natural progression of the disease. However, even when penicillin became available in the 1940s, researchers never gave the drug to participants in the study. In fact, they never informed the subjects that syphilis was their diagnosis, telling them instead that they had "bad blood." Therefore, the participants did not even seek treatment for syphilis on their own (Centers for Disease Control and Prevention [CDC], 2017; Alsan and Wanamaker, 2017; Tuskegee University, 2021).

Text Box 2: The Nuremberg Code

1. The voluntary consent of the human subject is absolutely essential. This means that the person involved should have legal capacity to give consent; should be so situated as to be able to exercise free power of choice, without the intervention of any element of force, fraud, deceit, duress, over-reaching, or other ulterior form of constraint or coercion; and should have sufficient knowledge and comprehension of the elements of the subject matter involved, as to enable him to make an understanding and enlightened decision. This latter element requires that, before the acceptance of an affirmative decision by the experimental subject, there should be made known to him the nature, duration, and purpose of the experiment; the method and means by which it is to be conducted; all inconveniences and hazards reasonably to be expected; and the effects upon his health or person, which may possibly come from his participation in the experiment. The duty and responsibility for ascertaining the quality of the consent rests upon each individual who initiates, directs or engages in the experiment. It is a personal duty and responsibility, which may not be delegated to another with impunity.
2. The experiment should be such as to yield fruitful results for the good of society, unprocurable by other methods or means of study, and not random and unnecessary in nature.
3. The experiment should be so designed and based on the results of animal experimentation and a knowledge of the natural history of the disease or other problem under study, that the anticipated results will justify the performance of the experiment.
4. The experiment should be so conducted as to avoid all unnecessary physical and mental suffering and injury.
5. No experiment should be conducted, where there is an appropriate reason to believe that death or disabling injury will occur; except, perhaps, in those experiments where the experimental physicians also serve as subjects.
6. The degree of risk to be taken should never exceed that determined by the humanitarian importance of the problem to be solved by the experiment.
7. Proper preparations should be made and adequate facilities provided to protect the experimental subject against even remote possibilities of injury, disability, or death.
8. The experiment should be conducted only by scientifically qualified persons. The highest degree of skill and care should be required through all stages of the experiment of those who conduct or engage in the experiment.
9. During the course of the experiment, the human subject should be at liberty to bring the experiment to an end, if he has reached the physical or mental state, where continuation of the experiment seemed to him to be impossible.
10. During the course of the experiment, the scientist in charge must be prepared to terminate the experiment at any stage, if he has probable cause to believe, in the exercise of the good faith, superior skill and careful judgment required of him, that a continuation of the experiment is likely to result in injury, disability, or death to the experimental subject.

Note. U.S. Department of Health and Human Services. (2016b [1949]). The Nuremberg Code. In *Trials of war criminals before the Nuremberg military tribunals under Control Council Law No. 10* (Vol. 2). Washington, DC: U.S. Government Printing Office. Retrieved from http://www.hhs.gov/ohrp/ archive/nurcode.html

This study continued unchanged until an undercover investigation by the media brought the situation to the attention of the public. When the story broke in 1972, only 74 of the original study participants were still alive (Lehman, 2021). Other research that caused similar ethical concerns during this period was taking place in U.S. prisons such as the Holmesburg Prison in Philadelphia and disabled children's inpatient facilities such as the Willowbrook State School in Staten Island (Rosenbaum, 2020; Amramova, 2019).

In 1974, amid increasing outcries over the controversial research occurring in the United States, Congress appointed the National Commission for the Protection of Research Subjects of Biomedical and Behavioral Research. They charged the commission with defining the underlying ethical principles that should surround research involving human subjects as well as clarifying the definition of legitimate research. In 1979, the commission released the Belmont Report (Muscente, 2020; U.S. Department of Health and Human Services [HHS], 2016a). This document provided the basis for modern ethical principles that still guide healthcare ethics today.

The Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) identified the basic principles of respect for persons, which means identifying individuals as autonomous decision makers and protecting persons with compromised capacity; beneficence, meaning minimizing harms and maximizing benefits; and justice, indicating a fairness in the distribution of the benefits and burdens of research. In its primary application, the Belmont Report forms the modern basis of informed consent (Czubaruk, 2019). The actual term *informed consent* dates to a judge's ruling in a 1957 court case relating to a surgeon who had not been forthcoming concerning the hazards of a surgical procedure that left the plaintiff paralyzed. In the 1957 US case of Salgo v. Leyland, Justice Bray wrote "a physician violates his duty

to his patient and his subjects himself to liability if he withholds any facts which are necessary to form the basis of an intelligent consent by the patient to the proposed treatment…" (Simpson and Innes, 2020).

The following historical events also significantly influenced the evolution of biomedical ethics in the 20th century (Jonsen, 2000):

- **Discovery of DNA (1953)**: This discovery was the beginning of the understanding of genetics and the inception of genetic engineering, whose many aspects have incited fierce ethical debate.
- **Oral contraceptives (1960)**: Greater understanding of the hormonal factors associated with female reproduction led to the development of oral contraceptives ("the pill") and subsequent debate over their moral permissibility.
- **Chronic hemodialysis and the Seattle Dialysis Selection Committee (1960)**: The success of hemodialysis as a medical treatment for acute and chronic kidney failure was a double-edged sword; the treatment could save lives, but resources were extremely limited. A committee was formed in Seattle, where the technology was first available, with the mandate to select patients for treatment based on specific criteria. Committee members debated the decision of who would live and who would die, and why (Butler, Mehrotra, Tonelli, & Lam, 2016).
- **Harvard definition of brain death (1968)**: As artificial life support became available, the debate over the definition of irreversible coma began (Wijdicks, 2018).
- **Roe v. Wade (1973)**: This landmark decision by the U.S. Supreme Court ruled that the right to privacy guaranteed under the U.S. Constitution extends to a woman's decision to have an abortion. This moral debate continues.
- **Karen Ann Quinlan (1976)**: The case of Karen Ann Quinlan spurred the debate over the definition of "persistent vegetative state," and when it should be permissible to remove someone from artificial life support. On March 31, 1976, the Supreme Court ruled in a 7 to 0 decision that Karen Ann Quinlan should be removed from life support because she could not reasonably be expected to recover (Nursinganswers.net, 2020). This case prompted the creation of ethics committees in many hospitals (CDC, n.d.).
- **Baby Louise Brown (1978)**: The world's first "test tube baby" was born to parents who could not conceive naturally. Some people accused physicians of playing God. Some people greeted the news with excitement and joy while others expressed fear and hostility (Saunders, 2018).
- **Baby Doe (1982)**: A child born with Down's syndrome had a serious but correctible birth defect that the parents decided, on the advice of their obstetrician, not to have repaired. The baby died after a few days (Kett, 2020). The baby's birth and death caused people to explore the moral and ethical dilemmas of "special care nurseries" for handicapped and premature infants.
- **Artificial heart (1982)**: A retired dentist named Barney Clark was the first artificial heart recipient to survive the procedure. He lived 112 days. This procedure sparked fierce debate over the allocation of healthcare resources for one person.
- **AIDS epidemic (1983)**: Although the acquired immunodeficiency syndrome (AIDS) was already prevalent in some areas of the country, it was officially labeled an epidemic in the United States on April 11, 1983. The epidemic brought up several ethical issues, including that of patient confidentiality (Hlongwa, 2016). The rights of the patient need to be balanced against the welfare of potential sex or needle-sharing partners (HIV.gov, 2017).
- **Patient Self-Determination Act (1990)**: The parents of Nancy Beth Cruzan, a patient in a vegetative state, requested that the hospital discontinue artificial nutrition and hydration keeping her alive. Their request was denied. This case drove Congress to enact the Patient Self-Determination Act (Teoli, 2021). The advent of advance directives, right-to-die, and end-of-life decision making continues to present ethical dilemmas, as was evident in the case of Terry Schiavo in 2005.
- **Terri Schiavo case (2005)**: In 1990, complications of an eating disorder caused Terri Schiavo to suffer a cardiac arrest that led to catastrophic brain damage. At her parents' insistence, she was kept alive through artificial hydration and a feeding tube for the next 15 years. Her husband insisted that all but the most basic brain function had ceased and that Terri Schiavo should be allowed to die. In the midst of legal wrangling, her feeding tube was removed and reinserted on several occasions. When the parents' final appeal was denied, and the feeding tube was not reinserted, Terri Schiavo died (Approved Scholars, 2017).

  The Oregon Death with Dignity Act of 1997 (Oregon Health Authority, n.d., 2018) has been developed for situations such as the Terri Schiavo case.

To read about these events in more detail, please see the Resources section of this course.

The 20th century was a pivotal time in the evolution of medical ethics. As technology became more sophisticated and consumers of health care more knowledgeable, healthcare practitioners had no choice but to look more closely at ethical practices that surrounded patient care and research involving human subjects. Dentistry was no exception. The ethical challenges in health care have not ceased; rather, they have only increased in number and variety as society has become more dependent on technology and as medical advances have continued to grow exponentially.

Early ethical theories

Before the 1979 release of the Belmont Report, which introduced principle-based ethics in health care, three schools of thought primarily guided the process of ethical decision making. These three approaches are important to understand because they have deep roots in history and society, and they governed ethical decision making in health care prior to the latter part of the 20th century. However, the diversity of these theories did not offer a standard upon which medical or dental practitioners could rely.

Utilitarian ethics

Attributed to the 19th century English philosopher John Stuart Mill, utilitarian ethics suggests that the moral value of any action – that is, whether the action is right or wrong – depends on what consequences will ensue once the person makes the decision. Mill believed that the right action should always be the one that maximizes benefit for the most people and causes the least amount of evil. This theory holds that the consequences of actions should be beneficial and avoid harm (Prassad, et.al., 2019).

For example, consider a scenario of a patient who visits the dentist only in cases of emergency as opposed to a patient who regularly schedules care and has many dental needs. Mill might say that treating the patient who comes in only for emergencies is a waste of time when the practitioner could be caring for the regular patient who is more likely to have a positive treatment outcome. It can be seen that using this philosophy alone when approaching ethics in dental practice will not work. Dental professionals have the ethical obligation to relieve pain in all patients.

Deontological ethics

Deontology is an ethical theory developed by Immanuel Kant, an 18th-century German philosopher. According to this theory the consequences of an action do not matter; it is the duty or obligation to do what is right in any situation that makes an action right or wrong. Kant believed that individual autonomy

and individual rights took precedence over what effect any action had on the multitude. He believed that people must never be used as a means to an end (Ethics Unwrapped, 2021). Deontology is the exact opposite of the theory of utilitarianism.

Whereas utilitarian ethics would see treating the sporadic patient as taking the practitioner's time away from the patient who is more likely to have a positive treatment outcome, Kant would say that this irregular patient has just as much of a right to care as the regular, consistent patient.

Deontology is a rigid ethical theory. Although the prior example does not seem unreasonable, if one takes this theory literally, a scientist who strictly abided by Kant's rules would never be able to perform research on human subjects. Under stringent guidelines, it is common practice to involve human subjects in research that exposes them to some measure of risk in order to benefit society. Deontology does not recognize this as an ethical practice. Because of its rigidity, deontology is not an ethical theory that always works well when applied to ethical dilemmas in dental practice (Crutchfield, Johnson, Brandt, & Fleming, 2016).

Virtue ethics

The ancient Greek philosophers Aristotle and Plato advocated virtue ethics. They considered an action virtuous if, once completed, it would lead the nature of the doer toward excellence of character. Clarification of the principles which indicate whether a practice or action is correct underlie this theory (Prassad, et. al., 2019).

Once again, consider the example of the irregular patient. Using this ethical theory, a dental practitioner must decide whether he or she considers it more virtuous to treat or not to treat the patient. Which action would propel the practitioner closer to excellence of character? It can be seen that using this type of ethics can be confusing when trying to navigate through an ethical dilemma in the dental office, making virtue ethics an impractical approach to problem solving.

TRANSFORMING ETHICAL PRINCIPLES INTO PROFESSIONAL CODES

The Belmont Report

The Belmont Report of 1979 was the document that strongly influenced the development of the current codes of professional ethics in health care. Principlism is the name given to the theory derived from the recommendations in the Belmont Report; this theory forms the basis of all codes of ethics in the health professions today. Principlism provides a practical approach to solving ethical dilemmas in health care, offering a standard upon which health professions can agree.

The American Dental Association's *Principles of Ethics and Code of Professional Conduct* (commonly known as the *ADA Code*), the American College of Dentists' (ADC) *Ethics Handbook for Dentists*, and the American Dental Hygienists' Association (ADHA) *Bylaws and Code of Ethics* (or *ADHA Code*) are no exceptions. These associations revise their living documents periodically to address new ethical issues within their professions. The latest edition of the *ADA Code* was released in 2020, the ACD's Ethics Handbook was revised in 2016, and the latest edition of the ADHA Code also came out in 2016.

It is important to remember that although each principle in a professional code of ethics has its own merits, the principles do not stand alone. They complement one another but at the same time often conflict with one another when ethical dilemmas occur. An ethical dilemma is a situation in which no best course of action exists; the person must choose between at least two options that have advantages and disadvantages. To solve ethical dilemmas, it is essential to identify which principles apply, how they conflict, and which ones take priority in a given scenario. Dental practitioners must also consider professional obligations and standards of care. An exploration of the process of ethical decision making later in the course will offer the opportunity to examine this concept more closely. Table 1 compares the ethical principles most commonly used in dentistry.

Table 1: Comparison of Ethical Principles Used in Dentistry

The Belmont Report	The American Dental Association Code	The American Dental Hygienists' Association Core Values	The American College of Dentists Core Values
• Autonomy. • Beneficence. • Justice.	• Autonomy. • Beneficence. • Justice. • Nonmaleficence. • Veracity.	• Autonomy. • Beneficence. • Justice and fairness. • Nonmaleficence. • Veracity. • Confidentiality. • Societal trust.	• Autonomy. • Beneficence. • Justice. • Competence. • Veracity. • Compassion. • Professionalism. • Tolerance. • Integrity.

The *ADA Code* has adopted the three principles of the Belmont Report and defined them as follows: respect for autonomy ("self-governance"), beneficence ("do good"), and justice ("fairness"). It also introduces two other principles: nonmaleficence ("do no harm") and veracity ("truthfulness"; ADA, 2020a). These five principles are a common theme throughout codes of professional conduct in health care. The ADHA has also added the core values of confidentiality ("protection of client information") and societal trust ("the valuing of public trust in the profession") to its code (ADHA, 2016). The ACD added compassion, competence, integrity, professionalism, and tolerance, as part of their core values (ACD, 2016).

The adoption of ethical principles by the ADA, ACD, and ADHA helps members of the professions aspire to provide care at a higher level than the simple performance of procedures. The introduction section of the *ADA Code* 2020 eloquently states its purpose:

> *The dental profession holds a special position of trust within society. As a consequence, society affords the profession certain privileges that are not available to members of the public-at-large. In return, the profession makes a commitment to society that its members will adhere to high ethical standards of conduct. These standards are embodied in the ADA Principles of Ethics and Code of Professional Conduct (*ADA Code*). The* ADA Code *is, in effect, a written expression of the obligations arising from the implied contract between the dental profession and society.* (p. 3)

To comply with professional standards and protect their clients from undue harm, members of any profession should be intimately familiar with their respective codes of ethics. Table 2 provides the online locations of the complete ADA, ACD, and ADHA professional codes.

Table 2: Website Addresses for Selected Professional Codes	
American College of Dentists *Ethics Handbook for Dentists*	http://acd.org/ethicshandbook.htm
American Dental Association *Principles of Ethics and Code of Professional Conduct*	https://www.ada.org/en/about-the-ada/principles-of-ethics-code-of-professional-conduct
American College of Dentists *Ethics Handbook for Dentists*	http://acd.org/ethicshandbook.htm
American Dental Hygienists' Association *Bylaws and Code of Ethics*	http://www.adha.org/resources-docs/7611_Bylaws_and_Code_of_Ethics.pdf
American Medical Association Telemedicine Coverage and Payment Guidelines	http://mb.cision.com/Public/373/9600400/99c2f1db96d7fec3.pdf

PROFESSIONALISM AND CODES OF ETHICS

Defining professionalism

Although dental ethics and professionalism are intertwined in many ways, they are not exactly the same. Ethical principles lay the foundation for professional practice. The principles in and of themselves do not mean anything unless the professional honors them.

Professionalism is sometimes hard to define, but it is recognizable. To be a professional implies practicing one's lifework at a higher level. But at what higher level? One who is a professional undergoes a length and specialized academic curriculum coupled with clinical rotations for those who are involved in the health professions (Prassad, et. al., 2019). The ACD *Ethics Handbook for Dentists* (ACD, 2016) describes professionals as having the following traits:

> A professional respects patients for their unique needs and values. A professional places patients' interests first and foremost, with only rare, legitimate exceptions. A professional always considers patients' values and relevant personal preferences. A professional has integrity. A professional is honest. A professional is competent. A professional strives to improve personally and to effect improvement in the profession. A professional actively supports professional organizations. A professional is concerned about conduct and perceptions of conduct. A professional is ethical. (p. iv)

The relationships among dentists, patients, and society are based on trust. Dentists and dental hygienists have the specialized knowledge and skills necessary to perform dental procedures within their scope of practice. Members of the public do not. In fact, dentists are some of the most highly educated individuals in terms of years of training required to practice in their field. Even after training is complete, the dentist must then become licensed.

The scope of professionalism and professional responsibility does not end with initial education and licensing, however. Patients and society trust that dental practitioners will provide care that is appropriate, safe, and in the best interest of their patients at all times. To maintain competence, dental professionals must also be lifelong learners. Science and technology are constantly changing. It is the dental practitioner's responsibility to ensure that the care he or she provides to patients is within the present standard of care. The ADA, ACD, and ADHA codes of ethics are guidebooks to help practitioners to function at a high ethical and professional level. Dental professionals must be careful not to lose the public trust.

Commercial versus care model of dental practice: Ethical implications

Dentistry is a profession, but it is also a business. Later in this course, learners will examine this point, which is often the biggest professional challenge to practitioners. Table 3 compares a typical commercial model with a care model for dental practice.

Table 3: Commercial Versus Care Model of Dental Practice	
Commercial	**Care**

• Profit is goal.
• Money is primary.
• Customer is a "means."
• Competitive:
  ○ Between companies.
  ○ Between buyer and seller.
• Caveat emptor.
• Creates needs and wants.
• Monopolies are prohibited.
• Relies on endorsements and testimonials.
• Focuses on commodities and things.
	• Care is goal (fiduciary).
	• Money is derivative.
	• Patient is the "end."
	• Cooperative:
	  ○ Between doctors.
	  ○ Between doctor and patient.
	• Buyer cannot compete (trust).
	• Focuses on treatment/prevention.
	• Monopoly is status.
	• Relies on science and empiricism.
	• Focuses on life or death and on health.

Note. Used with permission of Bruce Peltier, MBA, PhD and Cindy Lyon, BSDH, DDS, EdD	

In the care model, patient welfare always comes before commercial gain. This model also honors respect for patient autonomy, veracity, and nonmaleficence at all times (Lee, et al., 2018). Practicing under the principles of the care model will help a practitioner maintain perspective and support professional ethical practice as it embodies the aforementioned ACD-defined traits. Using the care model, the dentist can deliver dental services, earn a good living, and at the same time honor ethics and professionalism.

Professional codes of ethics

There are common themes and subtle differences throughout all the professional codes in dentistry and other health professions. To work through the solution of an ethical problem, it is important to know the definitions of the major principles. This course employs the *ADA Code* and professional obligations as guides to solving ethical dilemmas. Table 4 defines the major principles of the *ADA Code* (ADA, 2020a). The concept of professional obligations will follow.

Table 4: Principles of the American Dental Association Code of Ethics	
Autonomy ("self-governance")	The dentist has a duty to respect the patient's rights to self-determination and confidentiality. This principle expresses the concept that professionals have a duty to treat the patient according to the patient's desires, within the bounds of accepted treatment, and to protect the patient's confidentiality. Under this principle, the dentist's primary obligations include involving patients in treatment decisions in a meaningful way, with due consideration being given to the patient's needs, desires, and abilities, all while safeguarding the patient's privacy.
Nonmaleficence ("do no harm")	The dentist has a duty to protect the patient from harm. Under this principle, the dentist's primary obligations include keeping knowledge and skills current, knowing one's own limitations and when to refer to a specialist or other professional, and knowing when and under what circumstances delegation of patient care to auxiliaries is appropriate.
Beneficence ("do good")	The dentist has a duty to act for the benefit of others. Under this principle, the dentist's primary obligation is service to the patient and the public at large. The most important aspect of this obligation is the competent and timely delivery of dental care within the bounds of clinical circumstances presented by the patient, with due consideration being given to the needs, desires, and values of the patient. The same ethical considerations apply whether the dentist engages in fee-for-service, managed care, or some other practice arrangement. Dentists may choose to enter into contracts governing the provision of care to a group of patients; however, contract obligations do not excuse dentists from their ethical duty to put the patient's welfare first.
Justice ("fairness")	The dentist has a duty to treat people fairly. This principle expresses the concept that professionals have a duty to be fair in their dealings with patients, colleagues, and society. Under this principle, the dentist's primary obligations include dealing with people justly and delivering dental care without prejudice. In its broadest sense, this principle expresses the concept that the dental profession should actively seek allies throughout society on specific activities that will help improve access to care for all.
Veracity ("truthfulness")	The dentist has a duty to communicate truthfully. This principle expresses the concept that professionals have a duty to be honest and trustworthy in their dealings with people. Under this principle, the dentist's primary obligations include respecting the position of trust inherent in the dentist-patient relationship, communicating truthfully and without deception, and maintaining intellectual integrity.
Note. Adapted from the American Dental Association (2020a). American Dental Association principles of ethics and code of professional conduct. https://www.ada.org>about>principles>code.of>ethics	

Professional relationships and obligations

All codes of ethics recognize three professional relationships that are at the core of most ethical dilemmas (Kaur and Singh, 2018; ADA, 2020a). These are:

- The professional and client.
- The professional and professional.
- The professional and society.

Underlying all of these relationships is a foundation of trust; the same trust is at the core of professionalism itself. When either entity in a relationship violates trust, an ethical dilemma will most likely result. Besides trust violations, however, there are many other causes of ethical dilemmas. Furthermore, as the world changes, so do the ethical challenges involved.

Professional obligations are inherent in the practice of dentistry as defined in the principles outlined above and in the very definition of professionalism discussed earlier in the course. Professional obligations imply that there is a *duty* involved, meaning that:

- To act or refrain from acting in a particular manner is something one ought to do in a given situation with the welfare and the best interests of the patient as the ultimate guiding force.
- Ethically defensible reasons exist to support the claim that one ought to act or refrain from acting in a certain manner and to meet the standards of community care and competence in the provision of dental services.
- These reasons make acting or refraining from acting relatively important compared with other possible actions in the situation.

(Prasad, et al., 2019)

As a result, ethical decision making is quite different from decision making in other aspects of a dental professional's life. Professionals must be willing to make personal sacrifices for patients and the profession, identify conflicting professional obligations, and subsequently act on them.

To help prioritize where to focus one's attention when attempting to honor professional obligations in the midst of an ethical dilemma, there are six priorities, or central values, of dental practice. In order of importance, they are:

1. The patient's life and general health.
2. The patient's oral health.
3. The patient's autonomy.
4. The dentist's preferred patterns of practice.
5. Esthetic values.
6. Efficiency in the use of resources.

(Prasad, et al., 2020)

The patient's life and general health

If a patient's life or general health is at risk, a dental professional must always strive to protect it. There is no more important task in any given scenario.

The patient's oral health

A patient's oral health is the most obvious value that dental professionals seek with their patients. However, oral health is a very broad topic. Striving for a patient to be free of pain and to have optimal oral function is what dentists ultimately do for their patients, and this goal is extremely important when prioritizing a course of action in any scenario.

The patient's autonomy

Respecting patient autonomy is important, and dental practitioners should honor it whenever possible. Patients have the right to determine what is done to their bodies. Informed consent is one example of honoring patient autonomy. Patients cannot make good treatment decisions about their oral health unless they have all relevant information. Patients also have the right to refuse dental treatment after dental practitioners inform them of the associated risks and benefits. Although this right does not mean that a patient can dictate care to the dental provider, patient autonomy does rank high on the priority list.

The dentist's preferred patterns of practice

Dental providers who practice within the standard of care have a right to provide care in a manner that suits them. For example, providers can choose among different techniques, various dental materials, a variety of styles and brands of instruments, and

many more options. Dental providers have a right to practice in their comfort zones, following their personal preferences, within the generally accepted standard of care. They should consider their preferred patterns of practice when ethical dilemmas arise, as long as they first honor the former three central values.

Esthetic values

Esthetics are important, and providers must pay attention to the oral and facial appearance of patients and to esthetic standards; however, this value ranks lower than the patient's life and general health, oral health, and autonomy, as well as the dentist's preferred patterns of practice. Unless a dilemma directly relates to an esthetics case, the dental provider should consider the previous four values first.

Efficiency in the use of resources

Dental expertise and other resources are not unlimited. Dental providers must consider allocation of resources and costs when developing patient treatment plans and solving ethical dilemmas. Use of resources is definitely a lower priority than the first three values. However, some might argue that it would rank above the dentist's preferred patterns of practice. The main point is that cost and allocation of resources should not be a primary consideration when solving an ethical dilemma.

BALANCING LAW AND ETHICS

At various times in health care, ethics and the law can work either synergistically or in opposition to one another. Although the study of healthcare law is a course in and of itself, it is important to have some basic knowledge of how law and ethics may intersect when confronting ethical dilemmas. Dental clinicians must obey local, state, and federal regulations which govern the practice of dentistry and the specific regulations established by their state board of dentistry. They must also obey laws which govern issues which concern their employees. When laws and professional ethics conflict the best interest, safety and well-being of the patient must be placed first (XXXXX, et al., 2021).

It is important to remember some of the basic differences between ethics and the law. Laws can change over time, will vary from state to state, and can be significantly influenced by politics and economic interests. Ethical standards, however, transcend all of these considerations. Although legal rules have shaped bioethical principles and their application, bioethical principles have strongly influenced the development of law. Laws are a composite of rules and regulations while ethics represent a formal or informal rule of behavior. Legal rights have a foundation in law while ethical rights have a foundation in principles and ethical values (XXXXX, et al., 2021). Consider the Nuremberg Code and the Belmont Report as examples. Legal duties are also often ethical duties, but ethical duties may not always be legal obligations. Although individuals may have an ethical obligation to obey the law, the law is often the lower standard even though ethics and the law may draw on the same sources of authority.

Ethical principles generally provide the foundation for laws, as can be seen in the example of informed consent. A patient's right to personal autonomy is the basis for the healthcare provider's legal obligation to obtain informed consent from patients before commencing treatment. Another example is the legal mandate to report suspected cases of child abuse and neglect. This law is anchored in the principle of beneficence.

Dentistry is regulated by federal and state laws. Federal laws apply to all dentists, whereas state laws vary and apply only to dentists practicing in a particular state. Most states regulate the dental profession through a Dental Practice Act that falls under the purview of a state board of dentistry or board of dental examiners. Laws regulating the profession are also enforced by different bodies in different states.

The standard of care in its most empiric definition "is the level at which the average, prudent provider in a given community would practice." If a general dentist performs procedure that would often be performed by a specialist, he/she is held to the standard of care of the clinician in that given specialty (Dental Beacon, 2017). The discernment of the standard of care can be difficult as the words "average and prudent" cannot easily be defined. Does community refer to the town city or country in which the clinician practices? The standard of care is, however, a fluid concept. As new technologies emerge and are accepted by the profession and the scope of practice is expanded or contracted, the standard of care must also change.

As noted above, Dental Practice Acts define the scope of the practice of dentistry in each state. For instance, the ability of dentists to delegate duties to dental auxiliaries is not consistent nationally. Some states allow for expanded duties such as the taking of impressions or the placement of dental restorations. Other states do not allow dentists to delegate these same duties. Practicing within the standard of care involves abiding by the Dental Practice Act in the state in which the dentist holds a license *as well* as upholding ethical professional obligations. The parallel between ethics and the law can be seen by comparing the language in the *ADA Code* (2020) with a state's Dental Practice Act. For example, the *ADA Code* (2020) addresses the delegation of duties to dental auxiliaries under the principle of nonmaleficence in Section 2.C. Use of Auxiliary Personnel: "Dentists shall be obliged to protect the health of their patients by only assigning to qualified auxiliaries those duties which can be legally delegated. Dentists shall be further obliged to prescribe and supervise the patient care provided by all auxiliary personnel working under their direction" (p. 6). This wording can be seen to complement that of the Dental Practice Act of any state, whether expanded duties are permissible or not.

Offenses against the law are either civil or criminal (Erstad, 2018). An offense against a person or group for which some satisfaction is sought, usually in monetary form, is classified as civil. A criminal offense is a wrongful act against society, and criminal law is charged to protect the public as a whole against the harmful acts of others. Most healthcare issues that become legal issues are dealt with as civil offenses.

Civil law can be further broken down into two primary categories: *contract law* and *tort law*. A contract is an agreement between two or more consenting parties to perform or not perform a legal act for which there is sufficient consideration. ("Consideration" is a vital element in contract law; it is the benefit or value bargained for between the parties.) A "breach of contract" occurs if either party fails to comply with the terms of the agreement. Contracts can be expressed orally or in writing or implied by signs, inaction, or silence. In dentistry, the relationship and roles and responsibilities of both parties, the practitioner and patient, can be defined in terms of a contract (Colgate-Palmolive, 2021).

Examples of professional contractual responsibilities include:

- Being properly licensed and registered.
- Exercising reasonable skill and judgment in providing care.
- Referring when appropriate.
- Respecting patients' confidentiality.
- Practicing within the standard of care and providing treatment in a reasonable timeframe.
- Honor the patient's individual needs and do no harm.

Conversely, patient contractual responsibilities include:

- Paying for services rendered in a reasonable amount of time.
- Keeping appointments.
- Providing accurate health history information.
- Cooperating in care.
- Following at-home care instructions.

A *tort* is defined as an interference with another's right to enjoy his or her person, privacy, or property which causes someone

to suffer harm (Level Up RN 2021). Torts can be *intentional* or *unintentional*. Intentional torts involve an element of intent to cause harm and include such offenses as:

- Assault (threat of bodily harm).
- Battery (unauthorized touching).
- False imprisonment (unlawful restraint).
- Mental distress (purposeful cause of anguish).
- Defamation (damage to a person's reputation).
- Interference with property (damage to a person's property).
- Misrepresentation (incorrect or false representation).

Intentional tort offenses relative to the practice of dentistry may include:

- Failure to get informed consent (battery).
- Promising a cure or other outcome that is not practically attainable (misrepresentation).
- A patient making a derogatory statement about a dentist (defamation).

Unintentional torts include *negligence* (failure to act appropriately) and *malpractice* (acting inappropriately). Although an unintentional tort involves no intention to do harm, the following has taken place:

- A recognized legal duty or responsibility owed to the patient was breached.
- The patient was harmed, damaged, or injured.
- The breach of duty was the primary or proximate cause of the harm.

Both negligence and malpractice involve practicing below the standard of care. A breach of duty occurs when a dental provider behaves in such a way that his or her actions give rise to a risk of harm to the patient. The provider has the duty to provide treatment that will not cause such harm (ADA, 2020a). This concept is rooted in the ethical principle of nonmaleficence.

The legal aspects of any ethical case should be examined but cannot be the sole consideration in the decision-making process. Providers need to know the law in their jurisdictions, strive to obey it, and always consider it. What is ethical is usually also legal, but the converse may not always be true (Prasad, et. al., 2019). Breaches of the law may constitute unethical behavior, but not necessarily in every situation. As the law and ethics intersect in any given case, the decision maker must look for common ground and points of opposition or intersection, then determine a course of action. Consider the following case:

> *George has always been a rebellious child. He is now 17 and has been estranged from his parents for more than a year. He and his parents do not see eye to eye on a lot of issues, and he has finally left home after admitting to them that he has a drug problem but is not ready for treatment. For a while, he has lived on the streets. About six months ago, however, he moved in with a 20-year-old friend in a rundown apartment. At least now he has a roof over his head. He is able to support himself with menial jobs. He is not in school, but he has been trying to clean up his act. George has no desire to have any contact with his family, and he has no health or dental insurance. His parents have no idea where he is, and George wants to keep it that way.*
>
> *Because of his drug habit, George has some major problems with his teeth. Multiple deep carious lesions have gone untreated, and now he is experiencing the severe pain and visible swelling of a serious infection. George has called the neighborhood dental office owned by Dr. Cooper and has made an appointment for emergency care. On the phone, George did not disclose that he is a minor and would not have a parent accompanying him to his appointment. He also has no idea how much treatment will cost, but he does not care. He needs to be out of pain. When Dr. Cooper notices George's age on his health history, he questions George about why his parents have not come with him. George tells Dr. Cooper he does not talk to his parents and his parents do not know where he lives. He is on his own.*
>
> *Dr. Cooper faces a serious dilemma in this case, with legal implications. Should he treat George for the serious infection without parental consent even though that would be technically illegal in his state? Should he refuse to treat George and dismiss him from his practice because of his minor status? If he dismisses him, the infection will probably go untreated and George could suffer serious health consequences, perhaps even death. Thinking back to his ethics training, Dr. Cooper remembers the central values of dental practice that state that the patient's life and general health are the central concerns for all clinicians and patients and must be considered the number one priority in determining a course of action in any ethical case (Prasad, et al, 2019). He then decides that taking care of this patient's dire need is a more ethically appropriate choice than following the strict law of the land. Because of the seriousness of the infection, Dr. Cooper chooses to treat George's infection by surgically draining the abscess and placing him on antibiotics. He also accepts half the fee charged as payment in full, as that is all George can afford.*

As is evident in this case, ethical and legal standards do not always coincide, and the legal standards can vary from state to state. States define the age of majority, or the age at which a person is legally able to make adult decisions regarding his or her health care. A 17-year-old in George's position might be able to make independent healthcare decisions legally in some states, whereas in Dr. Cooper's state, the age that this is permissible is 18.

Although every potential legal or ethical situation cannot be anticipated or accounted for in either the *ADA Code* (2020a) or any given state's Dental Practice Act, it is important to appreciate how the two documents complement and support each other and to understand their underlying foundation in law and ethics. In different ways, both documents offer sound guidance to the process of managing ethical and legal challenges. It is prudent for every dental practitioner to be intimately familiar with both the *ADA Code* (2020a) and his or her individual state's Dental Practice Act for the protection of his or her patients and the ethically and legally sound practice of dentistry.

CURRENT AND EMERGING ETHICAL CHALLENGES TO THE PROFESSION

Dentistry has always had its ethical challenges, but in today's world these challenges are both more numerous and more complex. Just as events forced the need for further examination of medical ethics as a whole in the 20th century, the 21st century brings new challenges. Some of the major ethical challenges to the dental profession are outlined below:

- **Advertising**: Has the profession gone too far?
- **Scope of practice issues**: What defines dental practice in the 21st century?
  - Estgetics.
  - Injectable botulinum toxin products (e.g., Botox, Dysport, and Xeomin).
  - Vaccinations.
- **Electronic explosion**: What are the good, the bad, and the ugly?
  - Social media and networking telemedicine.
  - Privacy issues and dual relationships.
  - Cyberbullying.
- **Student loan debt**: Does excessive debt lead to unethical behavior?
- **Corporate dentistry**: Whose practice is it, anyway?
- **Third-party payers**: How has the Patient Protection and Affordable Care Act changed the insurance industry?
- **Millennial mentality**: How do expectations for education, practice, and care differ among students, practitioners, and patients?

- **Dental education**: Do academic pressures lead to academic dishonesty? (Fita, et al., 2020; Beemsterboer, 2018).

Although each of these areas poses concrete and pressing ethical challenges for today's dental practitioners, the focus here will be on the ethical issues specifically related to digital communication and arising from the technology boom of the 21st century. After exploring important definitions related to digital communication, this section will consider the ethical problems most commonly associated with this use of technology. Case studies will illustrate how dental practitioners can prioritize and navigate through these complex issues.

Advertising

According to the ADA's social media posting protocol (ADA, n.d.b), the term *social media* means "any website, application or other platform that allows end-user interaction, and includes, but is not limited to, blogs, websites, networking websites (such as Twitter, Facebook, LinkedIn, etc.), online forums, podcasts, message boards, chat rooms and interactive web or mobile applications." There is no doubt that the advent of social media has changed the way dental practices market their businesses. The digital generation wants to shop online for just about everything, including healthcare providers. Web pages can speak volumes about professional offices, and not having one at all may say even more. The advantages of advertising online and having a dynamic Web presence are apparent. The sheer number of people whom dental practices can reach this way is astounding. It is also convenient for patients to be able to peruse practices and compare services when searching for a new dental provider. Advertising by a dentist cannot misrepresent facts or fees, imply specialty certification where there is none, cannot create false expectations and cannot guarantee results (Kaur, 2018).

Advertising itself has been a hot topic in dentistry since "Painless Parker" began his marketing campaign near the end of the 19th century. According to Peltier (2007), who wrote on Painless Parker's legacy, Parker was a dentist with a questionable reputation among his colleagues; some called him a quack and charlatan, and they believed he was a menace to the dignity of the profession. At one point, he owned 30 dental practices and his dubious ethics of practice were a hot topic. He was famously photographed wearing a necklace made of 357 teeth, all of which he extracted in one day. He also did a lot of advertising (Billock, 2016; Peltier, 2007). In that era, there was a strong aversion to advertising dental and other professional services publicly. Some accused professionals who advertised of cheapening their profession.

Advertising by professionals, including dentists, was considered beneath the dignity of professionals. It implied that only those with inadequate clinical skills and who lacked an adequate patient volume would need to advertise their services to the public. In the 1970s, the Federal Trade Commission began interpreting bans on advertising by professionals as being unfairly restrictive. Advertising has been legal since then, provided the messaging is truthful, accurate, and not misleading in any way. The *ADA Code* (2020a), under the principle of veracity, offers extensive guidance on the subject of advertising in dentistry. Basically, the code states that any dentist may advertise but no dentist shall advertise or solicit patients in any form of communication in a manner that is false or misleading.

The digital era has once again challenged the boundaries of acceptable advertising. Internet advertising is more abundant and comes in many forms; however, dental professionals must apply the same professional standards they use when advertising by traditional means, such as telephone directories or newspapers. The information conveyed should be truthful, accurate, and not misleading in any way. Although websites can be flashy and creative, dentists must work carefully with website designers to ensure that they portray their practices in an appropriate manner, maintaining professional decorum at all times. Because Web designers may also work with other types of businesses that may not be as ethically sensitive to professional standards, it is the dentists' responsibility to ensure that they uphold ethical principles.

A recent electronic advertising trend and a new challenge to the profession, is the selling of group discount coupons for dental services. Daily-deal websites, such as Groupon and LivingSocial, offer professionals the opportunity to mass market their services at a discounted rate. Potential patients buy the discounted services directly through these websites, the websites pay the professional a flat fee, and the website gets a financial cut of the profit. The patient pays the third-party entity, rather than the dentist directly, for these services. Ethical challenges come to light upon closer examination of these transactions.

An example of how an electronic coupon broker site might work is as follows: A dentist usually charges $400 per arch for tooth whitening. He contracts with the coupon broker to offer patients the discounted rate of $300 per arch. The coupon company collects the fee from the patients and takes a percentage, such as 25%, off the amount. The dentist receives $300 minus 25% ($75), or $225 per arch from coupon purchasers. The cost of the whitening material and miscellaneous overhead is $75 per arch. This leaves a profit of approximately $150 per arch for the dentist as opposed to $325. The dentist hopes to make up the difference either by volume (the number of patients buying the coupon and coming in for treatment) or by the number of patients buying the coupon and not ever coming in for treatment. This type of promotion poses several problems. The first issue with this sort of advertising via social media is that some may perceive it as unprofessional. The websites may offer dental services next to movie tickets, body massages, hair coloring, and bowling games. Thus, this type of advertising moves the dental profession to a merchant-level occupation. When referring back to what it means to be professional and have professional obligations, this situation raises an "ethical red flag."

In an Advisory Opinion, the *ADA Code* (2020a) clearly states that the prohibition against a dentist accepting or tendering rebates or split fees extends to a dentist's dealings with any third party, not just other dentists (Section 4.E.1, p. 10). The Advisory Opinion specifically addresses the use of "social coupons" and explicitly prohibits their use if a third party receives a portion of the fee from the patient.

Social coupons may attract new patients to a practice. However, because social coupons are often procedure specific, they may attract prospective patients who are not good candidates for the advertised service. When this happens, the ethical problem becomes more complex, especially when money has already changed hands. Dentists may feel pressure to perform the procedure to appease the patient or to increase practice income. In such cases, dentists are not serving the best interests of the patients.

Several states, such as Illinois and California, have recently issued regulations enabling healthcare providers to use social coupons without violating ethical obligations. Some of the stipulations that must be satisfied in order to be able to advertise dental services through a social coupon include incorporating into the advertisement a description of the discounted price in comparison to the actual cost of the service, disclosing that not all purchasers may be eligible for the advertised service and that professional consultation will be required to determine appropriate care, and providing a full refund if the purchaser is not a candidate for the purchased service or does not claim the service (California Dental Association, 2016).

Referring back to the commercial versus care model patients cannot fairly compete in the marketplace (Prasad, et al., 2019).

They trust their dental professionals to be honest in business. Advertising online can be a worthwhile endeavor and, some may argue, a necessity these days. However, dental providers should consult the *ADA Code* and their state dental association to ensure ethical and legal compliance before deciding to use social coupons to promote a dental practice or when engaging in a new marketing endeavor that involves the latest trend.

Dual relationships and digital communication

One of the major ethical pitfalls of digital communication between the dental provider and patient is the problem of "dual relationships." Dual relationships are not just a problem of the electronic age, but the electronic age has made it easier for them to occur. Dual relationships in dental practice happen when a dental professional enters into or is inherently involved in a second, nonprofessional relationship with a patient be it friendship, business associate, family member or sexual partner (Haddad and Purtilo, 2019). An example of this is when a dentist or dental hygienist provides dental care to a friend or family member. The dual relationship exists because the person is both a patient on a professional level and a friend or family member on a personal level. Thus, the two relationships exist simultaneously.

As stated previously, the professional relationship that occurs between the dental provider and the patient is one based on trust and on the premise that the provider places the patient's supreme interest before his or her own interests. Conflicts arise in dual relationships when roles become blurred or the provider fails to place the patient's supreme interest above his or her own interests, either consciously or unconsciously. The following scenario provides an example of a dual relationship:

> *Rebecca is a casual acquaintance of Dr. Hayes. They see each other often at their children's softball games and occasionally attend the same social events at the homes of mutual friends. Rebecca has a missing tooth and would like it replaced. Dr. Hayes provides treatment options that include a removable partial denture, a fixed bridge, or an implant. When they discuss costs, Dr. Hayes informs Rebecca that the least expensive option is the removable partial denture and the most expensive option is the implant, which is about three times as expensive as the partial denture. The cost of a fixed bridge falls in between, but Rebecca does not want to cut two perfectly good teeth to replace one. Rebecca really wants the removable partial denture because that is all she can comfortably afford right now; however, she chooses the implant because she does not want Dr. Hayes to think she is a cheapskate. She has many more softball games to attend in the near future. As a result, she is paying considerably more money for a procedure she really does not want just to please Dr. Hayes.*

In this scenario, the final outcome does not honor Rebecca's supreme interest. Even though Dr. Hayes has provided several options and Rebecca has made the decision on her own, the dual relationship of patient and acquaintance influenced her choice. This is just one example. Dentists and patients in dual relationships may also encounter problems with the disclosure of sensitive medical information and the ability of the dentist to remaining objective about the development of treatment options for their patient can be compromised (Haddad and Purtilo, 2019). Because patients in such hybrid relationships are being asked to disclose information to both their dentist and friend (or family member), they might not be willing to tell the truth about their condition. If a patient has a serious medical condition or takes a medication that could affect dental treatment and he or she does not disclose the information, both the patient's health and the dental provider's ability to practice safe dentistry are jeopardized. Conversely, if a provider learns sensitive information from a friend while the friend is in the patient role, information obtained in one role may not be ethically usable in the other role. Role conflicts blur the burden of responsibilities within each role. For example, suppose a patient or friend tells a dentist that he is HIV-positive but in the next breath admits that he has not yet told his wife. His wife is also the dentist's friend. This is an awkward situation and a very difficult dilemma to solve.

Digital communication has exponentially increased the potential for dual relationships between patients and professionals of all types. Social media websites such as Facebook, Instagram, and Twitter are great communication and marketing tools but *inherently create dual relationships the moment a provider and patient connect in that way*. Dental providers who choose to engage in these activities should be mindful to respect the boundaries of the professional-patient relationship in accordance with professional ethical codes and guidelines to the greatest extent possible. These boundaries promote a safe space where patients can trust, respect and feel confident about their dental health provider and the care that they are receiving. Online communication can blur the distinction between the dental provider's professional and personal life. Providers should be particularly careful about giving dental advice to people online. If they do so, they may create a cyber-dental professional-patient relationship they never intended. A "friend" request received from a patient can create a challenging situation. It has been suggested that dental providers keep their personal and professional content separate (Howley, 2019).

Privacy issues

The Internet is a very public place. Dental professionals must therefore think before they post. Privacy is another major concern with social media use, both for patients and providers. The strict regulations of the Health Insurance Portability and Accountability Act (HIPAA) of 1996 protect patients' personal health information. According to the HHS (n.d.b):

> *The Office for Civil Rights enforces the HIPAA Privacy Rule, which protects the privacy of individually identifiable health information; the HIPAA Security Rule, which sets national standards for the security of electronic protected health information; the HIPAA Breach Notification Rule, which requires covered entities and business associates to provide notification following a breach of unsecured protected health information; and the confidentiality provisions of the Patient Safety Rule, which protect identifiable information being used to analyze patient safety events and improve patient safety.*

Also to be considered is the ethical obligation under dental professional codes to maintain patient confidentiality. Both the *ADA Code* (Section 1.B.2, Confidentiality of Patient Records) and the ADHA Code (Section 6, Core Values) address privacy specifically. Social media presents the difficult challenge of keeping patient information private.

Dental providers can breach privacy intentionally or unintentionally. In addition to violating HIPAA, breaches of privacy can, like dual relationships, have a negative impact on the professional-patient relationship, in addition to violating HIPAA. Most dental providers would never think of intentionally posting patient names and associated dental conditions or medical histories online via a social media site. That would be a blatant breach of patient confidentiality and is contrary to their ethical obligations. However, the following scenario offers a cautionary tale:

> *Dr. Paul is a dentist whose patient, Roger, came in to see him with a fractured tooth #8. Roger is a well-respected local businessman who owns a very expensive motorcycle. Roger admitted to Dr. Paul that he had too much to drink the other night, drove the motorcycle into a tree, and totaled it. Roger was lucky that he walked away with only a fractured tooth and a few scratches and bruises. Dr. Paul himself had*

been pondering getting a motorcycle, but after hearing what happened to Roger, changed his mind. Later that evening, Dr. Paul went on Facebook and proclaimed, "No motorcycle for me! I see what can happen when you crash your bike into a tree. Too bad. That was a nice bike and a beautiful tooth! I don't think the scotch and water was worth it, but what do I know?" A couple of days later, Roger called Dr. Paul and was livid about the Facebook post. Apparently, Roger's wife, who was a Facebook friend with Dr. Paul's wife, saw the post and told Roger about it. Although Dr. Paul did not mention any names in his Facebook post, several people inferred that the post was about Roger. Before long, the post was "liked" and "shared" several times. Roger was upset that his reputation in town might be ruined. Dr. Paul felt terrible, but the damage was already done.

It can be seen in a situation like this that, even without specifying names, it is possible to reveal sensitive information on a social media site. This case is a good example of a situation in which a dental professional can reveal information other than medical information. The unintended consequences of a seemingly innocent Facebook post may have caused significant collateral damage. Dental professionals need to exercise extreme caution when posting anything remotely connected to a patient on public forums that would allow identification by association.

Increasingly, more professional societies are setting standards regarding the use of social media and the Internet in professional practice. The ACD has published a position paper on the use of digital communication in dentistry (ACD, 2016). To honor the professional standards of dentistry, the ACD holds that dentists should adhere to the following eight principles when engaging in the use of digital communication, including social media:

1. The professional relationship between dentist and patient should not be compromised by the use of digital communication.
2. Digital communication should not permit third parties to influence the dentist-patient relationship.
3. Dentists should exercise prudence to ensure that messages are professional and cannot be used in unprofessional ways by others.
4. Personal data should be protected and professional communication should be separated from personal communication.
5. Dentists should be generally familiar with the potential of digital communication, applicable laws, and the types of information to which patients have access on the Web.
6. Practitioners should maintain an appropriate distinction between communication that constitutes the practice of dentistry and other practice-related communication.
7. Responses to criticism on digital media should be managed in a professional manner.
8. Dentists should be prepared to make more accommodations for patients than patients make for dentists in resolving misunderstandings about treatment.

As can be seen, privacy and dual relationship issues form the core of these recommendations.

The image of the profession as a whole is at risk when individual members engage in unbecoming behavior. The bad behavior of one will reflect on all. Social media as with any other technological advancement can have beneficial applications and those which are inappropriate. Within the context of social media use in the dental profession it is essential that patient confidentiality and date protection remain the highest priority. Similarly, disparaging remarks about current or former employees or about other dental professionals must not be used. Once in cyberspace, such remarks cannot be retrieved (Bahabri and Zaidan, 2021).

Although casual conversations with patients in the dental office may include some self-disclosure of personal information about the provider and can actually help build rapport, individuals may take online posts out of context and misconstrue them. Patients may feel vulnerable or distressed if they learn information about a provider that is troublesome to them outside the normal realm of the professional relationship Clinicians who use social media must not use information that is demeaning to themselves or of the dental profession as such comments can form a negative image of both the individual clinician and the entire dental profession (Bhola and Hellyer, 2016). Potential employers also may search a healthcare professional's Facebook page. What is online is fair game. Any incriminating information obtained could affect potential employment.

Facebook claims to have an average of 1.47 billion daily active users as of June 2018 (Facebook, 2018). The chance of leaks of sensitive information on either side of the dental chair is increasingly possible. Dental clinicians and all of their staff members must respect the confidentiality of the patient's personal dental and medical information and that a breach of this security and trust can to legal problems lead and can also be considered a (HIPAA) violation if confidential patient information is made public (Bhola and Hellyer, 2016).

Social media and social networking

The digital age has arrived, and it is here to stay. Young adults, including recent dental school graduates, have grown up with computers and other electronic devices. They communicate with others and learn and see the world through a digital lens. The use of digital communication for social media and social networking is a relatively new phenomenon compared with the use of computers themselves for performing tasks. Individuals communicate on many levels using social media and social networking.

Digital communication: Social media versus social networking

According to Chambers and the Officers and Regents of the American College of Dentists (2012). digital communication can be classified into three general categories: broadcast, relationship, and transaction. Broadcast communication conveys information (e.g., advertising, blogs, public service announcements, online journals) through a one-way digital channel. The entity generating the information is trying to influence or inform consumers, but direct and personal communication between the parties is not usually expected. Dentists and other healthcare professionals may use broadcast digital communication to advertise their practices or gather information. Social media encompass broadcast digital communication, but social media are more than the dissemination of information, as the next two categories will show.

Relationship digital communication involves an exchange of information between or among parties. The purpose of the exchange of information is to build relationships through the messages conveyed. Facebook, Google+, and LinkedIn are examples of relationship digital communication. Relationship digital communication is primarily what "social networking" entails, but it is also another form of social media. Social networking is essentially online relationship building. It is the active engagement of two or more parties communicating back and forth.

Transaction digital communication simply means doing business online. Purchasing items online is now commonplace. Dental practitioners may order supplies online, register for meetings, collect payment for services, and submit insurance claims, to name a few actions in this category. Digital transactions and communication between dental offices and insurance companies are becoming commonplace. Although the practice of engaging in transactions online to transmit financial or patient information is becoming more common, dentists need to be aware that security and confidentiality are still vulnerable and require protection (Bhola and Hellyer, 2016).

Social media = Social networks + publishing

In other words, social media consist of both relationship digital communication and broadcast communication. Often the line between what is a social network website and what is a broadcast communication website blurs. For instance, Facebook and other social networking sites also have advertising and newsfeeds available. In contrast, transaction digital communication mainly serves a utilitarian function, although it could involve aspects of social media.

Telemedicine and teledentistry

Along with other social changes, the digital explosion has led to patients and physicians communicating in new ways. Telemedicine, or virtual doctor visits, is a new phenomenon more common in medicine than dentistry. Texting, video conferencing, and email are just some of the ways that patients can interact and converse with their healthcare providers, eliminating the need to be always physically present at an office visit. The COVID-19 pandemic has undoubtedly increased the availability and use of telemedicine and teledentistry. In 2020 the estimated amount spent on these services was 10 billion dollars and is estimated to reach 43 billion dollars by 2026 (Arizton, 2021). The American Medical Association (AMA), in response to the increase in demand for electronic medicine services, has developed a set of guidelines to help the medical profession manage this new way of interacting with patients. These guidelines were Concil on Ethics and Judicial Affairs and involved the support from physicians across the United States. As with any other model of medical care the provision of competent medical care and the placement of the welfare of the patient above all else are the primary concerns (The American Medical Association, 2016). In 2017, the American Dental Association published a 10-page Guide to Understanding and Documenting Teledentistry Events. (See the Resources section of this course.)

The ADA's Comprehensive Policy Statement on Teledentistry (2020b) concerns the use of a variety of technologies and tactics for delivering virtual dental health care, education services, and the transmission of images. This combination of telecommunications and dentistry allows for the exchange of clinical information and images over remote distances for the purposes of consultation and treatment planning. The ADA indicates that teledentistry can include, but is not limited to the following modalities:

- **Live video**: Two-way interaction between patient and provider.
- **Store-and-forward**: Transmission of recorded health information such as radiographs or digital impressions through a secure electronic communications system to a practitioner who uses the information to evaluate a patient or render a service outside of a live interaction.
- **Remote patient monitoring**: Personal health data collection from a patient in one location via electronic communication technologies, which is transmitted to a provider in a different location to support care of the patient.
- **Mobile health care and education supported by mobile communication devices**: Such as cell phones or tablets. Teledentistry has the potential to improve access and delivery of oral healthcare, lower the cost of dental care, eliminate disparities between rural and urban populations, help address shortages or geographic maldistribution of dentists, and open the door to a new era for dentistry (Moore and Rover, 2017). However, the dental profession must address ethical and legal issues that arise from the use of teledentistry. These may include confidentiality and privacy of information stored and transferred electronically; obtaining proper informed consent; risks of improper diagnosis or treatment due to a technology failure; and issues of licensure, jurisdiction, and malpractice (American Dental Association, 2020b).

Cyberbullying

It is well known that not all digital communication is positive. As people find more ways to communicate and build relationships via the Internet and mobile devices of all types, they also acquire the ability to communicate in a negative way. Cyberbullying refers to bullying that occurs through electronic means. Whether it occurs through texting, social media, or picture messaging, cyberbullying is a form of abuse (stopbullying.gov, n.d.). Unlike face-to-face bullying at school, cyberbullying does not stop when the school day ends. Electronic media are always accessible. Just like physical bullying, cyberbullying can be devastating to the victim. Headlines tell a tragic tale of the effects of cyberbullying on the nation's youth. Several highly publicized suicides of adolescents and young adults have taken place as a direct result of this type of abuse (CBSNews.com, 2016; Veloce, 2018; The Clever, 2017). Dental professionals may not think this topic is relevant to them; however, as will be shown, dentists are ethically obligated to be aware of this form of abuse.

As healthcare providers, dentists and dental hygienists have not only an ethical obligation to report suspected cases of child abuse; they have a legal requirement. Dental professionals are mandated reporters. The *ADA Code* dictates this obligation, as do laws in all 50 states under the Child Abuse Protection Act of 1974 (ADA, 2020a; Fisher-Owens, et. al, 2017) (Full details about reporting policies and procedures are available at HHS's Child Welfare Information Gateway [n.d.a] at https://www.childwelfare.gov/topics/systemwide/laws-policies/can/).

All dental professionals need to consider how to handle cases of cyberbullying should they become aware of them in relation to patients in their practice. Later, this course will examine a specific case involving the relevant ethical issues regarding cyberbullying. When the *ADA Code* (2020a) addresses the topic of abuse, it does so under the principle of *beneficence*. Under this principle, dentists have the ethical duty to put the patient's welfare first. The code states:

> *The public and the profession are best served by dentists who are familiar with identifying the signs of abuse and neglect and knowledgeable about the appropriate intervention resources for all populations.*
>
> *A dentist's ethical obligation to identify and report the signs of abuse and neglect is, at a minimum, to be consistent with a dentist's legal obligation in the jurisdiction where the dentist practices. Dentists, therefore, are ethically obliged to identify and report suspected cases of abuse and neglect to the same extent as they are legally obliged to do so in the jurisdiction where they practice. Dentists have a concurrent ethical obligation to respect an adult patient's right to self-determination and confidentiality and to promote the welfare of all patients. Care should be exercised to respect the wishes of an adult patient who asks that a suspected case of abuse and/or neglect not be reported, where such a report is not mandated by law. With the patient's permission, other possible solutions may be sought.*
>
> *Dentists should be aware that jurisdictional laws vary in their definitions of abuse and neglect, in their reporting requirements and the extent to which immunity is granted to good faith reporters. The variances may raise potential legal and other risks that should be considered, while keeping in mind the duty to put the welfare of the patient first. Therefore a dentist's ethical obligation to identify and report suspected cases of abuse and neglect can vary from one jurisdiction to another.*
>
> *Dentists are ethically obligated to keep current their knowledge of both identifying abuse and neglect and reporting it in the jurisdiction(s) where they practice. (ADA, 2020a, page 8).*

It is good for practitioners to be reminded of this ethical obligation mandated by the dental profession. Its strong language and articulate wording leave nothing to the imagination. Cyberbullying may rise to the level of abuse in some cases.

The *ADA Code* (ADA, 2020a), under the principle of nonmaleficence, states that dental professionals also have a duty to refrain from harming the patient. This ethical principle further suggests that dentists should know when to refer to other experts to protect a patient from harm. Although the intent may be to refer patients to a physician or dental specialist as appropriate, it could also be interpreted to mean referring to other appropriate agencies or entities to protect patients from other types of harms. Cyberbullying may require such intervention in some cases.

How does bullying cause harm? Bullying itself is repeated, aggressive behavior that involves an imbalance of power or strength. Hitting, shoving, threatening, teasing, intimidating, name-calling, spreading rumors, or stealing and damaging belongings are common behaviors of traditional bullying (stopbullying.gov, n.d.; The Anti-Defamation League (2021). and stopbullying.gov (n.d.), list common signs and symptoms of children who are cyberbullied may exhibit serious symptoms, some of which parallel the symptoms of child abuse. These include:

- Alcohol and drug use.
- Anxiety, depression and sadness.
- Bed-wetting in younger children.
- Sudden disinterest in school with a sudden decrease in grades.
- Poor grades/refuses to go to school.
- Lower self-esteem.
- Health problems and an increase in somatic complaints such as stomachaches and headaches.
- Decreased social activity.
- Withdrawal from family and friends.
- Becoming distraught or angry after online or cell-phone use.

As of early September 2017, 49 states had cyberbullying laws (stopbullying.gov, 2017). Information summarizing these state laws is available at https://www.stopbullying.gov/laws/index.html. States created the laws to provide protections and guidelines for managing cases of cyberbullying. Dental professionals should be familiar with the laws in their jurisdictions.

The medical and mental health professions are addressing cyberbullying in an effort to aid victims and find offenders. Physicians should ask their patients if they use the Internet, social media, and other electronic forms of communication and if they are the subjects of harassment. Dental professionals might consider a similar approach, especially in pediatric and orthodontic offices, where a large percentage of patients are adolescents, the age at highest risk. All adolescents are at risk of cyberbullying, but anyone who is online frequently can be a victim; thus, cyberbullying can affect people of all ages.

Bullying, whether it be traditional bullying or cyberbullying, should be considered when patients or parents of patients disclose, either to dental professionals or to staff, any of the previously listed symptoms. Consider the following scenario:

> *Julia, a bright 13-year-old girl, had been a patient of Dr. Joy's for most of her life. Dr. Joy had noticed a stark change in Julia's behavior during her two most recent routine dental visits. The child seemed quieter, and her oral hygiene had become poor. In fact, Julia's overall personal hygiene seemed to have degenerated. Previously very talkative and animated, Julia barely answered Dr. Joy's questions regarding her teeth. At first, Dr. Joy attributed her behavior to teenage growing pains. Many adolescents undergo a sullen, sloppy phase at some point. Since Dr. Joy had developed a rapport with Julia over the years, she felt comfortable and compelled to ask her how things were going in her life. What was new? What was the teenage buzz around town? What new technology was taking the teen world by storm? Maybe Dr. Joy could get to the root of what seemed to be bothering Julia. The questions seemed to upset Julia. She snapped back, "There is no buzz or great new technology as far as I'm concerned. I am sick of people on Facebook spreading lies and rumors about me. I might as well never go on the Internet again!" Further questioning revealed that Julia was a victim of cyberbullying. As a result, Dr. Joy spoke with Julia's mother after the appointment to initiate an intervention. Although annoyed at first, Julia was grateful for the opportunity to finally reveal the truth. She was tired of pretending everything was okay in her life. (HelpGuideOrg International, November 2020) offers several guidelines for stopping this type of bullying. At the top of the list is encouraging the victim to reach out to a trustworthy adult. Adults can do a lot to make a cyberbullying situation better. The dental office scenario above demonstrates that taking the time to ask a few simple questions may make a big difference in a young person's life.*

Consumer review websites

Consumer reviews are a part of everyday decision making and have existed for as long as choices have been offered in the marketplace. Before there was an Internet, consumers relied on verbal or written communication to provide feedback on all types of consumer products, services, and entertainment opportunities. Individual professional critics published reviews in newspapers and magazines, or on the radio and television, for audiences that were often familiar with their distinctive styles. This type of review can still be found, and consumers may trust certain critics to make reports consistent with their own tastes. Thus, reviews might be completely trusted or "taken with a grain of salt" if the consumer generally tends to disagree with that particular critic. In this scenario, the reader or listener knows that the opinion is that of an individual, possibly an individual in whose opinion he or she has little faith, and the consumer might choose to try a product or service knowing that there is a good possibility that he or she might disagree with this one other person. The review in this case is only a small factor in the choice to purchase an item or partake in a particular new experience.

In the pre-Internet world, medical professionals were "reviewed" by word of mouth – positive or negative comments made by existing patients to potential patients concerning their experiences in the office. The potential patient could evaluate the source of the opinion and decide whether or not to take that person's comments – good or bad – seriously.

Today, word of mouth is still critical to gaining new patients and building a practice. However, the form that "word of mouth" can take has greatly changed. Consumer review websites such as Yelp!, RateMDs.com, DR.Oogle, Angie's List, healthgrades, and dozens of others allow patients to post online comments about dental providers and practices quickly and easily. Online reviews may be just as powerful as personal word of mouth recommendations or disparagements. As these website reviews become a mainstay of consumer decision making, they cannot be ignored by dental professionals. Even dentists who have resisted the movement to a robust online presence cannot escape the commentary posted on these third-party review sites. Therefore, it is important to have a basic knowledge of how to handle negative commentary and protect a provider's and practice's reputation.

If all the comments posted on these sites were positive, clearly no one would find them cause for concern. Fortunately, according to one study of 33 physician-rating websites, approximately 88% of all comments posted were positive, only 6% negative, and approximately 6% neutral (Lee, 2013). Most consumer review websites use a grading system of 1 to 5 or 1

to 10, with the higher number being the higher rating. These sites also accept comments to go along with the numerical rating, and the postings can be anonymous. Although the vast majority of ratings tend to be positive, even one negative rating or disparaging comment can at least hurt a provider's feelings and, worse, damage his or her reputation. Imagine how it would feel to see posted on one of these review sites: "Dr. (insert your name) is a QUACK! Avoid him at all costs!" Or "The office is dirty and the staff is lazy." Because the posts can be anonymous, it is not out of the question that a disgruntled employee or a competitor might post something negative. It would be impossible for others who view that post to know the ill intent of such commentary.

Physicians and dentists have approached these issues in varying ways, and some cases revolving around these websites have made their way into the legal system (Lee, 2013). One challenge to responding to negative commentary on such sites is HIPAA. As discussed earlier in this course, online interaction with patients is a public forum. Patients have the legal right to disclose their own protected health information, but health providers cannot disclose any of that same information without the patient's consent. For example, if a patient posts a negative comment concerning the pain and slow healing of a dental extraction, the dentist must not respond by voicing the opinion that the patient's heavy smoking probably delayed the healing. It may seem like an uneven playing field from the provider's perspective, but it is the law. Healthcare professionals may still respond to criticisms with general information about their practices and procedures, but they may not discuss an individual case (Lee, 2013).

Dentists and physicians have had limited success in trying to sue for unwarranted negative commentary on such websites. Attempts have been made to prosecute authors of negative comments under defamation law. Defamation is a false statement which is construed as a fact and which causes injury or damage to the character and or reputation of the person about whom the statement is made (Earle, 2021). Defamation through a written medium is called *libel* and when it occurs in a spoken medium it is considered *slander* (Sember, 2020). Libel laws could apply to written commentary on such websites. Defamation law attempts to balance the alleged harms comments have done to the plaintiff's reputation against the defendant's first amendment rights. Proving defamation in court can be difficult and costly. The first amendment protects pure statements of opinion, no matter how derogatory. Furthermore, the anonymous nature of many review website posts can make identifying the commenter practically impossible (Lee, 2013).]. Bringing lawsuits against patients for defamation could also prove counterproductive. Dentists may focus more attention on what was said by bringing it into the legal realm and placing it before the public eye. Dentists should seek professional legal advice on matters such as these if they feel their reputations may be at risk.

Because defamation law is so complex, dentists and physicians have also attempted to use medical non-disclosure agreements (NDAs) as a means of preventing the occurrence of negative commentary in the first place. As patients enter the practice, they sign these agreements, which require them to limit what they can write online about the provider. However, these agreements, which seem like a good idea on the surface, are not advised because they pose many ethical issues. For instance, patients in pain may agree to anything just to be out of pain. Having a patient sign such a form at a time of extreme stress can be considered coercive. Also, these agreements are difficult if not impossible to enforce (Lee, 2013).

Another ethical issue involving these sites is the practice of posting *falsely positive* comments. Business owners can hire companies to post falsely positive comments to these websites to promote business. It goes without saying that this practice is unprofessional and unethical and should not be allowed to occur.

Connelly (2012) pointed out the following considerations related to the evaluation of healthcare services:

- The number of evaluations on average for a particular healthcare service, as compared with an entertainment venue or restaurant, will most likely be low, affording negative ratings a higher effect on the overall rating of healthcare services as compared with other industries with more frequent users.
- Healthcare services by their very nature can cause discomfort or pain. Patients have individual thresholds for pain and discomfort. Negative reviews of services that are completely within the standard of care may result simply from necessary unpleasantness arising from the services provided.

Lee (2013) points out, however, that most negative comments related to healthcare services are not doctor- or procedure-specific, but related more to facilities and systems. If need be, it is possible to respond to these concerns online and quickly rectify the problems in the office.

Since consumer review websites are here to stay, it is best for dentists to come to terms with them and even use them to their advantage. Lee (2013) has suggested the following strategies to help healthcare providers manage online reviews:

- Be aware of what is being posted online about individual providers as well as the practice. It might be prudent to assign a staff member to regularly search providers' names and the practice name to find and pull up recent posts. The program Google Alert and others like it can be used to track a particular online presence and send email reports on a regular basis with information on recent online activity involving a designated entity. Internet watchdog companies also exist and can be hired to monitor online reputations and posting trends. Being proactive allows for a timely response to any disparaging remarks and also provides a way to monitor patterns of patient feedback.
- Take control and establish a positive online presence. Building a website that provides information on a provider's credentials, practice philosophy, and practice methods can foster credibility. Posting office pictures, parking information, business hours, and other facilities-related information on the website will prepare patients for their office experience and provide information that can speak for itself should a negative comment arise in this realm.
- Encourage patients to address concerns directly with the owner of the practice. Keeping communication open and being respectful of patient concerns will enhance the doctor-patient relationship and may avert the posting of a negative comment online. Stating this "open door" policy on a practice's website could go a long way in promoting goodwill.
- Encourage satisfied patients to write reviews on specific websites. On the surface, this strategy may sound awkward or coercive, but there is nothing wrong with asking satisfied patients to spread the word to other potential patients. At the end of an office visit, personnel can offer cards to satisfied patients asking them to share their thoughts on specific websites. This can help build a positive online reputation more quickly than simply waiting for it to evolve on its own.
- Accept the reality of negative comments and be prepared to respond to them. Some patients will post negative comments. When they do, dentists should be prepared to respond in a respectful and thoughtful way. As mentioned above, it is important to avoid HIPAA violations. Providers should also trust that prospective patients can spot trends in reviews. A few negative or lukewarm comments are not likely to sway a patient away from a practice if most feedback is positive. In fact, a few negative comments may lend credibility to the review process itself. Providers should also consider responding to positive comments and thanking those patients for their loyalty.

- Consider improving the practice in areas frequently reviewed as negative. Online review websites may serve as a kind of "focus group" and help providers assess their performance. Such feedback could be a practice asset in disguise.

Getting past the emotional aspect of consumer review websites may be a challenge for some. People do not like to see their work criticized. However, if providers can overcome this obstacle, they may actually be able to use these websites to their advantage.

ETHICAL DECISION-MAKING MODELS

Ethical problems are complex and constantly changing. For example, the notions of cyberbullying and social media couponing were unheard of until the early years of the 21st century. The dental practitioner has an obligation to navigate through complex ethical problems and come to reasonable solutions. Reliance on a set of ethical principles greatly aids this process of ethical decision making.

In navigating through the process of solving ethical dilemmas, it is important to take a systematic approach. This practice helps the professional avoid overlooking an important aspect of the case as he or she formulates a solution. Ethical decision-making models provide a framework for case-by-case ethical reasoning.

One of the most difficult ideas to grasp about ethics is that ethical decision-making is rarely black and white; in fact, it is mostly gray. This apparent ambiguity does not mean that there is not a best answer for any particular situation. Dental practitioners must formulate a solution and be willing to act on it to properly perform their duties.

An ethical dilemma occurs when competing obligations confront the provider and he or she has to weigh two or more options to resolve it (Beemsterboer, 2017). Weighing the options involves a moral evaluation, not one based on clinical skills or scientific judgment.

Ethical decision making is multifaceted. Dental providers do not function in a vacuum. They bring to their practices of dentistry a personal world that influences perspectives and decisions when dilemmas occur. It is important to acknowledge the existence of potential bias resulting from these personal experiences and perspectives. By consciously making this acknowledgment, the dental professional may gain a more objective view of the particular scenario and eventually come to a more logical conclusion. Personal experiences that may influence ethical decision making include, but are not limited to, the dental provider's:

- Upbringing.
- Religious or faith-based influences.
- Professional training or codes of ethics.
- Practice type and location.
- Patient expectations.
- Social customs.
- Societal norms.

(Beemsterboer, 2018)

Many ethical decision-making models are available. All of them aim to guide the user to the most beneficial outcome of any scenario. Dilemmas are often complex and convoluted. In any case, it is important to consider:

- The professional relationship involved.
- The ethical principles involved.
- The professional obligations and conflicts involved.
- The central values of the dental practice.
- Potential personal biases.
- Alternative courses of action available.
- Appropriate actions to take.

The ACD *Ethics Handbook for Dentists* (2016) offers several user-friendly ethical decision-making models that provide a useful quick reference for dental practitioners. (A PDF version of the book is available at https://www.dentalethics.org/ethicshandbook.htm).

To resolve the ethical dilemmas in the case studies presented later in this course, readers will use the decision-making model shown in Table 5. This same decision-making model also appears in the Appendix. Learners can photocopy the model and use it as a helpful tool when working through the ethical dilemmas they will encounter in their practices.

Table 5: Ethical Decision-Making Model

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected*.
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). Ethics handbook for dentists. Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Steps 1 and 2 in the ethical decision-making model in Table 5 help define the problem, clarify the facts, and identify potential bias. This process enables the decision maker to be as objective as possible while navigating through the case. The purpose of steps 3 through 5 is to gather and direct thoughts and information into potential courses of action that ultimately lead to an ethically defensible solution to the problem. By using this approach, the dental practitioner will have completed the necessary due diligence regarding the particular ethical dilemma, ultimately arriving at a decision that is well-considered and appropriate.

Table 6 presents an ethical dilemma and decision-making solution using this five-step approach. After reviewing this case scenario, the reader should be able to work through the remaining case studies in the course. Solutions to these cases are not absolute. The cases are meant to be thought-provoking exercises that provide the dental practitioner with an opportunity to practice the skills learned in this course and ultimately apply them to dental practice. Work through each case independently, then read the discussion that follows.

Table 6: Case Scenario and Solution

Case: Martini Lunch

The longtime staff members of Dr. Ross's office knew he was a drinker. He frequented bars on the weekend, and the residents of town knew this. He often came back from lunch appearing red in the face; however, if his red face was due to drinking, it did not seem to affect his work or mood. In fact, he was often in a better mood on those days. The problem was not bad enough for patients to notice, and somehow he never smelled of alcohol. Angie, his hygienist, was new to the office and did not like this at all. She did not care if his work seemed unaffected. She grew up with an alcoholic father and knew what damage alcohol could do. When she asked the other staff members if this happened all the time, they assured her that, "It was no big deal, and he could handle his liquor just fine." The staff really liked Dr. Ross. He treated them very well. One day, Angie followed Dr. Ross to lunch to see where he went. Sure enough, she saw him enter Billie's Pub. That was it – she needed to do something.

This was not acceptable to her. What should Angie do?

Step	Procedure	Working up the Case

1	• Identify the *problem* and the *professional relationship(s) affected*.
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.
		• Professional and professional.
		• Dr. Ross was drinking alcohol at lunch and coming back to treat patients.
		• The office staff, aside from Angie, did not seem to find fault with this behavior.
		• A potential bias is that Angie's father was an alcoholic.

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).
		• One ethical principle is nonmaleficence (doing no harm). Dr. Ross's drinking on the job could harm patients (most important principle in this case).
		• This situation involves veracity (truthfulness). Dr. Ross is not being honest with himself, his patients, or his staff concerning his drinking being a problem at work.
		• The central values involved include life and general health of the patient, oral health of the patient, and the dentist's preferred patterns of practice.
		• Dentists have a professional obligation to put their patients' needs before their own and to protect their patients' safety at all times.
		• Dr. Ross could be providing care in a compromised capacity. He is potentially violating administrative law against the Dental Practice Act.

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	• Angie could confront Dr. Ross and ask him directly if he is drinking alcohol at lunch. If he admits to it, she could ask him to quit and get help. If she does this, she may lose her job. • Angie could report Dr. Ross to her state dental society's peer review committee. They may be able to assist him in getting the help he needs. • Angie could quit her job and go work elsewhere and not report him to the review committee. • Angie could quit her job, go work somewhere else, and report him to the review committee. • Ranked: 2, 1, 4, 3.
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	• Angie should report Dr. Ross to her state dental society's peer review committee. They may be able to assist him in getting the help he needs.
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	• I chose this course of action because Angie is new to the practice and does not know Dr. Ross well. He would probably not take kindly to her commenting on his drinking at lunch. • By calling the state dental society peer review committee, Angie is taking action to protect patients and get Dr. Ross some needed help. The report would be anonymous, so it is to be hoped that she will be able to continue working in his office. • The health and safety of the practice's patients were at risk with this behavior.

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists.* Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

CASE 1: MY PATIENT REALLY "LIKES" ME

Jane, a 23-year-old dental hygienist fresh out of school, had just got her first job in the office of Dr. Jay, a 29-year-old dentist. The office was a general dental practice, and Jane became very busy immediately. The young dentist's practice was growing, but he still was not comfortable with his patient base. He never turned a patient away and often worked through lunch to accommodate emergency patients.

One day Jane received a new patient named Elsa. Elsa was Jane's age, and they seemed to hit it off immediately. They made a lot of small talk during the visit and in the process realized they had a few mutual friends.

When Jane went on Facebook that night after work, she saw a "friend" request from Elsa. Without thinking, Jane accepted it. Before long, it seemed that Elsa was constantly commenting on and "liking" Jane's posts. Elsa seemed to be everywhere on Facebook, and it did not take long before Jane became annoyed. She was afraid to "unfriend" Elsa, however, because she did not want to make Elsa mad or upset Dr. Jay if Elsa should decide to leave the practice. Besides, if she did unfriend her, Elsa could possibly make a big deal about it and start a negative campaign against Jane, and even worse, Dr. Jay's practice.

What should Jane do now (see Table 7)?

Table 7: Case 1 Solution

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected.*
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists*. Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Discussion

The primary conflict is occurring between the professional, Jane (the dental hygienist), and Elsa (the patient). A dual relationship has developed between the two of them since they became Facebook friends. Jane wants to unfriend Elsa but is afraid that if she does, Elsa may become upset and leave the practice, thus angering Dr. Jay. The stakeholders include Elsa, Jane, and Dr. Jay. The most relevant ethical principles in this case are veracity, autonomy, and nonmaleficence. The central values involved are the patient's autonomy and the dentist's preferred patterns of practice. There are no legal issues in this case. This is mainly a matter of setting boundaries and respecting an appropriate provider-patient relationship. The relationship is unprofessional and becoming a distraction and potential barrier to appropriate care. Jane has three primary courses of action to choose from:

- Inform Elsa that the relationship is becoming inappropriate and then unfriend her.
- Unfriend Elsa and do not discuss it with her.
- Do nothing and continue the relationship.

Although it may be uncomfortable, and Elsa might choose to leave the practice, informing her that the relationship is becoming inappropriate and then unfriending her is an ethically appropriate course of action. Jane should also learn from this experience and reconsider "friending" patients in the future. An important recommendation for Dr. Jay would be to have a social media policy that clearly outlines appropriate and permissible online interactions for all members of the practice.

CASE 2: GRATEFUL GABBY

Gabby cannot recall how many times she had to visit Dr. Talbot on an emergency basis for issues related to a childhood accident that left her with several severely damaged teeth. She is grateful for every time Dr. Talbot was able to accommodate her into his busy schedule to provide necessary treatment. Fortunately, Gabby has always had the financial resources to pay for her treatment. Her parents' insurance initially covered the costs. Now she has a good job and pays for her own treatment.

Last spring a new problem occurred. Gabby developed a large and very painful sore on her gum tissue in the upper right posterior region. It was the Friday before Memorial Day at 5:00 p.m., and Dr. Talbot had closed his office for the holiday weekend. Because of his good nature and dedication to his patients, Dr. Talbot came in later that evening to examine Gabby and treat the problem. It was an easy fix. Gabby had lodged a large popcorn kernel sheath into the gingival sulcus of tooth #3, and the area had a small abscess. Dr. Talbot removed the kernel, drained the abscess, and assured Gabby that she should be fine in a day or two. Gabby was not only embarrassed but also upset for making Dr. Talbot come in on the holiday for something so trivial. She paid her bill and as she left the office, she decided she would do something nice for him in return.

In mid-July, Gabby arrived at Dr. Talbot's office with a gift of appreciation for all he had done for her over the years, especially during the latest incident. She had thought long and hard about the gift. She wanted to give Dr. Talbot something he

could always keep, as opposed to something like flowers or a food basket. She also thought it fitting to buy something nice because she had been his patient for so long. Gabby settled on mahogany bookends with a nice card of appreciation. She spent $155 on the gift, thinking that it was not too much money for so many years of care. She gave the wrapped gift to the office manager and left feeling satisfied that she had done something nice for Dr. Talbot. She could not wait to hear how he liked it.

When Dr. Talbot opened the gift, he was quite surprised. He did not know if it was appropriate to accept the gift or not. Something told him the gift might be too expensive to come from a patient. Conversely, he did not want to insult Gabby by not accepting it because she was a long-standing patient, and he hoped she would remain his patient.

What should Dr. Talbot do (see Table 8)?

Table 8: Case 2 Solution

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected*.
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists.* Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Discussion

The dilemma here is between the professional, Dr. Talbot, and patient, Gabby. Dr. Talbot and Gabby are also the stakeholders in this case. The major issue is whether or not Dr. Talbot should accept his patient's gift, which he feels is a bit extravagant. Gabby is grateful for the exceptional care Dr. Talbot has given her and has no ulterior motives in giving the gift.

Gabby can afford the gift and her intentions are good. Dr. Talbot's biggest concern is that declining the gift would hurt Gabby's feelings. *Patient autonomy* is a relevant ethical principle and central value that is in conflict with the principle of *nonmaleficence*. The ethical principle of justice is relevant as well, if the gift was given with the expectation of preferential treatment, as this would be unfair to other patients. A major professional obligation that is at risk is respect for boundaries in the provider-patient relationship. Another relevant central value is the *dentist's preferred patterns of practice*. There are no legal considerations evident in this case. Respecting boundaries in the provider-patient relationship is the major professional obligation at stake. The *ADA Code* does not provide guidance on this topic; however, Dr. Talbot has two choices:

- Graciously accept the gift.
- Decline the gift.

Balancing the dominant principles involved here (autonomy vs. nonmaleficence), it appears that more harm will be done if Dr. Talbot refuses the gift. Since Gabby is excited about being able to thank Dr. Talbot in this way and does not expect anything in return, it will be best if Dr. Talbot accepts the gift and thanks her for her generosity. Chances are that this is a onetime event and Gabby will be a happy, loyal patient for many years to come. You may also decide that a better decision would be to accept the gift this time, but also to tactfully explain to Gabby that other gifts will not be accepted in the future. If Gabby's intentions were suspect – for instance, if she were expecting preferential treatment in return for the gift – Dr. Talbot should consider declining the gift.

CASE 3: SUPREME DENTAL

In the 5 years since graduating from dental school, Dr. Arnold, a general dentist, has worked in three different dental practices. She left the practices for various reasons. These circumstances frustrate her, and she wants to find a practice she can call home for the long term. Her student loan debt is in excess of $250,000, so she needs a good job. She does not feel that she is ready to open her own practice.

Dr. Arnold enjoyed working as an associate at her last practice. The economy took its toll, however, and the senior dentist, Dr. Harold, could no longer employ her. At that practice, Dr. Harold was very old-school in his approach to business; he did not believe in advertising or actively trying to seek new patients. He believed that word of mouth was the best form of advertising since he had made a good living practicing that way. When Dr. Harold hired Dr. Arnold, his intention was to slow down and eventually sell the practice to her. However, his 401(k) retirement plan took a huge hit with the market downturn, and he decided he needed to continue working full-time. He could no longer afford to keep himself and Dr. Arnold on the payroll. He essentially laid her off from work.

Regardless, Dr. Arnold had always respected Dr. Harold for his adherence to ethical standards and professionalism. She never worried that the care provided to patients or the practice management style of the office violated ethical principles or fell below the standard of care. Despite her fondness for Dr. Harold's values, Dr. Arnold would have made some changes had she

been able to run the office herself. She believed that to maintain a steady flow of new patients and keep the practice fresh, she would need to be a little more proactive. That is what attracted her to Supreme Dental.

A relatively new practice, Supreme Dental has become well known in the community very quickly and is the exact opposite of Dr. Harold's practice. Supreme Dental's practice style is cutting edge, and the two dentist owners are extremely business savvy. This appeals to Dr. Arnold very much. Their advertisements on billboards are visible from the major highways surrounding town. Potential patients can hear their advertisements on the radio and see them in the local newspapers on a regular basis. Patients have mentioned that even the name of the practice elicits a positive feeling. The biggest payoff, however, came from a social media coupon site. This approach was effective; patient flow became phenomenal despite tough economic times.

Dr. Arnold was not about to lose another job to the economy. As soon as she got the call, she took a position with Supreme Dental. Dr. Arnold is busier now than she ever imagined. After 6 months, though, she is starting to have some concerns about the marketing strategy of the practice and the work they perform. Patients seem to be happy overall, but Dr. Arnold is having doubts. For example, she knows that to perform a proper dental examination, she needs to take a complete set of radiographs. She constantly has to explain the need for radiographs to her new patients when they present for their "free" examination from the social media coupon site. Another big concern is the "lifetime guarantee" that Supreme Dental offers to patients. She believes that she is an excellent dentist, but feels that she cannot realistically guarantee her work for life. She has also noticed that at local dental society meetings, her colleagues in the community are not especially friendly to her. The owners of Supreme Dental choose not to participate in the local dental society themselves, so they never attend the meetings.

As for the same-day denture, implant, and crown procedures she is performing, she is unsure if she is practicing within the standard of care. The owners have taught her these faster techniques, but she learned a very different way of doing things in dental school. Of course she knows that dental school did not always reflect the real world, and she realizes that many things, including materials and techniques, can change in 5 years. The owners of Supreme Dental say they are "mentoring" her to provide state-of-the-art care within a practice model that is "innovative."

Are Dr. Arnold's concerns valid (see Table 9)?

Table 9: Case 3 Solution

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected.*
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists.* Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Discussion

The primary conflict in this scenario is between professional and professional, Dr. Arnold and the owners of Supreme Dental. The problem is that Dr. Arnold, a relatively new practitioner, has concerns over potentially misleading advertising by the owners of the business, as well as over the pressure to rush patients through complex procedures. The primary stakeholders are Dr. Arnold, the owners of the practice, and patients. The ethical principles at play in this case are nonmaleficence, justice, veracity, and autonomy. The central values at stake are the life and health of the patient, the patient's oral health, the patient's autonomy, and the dentist's preferred patterns of practice. There is a potential for malpractice or negligence, as well as insurance fraud, in this case. Dr. Arnold could be biased to look the other way in this case just because she has had difficulty finding steady employment in the past and does not want to lose another job.

The nature of the concerns raised and the risk of potential damage to patients' general health and oral health are serious enough to warrant action. Dr. Arnold's limited experience in practice and possible bias seem to have made her unsure if her concerns are valid. She has the following options:

- Discuss her concerns with a trusted colleague, perhaps a former classmate or professor. Then take further action if necessary.
- Discuss her concerns with the owners of the practice and hope for the best as far as their reaction and her future employment are concerned. Perhaps they are unaware of the possible ethical and legal implications of their business practices.
- Report the owners anonymously to the dental board.
- Do nothing.

Since Dr. Arnold is questioning her own assessment of the situation, she should proceed with the first option, but in a timely fashion. It would be appropriate for Dr. Arnold to further investigate and discuss the situation with a colleague before taking any action that might jeopardize her job. In order to protect patients, the next step will most likely be to have the conversation about her concerns with the owners of the practice.

CASE 4: OH, NO! NOT AGAIN!

Dr. Ogilvie has been practicing in the quiet town of Collinsville for 20 years. As an oral surgeon, she has seen the gamut of cases from her referring dentists. As the only oral surgeon in a tri-county area, she is very busy and has a large referral base.

Dr. Midi has also been practicing for 20 years in a nearby blue-collar community of approximately 10,000 people, and she is an occasional referral source for Dr. Ogilvie. As professionals, Dr. Ogilvie and Dr. Midi are cordial acquaintances. They see each other occasionally at the Tri-County Dental Study Club meetings and social events; however, that is the extent of their relationship.

One afternoon Dr. Ogilvie received a call from Dr. Midi stating that she needed to refer a patient to her office immediately. Dr. Midi claimed that in the middle of a routine extraction of tooth #2 for her patient, Mr. Wayne, she heard a "crack," and before she knew it, the entire right posterior side of Mr. Wayne's palate was "moving with the tooth." Dr. Ogilvie received Mr. Wayne into her office right away as an emergency patient. She diagnosed a large right maxillary tuberosity fracture and was able, with some difficulty, to surgically dissect the ankylosed tooth from the fractured bone. This was no routine extraction. As a result, Mr. Wayne experienced a large oral-antral communication, which a bone and tissue graft repaired. When everything was complete, the surgeon's fee exceeded $1,500, and Mr. Wayne paid the balance with a check that day. He left the office in stable condition and in a surprisingly jolly mood, taking everything in stride and blaming no one.

Dr. Ogilvie knows that unsatisfactory outcomes occur even when dentists follow best practices; however, this is approximately the 10th time that she has received a referral from Dr. Midi under similar circumstances. As in all the other cases, Dr. Ogilvie feels that Dr. Midi should never have attempted the procedure in the first place. Dr. Midi should have referred this case to a specialist immediately. Dr. Ogilvie wonders how many other patients Dr. Midi should also have referred to a specialist. In addition, Dr. Ogilvie thinks that Dr. Midi should take full responsibility and reimburse Mr. Wayne for at least her fees, if not the oral surgery fees as well. She did not tell Mr. Wayne this. In all of Dr. Ogilvie's 20 years of practice, Dr. Midi is the only referring dentist she has had to "bail out" of an unsatisfactory situation this many times.

What, if anything, should Dr. Ogilvie do now (see Table 10)?

Table 10: Case 4 Solution

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected.*
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists.* Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Discussion

The primary conflict in this scenario is between professional and professional. Dr. Ogilvie is an oral surgeon who receives referrals from Dr. Midi. She feels that Dr. Midi is possibly taking on cases that are too complex, and beyond her skills and training, and thus causing patient's physical harm and additional expense. The stakeholders in this case are Dr. Ogilvie, Dr. Midi, and patients of Dr. Midi. Principles that apply here are nonmaleficence, beneficence, and justice. The central values include the life and health of the patient, the patient's oral health, the dentist's preferred patterns of practice, and efficiency in the use of resources (cost). Professional obligation dictates that dentists refer patients to other providers when the required procedure is beyond their skill level. Failing to do so could result in malpractice or negligence. Professional obligation also dictates professional self-regulation. Dentists who suspect a colleague of providing substandard care must take action to protect patients. The possible courses of action in this case include:

- Call Dr. Midi and discuss the concerns.
- Call the state dental board and report Dr. Midi for substandard care.
- Continue to monitor the patient referrals from Dr. Midi and report her to the board if she sends another case like Mr. Wayne's.

The best course of action would be for Dr. Ogilvie to call Dr. Midi to express her concerns and gain more information about the referral cases Dr. Midi is sending her. Patient safety has to come first, but professional courtesy is also prudent. Although

this will not be an easy conversation to have, Dr. Ogilvie needs to acquire more information before considering whether to refer Dr. Midi to the state dental board. By choosing this course of action, Dr. Ogilvie does run the risk of losing Dr. Midi as a referring dentist, but she also has the opportunity to strengthen and clarify her professional relationship with the other dentist. If the conversation goes badly and Dr. Ogilvie feels the situation is serious enough, she could then make the call to the state dental board, reporting Dr. Midi for substandard care.

CASE 5: I'LL TEXT YOU LATER

Dr. Jones is very much into new technologies. He has a state-of-the-art practice, and he owns many new electronic devices. He also has a very interactive website where patients can schedule and cancel appointments, view instructional videos, and so forth. The latest trend that interests Dr. Jones is teledentistry. He believes that using this technology can enhance his communication with his patients, save time, and help build his practice.

The teledentistry application that Dr. Jones has chosen to utilize first is simply texting with his patients for postoperative follow-up. In the past, he called patients personally after extensive surgeries to check on them. By switching to texting for follow-up, he is able to contact all of his patients who have undergone surgical and restorative procedures, to see how they are doing. He has noticed that they do not always respond to him, but at least he has reached out to them. Dr. Jones has had his staff members program all of his patients' cell phone numbers into an office cell phone dedicated to this use. Since he does not have time to call everyone personally, he thinks this is a great option.

Should Dr. Jones continue this practice (see Table 11)?

Table 11: Case 5 Solution

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected.*
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists.* Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Discussion

In this case, the relationship in question is between professional and patient. Dr. Jones has begun the practice of texting his patients to check on them after extensive procedures as opposed to calling them and speaking with them directly. The stakeholders are Dr. Jones and all of his patients. The ethical principles involved include autonomy, beneficence, and nonmaleficence. There may be patients who are not tech-savvy and will feel excluded (an issue of justice). The central values at stake include the dentist's preferred patterns of practice and patient autonomy, although the patient's overall health and patient's oral health may also be impacted. Legal implications include the potential for a HIPAA violation. Professional obligations include the duty to respect the patient's confidentiality. The question posed is whether or not Dr. Jones's method of communicating via text messaging with patients is appropriate.

The choices at hand include:

- Continue this practice.
- Discontinue this practice.
- Use this practice more selectively.

Although the practice of reaching out to more patients postoperatively for follow-up is an honorable one, the problem of sending text messages to patients' cell phones is that it is impossible to know who will retrieve the text message. There is the danger that a message may be read by someone other than the patient if a cell phone is left unattended. A dentist who calls patients directly can be sure he or she is talking to the right person. However, anyone can respond to a text message, and the dentist cannot easily confirm that he or she is communicating with the patient. Although it may not be necessary to discontinue this practice completely, Dr. Jones should be careful to obtain consent from patients first and carefully consider what will be written in text form. Patient confidentiality should be respected at all times.

Conclusion

This course has provided a comprehensive overview of dental ethics and current ethical challenges facing the dental profession today. After exploring important historical events that framed the development of ethical standards along with early ethical theories, legal concepts, and today's professional codes of conduct, dental practitioners should have a greater appreciation for their profession and a clearer understanding of their professional obligations. One of the important concepts

discussed was the relationship that dentistry maintains with society, which places trust and confidence in the dental profession because of practitioners' knowledge, training and commitment to the public's health. If the trust inherent in this relationship is lost, the professional status dentistry enjoys will also be lost. Dental providers must respect and honor this trust to safeguard dentistry's status as a learned profession.

Constant advancement and widespread use of modern technology and electronic communication can cause the boundaries of professional and personal relationships to blur. Now more than ever, dual relationships with patients, privacy concerns, and marketing strategies are pushing the boundaries of acceptable professional behavior. This course explored some of the major ethical issues associated with the use of these new technologies, including social media communication, advertising, teledentistry, and cyberbullying. The course went on to introduce the concept of ethical decision making, and it provided learners with an ethical decision-making model to help them navigate complex dilemmas. The course also offered case studies to help reinforce important ideas and provide a practical application of the concepts.

Ethical challenges have increased significantly as society has become more complex. Dental professionals have the obligation to continue their education in this area, stay current with new trends and ethical challenges to the profession, and be mindful of professional standards related to the use of new technologies. Dental providers should equip themselves with the ethical tools necessary to protect patients and the profession from harm, as well as protect their individual professional integrity. The ability to systematically analyze and solve any ethical dilemma is arguably as important as the technical skills required to perform clinical dentistry.

APPENDIX

BLANK ETHICAL DECISION-MAKING MODEL

Step	Procedure	Working up the Case (fill in below)

1	• Identify the *problem* and the *professional relationship(s) affected*.
	• Gather all *relevant* facts:
	  ○ Dental.
	  ○ Medical.
	  ○ Social.
	  ○ Identify stakeholders.
	  ○ Examine potential personal biases.
	  ○ Additional necessary information.	

2	• Identify the *ethical principles* and *central values* involved:
	  ○ Identify those that conflict.
	  ○ Identify those that should take priority.
	• Identify any *professional obligations* involved:
	  ○ Refer to relevant professional codes of ethics (ADA, ADHA) as necessary.
	• Identify legal issues (civil, criminal, and administrative).	

3	• List the *possible courses of action* available. • Answer the question, "What action *could* be taken?" • Rank the *courses of action* in light of information gathered in steps 1 and 2.	
4	• Select the *best solution* from the list of possible actions and be willing to act on it. ○ Answer the question, "What action *should* be taken?"	
5	• Prepare a *defense* for the chosen course of action: ○ Complete the sentence, "I chose this course of action *because* …"	

Note. Adapted from American College of Dentists. (2016). *Ethics handbook for dentists*. Gaithersburg, MD: Author. Retrieved from https://www.dentalethics.org/ethicshandbook.htm

Resources

Ethics

- The American Dental Association Principles of Ethics and Code of Professional Conduct (2018) https://www.ada.org/~/media/ADA/Publications/Files/ADA_Code_of_Ethics_2018.pdf?la=en
- The American Dental Hygienists' Association Bylaws and Code of Ethics (2016) http://www.adha.org/resources-docs/7611_Bylaws_and_Code_of_Ethics.pdf
- AMA Code of Medical Ethics (Accessed July 6, 2018) https://www.ama-assn.org/delivering-care/ama-code-medical-ethics

Ethical Decision Making

- American College of Dentists *Ethics Handbook for Dentists* (2016) https://www.acd.org/ethics/publications/ethics-handbook/

Prominent Cases Involving Ethical Issues

- Nancy Beth Cruzan Case and the Patient Self-Determination Act
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- Terri Schiavo Case
  T. E. Quill. (2005). Terri Schiavo – A Tragedy Compounded. *New England Journal of Medicine, 352*, 1630-1633.

Social Media and Young Patients

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Technology and Ethics

- **Dolly the Cloned Sheep**
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- **Human Genome**
  F. S. Collins. (2001). Implications of the Human Genome Project for Medical Science. *Journal of the American Medical Association, 285*(5), 540-544.
- **Oregon Death with Dignity Act**
  Oregon Health Authority. (Accessed on June 22, 2018). Death with Dignity Act. http://public.health.oregon.gov/ProviderPartnerResources/Evaluationresearch/deathwithdignityact/Pages/index.aspx
- **Sperm-Sorting Technology**
  M. Darnovsky. (2004). Revisiting Sex Selection. Gene Watch. Retrieved from https://pol285.blog.gustavus.edu/files/2009/08/Darnovsky_Revisiting_Sex_Selection.pdf

Teledentistry Guide

- American Dental Association. (2017). D9995 and D9996 – *ADA Guide to Understanding and Documenting Teledentistry Events*. Retrieved from http://www.americanteledentistry.org/wp-content/uploads/2018/04/D9995andD9996_ADAGuidetoUnderstandingandDocumenting TeledentistryEvents_v1_2017Jul17.pdf

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DENTAL ETHICS AND THE DIGITAL AGE, 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 100, or complete your test online at **EliteLearning.com/Book**

1. The earliest framework for the ethical practice of medicine, which continues to bind physicians to a set of obligations, including the obligation to do no harm, is known as the:
   a. Loyalty Pledge.
   b. Belmont Report.
   c. Hippocratic Oath.
   d. Nuremberg Code.

2. The Nuremberg Code emerged after World War II as the first document to:
   a. State the moral obligation of researchers to conduct legitimate research and protect human subjects who participate.
   b. Set the foundation for the ethical principles that are present in the ADA Code of Ethics.
   c. Provide a systematic approach to solving ethical dilemmas.
   d. Protect German physicians involved in research.

3. The Belmont Report of 1979 identified the ethical principles of:
   a. Respect for persons, justice, and societal trust.
   b. Compassion, autonomy, and nonmaleficence.
   c. Respect for persons, beneficence, and justice.
   d. Veracity, respect for persons, and professionalism.

4. The concept that the moral value of an action (whether right or wrong) is dependent on the consequences resulting from that action is most reflective of:
   a. Utilitarian ethics.
   b. Deontological ethics.
   c. Virtue ethics.
   d. Teleological ethics.

5. The theory derived from recommendations in the Belmont Report, which forms the basis of all codes of ethics in health professions, is known as:
   a. Paternalism.
   b. Empiricism.
   c. Principlism.
   d. Opportunism.

6. The ethical principle calling on dentists to "do good" is known as:
   a. Autonomy.
   b. Societal trust.
   c. Veracity.
   d. Beneficence.

7. Under the principle of nonmaleficence in the American Dental Association Code of Ethics, dentists are required to:
   a. Maintain ethical advertising practices.
   b. Treat all patients fairly.
   c. Minimize harm to their patients.
   d. Report cyberbullying.

8. One ethical principle that is present in the American Dental Hygienists' Association Core Values but not present in the American Dental Association Code of Ethics is:
   a. Autonomy.
   b. Confidentiality.
   c. Veracity.
   d. Beneficence.

9. The dentist-patient relationship and the dental profession's relationship with society are based on:
   a. Competition.
   b. Cooperation.
   c. Trust.
   d. Mutual autonomy.

10. The model of dental practice that best supports professional ethical practice is the:
    a. Commercial model.
    b. Guild model.
    c. Care model.
    d. Caveat emptor model.

11. The legal mandate to report suspected cases of child abuse and neglect is anchored in the ethical principle of:
    a. Autonomy.
    b. Beneficence.
    c. Veracity.
    d. Integrity.

12. In the context of a dentist-patient relationship, the best example of a patient's contractual responsibility would be:
    a. Providing accurate health history information.
    b. Referring to a specialist when appropriate.
    c. Being properly licensed and registered.
    d. Recommending the dentist to friends.

13. One example of a scope of practice issue that brings up ethical challenges is the:
    a. Placement of locally delivered antibiotics.
    b. Placement of full-mouth implants.
    c. Administration of local anesthesia.
    d. Administration of Botox.

14. The American Dental Association Code of Ethics offers extensive guidance on the subject of advertising in dentistry under the principle of:
    a. Autonomy.
    b. Veracity.
    c. Beneficence.
    d. Justice.

15. A dental professional who enters into, or is inherently involved in, a second, nonprofessional relationship with a patient is engaged in:
    a. A dual relationship.
    b. A symbiotic relationship.
    c. A composite association.
    d. An aggregate association.

16. Strict regulations regarding the protection of patients' personal health information are most clearly established through the:
    a. Belmont Report of 1979.
    b. American Dental Association Code of Ethics.
    c. American Medical Association Telemedicine Guidelines.
    d. Health Insurance Portability and Accountability Act of 1996.

17. According to Chambers and the Officers and Regents of the American College of Dentists (2012), digital communication can be classified into three general categories: broadcast, relationship, and:
    a. Transaction.
    b. Transmission.
    c. Collective.
    d. Communal.

18. Information conveyed through a one-way digital channel is considered to be:
    a. Broadcast digital communication.
    b. Relationship digital communication.
    c. Collective digital communication.
    d. Communal digital communication.

19. In his 2013 study, Lee points out that the majority of negative comments about healthcare services that appear on consumer review websites are specific to:
    a. Facilities and systems.
    b. Individual doctors involved.
    c. Procedures performed.
    d. Phone calls not being returned.

20. In order to navigate through the process of solving ethical dilemmas, it is important to take an approach that is:
    a. Inflexible.
    b. Situational.
    c. Capricious.
    d. Systematic.

Course 4: Herbal-Drug Interactions Important in Dentistry, 3rd Edition

2 CE Hours

Release Date: October 21, 2022 **Expiration Date:** October 21, 2025

Faculty

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Mark Donaldson has no significant financial or other conflicts of interest pertaining to this course.

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The planner has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

AGD Subject Code - 149

How to receive credit

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  - 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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INTRODUCTION

Learning objectives

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

- Describe the prevalence and risk for interactions involving herbal medications.
- List the herbal medications and drugs of greatest concern to dental professionals.
- Describe the ways in which levels of risk for herbal-drug interactions are evaluated.
- Identify the medical and dental implications for drug interactions with specific herbal medications.
- Discuss the special considerations of herbal-drug interactions for pregnant or breastfeeding dental patients.

Course overview

After completing this basic-level course, the learner will be able to discuss the most commonly used herbal medicines in the United States. A stoplight approach to risk assessment is discussed and a general strategy to avoid the most common herbal-drug interactions is suggested. Critical patient populations are emphasized and specific herbal-drug interactions that can lead to increased bleeding, decreased blood glucose levels, and sedation changes are discussed. This course is specifically designed for all members of the dental health care team: dentists, dental hygienists, and dental assistants.

INTRODUCTION

The use of plants for healing purposes and the knowledge required for their use (pharmacognosy) predates written human history and forms the origin of much of modern medicine. Many conventional drugs originate from plant sources; in fact, over a century ago, of the few effective drugs that were available, most were plant-based. In 1870, the U.S. Pharmacopeia listed 636 herbal entries; the new 2022 edition lists 970 herbal entries (U.S. Pharmacopeial Convention, 2022). Although some of the original herbal entries were found to be unsafe, most were replaced by pharmaceuticals derived from the original botanical medicines. Examples include aspirin (from willow bark), digoxin (from foxglove), quinine (from cinchona bark), and morphine (from the opium poppy). The development of drugs from plants continues, with drug companies being engaged in large-scale pharmacological screening of herbal substances.

In the United States and Europe, however, over-the-counter natural herb products constitute a rapidly growing market, having joined prescription and over-the-counter medicines that were originally derived from herbs. Interest in herbal medicine has been facilitated by multiple factors, including the perception that pharmaceutical medications are expensive, overprescribed, and often dangerous. Alternatively, herbal medicines are often perceived as being "natural," and therefore safe.

Herbal medicines now fall into the category of complementary and alternative medicines (CAMs). Herbal supplements are receiving increasing exposure through national media, in lay journals, and more recently in the scientific press. Although the growth of the herbal medicine industry in the United States can probably not continue indefinitely at its current accelerated pace, there is little indication of any major slowing (Ekor, 2013; Euromonitor International, 2022). Therefore, many patients will continue to use herbal medications. In fact, one survey conducted in the United States found that an estimated 12.3 million adults (5.4% of the population) used alternative therapies as a substitute for costly prescription medications (Wang, Kennedy, & Wu, 2015). According to the 2012 National Health Interview Survey, 33.2% of U.S. adults used complementary health approaches. This percentage is similar to the percentages in 2007 (35.5%) and 2002 (32.3%; National Center for Complementary and Integrative Health, 2016). In addition, a federally funded National Health Statistics 2016 report (Nahin & Barnes, 2016) revealed that Americans spend up to $60 billion per year on CAMs.

With the increasing popularity of CAMs, a new issue has arisen: herbal-drug interactions, of which oral healthcare professionals (OHCPs) must be aware. A survey of patients with heart disease, diabetes, psychiatric disorders, and/or hypertension found that 79% were taking supplements concurrently with prescription medications (Graham et al., 2008). Among those with cardiac disease, 20% reported regular use of herbals. About 16% of patients with diabetes and 16% of patients with psychiatric disorders reported regular use of CAMs. The results of this survey underscore the prevalence of herbal supplement use and the potential for herbal-drug interaction (Graham et al., 2008; Asher, Corbett & Hawke 2017; Agbabiaka, Wider, Watson & Goodman, 2017). Thus, the OHCP needs to be increasingly aware not only of these products' effects and advantageous synergies, but also of their side effects and possible or probable adverse drug reactions.

After completing this basic-level course, the learner will be able to discuss the most commonly used herbal medicines in the United States. A stoplight approach to risk assessment is discussed and a general strategy to avoid the most common herbal-drug interactions is suggested. Critical patient populations are emphasized and specific herbal-drug interactions that can lead to increased bleeding, decreased blood glucose levels, and sedation changes are discussed. This course is specifically designed for all members of the dental healthcare team: dentists, dental hygienists, and dental assistants.

PREVALENCE OF USE AND RISK FOR INTERACTIONS

Although the typical North American diet has sufficient vitamins and minerals for overall health, Americans spent more than $59.9 billion on herbal supplements in 2021, and these nutraceuticals continue to be the largest-growing category of complementary and alternative medicines (CAMs) in use (NIH, 2016; Bailey, Gahche, Miller, Thomas, & Dwyer, 2013; Nutrition Business Journal, 2022). According to the National Institutes of Health (NIH), more than one third of all Americans take dietary supplements (Bailey et al., 2011; NIH, 2007), and as many as 52% to 74% of prescription drug users also take CAMs (Ghildayal, Johnson, Evans, & Kreitzer, 2016; Hanigan, Dela Cruz, Thompson, Farmer, & Medina, 2008; John et al., 2016; Nahin et al., 2009; Qato et al., 2008; Sharma, Holmes, & Sarkar, 2016). The U.S. Food and Drug Administration (FDA) defines a dietary supplement as, "a product intended to supplement the diet" that includes "a vitamin, a mineral, an herb or other botanical" in the form of "a pill, capsule, tablet or liquid" (FDA, 2022).

Adverse health outcomes – including those resulting from interactions among foods, herbals, and drugs – are likely to increase as Americans live longer, have more chronic conditions, and take more prescription or herbal medications (Budnitz, Lovegrove, Shehab & Richards 2011; Budnitz, Shehab, Lovegrove, Geller, Lind & Pollock, 2021; Digmann, et al., 2019). Among adults 65 years of age and older, 40% take 5 to 9 medications regularly and 18% take 10 or more (Jamsen et al., 2016; Qato, Wilder, Schumm, Gillet, & Alexander, 2016; Slone Epidemiology Center at Boston University, 2006). Age-related physiological changes, a larger number of coexisting conditions, a greater degree of frailty, and polypharmacy have all been associated with an increased risk of adverse events (Digmann, et al., 2019; El Desoky, 2007; McLean & Le Couteur, 2004). Older adults are seven times more likely than younger individuals to experience adverse drug events that require hospitalization (Budnitz et al., 2006).

Given the prevalence of medications and CAM use among consumers, potential herbal-drug interactions warrant consideration in dental practice (Donaldson & Touger-Decker, 2013; Moghadam et al., 2020). Furthermore, considering that nearly 70% of these patients do not discuss their CAM use with their primary care providers, oral healthcare professionals (OHCPs) should ask all patients about their use, particularly when prescribing medications and when considering the patients' overall oral healthcare plan (Nutrition Business Journal, 2022).

HERBAL MEDICATIONS AND DRUGS OF GREATEST CONCERN

A multitude of herbal medications are available in the United States. However, to bring the greatest value to practicing OHCPs and their teams, this course focuses on the top 20 most common herbal medications that OHCPs are likely to encounter (Table 1; Smith, T., Majid, F., Eckl, V., & Morton Reynolds, C., 2021). The data in Table 1 correspond to retail sales of herbal supplements in mainstream, natural, and direct sales channels as defined by the Nutrition Business Journal and the Chicago area-based market research firms SPINS LLC and Information Resources, Inc. (American Botanical Council, 2021). Each of these herbal medications is represented by a common name and the accompanying Latin name. Elderberry is the most common herbal medication OHCPs are likely to encounter (Smith, T., Majid, F., Eckl, V., & Morton Reynolds, C., 2021); consumers spent an estimated $275,544,691 on elder berry supplements in 2020, with annual sales doubling each year since our first edition

of this module (where elderberry didn't even make the top 10 list). Elderberry is commonly used to support immune health and as a remedy to help alleviate cold and flu symptoms, often reducing the severity and duration of colds, and the duration of the flu. No doubt that the COVID pandemic played heavily in the rise of consumer spend on this product also.

Elderberry displaced horehound which was the top-selling herbal ingredient 2013 to 2019. Horehound is the primary ingredient in many throat lozenges that may contain other herbal and nonherbal ingredients. Cranberry is a type of evergreen shrub that grows in wet habitats (such as bogs or wetlands) in northeastern and northcentral parts of the United States. Orally, cranberry is used for prevention and treatment of urinary tract infections, kidney stones, neurogenic bladder, as a urinary deodorizer for people with incontinence, prevention of urinary catheter blockage, and to heal skin around urostomy stomas. Beyond these first three, Table 1 lists the complete top 20 herbal medications OHCPs are most likely to encounter, and additional high-risk herbal-drug interactions are discussed, despite their lower prevalence in the general population.

Medications that are commonly used in dentistry typically fall into five drug classes: analgesics and anti-inflammatories, antibiotics, local anesthetics, sedatives, and emergency medications (Donaldson & Goodchild, 2012). There may be some additional miscellaneous medications such as antiseptics (e.g., chlorhexidine), fluoride supplements, or drugs to treat xerostomia (e.g., pilocarpine); however, it is unlikely that these drugs are part of every OHCP's armamentarium. The drug component of the herbal-drug interactions to be reviewed, then, will focus on the drugs commonly used in dentistry (Table 2).

This approach will help to concentrate the discussion on the most common dental-related herbal-drug interactions, with a goal of defining strategies to help avoid these interactions.

Table 1: Top-Selling Herbal Medications that OHCPs are Most Likely to Encounter

Rank	Common Name	Latin Name
1	Elderberry	Sambucus nigra
2	Horehound	Marrubium vulgare
3	Cranberry	Vaccinium macrocarpon
4	Turmeric*	Curcuma longa
5	Apple cider vinegar	Malus spp.**
6	Ginger	Zingiber officinalis
7	Echinacea	Echinacea spp.
8	Garlic	Allium sativum
9	Fenugreek	Trigonella foeneum-graecum
10	Wheat grass / Barley grass	Triticum aestivum / Hordeum vulgare
11	Saw palmetto	Serenoa repens
12	Ashwagandha	Withania somnifera
13	Green Tea	Camellia sinensis
14	Ivy Leaf	Hedera helix
15	Ginkgo	Ginkgo biloba
16	Cannabidiol (CBD)	Cannabis sativa
17	Black cohosh	Actaea racemosa
18	Beta-sitosterol***	--
19	Red rice yeast	Oryza sativa
20	Aloe	Aloe vera

* Includes standardized turmeric extracts with high levels of curcumin.

** spp. = species pluralis (more than one species).

*** Beta-sitosterol is a common plant sterol that can be derived from various plants.

Note. Adapted from Smith, T., Majid, F., Eckl, V., & Morton Reynolds, C. (2021). Herbal Supplement Sales in US Increase by Record- Breaking 17.3% in 2020. HerbalGram 131:52-65. Retrieved from https://www.herbalgram.org/resources/herbalgram/issues/131/table- of-contents/hg131-mkrpt/

Table 2: The Drugs Commonly Used in Dentistry

Antibiotics/Antifungals	Anti-inflammatory Agents and Analgesics	Local Anesthetics	Sedatives	Emergency Medications
• Amoxicillin. • Azithromycin. • Cephalexin. • Chlorhexidine (topical; antiseptic). • Clarithromycin. • Clindamycin. • Clotrimazole (topical). • Doxycycline. • Erythromycin. • Fluconazole. • Metronidazole. • Nystatin. • Penicillin. • Tetracycline.	• Acetaminophen. • Aspirin. • Codeine. • Glucocorticoids (dexamethasone and prednisone). • Hydrocodone. • Ibuprofen. • Oxycodone.	• Articaine. • Benzocaine (topical). • Bupivacaine. • Dyclonine (topical). • Lidocaine (with or without epinephrine). • Lidocaine (topical). • Mepivacaine (with or without levonordefrin). • Prilocaine. • Tetracaine (topical).	• Benzodiazepines (alprazolam, diazepam, lorazepam, midazolam, and triazolam). • Zaleplon. • Zolpidem.	• Albuterol. • Aspirin. • Diphenhydramine. • Epinephrine. • Flumazenil. • Glucose. • Naloxone. • Nitroglycerine. • Oxygen.

Note. Adapted from "Pregnancy, Breast-Feeding and Drugs Used in Dentistry," by M. Donaldson and J. H. Goodchild, 2012, *Journal of the American Dental Association, 143*(11), 858-871.

Clinical decision support tools and databases are available to help OHCPs stratify herbal-drug interactions according to the level of risk they pose to patients. Two databases employed to evaluate interactions – Lexicomp (Hudson, OH) and the Natural Medicines Comprehensive Database (Stockton, CA) – were selected for the purposes of this course to determine the risks associated with CAM supplementation and particular drugs prescribed most commonly by dentists (Lexicomp, n.d.; Natural Medicines Comprehensive Database, n.d.a).

Lexicomp assigns grades to interactions as shown in Table 3. The Natural Medicines Comprehensive Database rates herbal-drug interactions with a traffic-light grading system (Table 4). Red-light interactions should be avoided, as these supplement-medication combinations are contraindicated and serious adverse outcomes could occur. Yellow-light interactions indicate caution and perhaps avoidance of the combination unless the benefits outweigh the risks. Green-light interactions indicate minimal risk of combination therapy. Both of these databases report interactions according to likelihood of occurrence, severity, and level of evidence, which aids in validating concurrence of data (Table 5). Regardless, patients should always be advised to be aware of warning signs of a potential interaction, however insignificant the reaction may seem.

Table 3: Lexicomp's Risk Rating Definitions for Drug Interactions

Risk Rating	Action	Description
A	No known interaction.	Data have not demonstrated either pharmacodynamic or pharmacokinetic interactions between the specified agents.
B	No action needed.	Data demonstrate that the specified agents may interact with one another, but there is little to no evidence of clinical concern related to their concomitant use.
C	Monitor therapy.	Data demonstrate that the specified agents may interact with one another in a clinically significant manner. The benefits of concomitant use of these two medications usually outweigh the risks. An appropriate monitoring plan should be implemented to identify potential negative effects. Dosage adjustments of one or both agents may be needed in a minority of patients.
D	Consider therapy modification.	Data demonstrate that the two medications may interact with one another in a clinically significant manner. A patient-specific assessment must be conducted to determine whether the benefits of concomitant therapy outweigh the risks. Specific actions must be taken to realize the benefits and/or minimize the toxicity resulting from concomitant use of the agents. These actions may include aggressive monitoring, empiric dosage changes, and choice of alternative agents.
X	Avoid combination.	Data demonstrate that the specified agents may interact with each other in a clinically significant manner. The risks associated with concomitant use of these agents usually outweigh the benefits. Use of these agents in combination are generally contraindicated.

Note. Adapted from "Lexicomp Online for Dentistry," by Wolters Kluwer, n.d., Retrieved from http://webstore.lexi.com/ONLINE-Software-for-Dentists

Table 4: The Natural Medicines Comprehensive Database Level of Interaction Significance for Herbal-Drug Interactions

	Likely	Probable	Possible	Unlikely
High				
Moderate				
Mild				
Insignificant				

Red = Major risk; do not use the combination; contraindicated; strongly discourage patients from using this combination; a serious adverse outcome could occur.

Yellow = Moderate risk; use cautiously or avoid the combination; warn patients that a significant interaction or adverse outcome could occur.

Green = Minor risk; be aware that there is a chance of an interaction; advise patients to watch for warning signs of a potential interaction.

Note. Adapted from "About Natural Medicines Comprehensive Database," by the Natural Medicines Comprehensive Database, n.d.a, retrieved from http://naturaldatabase.therapeuticresearch.com/Content.aspx?cs=&s=ND&page=aboutdbhtml&xsl=generic#ratings

Table 5: Additional Modifiers Regarding the Likelihood of Occurrence and Severity of Herbal-Drug Interactions

Likelihood of Occurrence	
Likely	Clinical research indicates that this interaction is likely to occur in most patients.
Probable	Clinical research or pharmacokinetic studies in humans suggest that this interaction will occur in a significant portion of patients.
Possible	Clinical research, pharmacokinetic data in humans or animals, or in vitro research suggests that this interaction might occur in some patients.
Unlikely	Clinical research, pharmacokinetic data in humans or animals, or in vitro research suggests that this interaction can occur, but is not likely to occur in many patients.
Severity	
High	Life-threatening or severe impairment is possible.
Moderate	Moderate impairment or significant discomfort is possible.
Mild	Mild impairment or mild discomfort is possible.
Insignificant	Drug levels may be affected, but a clinically significant interaction is not likely.

Note. Adapted from "About Natural Medicines Comprehensive Database," by the Natural Medicines Comprehensive Database, n.d.a, retrieved from http://naturaldatabase.therapeuticresearch.com/Content.aspx?cs=&s=ND&page=aboutdbhtml&xsl=generic#ratings

Herbal-drug interactions may be generally classified as pharmacodynamic (what the drug does to the human body) or pharmacokinetic (what the human body does to the drug – absorption, distribution, metabolism, and elimination), based on the mechanism of action (Donaldson & Touger-Decker, 2013; Ismail & Bader, 2004; Radler, 2008). Many of these types of interactions may be theoretical. This course is based, however, on a search of evidence-based interactions of greatest clinical concern between medications commonly used by dentists and those herbal supplements most commonly used in the United States. This compilation is most clinically useful for practicing OHCPs and their teams. Table 6 summarizes these findings, which are described in greater detail later in this course. Results were limited to the two highest levels of medical evidence ("A" and "B"), and if the likelihood of occurrence was remote or the severity of the interaction was insignificant, the outcomes were not reported. Table 7 lists the different descriptions of levels of evidence.

Table 6: Herbal-Drug Interactions of Clinical Concern

Herbal-Drug Interaction*	Interaction Rating by Lexicomp and the Natural Medicines Comprehensive Database	Implications for Dentistry
Apple Cider Vinegar - Antiplatelet or anticoagulant agents (aspirin and ibuprofen)	Risk rating = B Level of evidence = B Severity = High Occurrence = Possible	Capsicum found in apple cider vinegar may increase the risk of bleeding if used with anticoagulant or antiplatelet drugs.
Ashwagandha – antidiabetes drugs	Risk rating = B Level of evidence = B Severity = High Occurrence = Possible	Taking ashwagandha with antidiabetes drugs might increase the risk of hypoglycemia.
Ashwagandha – central nervous system depressants and antianxiety agents	Risk rating = B Level of evidence = D Severity = High Occurrence = Possible	Ashwagandha might increase the sedative effects of benzodiazepines. barbiturates, other sedatives, and anxiolytics.
Black cohosh – CYP2D6 substrates (codeine and hydrocodone)	Risk rating = B Level of evidence = B Severity = Moderate Occurrence = Probable	Black cohosh can modestly inhibit CYP2D6 and increase levels of drugs metabolized by this enzyme.
Echinacea – CYP1A2 substrates (acetaminophen and diazepam)	Risk rating = B Level of evidence = B Severity = Moderate Occurrence = Possible	Echinacea can increase levels of drugs metabolized by CYP1A2, such as acetaminophen and diazepam.
Echinacea – Glucocorticoids (dexamethasone, prednisone, and methylprednisolone)	Risk Rating = D Level of evidence = B Severity = High Occurrence = Possible	Echinacea might interfere with immunosuppressant therapy because of its immunostimulating activity.
Elderberry – Glucocorticoids (dexamethasone, prednisone, and methylprednisolone)	Risk rating = B Level of evidence = B Severity = High Occurrence = Possible	Elderberry might interfere with immunosuppressant therapy because of its immunostimulating activity.
Fenugreek – Glucose	Risk rating = B Level of evidence = B Severity = Moderate Occurrence = Probable	Fenugreek may lower blood glucose levels; be aware of use in patients with diabetes.
Fenugreek – Antiplatelet or anticoagulant agents (aspirin and ibuprofen)	Risk rating = C Level of evidence = D Severity = High Occurrence = Possible	Fenugreek can increase the risk of bleeding when used with anticoagulant or antiplatelet drugs.
Ginger – Antiplatelet or anticoagulant agents (aspirin and ibuprofen)	Risk rating = D Level of evidence = B Severity = High Occurrence = Possible	Ginger can increase the risk of bleeding when used with anticoagulant or antiplatelet drugs.
Gingko – alprazolam	Risk rating = B Level of evidence = B Severity = Mild Occurrence = Probable	Ginkgo might decrease the levels and clinical effects of alprazolam.
Gingko – Antiplatelet or anticoagulant agents (ASA, ibuprofen and warfarin)	Risk rating = A Level of evidence = A Severity = High Occurrence = Possible	Ginkgo has been shown to increase the risk of bleeding in some people when taken with warfarin. Theoretically, ginkgo might increase the risk of bleeding if used with other anticoagulant or antiplatelet drugs.
Gingko – CYP1A2 substrates (local anesthetics except articaine)	Risk rating = B Level of evidence = B Severity = Moderate Occurrence = Possible	Ginkgo can increase levels of drugs metabolized by CYP1A2 such as local anesthetics.

Table 6: Herbal-Drug Interactions of Clinical Concern		
Herbal-Drug Interaction*	**Interaction Rating by Lexicomp and the Natural Medicines Comprehensive Database**	**Implications for Dentistry**
Green Tea – Antiplatelet or anticoagulant agents (aspirin and ibuprofen)	Risk rating = C Level of evidence = D Severity = High Occurrence = Unlikely	Green Tea can increase the risk of bleeding when used with anticoagulant or antiplatelet drugs.
Horehound – Glucose	Risk rating = B Level of evidence = B Severity = Moderate Occurrence = Possible	Horehound might lower blood glucose. Be aware of use in patients with diabetes.
Turmeric – Antiplatelet or anticoagulant agents (aspirin and ibuprofen)	Risk rating = C Level of evidence = D Severity = High Occurrence = Possible	Turmeric can increase the risk of bleeding when used with anticoagulant or antiplatelet drugs.
Turmeric – Glucose	Risk rating = C Level of evidence = B Severity = Moderate Occurrence = Possible	Turmeric may lower blood glucose levels; be aware of use in patients with diabetes.
Turmeric – CYP3A4 substrates (clarithromycin, clindamycin, erythromycin, dexamethasone, hydrocodone, lidocaine, alprazolam, diazepam, midazolam, and triazolam)	Risk rating = C Level of evidence = D Severity = Moderate Occurrence = Possible	Turmeric can inhibit CYP3A4 and increase levels of drugs metabolized by this enzyme.
Valerian – CYP3A4 substrates (clarithromycin, clindamycin, erythromycin, dexamethasone, hydrocodone, lidocaine, alprazolam, diazepam, midazolam, and triazolam)	Risk rating = C Level of evidence = B Severity = Moderate Occurrence = Possible	Valerian can inhibit CYP3A4 and increase levels of drugs metabolized by this enzyme.

*Readers may consult the sections in which individual herbs are discussed for more details about their interaction with cytochrome isoenzymes.

Note. Adapted from "Lexicomp Online for Dentistry, by Wolters Kluwer, n.d., retrieved from http://webstore.lexi.com/ONLINE-Software-for-Dentists; and "About Natural Medicines Comprehensive Database," by the Natural Medicines Comprehensive Database, n.d.a, retrieved from http://naturaldatabase.therapeuticresearch.com/Content.aspx?cs=&s=ND&page=aboutdbhtml&xsl=generic#ratings

Table 7: Descriptions of Levels of Evidence	
Level of Evidence	**Description**
A	• High-quality randomized controlled trial. • High-quality meta-analysis (quantitative systematic review).
B	• Nonrandomized clinical trial. • Nonquantitative systematic review. • Lower-quality randomized controlled trial. • Clinical cohort study. • Case-control study. • Historical control. • Epidemiologic study.
C	• Consensus. • Expert opinion.
D	• Anecdotal evidence. • In vitro or animal study. • Theoretical based on pharmacology.

Note. Adapted from "About Natural Medicines Comprehensive Database," by the Natural Medicines Comprehensive Database, n.d.a, retrieved from http://naturaldatabase.therapeuticresearch.com/Content.aspx?cs=&s=ND&page=aboutdbhtml&xsl=generic#ratings

MEDICAL AND DENTAL IMPLICATIONS FOR DRUG INTERACTIONS WITH SPECIFIC HERBAL MEDICATIONS

Of the top 20 most common herbal medications that OHCPs are likely to encounter (shown in Table 1) and the list of drugs commonly used in dentistry (shown in Table 2), the medications that are not known to be involved in any significant herbal-drug interactions include:

- Azithromycin.
- Cephalexin.
- Chlorhexidine (topical).
- Clotrimazole (topical).
- Fluconazole.
- Metronidazole.
- Nystatin.
- Penicillin.
- Articaine.
- Epinephrine
- Benzocaine (topical).
- Dyclonine (topical).
- Lidocaine (topical).
- Tetracaine (topical).
- Albuterol.
- Epinephrine.
- Flumazenil.
- Naloxone.
- Nitroglycerine.
- Oxygen.

A similar list of the herbal supplements not known to be involved in any significant herbal-drug interactions includes:

- Aloe vera.
- Beta-sitosterol.
- Cannabidiol (CBD).
- Cranberry.
- Garlic.
- Ivy leaf.
- Red rice yeast.
- Saw palmetto.
- Wheat grass / Barley grass.

In other words, these drugs and herbal medications may be considered the safest supplements from the lists in Tables 1 and 2.

Elderberry

Orally, elderberry is used for influenza (the flu) and H1N1 "swine" flu. It is also used as a laxative; as a means to stimulate immune function (for example, in patients with HIV/AIDS); as a means to control pain, such as that seen with chronic fatigue syndrome, allergic rhinitis, sinusitis, sciatica, neuralgia, and cancer; and as a diuretic and diaphoretic. Although there is insufficient evidence in the medical literature to support its effectiveness in most of these situations, there is medical evidence in support of this herbal supplement's possible effectiveness in treating influenza. Clinical research shows that some elderberry extracts might reduce flu-like symptoms. Fifteen milliliters (1 tablespoon) of a specific syrup formulation of elderberry fruit extract administered orally four times daily seems to reduce the symptoms and duration of influenza infection when given within 48 hours of initial symptoms (Kinoshita, Hayashi, Katayama, Hayashi, & Obata, 2012; Zakay-Rones et al., 1995; Zakay-Rones, Thom, Wollan, & Wadstein, 2004). Significant symptom relief seems to occur within 2 to 4 days of treatment for most patients. On average, this elderberry extract reduces the duration of symptoms by about 56% (Zakay-Rones et al., 2004). In another preliminary clinical study, an elderberry extract lozenge taken four times daily for 2 days, starting within 24 hours of initial symptoms, significantly improved flu-like symptoms compared with placebo. Substantial symptom relief occurred within 48 hours for most treated patients (Kong, 2009).

Theoretically, elderberry might interfere with immunosuppressant therapy because of its immunostimulating activity. Elderberry stimulates production of cytokines, including interleukin and tumor necrosis factor (Barak, Halperin, & Kalickman, 2001). Immunosuppressant drugs include glucocorticoids, which may be administered or prescribed by OHCPs to help reduce pain, swelling, and trismus related to a dental procedure. Although this herbal-drug interaction may be only theoretical, it is based on a high level of medical evidence ("B"). From a dental perspective, then, when treating immunosuppressed patients (e.g., patients with inflammatory arthropathies such as rheumatoid arthritis or systemic lupus erythematosus, drug- or radiation- induced immunosuppression, malignancy, malnourishment, hemophilia, HIV infection, or insulin-dependent diabetes), if a glucocorticoid is intended to be used, patients should not suddenly start taking this herbal medication before the dental procedure, and if they do consume elderberry routinely, they should stop the supplement for 24 hours before the dental procedure and for at least 24 hours after the last dose of the glucocorticoid. However, OHCPs may choose to avoid glucocorticoids altogether in these high-risk immunosuppressed patients, regardless of whether they take elderberry supplementation.

Horehound

In manufacturing, the extracts of white horehound are used as flavoring in foods and beverages and as an expectorant in cough syrups and lozenges. Patients may be unaware that they are consuming this herbal medication as the primary ingredient in many throat lozenges, and this lack of awareness may be problematic specifically in the diabetic population (adding to the problem that many of these dosage forms also contain a significant amount of sugar; Donaldson, Goodchild, & Epstein, 2015). Evidence from animal research suggests that horehound might lower blood glucose (Roman, Alarcon-Aguilar, Lara-Lemus, & Flores-Saenz, 1992; Novaes et al., 2001 – although preliminary clinical research suggests that horehound only slightly lowers blood glucose when taken in combination with antidiabetic agents, suggesting that the effect may not be clinically significant (Boudjelal, Henchiri, Siracusa, Sari, & Ruberto, 2012; Herrera-Arellano, Aguilar-Santamaria, García-Hernández, Nicasio-Torres, & Tortoriello, 2004; Rodriguez Villanueva & Martin Esteban, 2016). Theoretically, horehound may have additive effects when used by patients taking antidiabetic drugs and the dose of diabetes medications might need to be adjusted if patients routinely consume these supplements. From a dental perspective, be aware of diabetic patients who may consume horehound-containing supplements, and request that they do not take these supplements at least 24 hours before the dental procedure. As with all patients with diabetes, routine blood glucose monitoring is paramount, dental appointments should be kept relatively short, and patients should maintain their normal nutritional routine. In patients with controlled diabetes, this potential herbal-drug interaction can be easily avoided.

Turmeric

Turmeric is possibly effective when given orally to treat allergic rhinitis (hay fever), depression, hyperlipidemia, nonalcoholic fatty liver disease, osteoarthritis, and pruritis. Topically, turmeric is used for analgesia, ringworm, sprains and swellings, bruising, leech bites, eye infections, acne, inflammatory skin conditions, skin lesions, psoriasis, inflammation of the oral mucosa, periodontitis, infected wounds, and gingivitis. As an enema, turmeric is used for ulcerative colitis.

Clinical research has also suggested that the turmeric constituent, curcumin, may lower blood glucose levels and glycosylated hemoglobin (HbA1C) in patients with diabetes (Azhdari, M., Karandish, M., & Mansoori, A. 2019; Kato, M, et

al, 2017). Theoretically, taking a combination of turmeric and antidiabetes drugs might have an additive effect and increase the risk of hypoglycemia. From a dental perspective, be aware of patients with diabetes who may routinely consume turmeric and request that they do not suddenly start or stop taking this supplement before the dental procedure; OHCPs will want patients to be as stable as possible when they are seen in the office. As with all patients with diabetes, routine blood glucose monitoring is paramount, dental appointments should be kept relatively short, and patients should maintain their normal nutritional routine. In patients with controlled diabetes, this potential herbal-drug interaction can be easily managed.

Turmeric can inhibit CYP3A4 causing increased blood levels of concomitant medications such as clarithromycin, clindamycin, erythromycin, dexamethasone, hydrocodone, lidocaine, alprazolam, diazepam, midazolam, and triazolam. If any of these medications are to be used during the dental appointment, patients should stop taking turmeric at least 24 hours before the procedure to avoid a potential herbal-drug interaction. Alternatively, medications that are not listed as having an interaction with turmeric could be substituted (e.g., azithromycin as an antibiotic, articaine as a local anesthetic, or lorazepam as a sedative agent).

In vitro, turmeric has been shown to have antiplatelet effects, however, results from human research are inconsistent (Shivalingu, B. R., Vivek, H. K., Nafeesa, Z., Priya, B. S., & Swamy, S. N., 2015). Until more is known, turmeric should be used cautiously in combination with anticoagulant and antiplatelet drugs as concomitant use might increase the risk of bleeding due to decreased platelet aggregation. Some of these drugs include aspirin, clopidogrel (Plavix), dalteparin (Fragmin), enoxaparin (Lovenox), heparin, ticlopidine (Ticlid), warfarin (Coumadin), and others.

On a dental note, a recent clinical trial evaluated the efficacy of turmeric gel as an anti-plaque and anti-gingivitis agent compared to chlorhexidine gel (Kandwal, A., Mamgain, R. K., & Mamgain, P., 2015). Both study groups reported a comparable reduction in plaque and gingival index. Turmeric gel reported better acceptance due to pleasant odor and no staining of teeth in comparison to chlorhexidine gel that reported a bitter taste and staining of teeth.

Apple cider vinegar

Apple cider vinegar was the only other herbal supplement ingredient besides Ashwagandha with a sales increase of more than 100% from 2019. Apple cider vinegar is the fermented juice from crushed apples. It contains pectin, vitamins, minerals, and acid in the form of acetic acid or citric acid (Hill, Woodruff, Foote, & Barreto-Alcoba, 2005). The crushed apples are soaked in water, and yeast converts the natural sugars in the apples to alcohol. The alcohol is then converted to acetic acid, the main component of vinegar, in the presence of bacteria. Over time, the liquid will turn murky, and this cloud of yeast and bacteria is known as the "mother." Some people credit the mother, which is considered a probiotic, with the potential health benefits of apple cider vinegar (McDonald, 2021; Fahey, 2017).

While it is most popularly used in salad dressings and cooking, apple cider vinegar has been traditionally used for a variety of medical reasons, including wound disinfection (Beheshti, et al., 2012). Despite these health claims, however, human clinical research on apple cider vinegar is limited. A number of small studies have reported positive findings, particularly related to glycemic control and lipid profiles. In a 2019 meta- analysis and systematic review of the health effects of vinegar, the authors reported that consumption of apple cider vinegar was associated with better glycemic control in patients with type 2 diabetes compared to other vinegars (Cheng, Jiang, Wu, & Wang, 2019; Martini, 2021). Another systematic review and meta-analysis published in 2021 examined the effects of apple cider vinegar on lipid profiles and glycemic parameters and concluded that apple cider vinegar had significant, positive effects on blood sugar and blood lipid levels (Hadi, Pourmasoumi, Najafgholizadeh, Clark, & Esmaillzadeh, 2021). High-quality research on apple cider vinegar's effects on metabolism and weight loss is lacking, however, according to a separate systematic review published in 2020 (Launhold, Kristiansen & Hjorth, 2020).

From a dental perspective, a recent study evaluating the effects of newly proposed irrigants; the pomegranate, apple cider, and grape vinegars in comparison with contemporary irrigants; sodium hypochlorite (NaOCl), chlorhexidine gluconate (CHX), and octenidine-hydrochloride (OCT) on microhardness and surface roughness of human root canal dentin, found that he use of vinegar for endodontic irrigation may have a softening effect on root canal dentin with time and may increase dentin roughness (Akbulut, Guneser, & Eldeniz, 2019).

One other study evaluated the in vitro antifungal activity of apple cider vinegar on Candida spp. involved in denture stomatitis (Mota, de Castro, de Araújo Oliveira, & de Oliveira Lima, 2015). The authors concluded that apple cider vinegar showed antifungal properties against Candida spp., thus representing a possible therapeutic alternative for patients with denture stomatitis.

Ginger

Ginger has been shown in the medical literature as being possibly effective to treat nausea and vomiting (Chaiyakunapruk, Kitikannakorn, Nathisuwan, Leeprakobboon, & Leelasettagool, 2006; Dabaghzadeh, Khalili, Dashti-Khavidaki, Abbasian, & Moeinifard, 2014; Matthews, Haas, O'Mathúna, & Dowswell, 2015), dysmenorrhea (Ozgoli, Goli, & Moattar, 2009; Pattanittum et al., 2016), morning sickness (Fischer-Rasmussen, Kjaer, Dahl, & Asping, 1991; Jewell & Young, 2003; Matthews et al., 2015; Thomson, Corbin, & Leung, 2014), osteoarthritis (Amorndoljai, Taneepanichskul, Niempoog, & Nimmannit, 2015; Bartels et al., 2015; Leach & Kumar, 2008; Terry, Posadzki, Watson, & Ernst, 2011), and vertigo (Grøntved & Hentzer, 1986). People have also reported taking this herbal supplement for motion sickness, colic, diarrhea, dyspepsia, flatulence, irritable bowel syndrome, loss of appetite, migraine headache, and for discontinuing selective serotonin reuptake inhibitor drug therapy – despite the lack of evidence in support of these uses. Topically, the fresh juice of ginger has been used for treating thermal burns, and the essential oil of ginger is used topically as an analgesic.

Ginger is thought to inhibit thromboxane synthetase and decrease platelet aggregation (Abebe, 2002; Argento, Tiraferri, & Marzaloni, 2000; Backon, 1991; Stanger, Thompson, Young, & Lieberman, 2012; Thomson et al., 2002; Srivastava, 1989). Excessive amounts of ginger might increase the risk of bleeding when used with anticoagulant/antiplatelet drugs such as aspirin or any of the nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen. Patients should stop taking ginger at least 24 hours before the dental procedure to avoid this potential herbal-drug interaction, and they should continue to avoid taking ginger concurrently with any NSAID that may be prescribed for postoperative dental pain. OHCPs should exercise caution with patients who regularly consume ginger and any antiplatelet agent as they may be at higher risk for bleeding postoperatively, which could interfere with wound healing. In patients who refuse to interrupt their usual doses of ginger, dentists may elect to use a cyclooxygenase-2 (COX-2) inhibitor such as celecoxib to manage postoperative dental pain with or without acetaminophen or a glucocorticoid (e.g., dexamethasone) because these agents do not interact with ginger.

Echinacea

Echinacea is taken orally for treating and preventing the common cold, for which it may be effective (Caruso & Gwaltney, 2005; Giles, Palat, Chien, Chang, & Kennedy, 2000; Karsch-Völk, Barrett, & Linde, 2015; Ross, 2016). Echinacea is also used orally as an immunostimulant for fighting a variety of other infections, including influenza, other upper respiratory infections, otitis media, urinary tract infections, vaginal candidiasis, herpes simplex virus, human papilloma virus, HIV/AIDS, septicemia, tonsillitis, streptococcus infections, syphilis, typhoid fever, malaria, swine flu, warts, and diphtheria. Topically, echinacea is used for gingivitis, boils, abscesses, skin wounds and ulcers, burns, eczema, psoriasis, ultraviolet radiation-induced skin damage, herpes simplex, Candida infections, bee stings, snake and mosquito bites, and hemorrhoids.

Echinacea appears to inhibit cytochrome CYP1A2 isoenzymes in humans (Gorski et al., 2004). Theoretically, echinacea might increase levels of drugs metabolized by CYP1A2 such as acetaminophen and diazepam. Although the occurrence of this herbal-drug interaction is listed as possible and the severity moderate, given the high level of evidence ("B"), practitioners should be cautious of this combination. From a dental perspective, patients should refrain from ingesting echinacea at least 24 hours before the dental appointment if diazepam use is anticipated for sedation. If acetaminophen is to be used for postoperative pain management, concurrent use of echinacea and acetaminophen should be avoided. If patients do not want to discontinue echinacea use in order to avoid this potential herbal-drug interaction, then the dose of acetaminophen should be empirically reduced. Unfortunately, there are no published recommendations to suggest the appropriate dose reduction, but the prudent practitioner may want to consider at least a 50% reduction in the total daily acetaminophen dose.

Theoretically, echinacea may also interfere with immunosuppressant therapy because of its immunostimulating activity (Barrett, 2003; Chavez & Chavez, 1998; Fonseca et al., 2014; Luettig, Steinmuller, Gifford, Wagner, & Lohmann-Matthes, 1989; Schapowal, Klein, & Johnston, 2015; Stimpel, Proksch, Wagner, & Lohmann-Matthes, 1984). Immunosuppressant drugs include glucocorticoids, which may be administered or prescribed by OHCPs to help reduce pain, swelling, and trismus related to a dental procedure. Although this herbal-drug interaction may be only theoretical, it is based on a high level of medical evidence ("B"). From a dental perspective, then, when treating immunosuppressed patients (e.g., patients with inflammatory arthropathies such as rheumatoid arthritis or systemic lupus erythematosus, drug- or radiation-induced immunosuppression, malignancy, malnourishment, hemophilia, HIV infection, or insulin-dependent diabetes), if a glucocorticoid is intended to be used, patients should not suddenly start taking this herbal medication before the dental procedure. If they do consume echinacea routinely, they should stop the supplement for 24 hours before the dental procedure and for at least 24 hours after the last dose of the glucocorticoid. However, OHCPs may choose to avoid glucocorticoids altogether in these high-risk immunosuppressed patients, regardless of whether they take echinacea supplementation.

Fenugreek

Orally, fenugreek is possibly effective when used for diabetes, dysmenorrhea, sexual dysfunction and sexual drive in both men and women. Other indications for use such as treating loss of appetite, dyspepsia, gastroesophageal reflux disease (GERD), gastritis, constipation, polycystic ovary syndrome, obesity, atherosclerosis, hyperlipidemia, and for stimulating lactation, lack sufficiently reliable evidence. Topically, fenugreek is used as a poultice for local inflammation, myalgia, lymphadenitis, gout, wounds, leg ulcers, and eczema. In foods, fenugreek is included as an ingredient in spice blends. It is also used as a flavoring agent in imitation maple syrup, foods, beverages, and tobacco. In manufacturing, fenugreek extracts are used in soaps and cosmetics.

There is some concern that fenugreek might have additive effects when used with anticoagulant or antiplatelet drugs, resulting in increased risk of bruising and bleeding. Some of the constituents in fenugreek have antiplatelet effects, although these might not be present in concentrations that are clinically significant (Lambert, J., & Cormier, J., 2001; Bordia, A., Verma, S. K., & Srivastava, K. C..1997). Until more is known, fenugreek should be used cautiously in combination with anticoagulant and antiplatelet drugs as concomitant use might increase the risk of bleeding due to decreased platelet aggregation. Some of these drugs include aspirin, clopidogrel (Plavix), dalteparin (Fragmin), enoxaparin (Lovenox), heparin, ticlopidine (Ticlid), warfarin (Coumadin), and others. Concomitant use of herbs that have constituents that might affect platelet aggregation could theoretically increase the risk of bleeding in some people who take fenugreek also. These herbs include angelica, clove, danshen, garlic, ginger, ginkgo, red clover, turmeric, and others.

Fenugreek may reduce blood glucose levels and could theoretically have additive effects on glucose levels when used with antidiabetes drugs. From a dental perspective, be aware of patients with diabetes who may routinely consume fenugreek and request that they do not suddenly start or stop taking this supplement before the dental procedure; OHCPs will want patients to be as stable as possible when they are seen in the office. As with all patients with diabetes, routine blood glucose monitoring is paramount, dental appointments should be kept relatively short, and patients should maintain their normal nutritional routine. In patients with controlled diabetes, this potential herbal-drug interaction can be easily managed.

Green tea

Green tea is used to improve cognitive performance and mental alertness. It is likely effective in treating genital warts and there is a specific green tea extract ointment (Veregen, Bradley Pharmaceuticals; Polyphenon E ointment 15%, MediGene AG) providing 150 mg of sinecatechins per gram of ointment which completely clears external genital and perianal warts in 24% to 60% of patients after 10-16 weeks of treatment (Bradley Pharmaceuticals, 2006). This green tea extract is an FDA-approved prescription product.

Green tea taken orally seems to lower cholesterol and triglycerides. Epidemiological research has found that higher consumption of green tea, especially 10 cups daily or more, is associated with improved serum lipids in men but not women (Imai, K., & Nakachi, K., 1995; Pang, J., et al., 2016). There is also preliminary evidence that taking a green tea extract containing catechins 676 mg daily for 12 weeks reduces oxidation of LDL cholesterol, which might lead to reduced damage to the vascular endothelium and reduced arteriosclerosis (Miyawaki, M., et al., 2018).

Green tea is possibly effective in treating cervical dysplasia, coronary artery disease, endometrial cancer, hypertension, hypotension, oral leukoplakia, ovarian cancer, and Parkinson's disease, but clinical studies are conflicting. Gargling with green tea is used for the prevention of colds and flu. Green tea extract is used in a mouthwash for postoperative pain associated with tooth extraction. Topically, green tea bags are used as a wash to soothe sunburn, as a poultice for bags under the eyes, as a compress for headache or tired eyes, and to stop the bleeding of tooth sockets. Green tea in chewable candy is used for gingivitis. Green tea is also used topically to prevent skin damage and cancer related to ultraviolet (UV) radiation (e.g., sunburn) and other environmental causes. A green tea footbath is used for athlete's foot.

The caffeine in green tea might increase the risk of additive central nervous system effects in patients taking amphetamines and amphetamine- like medications such as dextroamphetamine and methylphenidate. These medications are typically used in the treatment of attention deficit hyperactivity disorder (ADHD), narcolepsy, and obesity. The severity of this interaction is high and gets an interaction rating of, "major," since the risk of occurrence is probable.

Catechins in green tea and caffeine are reported to have antiplatelet activity. Theoretically, green tea might increase the risk of bleeding when used with antiplatelet or anticoagulant drugs. This interaction has not been reported in humans; however, contradictory case reports suggest that green tea might actually decrease the anticoagulant effect of warfarin. This could be due to vitamin K or other constituents contained in green tea. Until more is known, green tea should be used cautiously in combination with anticoagulant and antiplatelet drugs as concomitant use might increase the risk of bleeding due to decreased platelet aggregation. Some of these drugs include aspirin, clopidogrel (Plavix), dalteparin (Fragmin), enoxaparin (Lovenox), heparin, ticlopidine (Ticlid), warfarin (Coumadin), and others.

Ginko

Ginkgo biloba is the oldest living species of tree on earth originating two hundred million years ago. It is native to temperate Asia, including China, Japan, and Korea, but is now cultivated in Europe and the United States. Ginkgo has a long history of use in traditional Chinese medicine and ginkgo leaf preparations have been used to treat cerebral insufficiency, peripheral vascular disease, attention and memory loss, and vertigo and tinnitus. There have been over four hundred scientific studies conducted on proprietary standardized extracts of the ginkgo leaf in the past 30 years.

Standardized ginkgo leaf extracts have been used safely in trials lasting for several weeks up to 6 years. There is some concern about toxic and carcinogenic effects seen in animals exposed to a ginkgo leaf extract containing 31.2% flavonoids, 15.4% terpenoids, and 10.45 ppm ginkgolic acid, in doses of 100 to 2000 mg/kg five times per week for 2 years (National Toxicology Program, 2013). However, the clinical relevance of this data for humans, using typical doses, is unclear. The content of the extract used is not identical to that commonly used in supplement products, and the doses studied are much higher than those typically used by humans. A single dose of 50 mg/kg in rats is estimated to be equivalent to a single dose of about 240 mg in humans (National Toxicology Program, 2013). There is concern that ginkgo might have labor- inducing and hormonal effects. There is also concern that the antiplatelet effects of ginkgo could prolong bleeding time if taken around the time of labor and delivery (Dugoua, Mills, Perri, & Koren, 2006). Theoretically, ginkgo might adversely affect pregnancy outcome; avoid using during pregnancy.

Clinical research shows that taking a specific ginkgo extract called *EGb 761* (Dr. Willmar Schwabe Pharmaceuticals) for 4 weeks can modestly reduce symptoms of anxiety in a greater percentage of adults with generalized anxiety disorder or adjustment disorder with anxious mood when compared with placebo. After 4 weeks of treatment, a reduction in anxiety rating score of at least 50% was seen in 44% of patients treated with 480 mg daily, 39% of patients treated with 240 mg daily, and 22% of patients treated with placebo (Woelk, Arnoldt, Kieser, & Hoerr, 2007). It is unclear whether these effects would persist when taken for longer than 4 weeks.

Oral ginkgo 240 mg seems to improve symptoms of various types of dementia, but lower doses are not always effective. Oral ginkgo does not seem to prevent or slow down the progression of dementia (Wang, Wang, Song, Qi, Rong, Wang, Zhang, & Chen, 2010). Few clinical studies compare ginkgo leaf extract to conventional drugs such as cholinesterase inhibitors. Some preliminary comparative studies show that taking a specific ginkgo leaf extract called *EGb 761* (Dr. Willmar Schwabe Pharmaceuticals) 160-240 mg daily for 22-24 weeks seems to be comparable to donepezil (Aricept) 5-10 mg daily for mild to moderate Alzheimer disease (Pennisi, 2006).

Taking ginkgo leaf extract orally 80 mg twice daily or 40 mg three times daily seems to produce significant relief in breast tenderness and other physical and psychological symptoms associated with PMS when started during the 16th day of the menstrual cycle and continued until the 5th day of the following cycle for up to two cycles (Tamborini, & Taurelle, 1993).

Black cohosh

Black cohosh is taken orally for symptoms of menopause; to induce labor in pregnant women; for premenstrual syndrome, dysmenorrhea, nervous tension, dyspepsia, rheumatism, fever, sore throat, and cough; as an insect repellent; and as a mild sedative. Topically, black cohosh is used to treat acne, remove moles and warts, improve the appearance of the skin, and treat rattlesnake bites. For all these indications, only in the case of menopausal symptoms (hot flashes) has the medical literature suggested that this herbal supplement may be effective. However, there is considerable variability in the preparations used in clinical trials and in the results obtained (Jiang et al., 2015; Shams et al., 2010; Taylor, 2015).

Some clinical research suggests that black cohosh might modestly inhibit cytochrome P450 2D6 (CYP2D6) and increase levels of drugs such as codeine and hydrocodone that are metabolized by this enzyme (Gorman, Coward, Darby, & Rasberry, 2013; Gurley et al., 2005). However, contradictory clinical research shows a specific black cohosh product (Remifemin, Enzymatic Therapy) 40 mg twice daily does not significantly inhibit metabolism of a CYP2D6 substrate in healthy study volunteers (Gurley et al., 2008). Until more is known, black cohosh should be used cautiously or avoided in patients taking drugs such as codeine and hydrocodone. From a dental perspective, these drugs should not be prescribed for postoperative dental pain – especially in patients who may concurrently consume black cohosh.

ADDITIONAL HERBAL-DRUG INTERACTIONS OF NOTE

Although the compilation of herbal-drug interactions listed in Table 6 summarizes the findings of evidence-based interactions of greatest clinical concern between medications commonly used by dentists and those herbal supplements most commonly used in the United States, there are some additional herbal-drug interactions of which OHCPs should be aware. Table 8 highlights these interactions, which may have a lower prevalence than those that have been described so far, but for which the consequences of not recognizing and avoiding these potential herbal- drug interactions could be severe. These additional herbal-drug interactions all have an interaction rating of "major." In other words, these combinations are not to be used. Concomitant use of the drug and herbal supplement is contraindicated and could lead to a serious adverse outcome.

Table 8: Additional Herbal-Drug Interactions of Note		
Herbal-Drug Interaction	**Interaction Rating by Lexicomp and the Natural Medicines Comprehensive Database**	**Implications for Dentistry**
Acacia – Amoxicillin	Risk rating = D Level of evidence = B Severity = Moderate Occurrence = Likely	Acacia can reduce the absorption of amoxicillin.
Alcohol – Acetaminophen	Risk rating = C Level of evidence = C Severity = High Occurrence = Probable	Alcohol-containing beverages taken with acetaminophen can increase the risk of hepatotoxicity.
Alcohol – Metronidazole	Risk rating = X Level of evidence = C Severity = Moderate Occurrence = Likely	Metronidazole can cause a disulfiram-like reaction when taken with alcohol.
Alcohol – CNS* depressants (codeine, hydrocodone, oxycodone, alprazolam, diazepam, lorazepam, midazolam, triazolam, zaleplon, zolpidem, and diphenhydramine)	Risk rating = C Level of evidence = C Severity = High Occurrence = Probable	Alcohol can increase the risk of drowsiness and motor reflex depression when combined with other CNS depressants.
Arsenic – Macrolide antibiotics (azithromycin, clarithromycin, and erythromycin)	Risk rating = X Level of evidence = B Severity = High Occurrence = Probable	Arsenic could have an additive effect with macrolide antibiotics and prolong the QT interval, causing ventricular arrhythmias.
Berberine – Glucose	Risk rating = B Level of evidence = A Severity = High Occurrence = Probable	Berberine might lower blood glucose. Be aware in diabetic patients.
Bitter orange – Midazolam	Risk rating = C Level of evidence = B Severity = High Occurrence = Probable	Bitter orange juice can significantly inhibit CYP3A4 metabolism of midazolam and increase drug levels and the risk for adverse effects.
Cinnamon – Glucose	Risk rating = B Level of evidence = B Severity = Moderate Occurrence = Possible	Cinnamon may lower blood glucose levels; be aware of use in patients with diabetes.
Cocoa – Antiplatelet or anticoagulant drugs (aspirin and ibuprofen)	Risk rating = C Level of evidence = B Severity = High Occurrence = Probable	Cocoa can inhibit platelet adhesion, aggregation, and activity, increasing the risk of bleeding.
Ephedra – Macrolide antibiotics (azithromycin, clarithromycin, and erythromycin)	Risk rating = X Level of evidence = B Severity = High Occurrence = Probable	Ephedra could have an additive effect with macrolide antibiotics and prolong the QT interval, causing ventricular arrhythmias.
Grapefruit juice – CYP3A4 substrates (clarithromycin, erythromycin, clindamycin, hydrocodone, lidocaine, alprazolam, diazepam, midazolam, triazolam, zaleplon, and zolpidem)	Risk rating = D Level of evidence = B Severity = High Occurrence = Probable	Grapefruit juice can inhibit cytochrome CYP3A4 metabolism of drugs, causing increased drug levels.
Kava – CNS depressants (codeine, hydrocodone, oxycodone, alprazolam, diazepam, lorazepam, midazolam, triazolam, zaleplon, zolpidem, and diphenhydramine)	Risk rating = C Level of evidence = A Severity = High Occurrence = Probable	Kava can increase the risk of drowsiness and motor reflex depression when combined with other CNS depressants.
l-Tryptophan – CNS depressants (codeine, hydrocodone, oxycodone, alprazolam, diazepam, lorazepam, midazolam, triazolam, zaleplon, and zolpidem)	Risk rating = C Level of evidence = B Severity = High Occurrence = Probable	l-Tryptophan can increase the risk of drowsiness and motor reflex depression when combined with other CNS depressants.
Sida cordifolia – Macrolide antibiotics (azithromycin, clarithromycin, and erythromycin)	Risk rating = X Level of evidence = B Severity = High Occurrence = Probable	*Sida cordifolia* could have an additive effect with macrolide antibiotics and prolong the QT interval, causing ventricular arrhythmias.

Table 8: Additional Herbal-Drug Interactions of Note		
Herbal-Drug Interaction	**Interaction Rating by Lexicomp and the Natural Medicines Comprehensive Database**	**Implications for Dentistry**
St. John's wort – P-glycoprotein substrates (doxycycline, tetracycline, and glucocorticoids)	Risk rating = D Level of evidence = B Severity = High Occurrence = Probable	When P-glycoprotein is induced in the gastrointestinal tract, it can prevent the absorption of some medications.
St. John's wort – CYP3A4 substrates (clarithromycin, erythromycin, clindamycin, glucocorticoids, hydrocodone, and lidocaine)	Risk rating = D Level of evidence = B Severity = High Occurrence = Possible	St. John's wort can induce cytochrome CYP3A4 metabolism of drugs, causing decreased drug levels.
*CNS = Central nervous system. *Note.* dapted from "Lexicomp Online for Dentistry, by Wolters Kluwer, n.d., retrieved from http://webstore.lexi.com/ONLINE-Software-for-Dentists; and "About Natural Medicines Comprehensive Database," by the Natural Medicines Comprehensive Database, n.d.a, retrieved from http://naturaldatabase.therapeuticresearch.com/Content.aspx?cs=&s=ND&page=aboutdbhtml&xsl=generic#ratings		

Acacia
Acacia can reduce the absorption of amoxicillin, the doses of which should be separated by at least 4 hours (Eltayeb, Awad, Elderbi, & Shadad, 2004).

Alcohol
Metronidazole can cause a disulfiram-like reaction when taken with alcohol (Fjeld & Raknes, 2014; Fraser, 1997; Jang & Harris, 2007). Concomitant use of excessive amounts of alcohol-containing beverages, such as beer or wine, with acetaminophen can increase the risk of hepatotoxicity (de Oliveira, Rocha, & Abreu, 2014; Fraser, 1997; Jang & Harris, 2007; Thummel et al., 2000). Studies of concomitant use of beer with antihistamines, barbiturates, benzodiazepines, and tricyclic antidepressants found that the combination may increase sedative and other adverse effects (Fraser, 1997; Jang & Harris, 2007).

Arsenic
Up to 40% of patients treated with prescription arsenic trioxide have a prolonged QT interval on their electrocardiograms (Zhang et al., 2013). Theoretically, arsenic could have an additive effect when combined with drugs such as the macrolide antibiotics (azithromycin, clarithromycin, and erythromycin) that prolong the QT interval and potentially increase the risk of ventricular arrhythmias.

Berberine
Clinical research suggests that berberine can lower blood glucose levels (Wei, Zhang, et al., 2016; Wei, Zhao, et al., 2012; Yin, Xing, & Ye, 2008; Yu et al., 2015; Zhang et al., 2008; Zhang et al., 2010). Theoretically, therefore, berberine may have additive effects when used with antidiabetic drugs and could increase the risk of hypoglycemia.

Bitter orange
Bitter orange can significantly inhibit CYP3A4 metabolism of midazolam and can potentially increase drug levels and adverse effects (Loue & Tod, 2014; Malhotra, Bailey, Paine, & Watkins, 2001).

Cinnamon
There are many types of cinnamon. Cinnamomum verum (Ceylon cinnamon) and Cinnamomum aromaticum (cassia cinnamon, or Chinese cinnamon) are commonly used. In many cases, the cinnamon spice purchased in food stores contains a combination of these different types of cinnamon. So far, only cassia cinnamon has been shown to have any effect on blood glucose in humans. However, Cinnamomum verum also contains the hydroxychalcone polymer thought to be responsible for lowering blood sugar (Anderson et al., 2004; Bernardo et al., 2015; Medagama, 2015). Orally, cassia cinnamon is used for diabetes, flatulence, muscle and gastrointestinal spasms, preventing nausea and vomiting, diarrhea, infections, the common cold, and loss of appetite. Topically, cassia cinnamon is used as a mosquito repellent. Despite all of these indications for use, and others, the medical literature has insufficient reliable evidence to confirm this herbal medication's effectiveness.

Cassia cinnamon seems to lower blood glucose levels and cause additive effects in patients treated with antidiabetic agents such that dose adjustments to diabetes medications are often necessary in patients who routinely consume this herbal medication (Akilen, Tsiami, Devendra, & Robinson, 2010; Bernardo et al., 2015; Crawford, 2009; Davis & Yokoyama, 2011; Khan, Safdar, Ali Khan, Khattak, & Anderson, 2003; Lu et al., 2012; Medagama, 2015). For type 1 or type 2 diabetes, 1 to 6 g (1 teaspoon = 5 g) of cassia cinnamon daily for up to 4 months has been used (Baker, Gutierrez-Williams, White, Kluger, & Coleman, 2008; Bernardo et al., 2015; Crawford, 2009; Khan et al., 2003; Medagama, 2015).

From a dental perspective, be aware of patients with diabetes who may routinely consume cinnamon, and request that they do not suddenly start or stop taking this herbal medication before the dental procedure; OHCPs will want patients to be as stable as possible when they are seen in the office. As with all patients with diabetes, routine blood glucose monitoring is paramount, dental appointments should be kept relatively short, and patients should maintain their normal nutritional routine. In patients with controlled diabetes, this potential herbal-drug interaction can be easily managed.

Cocoa
Human research suggests that intake of cocoa can inhibit platelet adhesion, aggregation, and activity (Flammer et al., 2007; Flammer et al., 2012; Heptinstall, May, Fox, Kwik-Uribe, & Zhao, 2006; Innes, Kennedy, McLaren, Bancroft, & Belch, 2003; Murphy et al., 2003; Ostertag et al., 2013; Pearson et al., 2002; Rein et al., 2000) and increase aspirin-induced bleeding time (Zubair et al. 2011). Theoretically, cocoa may increase the risk of bleeding when used with other antiplatelet or anticoagulant drugs.

Ephedra
Ephedra may have an additive effect with drugs that prolong the QT interval. This additive effect may increase the risk of ventricular arrhythmias when combined with drugs such as the macrolide antibiotics (azithromycin, clarithromycin, and erythromycin; Maffè et al., 2013; McBride et al., 2004).

Grapefruit
Grapefruit juice can inhibit cytochrome CYP3A4 metabolism of drugs, causing increased drug levels and potentially increasing the risk of adverse effects (Ainslie et al., 2014; Charbit, Becquemont, Lepère, Peytavin, & Funck-Brentano, 2002; Fuhr et al., 2002; Jetter et al., 2002; Kanazawa, Ohkubo, & Sugawara, 2001; Lilja, Kivisto, & Neuvonen, 1998, 1999; Tanaka et al., 2013).

Kava
Concomitant use of kava and alcohol, barbiturates, benzodiazepines, or other CNS depressants can increase the risk of drowsiness and motor reflex depression (Abe, Kaye, Gritsenko, Urman, & Kaye, 2014; Meng & Liu, 2014; Munte, Heinze, Matzke, & Steitz, 1993; Pittler & Ernst, 2000).

l-tryptophan
Theoretically, concomitant use of l-tryptophan with medications that cause sedation may have additive effects, as l-tryptophan can cause fatigue and drowsiness (Lieberman, Corkin, & Spring, 1985; Robinson et al., 2014).

Sida cordifolia
Sida cordifolia contains the constituent ephedrine, which gets its name from another herb, ephedra (discussed in the preceding paragraph). Ephedrine has been linked to QT-interval prolongation (Konaté et al., 2012; McBride et al., 2004). Theoretically, Sida cordifolia might have an additive effect with drugs such as the macrolide antibiotics (azithromycin, clarithromycin, and erythromycin) that prolong the QT interval.

St. John's wort
St. John's wort induces CYP3A4, causing decreased drug levels of interacting substrates (Dresser, Schwarz, Wilkinson, & Kim, 2003; Foster et al., 2003; Goey, Mooiman, Beijnen, Schellens, & Meijerman, 2013; Gurley et al., 2002; Henderson, Yue, Bergquist, Gerden, & Arlett, 2002; Izzo & Ernst, 2009; Kawaguchi et al., 2004; Komoroski et al., 2004; Markowitz et al., 2003; Patel, Buddha, Dey, Pal, & Mitra, 2004; Rahimi & Abdollahi, 2012; Smith, Lin, & Zheng, 2001).

St. John's wort also induces P-glycoprotein, which is a carrier mechanism responsible for transporting drugs and other substances across cell membranes. When P-glycoprotein is induced in the gastrointestinal tract, it can prevent the absorption of some medications such as doxycycline (Dürr et al., 2000; Hennessy et al., 2002; Kim, 2002; Rahimi & Abdollahi, 2012). In addition, induction of P-glycoprotein can decrease entry of drugs into the central nervous system (CNS) and decrease access to other sites of action.

HERBAL AND DRUG USE IN DENTAL PATIENTS WHO ARE PREGNANT OR BREASTFEEDING

The dental patient who is pregnant represents two significant challenges to the dental professional. First, although most dental procedures are elective and can be postponed until after the baby is delivered, dental treatment for a pregnant woman who has oral pain, advanced disease, or infection should not be delayed. Second, not all women of childbearing age know that they may be pregnant, and when selecting and prescribing a medication for any woman of childbearing age, the clinician should always consider the possibility of her conceiving while she is still receiving the medication. Balancing the risks of the drug's potential adverse effects (usually on the fetus) with the benefit (usually to the mother) of treating the disease is the goal when prescribing medication to a patient who is pregnant (Donaldson & Goodchild, 2012). This goal would also apply to herbal supplements.

The U.S. Food and Drug Administration traditionally has classified drugs on the basis of the level of risk they pose to the fetus in order to determine the risks associated with the use of drugs in pregnancy (Table 9). For many years the FDA used a lettering system to categorize risk (FDA, 2016). Drugs in categories A and B were considered safe for use, whereas drugs in category C were to be used only if the benefits outweighed the risks. Drugs in category D were to be avoided except in certain exceptional circumstances (i.e., life-threatening condition to mother). The use of category X drugs in pregnant women was stringently proscribed. The categorization for the top 20 most common herbal medications that OHCPs are likely to encounter and their traditional FDA pregnancy risk factor categories are listed in Table 10. It is important to note that the lettered system is being phased out, and the letters are no longer being placed on the packaging of new drugs (FDA, 2016). The system came to be considered too simplistic and easily misinterpreted (Johnson, 2016). By the year 2020, no drug will use this system (Johnson, 2016).

Table 9: U.S. Food and Drug Administration Pregnancy Risk Factor Definitions*

Category	Definition
A	The results of controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of risk in later trimesters), and the possibility of fetal harm appears remote.
B	The results of controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of risk in later trimesters), and the possibility of fetal harm appears remote. OR The results of animal reproduction studies have shown an adverse effect (other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester and there is no evidence of risk in later trimesters.
C	Either the results of studies in animals have revealed adverse effects (teratogenic, embryocidal, or other) on the fetus and there are no controlled studies in women. OR Results of studies in women and animals are not available; drug should be given only if the potential benefit justifies the potential risk to the fetus.
D	There is positive evidence of human fetal risk, but the benefits of use in pregnant women may be acceptable despite the risk (for example, if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective).
X	Results of studies in animals or humans have demonstrated fetal abnormalities or evidence of fetal risk based on human experience, or both, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit; use of the drug is contraindicated in women who are or may become pregnant.

*Being phased out as of June 30, 2015.
Note. From "Pregnancy and Medicines," by the U.S. Department of Health and Human Services, 2010, retrieved from https://www.womenshealth.gov/publications/our-publications/fact-sheet/pregnancy-medicines.html

Any drug or chemical substance administered to the mother is capable of crossing the placenta to some extent unless it is destroyed or altered during passage or its molecular size and low lipid solubility limit transplacental transfer (Illsley, Hall, Penfold, & Stacey, 1985). Substances of low molecular weight (<600 daltons) diffuse freely across the placenta, driven primarily by the concentration gradient (Kraemer, 1997; Zhang, Xia, Yan, & Liu, 2015). It is important to note that almost every substance used for therapeutic purposes can and does pass from the mother to the fetus; the concept of a "placental barrier" is a misnomer. Of greater importance is whether the rate and extent of transfer are sufficient to result in significant concentrations within the fetus to cause either teratogenicity or fetotoxicity. The aim when prescribing in pregnancy is to balance the risks of potential adverse effects of the drug (usually to the fetus) with the benefit (usually to the mother) of treating the disease. This balance may change during the pregnancy depending on the disease activity and the gestation. In general, there is insufficient reliable information available with regard to the safety during pregnancy of herbal medications, so the general recommendation is to avoid using these supplements during this important 9-month period.

For most drugs, the infant is exposed to a much higher concentration during pregnancy than during breastfeeding. Therefore, if a drug is considered acceptable during pregnancy, it is usually reasonable to continue taking it during breastfeeding (Henderson & Mackillop, 2011). However, there are exceptions, and the most important factors are the concentration of the drug in the infant's blood and the effects that this concentration of the drug might have. Small molecules get into breast milk more easily than large molecules (e.g., heparin is not excreted in breast milk). Furthermore, the half-life of some drugs in the neonatal circulation may be longer than in the mother, because infant liver metabolism is immature. This factor may lead to accumulation of the drug in the infant and is especially true of morphine, lamotrigine, phenobarbital, some benzodiazepines, and aspirin (Briggs & Freeman, 2014; Hale, 2002; Liporace, Kao, & D'Abreu, 2004; Rutherford, 2008).

For some medications with a short half-life, the "pump and discard" strategy can be effective. This is best demonstrated with the recently popular enteral sedation drug triazolam (Howie & McMullen, 2006; Lee, 2007). The lactating mother is counseled to pump and save milk before the dental appointment. She takes triazolam before the dental appointment to help ameliorate her anxiety, and for the next 8 to 10 hours after the dental appointment (four half-lives), she will pump and discard the milk, while feeding her baby with the milk she had pumped and saved from the previous day. After the four half-lives have passed, she can then return to her regular breastfeeding schedule. It takes approximately four half-lives for more than 90% of most medications to be eliminated from the body (Winter, 2010). In general, there is insufficient reliable information available with regard to the safety of herbal medications in breastfeeding, so the general recommendation is to avoid using these supplements during this critical time period.

Table 10: The Top 20 Most Common Herbal Medications that OHCPs are Likely to Encounter and their U.S. Food and Drug Administration Pregnancy Risk Factor Categories*

Herbal	Pregnancy Risk Factor Category	Herbal	Pregnancy Risk Factor Category
Elderberry	D	Saw palmetto	X
Horehound	X	Ashwagandha	X
Cranberry	D	Green Tea	C
Turmeric	D	Ivy Leaf	D
Apple cider vinegar	D	Ginkgo	X
Ginger	C	Cannabidiol (CBD)	D
Echinacea	C	Black cohosh	D
Garlic	C	Beta-sitosterol	D
Fenugreek	D	Red rice yeast	X
Wheat grass / Barley grass	D	Aloe	X

*Being phased out as of June 30, 2015.

Note. Adapted from "Lexicomp Online for Dentistry," by Wolters Kluwer, n.d., retrieved from http://webstore.lexi.com/ONLINE-Software-for-Dentists; and "About Natural Medicines Comprehensive Database," by the Natural Medicines Comprehensive Database, n.d.a, retrieved from http://naturaldatabase.therapeuticresearch.com/Content.aspx?cs=&s=ND&page=aboutdbhtml&xsl=generic#ratings

Conclusion

Recognition and avoidance of potential herbal-drug interactions with commonly prescribed medications in dentistry will help OHCPs to optimize patient treatment while emphasizing patient safety. Based on the half-life of many of these agents, simply asking the patient to stop taking the herbal medication at least 24 hours before the dental appointment will prevent many potential interactions. Although medications that are commonly prescribed by OHCPs can be given without regard to many herbal-drug interactions, there are definitely exceptions, which this course has described in detail, as well as outlining strategies for the practicing dentist to help keep the patient safe. Access to and use of clinical evidence databases as described herein can help prevent risk of herbal-drug interactions.

Resources

Helpful websites and literature to enhance further learning:
Websites

- **The American Herbalists Guild (AHG)** contributes to the evolution of herbalism in our country and in the world. Their vision is that all herbalists, regardless of their affiliation or nonaffiliation with the AHG, will work together as peers toward this end.
  website: http://www.americanherbalistsguild.com
- For more than 30 years, the **Herb Research Foundation** has been helping to educate the world about herbs. They offer solid science and informed opinion, for free.
  website: http://www.herbs.org
- **The Natural Medicines Comprehensive Database** took 2 years to create and was released in September 1999. Since its original release, the volume of information has grown exponentially and continues to grow at a rapid pace. Research in this area is booming and their research and editorial team continues to update the database daily. The team had been researching and publishing objective drug information about conventional prescription and nonprescription drugs for many years and maintained a practice of answering drug therapy-related questions for pharmacists and physicians throughout the United States and Canada.
  website: http://www.naturaldatabase.com

- **The National Center for Complementary and Integrative Health** is the federal government's lead agency for scientific research on the diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine.
  website: https://nccih.nih.gov
- **The Office of Dietary Supplements (ODS)** provides fact sheets that give a current overview of individual vitamins, minerals, and other dietary supplements. ODS has fact sheets in two versions: health professional and consumer. Both versions provide the same types of information but vary in the level of detail. Consumer versions are also available in Spanish.
  website: http://www.ods.od.nih.gov
- **The MotheRisk** Program ("Treating the mother – Protecting the unborn") at the Hospital for Sick Children is affiliated with the University of Toronto and provides up-to-date information for mothers and professionals in regard to issues around medications, pregnancy, and lactation. MotheRisk counselors talk to hundreds of women and their healthcare providers each day, providing guidance, support, and peace of mind, as well as supporting research in this field. *website:* http://www.motherisk.org

Textbooks

- G. Briggs, C. V. Towers, & A. B. Forinash, 2021. Drugs in Pregnancy and Lactation: A Reference Guide to Fetal and Neonatal Risk (12th ed.). Philadelphia, PA: Lippincott Williams & Wilkins (ISBN: 978-1-975- 16237-5).
- Johns Hopkins Hospital, K. Kleinman, l. McDaniel, & M. Molloy, 2021, The Harriet Lane Handbook, 22nd Edition, (ISBN: 978-0-323-67407-2).
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HERBAL-DRUG INTERACTIONS IMPORTANT IN DENTISTRY, 3RD EDITION

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 100, or complete your test online at **EliteLearning.com/Book**

1. According to the National Institutes of Health (NIH), what percentage of prescription drug users also take complementary and alternative medicines (CAMs)?
   a. 21% to 39%.
   b. 40% to 51%.
   c. 52% to 74%.
   d. 75% to 79%.

2. What percentage of adults 65 years of age or older take 10 or more prescription and/or herbal medications regularly?
   a. 10%.
   b. 18%.
   c. 23%.
   d. 39%.

3. Approximately what percentage of patients using complementary and alternative medications do not discuss their use of these medications with their primary care providers?
   a. 100%.
   b. 70%.
   c. 50%.
   d. 30%.

4. According to a study by Smith and colleagues (2021), published in the American Botanical Council's journal HerbalGram, the most common herbal medication that oral healthcare providers are likely to encounter is:
   a. Echinacea.
   b. Cranberry.
   c. Aloe vera.
   d. Elderberry.

5. Horehound is the primary ingredient found in many:
   a. Throat lozenges.
   b. Eye drops.
   c. Nasal sprays.
   d. Lip balms.
6. The Natural Medicines Comprehensive Database rates herbal- drug interactions based on a:
   a. Traffic-light grading system.
   b. Percentage grading system.
   c. Numeric grading system.
   d. Letter grading system.
7. Based on their mechanism of action, herbal-drug interactions can generally be classified as pharmacodynamic or:
   a. Pharmacogenetic.
   b. Pharmacokinetic.
   c. Pharmacotherapeutic.
   d. Pharmacovigilant.
8. The extracts of white horehound are used as flavoring in foods and beverages and as:
   a. An expectorant in cough syrups and lozenges.
   b. A sedative in many analgesics used in dentistry.
   c. A blood thinner in anticoagulants.
   d. A thickener in liquid medications.
9. Patients should refrain from ingesting echinacea at least 24 hours before a dental appointment if:
   a. Bleeding is anticipated.
   b. The patient has type 1 diabetes.
   c. Diazepam use is anticipated for sedation.
   d. Ibuprofen will be prescribed for postoperative pain management.
10. The medical literature suggests that black cohosh may be useful for alleviating:
    a. Headaches.
    b. Menopausal symptoms (hot flashes).
    c. Osteoporosis.
    d. Erectile dysfunction.
11. When using aspirin or other NSAIDs to control postoperative dental pain, taking excessive amounts of ginger might increase the risk of:
    a. Nausea.
    b. Depression.
    c. Sedation.
    d. Bleeding.
12. Clinical research shows that some elderberry extracts might reduce:
    a. Respiratory congestion.
    b. Blood glucose levels.
    c. Flu-like symptoms.
    d. Essential tremors.
13. Oral ginkgo 240 mg seems to improve the symptoms of various types of:
    a. Dementia.
    b. Hypertension.
    c. Hypothyroidism.
    d. Parkinson's disease.
14. _____ is a UVC sensitizer to inhibit the proliferation of oral cancer cells:
    a. Turmeric
    b. Cannabidiol (CBD).
    c. Ivy leaf.
    d. Ashwagandha.
15. Metronidazole given to treat a dental infection can cause a disulfiram-like reaction when taken with:
    a. Kava.
    b. Alcohol.
    c. St. John's wort.
    d. Grapefruit juice.
16. Clinical research suggests that the herbal supplement echinacea can:
    a. Increase flu- like symptoms.
    b. Treat and prevent the common cold.
    c. Lower blood glucose levels.
    d. Decrease the risk of high blood pressure.
17. Which herbal supplement is used to improve cognitive performance and mental alertness:
    a. Ivy leaf.
    b. Beta- sitosterol.
    c. Red rice yeast.
    d. Green tea.
18. Which of the following statements is true regarding the effects of drugs during pregnancy and breastfeeding?
    a. The concept of a "placental barrier" is a real and true phenomenon.
    b. For most drugs, the infant is exposed to a much higher concentration during pregnancy than during breastfeeding.
    c. Drugs that contain large molecules get into breast milk more easily than drugs that contain small molecules.
    d. The half-lives of drugs are usually longer in the maternal circulation than in the neonatal circulation.
19. An example of a substance with large molecules that is not excreted in breast milk is:
    a. Ethanol.
    b. Heparin.
    c. Amphetamine.
    d. Benzodiazepines.
20. How many half-lives does it take for more than 90% of most medications to be eliminated from the body?
    a. One.
    b. Two.
    c. Three.
    d. Four.

Chapter 5: Maintaining Dental Implants, 2nd Edition

1 CE Hour

Release Date: October 16, 2022

Expiration Date: October 15, 2025

Faculty

Author:

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Mark J. Szarejko has no significant financial or other conflicts of interest pertaining to this course.

Dental Planner: Karen Hallisey, DMD

The planner has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

AGD Subject Code - 690

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.
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Learning objectives

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

- Describe the basic types of dental implants and their indications.
- Explain oral hygiene for dental implants.
- Identify similarities and differences in the periodontal structure surrounding a natural tooth versus that of an implant.
- Explain the clinical procedures for evaluating the status of dental implants and determining healthy, ailing, and failing status.
- Explain methods for the professional cleaning of implants and improved home care techniques.

Course overview

The use of dental implants has been an important treatment in restorative dentistry since the establishment of outcome predictability and recognition of long-term dental implant and restoration success. Additionally, the evolution of this treatment modality has resulted in widespread interest in restorative implant options among both patients and practitioners (Rosen, 2020). The increasing number of patients selecting dental implants as a treatment option presents the dental team with the challenge of maintaining these implant-supported restorations.

This basic-level course, appropriate for dentists, dental hygienists, and dental assistants, provides a general overview of the basic types of dental implants and the oral hygiene for dental implants, including the identification of similarities and differences in the periodontal structure surrounding a natural tooth versus that surrounding a dental implant. The course discusses the clinical procedures used to evaluate the status of dental implants as healthy, ailing, or failing and the methods employed in professionally cleaning implants and improving home care techniques.

TYPES OF DENTAL IMPLANTS

Dental implants are used to replace missing teeth. Teeth can be lost due to many reasons including caries, root canal failure, periodontitis, trauma, or congenital reasons. There are two main types of dental implants; endosteal and subperiosteal (AAID, 2022). Below is a discussion of both types and their indications.

Endosteal dental implants; traditional endosteal implants

Endosteal dental implants are the most common type of dental implants used. They pierce only one cortical plate of maxilla or mandible and are surgically placed into the maxillary or mandibular bone to replace the root of a missing tooth. They are typically shaped like small screws and are made of titanium. Titanium is an ideal material for dental implants as it is biologically inert (does not trigger foreign body reactions) (Hupp, 2017). Endosteal implants vary in overall shape, length and diameter (Ebenezer, et al., 2021).

Dental implants provide an alternative to traditional fixed bridges and removable partial dentures to replace missing teeth. Endosteal implants are typically placed in a dental office with the use of local anesthesia. These types of dental implants can sometimes be placed in a single surgery (immediate loading) or more commonly during a series of two surgical appointments in a dental office. In the placement of two-stage implants, the first surgery consists of surgically placing the implant fixture in the bone, essentially replacing the root of the missing tooth. Following a sufficient period of healing, an abutment is placed, and then a traditional crown can be placed on the dental implant. These types of dental implants can replace one or multiple teeth. They can also be used as abutments for fixed bridgework or full dentures (Ebenezer, et al., 2021).

Mini dental implants

The main difference between traditional endosteal implants and mini-dental implants is the size. And unlike traditional dental implants, mini-dental implants do not have an abutment placed on them. Instead, they have a ball, socket, and rubber o-ring present which is commonly used to hold overdentures. These dental implants are great options for patients who do not have a sufficient amount of bone present for traditional implants or are looking for a lower cost, less invasive option (Healthline, 2021).

Subperiosteal dental implants

Subperiosteal dental implants represent a far less common type of dental implants. They are attached below the gingival tissue, above the jaw bone, not within the bone like traditional endosteal implants. This is a possible option for patients without a sufficient amount of healthy alveolar bone. However, subperiosteal dental implants are not commonly used in the dental field today (AAID, 2022).

IMPLANTS AND ORAL HYGIENE

Proper monitoring and maintenance of the dental implant and its associated restoration through a combination of appropriate professional care and effective patient oral hygiene are essential to ensure their longevity (Bansal et al., 2019). The value of conventional periodontal parameters in determining peri-implant health is not clearly evident in the literature, but these evaluation techniques do not appear to have a detrimental effect. The concern about compromising the integrity of the implant and the contiguous tissues can cause improper monitoring and treatment which can promote the development of peri-implant disease (Hutto and Liberman, 2020). Therefore, it is paramount that the dental implant team understand the similarities and distinctions between the dental implant and the natural tooth. Subsequently, by comparing and contrasting these characteristics of the natural tooth and a dental implant, basic guidelines can be provided for maintaining the long-term health of the dental implant.

Direct anchorage of the dental implant body to alveolar bone provides the foundation for a prosthesis and transmits occlusal forces to the alveolar bone. This is the definition of osseointegration which includes clinical and radiographic evidence of successful osseointegration of the implant to the alveolar bone (Pirc and Dragan, 2017). With the increased acceptance of dental implants as a viable treatment option for the restoration of a partially or fully edentulous mouth, the tasks of maintaining the implant and associated prosthesis and educating patients about dental hygiene have fallen to the dental team.

In recent years, the focus of implant dentistry has changed from obtaining osseointegration, which is now highly predictable, to the long-term maintenance of the health of the peri- implant's hard and soft tissues. This can be achieved through appropriate professional care, patient education and cooperation, and effective home care (Kandasamy, et al., 2018). Patients must accept the responsibility of being cotherapists in maintenance therapy, and thus, the dental team essentially must screen the potential implant patient to ensure that this is an achievable goal. Typically, diagnosis and treatment planning based on a risk-benefit analysis are performed after thorough medical, dental, head-and-neck, psychological, and radiographic examinations and a temporomandibular joint health evaluation (Hutto and Liberman, 2020).

There is convincing evidence that bacterial plaque not only leads to gingivitis and periodontitis (Shankar, et al., 2016) but also can induce the development of peri-implantitis (Caton et al., 2018). 0 Thus, personal oral hygiene must begin at the time of implant placement and should be modified as required using various adjunctive aids to effectively clean the altered morphology of the peri-implant region before, during, and after implant placement. For instance, the routine use of interproximal brushes should be encouraged because it can provide additional access for routing hygiene and may effectively clean the peri-implant sulcus and studies have indicated the superiority of the use interproximal brushes compared to use of traditional floss (Hatfield, 2021; Van Velzen, et al., 2016). In addition to mechanical plaque control, daily rinses using 0.1% chlorhexidine gluconate and the use of a dentifrice with 0.3% triclosan are effective adjuncts for implant home care (Stewart, et al. 2018).

Clinical inspection for signs of inflammation (i.e., bleeding on probing, exudate, mobility, probable pockets) and a radiographic evaluation of the peri-implant bony housing are common methods for evaluating the long-term status of endosseous dental implants. For instance, successful and stable endosseous dental implants exhibit no mobility. When there is clinically perceptible mobility, the dental professional should examine the abutment retaining screw and/or prosthetic abutment collar interface for looseness or breakage subsequent to radiographic evaluation of the implant and its surrounding bony housing. The presence of saliva bubbling at the gingival margin when pressure is applied to the implant-retained restoration in a buccal-lingual direction can indicate a loose internal screw while movement and no bubbling or pain can indicate detachment of the external screw or the breakdown of the cement (Hutto and Liberman, 2020).

The dental team routinely uses all of these modes of clinical assessment, except for periodontal probing around peri-implant tissues that appear to be in a state of good health. To properly assess peri-implant status longitudinally, the team should record the baseline data and data from subsequent recall visits in the daily progress notes.

After a thorough intraoral examination, unless there is visual evidence of soft tissue changes (i.e., inflammation of peri-implant tissue with even slight attachment loss or mucositis), routine probing of the peri-implant tissue should not be performed.

The dental team should inform the implant patient that current evidence indicates lifelong maintenance is required for dental implants and implant-supported restorations (Pirc and Dragan, 2017). The dental care professional should be cognizant of each patient's level of home care effectiveness and the systemic health and periodontal status of the peri-implant tissues when determining the frequency of these recare intervals.

With dental implant patients, the dental professional must also examine the prosthetic components for plaque and calculus and evaluate the stability of the implant abutment. He or she should take radiographs of the dental implants periodically during maintenance recall as indicated and appropriate. For screw-retained dental implant restorations, the dental professional may remove the prosthesis periodically to assess the status of the peri-implant's hard and soft tissues, the acceptable mobility of the prosthetic components or the implant fixture, and the patient's level of home care effectiveness. The dental professional should assess and diagnose as appropriate any symptoms of infection, radiographic evidence of peri-implant bone loss, and/or neuropathies.

Case scenario: The reluctant maintenance patient

Bob is a 50-year-old man who informs his hometown dentist that he is interested in getting dental implants. Bob states that he has been waiting his entire adult life for this moment and finally has the funds for the treatment. He has seen the ads on television and is looking forward to "teeth in a day." In addition, Bob states that he has always been afraid of the dentist and is looking forward to never having to see one again. The patient explains that if he does not have teeth, then he has no reason to go to the dentist. The patient then offers to write the dentist a check for the entire cost of the treatment and asks when he can begin the process.

Question:
Should Bob's dentist proceed with care for this patient at this time?

Unfortunately, Bob's sentiment is echoed by many dental patients. Bob is presenting to his dentist's office with unrealistic expectations, and it is the responsibility of the dental provider to explain the realities of dental implant therapy to him. Moreover, Bob's current financial freedom should not change how the dentist responds to his request. It is the dentist's responsibility to act ethically and responsibly.

First, restorations supported by dental implants require maintenance by both the patient and the provider. If the patient is not committed to home hygiene, he or she should carefully reconsider the option of implant-supported restorations. Additionally, the dental professional must perform recall for both patient hygiene and evaluation of the implant restorations. Often, the dental implant restoration may have a mechanical or biological complication that the patient cannot identify. With regular recall and maintenance appointments, the dental professional can identify and fix these complications. In addition, complications are often easier and less expensive to fix when they are identified early. When patients are aware of these facts, they may be more motivated to return for regular follow-up.

The patient must also understand that there are costs for maintaining dental implant restorations, and he or she must be able to meet these financial obligations in the future. This is critical for the patient who states that he has been saving his money for this one treatment and may not have the funds for future care. It would be irresponsible to perform a treatment that has expensive follow-up or repair requirements because these costs would be the responsibility of the patient in the future. Once the patient has a better understanding of the current and future fees associated with treatment, the desired treatment plan may change.

Finally, the dental professional should counsel the patient regarding a realistic timeline for treatment; the patient should not expect to have everything completed in one appointment if this is not clinically possible. Patients also obtain information about care from various sources, including friends, family, television, and the internet, and this information may not be correct. In such cases, it is the role of the dental provider to clarify and correct misinformation so the patient can make an informed choice about current or ongoing treatment.

IMPLANTS VERSUS NATURAL TEETH

It is essential to understand the periodontal relationship between the gingiva and the structure it attaches to, regardless of whether it is a natural tooth or an implant. The gingival cuff is composed of two zones around both natural teeth and dental implants. The crestal connection with the tooth or implant is the junctional epithelium, which acts as a physical barrier to the ingress of bacteria, limiting or preventing inflammation. The difference between natural teeth and implants is the strength of the connection between the junctional epithelium and the structure it attaches to. Below this circumferential zone lie the connective tissue fibers.

The fiber orientation of the gingival cuff around a natural tooth attaches perpendicular to the long axis of the tooth. These oriented fibers act as a barrier when a periodontal probe is inserted within the sulcus, in that the probe tip advances apically until the tip contacts the perpendicular fibers and is halted. The gingival cuff around an implant does not sow this orientation. With an implant, the gingival fiber orientation is parallel to the implant's long axis. When the dental provider inserts a periodontal probe into the sulcus around an implant, the advancing probe tip passes between the fibers of the gingival cuff until the crestal bone prevents it from further advancement.

The peri-implant mucosal seal surrounding an implant may be a less effective barrier to bacterial plaque than the periodontium around a natural tooth. The keratinized tissue around an implant has a decreased vascularity and lacks a true connective tissue attachment compared to that of a natural tooth which makes the implant more vulnerable to bacterial ingress (Fody and Marsh, 2020). Furthermore, there is less vasculature in the gingival tissue surrounding dental implants than in the tissue around natural teeth. This reduced vascularity along with the parallel-oriented collagen fibers adjacent to the body of any dental implant make them more vulnerable to bacterial insult (Atout, et al., 2018). For these reasons, during recare appointments, peri-implant periodontal probing is advised only where there are signs of infection (i.e., exudate, swelling, bleeding on probing, inflamed peri-implant soft tissue) and/or radiographic evidence shows peri-implant alveolar bone loss. In addition, dental providers should not perform routine periodontal probing of dental implants because this procedure could damage the weak epithelial attachment around them,

possibly creating an ingress for periodontal pathogens which can induce a host inflammatory response and cause bone resorption. (Coli and Sennerby, 2019).

The clinical utility of probing around dental implants to determine peri-implant health has been questioned. It has been reported that probing depths as great as 6-9 mm can be associated with osseointegrated and healthy dental implants. As a result, using periodontal probing depths as a clinical indicator for implant health or peri-implant disease should be avoided by the practitioner (Coli and Senerby, 2019). It follows from the previous discussion that personal home care and consistent professional maintenance are critical in the success and longevity of endosseous dental implants. This is true especially in an environment with adjacent natural teeth; if affected by periodontal disease, natural teeth could act as a reservoir for pathogenic bacteria (i.e., gram-negative anaerobic rods) and seed the peri-implant sulcus (Wilson, 2020).

The physical characteristics of the peri-implant soft tissues are the focus of all oral hygiene instruction. The literature is equivocal about whether the presence or absence of keratinized tissue has any effect on the ingress of pathogenic bacteria into the tissues around dental implants. The controversial issue is about the necessity of keratinized tissue and its role in the maintenance of long-term peri-implant tissue health (Berglund, et al., 2018). One argument suggests that keratinized tissue surrounding implants may facilitate a patient's ability to perform home hygiene. Thus, intervention may be indicated when a patient has no keratinized tissue around an implant and experiences a pull from a frenum or chronic peri-implant mucositis. To date, this argument has not been resolved.

EVALUATION

Research has not yet clearly defined specific evaluation criteria for obtaining clinical data around dental implants that would allow proper monitoring and prediction of early possible failure of osseointegrated dental implants. Currently, mobility is the best indicator and/or predictor of implant failure. As opposed to natural teeth, dental implants exhibit minimal clinically detectable movement because of the absence of a periodontal ligament. Therefore, healthy implants should appear nonmobile, even in the presence of peri-implant bone loss, provided an adequate amount of supporting alveolar bone exists. Implants may also experience early or delayed failures. It is for this reason that the dental team must monitor and evaluate implants over time (Hutto and Liberman, 2020).

When monitoring the health of the peri-implant soft tissues, the practitioner and hygienist should be cognizant of changes in soft tissue color, contour, and consistency. A fistulous tract could indicate a pathologic process or impending implant fracture.

Bleeding

There is controversy as to the accuracy and significance of bleeding upon probing around dental implants. Presently, the literature indicates that bleeding on probing is an indicator of peri-implant disease because it can occur before histologic signs of inflammation or concurrently with other signs of implant failure (e.g., bone loss). Some research has suggested that bleeding on probing is associated with peri-implant disease, but additional studies are needed to determine how local factors contribute to peri-implantitis. The inflammation of Peri-implant mucositis can be more severe compared to gingivitis around natural teeth and can be more challenging to treat. Early recognition of the biofilm and its removal are critical to avoid the progression to peri-implant mucositis (Wang, et al., 2017). However, as previously mentioned, routine probing is not recommended.

Radiographic evaluation

Radiographic interpretation is one of the most useful clinical parameters for evaluating the status of an endosseous dental implant. Classic reports of dental implants indicate that an average horizontal crestal bone loss of 1.0 to 1.5 mm during the first year following prosthetic rehabilitation. The development of new implant surface technology and advanced placement techniques minimize the occurrence of progressive bone loss (Hutto and Liberman, 2020). Thus, progressive bone loss that exceeds these averages around a dental implant may be indicative of an ailing or failing implant. In addition, there should be no evidence of peri-implant radiolucency during radiographic evaluation because such a rarefaction usually indicates an active (or past) infection and/or failure of osseointegration. Currently, it is advisable to take radiographs at defined intervals to identify changes in the implant site. Periapical radiographs are effective for this purpose, but they have limited ability to evaluate the implant site circumferentially. When available and appropriate, three-dimensional imaging can be used to further evaluate the peri-implant area for pathology (Pocket Dentistry, 2020).

PROFESSIONAL CLEANING AND HOME CARE

Instruments made of metal, such as stainless steel, should be used only on natural teeth; dental providers should not use these instruments to probe or scale dental implants. The rationale for this well-documented and often-stated injunction is that dental and surgical instruments made from this alloy are so hard that they can scratch, contaminate, or cause a galvanic reaction at the implant-abutment interface (Rapley, Swan, Hallmon, & Mills, 1990).

Ideally, dental providers should use manual periodontal scalers fabricated from implant-safe materials, such as plastic, Teflon, gold-plated metals, and even wood. The manufacturer discourages sharpening gold-plated curettes because the gold surface can be chipped or damaged, exposing the hard metal underneath. For example, stainless steel instruments are harder than the titanium alloy used to fabricate implants; thus, they may abrade the implant surface, stripping off treatments such as hydroxyapatite (HA), because the instrument's hardness is greater than that of the titanium alloy from which the implant is fabricated.

Most dental instruments used to clean implants can cause damage to the implant surface. Effective cleaning methods include sonic and ultrasonic instrumentation with oscillating plastic tips and air polishing while plastic implant instruments cause the least damage to the implant surface but are the least effective means of debridement (Hatfield, 2021). Ultrasonic, piezoelectric, or sonic scaler tips may mar the implant's surface, leading to microroughness and plaque accumulation. The stainless steel tip may also lead to gouging of the implant's polished collar. Some clinicians, however, advocate use of a sonic instrument with a plastic sleeve over the tip for scaling dental implants; this approach provides effective cleaning with reduced potential for damage to the implant. Air powder polishing units may also damage the implant surface, and dental providers should avoid using these during hygiene appointments. Even the use of baking soda powder in

these units may strip off the surface coating of an implant. Additionally, the air pressure may detach the soft tissue connection with the coronal portion of the implant, leading to emphysema. However, dental providers can polish the titanium or titanium alloy surfaces of dental implants using a rubber cup along with a nonabrasive polishing paste or a gauze strip with tin oxide. Current research has indicated that nonsurgical therapy is an effective means of implant maintenance if performed properly. Research suggests that a sonic scaler with a plastic tip and rubber cup for polishing is more effective on implant surfaces than other conventional scalers, such as titanium or other air- driven powder techniques (Hatfield, 2021).

Although professional dental care of implants is essential, home care techniques used to maintain endosseous dental implants are also highly important. Dental providers should teach patients the modified Bass technique of brushing using a soft-bristled toothbrush with a medium-sized head. Dental providers should encourage the use of intradental brushes by implant patients only after they have received instruction on their proper use. To avoid scratching the implant surface, patients should only use the plastic-coated wire brush to clean dental implants.

Automated mechanical toothbrushes have been advocated for daily tooth cleaning because they are superior to manual toothbrushes in removing plaque and for interproximal cleaning (Kanathila, et al., 2018). These devices can have rotary, reciprocating, or sonic action. The key to using these instruments effectively in the home is proper instruction on their operation and then diligent daily use by the patient.

As with natural dentition, flossing and other adjunctive cleaning aids are valuable. As with dentate patients, the dental provider should also tailor the implant patient's home care requirements according to his or her needs (i.e., based on the location and angulation of the dental implants, the position and length of the transmucosal abutments, the type of prosthesis, and the manual dexterity of the patient).

Another popular cleansing method is the use of oral irrigators with or without the addition of antimicrobial solutions. In addition, preventive maintenance can include daily rinsing with an oral antimicrobial solution (e.g., chlorhexidine; (Kanathila, et al., 2018). Recently, a systematic review reported that there is a lack of information regarding optimal at-home maintenance techniques for implant-supported restorations. Current recommendations are based on knowledge from hygiene protocols for natural teeth. Additional studies are needed to fill in this gap in the literature and better advise patients in the future (Pirc and Dragan, 2017).

Conclusion

Many factors have to be considered when deciding on the best type of implant for a specific patient. The two main types of dental implants are endosteal implants or subperiosteal. The benefits and risks of each should be discussed with the patient so an educated and evidence- based decision can be reached.

During the early years of dental implantology, the focus was on the surgical phase and ensuring the long-term success of osseointegrated implants. In the following years, the focus shifted to proper fixture placement, which is dictated by the prosthetic and aesthetic needs in each case.

Today, professional implant maintenance and diligent home care are critical for the long-term success of dental implants. The microbiota and clinical presentation of peri-implantitis are the same as those for periodontitis around a natural tooth, and they require the same diligent professional and home care to prevent damage to the surrounding hard and soft tissues.

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MAINTAINING DENTAL IMPLANTS, 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 100, or complete your test online at **EliteLearning.com/Book**

1. Direct anchorage of the dental implant body to alveolar bone, which provides the foundation for a prosthesis and transmits occlusal forces to the alveolar bone, is referred to as:
   a. Osseointegration.
   b. Ankyloses.
   c. Fibrointegration.
   d. Load transfer.

2. The current focus of implant dentistry is:
   a. Exploring new surgical techniques.
   b. The concept of osseointegration.
   c. The long-term health of peri-implant tissues.
   d. Proper prosthesis fitting.

3. Routine use of an interproximal brush should be encouraged for at-home cleaning around implants because it:
   a. Causes no damage to the tissue around the implant even if used aggressively.
   b. Provides the only way to get interproximal areas clean because flossing is contraindicated.
   c. Can penetrate up to 6 mm into the gingival sulcus or pocket.
   d. Provides additional access for routing hygiene.
4. How frequently during maintenance visits should the dental provider take radiographs to monitor implant bone levels?
   a. Periodically as indicated and appropriate.
   b. Once a week for the year following implantation.
   c. Every 16 months.
   d. Never.
5. Compared with an implant, the periodontal fiber orientation of the gingival cuff is:
   a. Identical for both a natural tooth and an implant.
   b. Perpendicular to the long axis around implants.
   c. Parallel to the long axis around implants.
   d. Perpendicular to the long axis of the tooth.
6. One difference between natural teeth and implants is that implants have:
   a. A strong epithelial attachment.
   b. Increased vasculature in the surrounding gingival tissue.
   c. A mucosal seal that is a less effective barrier to plaque.
   d. A mucosal seal that is a more effective barrier to plaque.
7. Which clinical evaluation should dental providers perform only when signs of infection, such as exudate and swelling, are present?
   a. Radiographic examination.
   b. Occlusion evaluation.
   c. Mobility evaluation.
   d. Probing.
8. Which of the following statements is correct regarding probing around dental implants?
   a. Only titanium probes should be used when probing around dental implants.
   b. Dental practitioners should avoid using periodontal probing depths as a clinical indicator for implant health or peri-implant disease.
   c. The probing depths around implants are typically double the size of probing depths around natural teeth.
   d. Probing around dental implants should be done at every recall appointment.
9. Currently, the best indicator for the diagnosis and/or prediction of implant failure is the presence of:
   a. Bleeding.
   b. A probable pocket.
   c. Mobility.
   d. Inflammation.
10. When monitoring the health of peri-implant soft tissues, the practitioner should be cognizant of changes in color, contour, and:
   a. Consistency.
   b. Pigmentation.
   c. Vascularity.
   d. Opacity.
11. The presence of a fistulous tract may indicate:
   a. Impending implant fracture.
   b. An allergy to the metal of the implant.
   c. Insufficient implant diameter.
   d. Damage from use of stainless steel instruments.
12. Bleeding on probing has presently been associated with:
   a. P-implant disease.
   b. Prosthetic screw loosening.
   c. Osseointegration.
   d. Trismus.
13. One of the most useful clinical parameters for evaluating the status of an endosseous dental implant is:
   a. Biting sensitivity.
   b. The presence of mobility.
   c. Increased probing depths.
   d. Radiographic interpretation.
14. Bone loss of 1.0 to 1.5 mm during the first year after placement of the implant is:
   a. A sign of peri-implantitis.
   b. Normal.
   c. A sign of implant occlusal overload.
   d. An indication for further evaluation.
15. Dental professionals should avoid using instruments that can scratch, contaminate, or cause a galvanic reaction at the implant-abutment surface; these are typically instruments made of:
   a. Plastic.
   b. Titanium.
   c. Stainless steel.
   d. Wood.
16. Ultrasonic scalers should be used to clean around implants only:
   a. In conjunction with pumice for enhanced polishing.
   b. With air powder abrasive units.
   c. When probing with a metal probe shows normal pocket depths.
   d. With a plastic sleeve over the tip to reduce the potential for damage.
17. Which of the following can detach the soft-tissue connection with the coronal portion of the implant, leading to emphysema?
   a. Ultrasonic scalers.
   b. Air powder polishing units.
   c. Gauze strips with tin oxide.
   d. Instruments made of Teflon.
18. The titanium or titanium alloy surfaces of dental implants can safely be polished with:
   a. Flour of pumice.
   b. An ultrasonic scaler.
   c. An air powder polishing unit.
   d. A gauze strip with tin oxide.
19. With regard to the home care of implants, automated mechanical toothbrushes:
   a. Will loosen fixation screws.
   b. Will damage the surface of the implants.
   c. Are a good adjunct to home care.
   d. Are not as effective as a manual toothbrush.
20. Which of the following statements is true regarding optimal at-home maintenance for implant-supported restorations?
   a. Additional research is needed to determine optimal techniques.
   b. Patients should brush only once per day to avoid damaging the implant.
   c. The required at-home care is minimal.
   d. Patients do not require education regarding at-home care.

Course Code: DCA01MD

Course 6: Oral Health Issues for the Female Patient, 3rd Edition

2 CE Hours

Release Date: March 14, 2022

Expiration Date: March 13, 2025

Faculty

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The planner who worked on this continuing education activity have disclosed that they have no significant financial or other conflicts of interest pertaining to this course book.

AGD Subject Code: 750

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.
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INTRODUCTION

Learning objectives

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

- Identify oral health issues in the developing woman and young adult female patient.
- Describe reproduction-related oral health issues.
- Explain clinical practice guidelines on oral health care for women of childbearing age.
- Discuss dental care and treatment during pregnancy.
- Identify concerns of middle-aged and older female dental patients.

Course overview

Oral health encompasses the craniofacial complex and includes the teeth, periodontium, mucosa, gingiva, oral pharynx, temporomandibular joints, and muscles used for mastication. Although men and women face many common oral health issues, it is no longer acceptable to consider oral health to be gender neutral. Indeed, women differ from men in their oral health needs and concerns. This basic-level course explores the variables affecting women's oral health and discusses the issues and concerns that dental professionals face in providing care to females across their lifespan.

ORAL HEALTH IN THE DEVELOPING WOMAN

In recent years, organized dentistry has increasingly recognized that oral health habits, conditions, disorders, and diseases may differ between the sexes for a variety of reasons. These include, but are not limited to, oral hygiene practices, esthetic considerations, eating behaviors, temporomandibular disorders, and the effects of hormones at different stages of life (Patton and Glick, 2016). Gender-specific conditions may affect a woman's oral health over the course of her life span (e.g., from pregnancy gingivitis to burning mouth syndrome during menopause) and should be taken into account in the approach to therapy.

Aggressive periodontitis in childhood

Like adults, children and adolescents can develop periodontitis in a chronic form, either as a manifestation of systemic diseases or as an aggressive course. Aggressive periodontitis may be more common in children and adolescents than in adults, typically appearing around the onset of puberty and characterized by severe angular bony defects adjacent to the permanent molars and incisors. The disease is generally recognized in two clinical forms: localized and generalized (Babay, et. al., 2019; Hamasni, El Hajj, & Abdallah, 2018).

The prevalence of localized aggressive periodontitis (LAP) varies by gender and race. African American individuals are more prone to develop LAP compared to Caucasians. Females are more prone to develop (LAP) than males among Caucasian individuals while among African American individual males are more prone to develop LAP compared to females (Mani, et. al., 2018). However, older studies reporting a female predominance may reflect selection bias because females are more likely than males to seek dental care. More recent studies generally fail to demonstrate a marked greater prevalence in females (Koroluk, 2017). For example, a 2014 study focused on the demographics of aggressive periodontitis, looking more specifically at ethnicities and cultures of prevalent periodontitis. In examining various demographics, the study noted that there is no notable difference between men and women; however, there is a prevalence of periodontitis in older adults. The study also draws attention to the lack of studies examining the various demographic differences for periodontitis (Susin, Haas, & Albandar, 2014).

Additional studies are needed to definitively establish the association between gender and the prevalence of aggressive periodontitis in children and adolescents.

Hormonal influences on periodontal health

Hormones have potent effects on the development and integrity of the craniofacial skeleton and the soft tissues of the oral cavity, including periodontal tissues (American Dental Association [ADA], n.d.; Meghana, et al., 2019; Nirola, et al., 2018; Shee tal, et. al., 2018). It has long been recognized that sex hormones influence periodontal tissues (cellular proliferation, differentiation, and growth of keratinocytes and fibroblasts), bone turnover rate, wound healing, resistance to dental plaque, and the progression of periodontal disease. Estrogen, progesterone, and chorionic gonadotropin (during pregnancy) all affect the microvascular system by influencing endothelial cells and pericytes of the venules, adherence of granulocytes and platelets to vessel walls, the formation of microthrombi, disruption of the perivascular mast cells, vascular permeability, and vascular proliferation (Meghana, et al., 2019; Nirola, et al., 2018; Sheetal, et al., 2018; Kshirsagar and Balamurugan, 2018). Estrogen is mostly responsible for alterations in blood vessels, and progesterone stimulates the production of inflammatory mediators.

Periodontal health during puberty

The sexual maturation of an individual begins at puberty, a period in which gingival inflammation and enlargement can occur in both sexes, but it is more common in females (Cleveland Clinic, 2018; Tevatia, 2017). Sex hormones affect females at puberty with transitory changes in levels of estrogen and progesterone, followed by a return to normal levels in the postcircumpubertal period. When concentrations of sex hormones are high, some bacterial species can flourish. In addition, the gingiva can exhibit a heightened inflammatory response to food debris, materia alba, and plaque. Most pubertal females with healthy gingiva will not develop signs of gingival inflammation, but others will, even with relatively little accumulation of dental plaque. Clinically, puberty-associated gingivitis is characterized by inflammatory signs, such as redness and swelling and bleeding on probing. These features generally resolve with improved oral hygiene and are reversible following puberty. Radiologic evidence of bone loss is not a common feature of puberty-associated gingivitis.

Periodontal health and menses

Many oral changes may occur with the start of menses and during the menstrual cycle. These include swollen gingival tissues, herpes labialis, aphthous ulcers, prolonged bleeding following oral surgery, and swollen salivary glands. Menstruation typically begins one to two days prior to the start of menses and dissipates shortly after the menstrual period has begun (Cleveland Clinic, 2018). Some women regularly experience swelling and bleeding of the gingiva before the onset of menstrual flow, which resolves with the beginning of menstruation (American Academy of Periodontology, n.d.). Salivary gland swelling, particularly of the parotid, may occasionally occur during menses. Recurrent intraoral aphthous

ulcers and herpetic lesions may appear during the luteal phase (between ovulation and menstruation) of the cycle and heal after menstruation. Dental professionals should be aware of these issues in the context of hormone fluctuations associated with the menstrual cycle.

ORAL HEALTH ISSUES IN YOUNG ADULT FEMALE PATIENTS

Lifestyle choices

Habits affecting health develop throughout adolescence and are usually established during the young adult years. For example, a lifestyle choice that often begins during the teen years is smoking, which is associated with tooth loss, periodontal disease, and poor wound healing (Centers for Disease Control and Prevention [CDC]; Today's RDH, 2020). This is also the time during which adolescent and young adult female patients become sexually active and are exposed to exogenous sex hormones in oral contraceptives as well as changes in endogenous sex hormones associated with pregnancy.

Eating disorders

Eating disorders in patients are a particular challenge to oral health professionals, given the psychological component of these disorders. Anorexia nervosa, bulimia nervosa, binge eating, and pica are all characterized by serious disturbances to both nutritional and mental health (National Institute of Mental Health, 2018; Psychology Today, 2018). The prevalence of eating disorders is disturbingly high in industrialized countries, especially in young women, possibly due to messages promoted in the media or conveyed by social media, peer pressures and by societal and personal expectations of an ideal body form (Jones, et al., 2018; Gividen, 2020; Riva & Dakanalis, 2018). Patients afflicted with eating disorders may use any combination of severe caloric restrictions, excessive use of exercise regimens, self-induced vomiting and laxative use in an effort to attain their ideal of a proper form of their body (Pocket Dentistry 2020; CDHO, 2019).

The eating disorders anorexia and bulimia are typically characterized by times of extreme starvation (anorexia) followed by eating binges and forced vomiting (bulimia). The results of the largest national sample of 36,309 adults indicated that 0.80 of US adults will be affected by anorexia nervosa in their lifetime while 0.28 percent will be affected by bulimia nervosa and 0.85 % will be affected by the binge eating disorder (Biological Psychiatry, 2018).

Each eating disorder presents with distinct patterns of psychological, medical, and dental characteristics. One study of bulimia nervosa found that the principal dental manifestations include erosion of the dental enamel, dental caries, and dental sensitivity (CDHO, 2019). A significant alteration in oral tissue also occurs, having an adverse impact on oral health. Specific oral manifestations in patients with eating disorders include:

- Smooth erosion of enamel (perimylolysis).
- Dental caries.
- Traumatized oral mucosal membranes and pharynx.
- Variations in the periodontium.
- Xerostomia.
- Enlargement of the parotid glands.

(Antonelli and Seltzer, 2016; Gividen, 2020; Forney, Buchman-Schmitt, Keel, & Frank, G. K. W., 2016; Patton and Glick, 2016; CDHO, 2019).

The most serious oral problems arise from self-induced vomiting. Perimylolysis is the most common and dramatic dental effect of chronic regurgitation. Its clinical manifestations include loss of enamel and dentin on the lingual tooth surfaces due to chemical erosion by the acidic stomach contents, aided by mechanical effects. The eroded tooth surfaces are usually smooth and glossy in appearance. It is common for the occlusal surfaces to be lost in the posterior teeth (Dentagama, 2019; Pocket Dentistry, 2020). Restoring teeth with the substantial loss of tooth structure via perimylolysis will require full-coverage crowns which may be preceded by endodontic treatment for hypersensitive teeth.

The aforementioned oral manifestations of eating disorders places dentists and dental hygienists in a pivotal role for initiating a non-judgemental discussion about their origin (Gividen, 2020). Regurgitation and common vomiting cause enamel and dentin to erode and acid-resistant restorations to appear to emerge from their preparations. This is important to note because margins may open, leading to microleakage. Salivary gland enlargement may also be present because salivary stimulation occurs prior to vomiting.

REPRODUCTION-RELATED ORAL HEALTH ISSUES

Oral contraceptives

Oral contraceptives are synthetic hormones taken to prevent ovulation by hormonally mimicking pregnancy. Historic evidence suggests that use of *high-dose* combined oral contraceptives (containing more than 50 mcg of estrogen and 1 mg or more of progestin) places women at increased risk for periodontal diseases (Cleveland Clinic, 2018; Lugo, et al., 2021; Prachi et. al., 2019). Some reports indicate that women taking oral contraceptives experience an increased incidence of localized osteitis following extraction of mandibular third molars (Almeida, Pierce, Klar, & Sherman, 2016; Prachi, et al., 2019). Other studies have not confirmed the relationship between the use of oral contraceptives and alveolitis (inflammation in the tooth socket post-surgically), but they have noted a higher risk of postoperative alveolitis and infection among women after tooth extraction which may be caused by the fibrinolytic effect which oral contraceptives have upon blood clotting (Patton and Glick, 2016).

Some studies have not found a statistically significant difference in the risk of the development of gingival disease parameters such as increased probing depths and bleeding upon probing among those who use oral contraceptives and those who do not (Smadi and Zakaryia, 2018). However, Ali and colleagues (2016) point out that women who have been taking oral contraceptives for some time show the same features of gingiva-periodontitis that are seen in pregnant women, and that the mechanism is either an increase in certain local microorganisms or an altered host response.

In any case, it is important when taking a medical health history to ascertain if female patients are taking oral contraceptives, in part because the efficacy of contraceptives may be decreased when women receive an antibiotic (American Family Physician 2019). If antibiotic coverage is required as part of dental treatment, the dentist should consider advising female patients to use additional methods of birth control.

Pregnancy hormonal changes

During pregnancy, a woman is exposed to significant hormonal changes. The placenta produces high levels of estrogen and progesterone, which affect the oral tissues. Changes in hormone levels like those that occur during pregnancy have long been associated with the development of gingivitis (Kshirsagar and Balamurugan, 2018; González-Jaranay, Téllez, Roa-López, Gómez-Moreno, & Moreu, 2017; Nirola, 2018, et al., 2018).

Subgingival microbiota changes during pregnancy

Some researchers have speculated that the accumulation of progesterone and estrogen in gingival tissues during pregnancy may enhance bacterial growth by providing bacterial growth factors. Species such as P. melaninogenica and P. Intermedia can use these factors rather than Vitamin K for their growth (Kshirsagar and Balamurugan, 2018). Longitudinal changes in subgingival microbiota during pregnancy have been documented, but study populations are small; determining the clinical significance of microbiotic changes requires further investigation. For example, a study of 20 pregnant women aged 18 or older found that although the subgingival levels of bacteria associated with periodontitis do not change over time, the number of individual bacterial species do. The qualitative microbiota changes during pregnancy feature a shift from aerobic or facultative gram-positive species towards an anaerobic gram-negative species (Kshirsagar and Balamurugan, 2018). Patients were followed with increased bacterial counts noted for *Neisseria mucosa* ($p < 0.001$), and lower counts were noted for *Fusobacterium nucleatum* and *F. naviforme*, *Staphylococcus aureus*, *Streptococcus mutans*, and *S. sanguinis* ($p < 0.001$). Results from this study suggest that while decreases in the levels of many species occur during a normal pregnancy, other species, such as N. mucosa, increase. These elevated counts were significantly associated with gingivitis ($p < 0.001$) and bleeding on probing. Machado and colleagues (2016) observed changes in the proportions of oral microflora during pregnancy, most notably a reduction in *Prevotella nigrescens*.

Oral health during pregnancy

The assumed link between periodontitis and the risk for adverse birth outcomes (discussed later) has spurred interest in oral health during pregnancy. However, optimal oral health in pregnant patients has, until recently, been impeded by myths surrounding the safety of dental care during pregnancy specifically that dental care may pose dangers to the developing fetus. (Hartnett, et. al., 2016; Muralidharan and Merill, 2019). In addition, the lack of access to dental care for pregnant patients, and possibly the lack of dental insurance, can interfere with the utilization of oral healthcare services. Variations in income levels, lack of education, lack of perceived need and personal circumstances and stressors can all contribute to the lack of oral health care during pregnancy (Hartnett, et al., 2016).

Given the clear links between oral and general health, and between maternal and infant oral health, oral health care should be a goal for all individuals. It has been estimated that only 22% to 34% of women obtain dental care during pregnancy despite an awareness of the importance of maintaining oral health during pregnancy (Vogell, 2017). Some women believe that poor oral health during pregnancy is normal (Muralidharan and Merrill, 2019). In addition, some women may have concerns regarding the impact of dental care while pregnant (e.g., potential harm to themselves or their fetus). If perceptions of oral health during pregnancy are truly viewed differently by women that may be one contributing factor in women's avoidance of dental treatment while pregnant (Rocha, Arima, Werneck, Moysés, & Baldani, 2018).

Odontogenic infection

Pregnant women are at higher risk for dental infections because of hormonal changes, lack of routine dental examinations, and delays in treatment for oral disease. In addition, the maternal immune system is slightly suppressed during pregnancy, with a decrease in cell-mediated immunity and natural killer cell activity (Shah et al., 2017; Kshirsagar and Balamurugan, 2018). As a consequence, odontogenic infections in pregnant women can more rapidly develop into deep-space infections. For these reasons, it is important to promptly treat odontogenic infections during pregnancy by draining an abscess, extirpating offending pulp tissue, or extracting a tooth. The patient's obstetrician should be informed of the patient's status and consulted regarding any course of treatment.

Enamel erosion

The pregnant patient is at higher risk of gastric acid reflux due to hormonal and mechanical changes in the gastrointestinal tract (The American Dental Association, 2021). Consequently, the risk of dental erosion is increased. Nausea and vomiting associated with pregnancy can also contribute to erosion. Patients with severe gastric reflux caused by nausea and vomiting during early pregnancy are candidates for fluoride treatment to enhance the remineralization of eroded surfaces and to prevent further progression of dental wear. Topical fluoride is a U.S. Food and Drug Administration (FDA) category B drug, although fluoride taken internally is listed as category C (Prescribers' Digital Reference, n.d.; see the section on drugs and pregnancy). Please note, however, that the letter categories have been replaced by the Pregnancy and Lactation Labeling Rule (PLLR) as developed by the FDA as of June 30, 2015 (Drugs.com, 2021). The application of a fluoride varnish may be better tolerated than topical fluoride gel, which may cause nausea (ADA, 2017; CVS Pharmacy, n.d.).

Pregnancy gingivitis

So-called pregnancy gingivitis occurs in approximately 35% to 100% of pregnant women (Hartnett, et al., 2016; Kashetty, Kumbhar, Patil, & Patil, 2018). This condition usually emerges in the first trimester of pregnancy and peaks during the second trimester. Its cause is most likely related to increased levels of sex hormones (progesterone and estrogen), which trigger an exaggerated gingival inflammatory response to local irritants. Clinically, pregnancy gingivitis is characterized by redness, edema, and tenderness of the interproximal papillae with bleeding on probing. It usually responds to removal of local irritants and improved oral hygiene. A so-called pregnancy tumor (pyogenic granuloma) may occur in some patients and usually is located on the labial surface of the papilla (Figueiredo C, et al., 2017). Local debridement, chlorhexidine rinses, and improved oral hygiene are appropriate interventions for small pyogenic granuloma lesions, although surgery may be required for large lesions.

Periodontitis and adverse pregnancy outcomes

The health impact of maternal periodontal disease and caries has generated considerable analysis and debate, particularly regarding the effect on pregnancy outcomes (e.g., premature birth and low birth weight) and early childhood health. Several putative mechanisms have been proposed linking periodontal disease and preterm birth or low birth weight. For example, periodontitis may cause preterm birth by producing low-grade bacteremia concentrated in the decidua and chorioamnion or by releasing an endotoxin into the maternal circulation that triggers intrauterine inflammation. Inflammatory mediators, such as prostaglandins (PG), interleukins (IL), and tumor necrosis factor, can potentially trigger preterm labor. Alternatively, periodontitis can produce a systemic host response with an upregulation of serum cytokines. Thus, it is possible that periodontal infections can precipitate the birth of preterm low birth weight infants by acting as reservoirs for gram-negative anaerobic organisms and inflammatory mediators (Kawar, Patovi, Hildebolt, McLeod, & Miley, 2016; Lee and Hoerler, 2019; Lohana, Suragimath,

Patange, Varma, & Zope, 2017; Teshome & Yitayeh, 2016; American Dental Association 2021). It has also been proposed that periodontitis might serve as a marker for unhealthy behaviors or immune hyperresponsiveness that might cause preterm birth (Cobb et al., 2017).

Impact on pregnancy outcomes

A number of clinical studies have suggested that gingivitis and periodontitis are risk factors for preterm birth and low birth weight (Yenen and Atacag, 2019; Daalderop, et al., 2018; Corbella, et al., 2016; Hartnett, 2016; Patton and Glick, 2016). Both gingivitis and periodontal disease during pregnancy exacerbate inflammatory reactions though mediators through mediators such as cytokines, lipopolysaccharides and prostaglandins all of which can reach the placenta and reach a critical threshold level which can induce premature labor (Patton and Glick, 2016; Lee and Hoerler, 2019).

Conflicting results have also been published as some studies have not found conclusive evidence that there was a link between periodontal disease during pregnancy and adverse pregnancy outcomes (American Dental Association, 2021; Hartnett, et al., 2016). However, most of the evidence supports a link between periodontal disease and pregnancy outcomes. A systematic review concluded that despite some contradictory findings and methodological limitations, the majority of clinical studies show a positive correlation between preterm birth and periodontal disease (Daalderop, et al., 2018). An evaluation of 23 systematic reviews completed through 2016 concluded that there was an existing association between periodontal disease during pregnancy and pre-term births, low birthweight babies and pre-eclampsia (Daalderop, et. al., 2018).

In 2015, Schwendicke and colleagues published a meta-analysis of 13 randomized clinical trials evaluating 6,283 pregnant women, in an effort to determine whether periodontal treatment could prevent preterm birth, low birth weight, and ultimately perinatal mortality. These researchers were unable to come to a definitive conclusion and pointed out the need for further trials.

A critical assessment of adverse pregnancy outcomes and periodontal disease concluded that although nonsurgical mechanical periodontal treatment in the second trimester of pregnancy is safe and effective in reducing signs of maternal periodontal disease, it does not reduce the rate of preterm birth (Bobetsis, et. al., 2020). However, in 2013, Khairnar and colleagues reported that in their study of 100 pregnant women they had found evidence that nonsurgical supportive periodontal therapy could reduce the instances of preterm birth and low birth rate. Patients and healthcare providers should be educated about the biological plausibility of an association between periodontal disease and the potential risk of adverse pregnancy outcomes, even though evidence is limited concerning the usefulness of routine periodontal treatment in reducing the risk of adverse pregnancy outcomes (Komine-Aizawa, et. al., 2018).

Transmitting cariogenic bacteria

Women at risk for dental caries have the potential to pass the disease to their newborns. In addition, the caries status of the mother has implications for her child because the mother is the most common donor of cariogenic bacteria. DNA fingerprinting studies show that, in most cases, the genotype of cariogenic bacteria is the same in mothers and their infants (Childers et al., 2017; Xiao et al., 2016; Lee and Hoerler, 2019). These cariogenic bacteria are typically transmitted via saliva from mother to child by behaviors such as sharing a spoon when tasting baby food (Damle et al., 2016; Lee and Hoerler, 2019).

CLINICAL PRACTICE GUIDELINES REGARDING ORAL HEALTH CARE

Clinicians increasingly look toward evidence-based treatment options for guidance in the context of oral health. To many practitioners, these recommendations serve as important tools to help make informed choices about best practices to optimize outcomes. Accordingly, professional organizations and key federal agencies have promulgated guidelines to optimize oral health during pregnancy.

Centers for Disease Control and Prevention recommendations

The CDC published a series of recommendations based on expert opinion to improve preconception health and health care (CDC, 2020). Several of these recommendations were directly relevant to improving preconception oral health. The CDC recommended preventive visits that offer routine risk assessment through screening for chronic conditions, including oral disease. The recommendations also call for additional counseling and interventions for women who are at increased risk for morbidity and mortality to the mother and fetus as a result of medical conditions, including dental disease.

The CDC recommendations for interconception care advocate for additional intensive interventions for women with a prior pregnancy that ended in an adverse outcome (i.e., fetal loss, low birth weight or preterm birth, birth defects, or infant death). In this context, the CDC recommendations cite a program that was tested in Atlanta, Georgia, called the *Interpregnancy Care Program of Grady Memorial Hospital*. This program focused on reducing identified medical, dental, and psychosocial risks. The program enrolled women who were at risk for delivery of very low birth weight infants and provided them with 24 months of funded, comprehensive, and integrated primary healthcare services; enhanced case management; and outreach in the community setting, including dental services (County Health Rankings & Roadmaps, 2016).

New York State Department of Health guidelines

Several professional organizations and state agencies have undertaken efforts to promote oral health during pregnancy. For example, the New York State Department of Health published guidelines that provide separate recommendations for prenatal care providers, oral health professionals, and child health professionals for the purpose of guiding treatment (New York State Department of Health, 2006).This section will highlight recommendations in the literature which follow these guidelines and where necessary provide updates on these recommendations.

Other evidence-based guidelines

The California Dental Association Foundation (CDA) published "*Oral health During Pregnancy and Early Childhood: Evidence-Based Guidelines for Health Professionals*" in February 2010 (California Dental Association, 2010). This publication featured evidence-based clinical practice guidelines for the provision of dental care to women before, during, and after pregnancy. In 2013, ACOG published a list of recommendations for healthcare practitioners concerning oral healthcare during pregnancy and early childhood which were reaffirmed in 2017. A primary concern was that delaying dental treatment could result in more complex oral and systemic problems (American Dental Association, 2021).

Unlike the New York guidelines, which were provider centric, the California Dental Association Foundation guidelines (2010) focus on a patient-centered approach from a more holistic perspective. The goal is to establish a framework for collaboration among

practitioners to provide comprehensive health care for women, children, and families employing a multidisciplinary model of health care.

In 2016, the American Academy of Pediatric Dentistry updated the 2011 perinatal oral healthcare guidelines which were a revision of the original 2009 guidelines (American Academy of Pediatric Dentistry, 2016). In 2015, Michigan produced guidelines to perinatal oral health, and in 2016, the Massachusetts Department of Public Health published its own guidelines on oral health in pregnancy and early childhood, focusing on health literacy and addressing healthcare disparities.

Dental care and treatment during pregnancy

Oral health professionals are responsible for providing preventive care and treatment before, during, and after pregnancy. Screenings for oral health risks, counseling on proper oral hygiene, and referrals for dental treatment when necessary should be available to every pregnant woman. Dental care during pregnancy is considered necessary and safe for the well-being of the mother and the developing fetus (Vogell, 2017). After the birth of the child, preventive healthcare visits for the child during the first year of life provide an opportunity for dentists and pediatric health professionals to also improve the oral health of the mother. Women who have obtained oral health care while they were pregnant will usually continue to receive routine dental care for themselves and their child (Vogell, 2017).

Oral healthcare visits

The oral healthcare visit is an occasion to educate pregnant women about improving their oral health. Pregnant women may be more receptive to changing behaviors that are potentially associated with a higher risk of poor pregnancy outcomes. In addition, pregnant women are more likely to adopt better health behaviors when they understand the impact their actions have on their children (Flynn, 2009). The following practices utilized by women can promote optimal oral health during their pregnancy:

- Twice-daily brushing with a fluoride toothpaste and daily flossing.
- Restricting sugar-containing foods to mealtimes.
- Selecting water or low-fat milk and avoiding carbonated beverages during pregnancy.
- Selecting fruit instead of fruit juice to meet the recommended daily intake of fruit.

(Yenen and Atacag, 2019; Vogell, 2017)

Reducing caries risk

Oral healthcare professionals can implement best practices to assess caries risk and manage caries in pregnant women. Furthermore, these guidelines cite several strategies for decreasing the maternal cariogenic bacterial load, including:

- Restoration of untreated caries.
- Use of fluoride toothpaste and fluoride mouth rinses, depending on water fluoridation status.
- Appropriate use of chlorhexidine mouth rinses and fluoride varnish.
- Use of chewing gum that contains xylitol.

These strategies reflect efforts to reduce the transmission of cariogenic bacteria from mother to child by decreasing the maternal reservoir and avoiding transmission and colonization vectors (Kolen, 2020; Vogell, 2017).

Consistent with the New York State Department of Health guidelines, the CDC recommendations note that evidence supports the use of fluorides and dietary controls for reducing reservoirs of cariogenic bacteria in maternal saliva to decrease transmission from mother to child (Vogell, 2017). The use of xylitol-containing gum during pregnancy has been shown to reduce the transmission of the cariogenic S. mutans from mother to child late in the pregnancy and during the postpartum period (Drugs.com, 2021; Lee et.al, 2019). Lin and colleagues (2016) also found a significant reduction in transmission in their meta-analysis of randomized controlled trials.

Another strategy is to minimize saliva-sharing activities because cariogenic bacteria can be transmitted from mother to child by behaviors that directly pass saliva (Lee and Hoerler, 2019). Interventions focused on the child are also appropriate to reduce caries risk. The New York State Department of Health guidelines indicate that increasing the child's resistance to colonization can be achieved by applying fluoride varnish and limiting the frequency of carbohydrate intake.

Periodontal interventions

Several guidelines, policy statements, and recommendations provide guidance regarding periodontal interventions in pregnant patients. A complete periodontal assessment is essential in the early stages of the pregnancy and women must be educated about the potential for the development of pregnancy gingivitis (Lee and Hoerler, 2019). The American Academy of Periodontology published a policy statement regarding periodontal management of pregnant patients, which concluded that preventive oral care services should be provided to such patients as early as possible to reduce the amount of periodontal pathogens associated with gingivitis and periodontal disease during pregnancy (Vogell, 2017). A high level of oral hygiene should be encouraged in women before they become pregnant and throughout their pregnancies. Procedures such as periodontal scaling and root planing or more involved periodontal treatments are usually scheduled early in the second trimester. However, prompt intervention for acute infection, abscess, or other potentially disseminating sources of sepsis is warranted irrespective of the stage of pregnancy as these issues can have an adverse effect upon the health of the developing baby (Yenen and Atacag, 2019).

Nutrition during pregnancy

Optimal nutrition during pregnancy has been shown to enhance dental health for both mother and fetus by providing important nutrients that are necessary for gingival health of the mother and mineralization of the baby's teeth (Vogell, 2017). Fetal tooth development begins by week 6 of gestation for primary dentition and by week 10 for permanent teeth. Tooth development can be affected by severe maternal malnutrition. Oral health education during pregnancy should include the importance of proper nutrition to ensure maternal and fetal oral health, including eating foods that are high in the right nutrients and taking prenatal vitamins.

Nutrients that are important to maternal and fetal oral health include vitamins A, C, and D; folic acid; calcium; phosphorus; protein; and fluoride (March of Dimes, 2018). Healthy foods are the best sources of vitamins and minerals, and pregnant women should be encouraged to satisfy their vitamin requirements through food sources:

- **Vitamin A**: Found in deep green leafy vegetables, dark yellow vegetables, fruits, egg yolks, liver, fortified milk, dairy products, and breakfast cereals.
- **Vitamin C**: Found in citrus fruits, strawberries, collard greens, spinach, broccoli, tomatoes, and green and red peppers.
- **Vitamin D**: Found in liver, fish liver oils, and eggs.

It is important for pregnant women to get adequate amounts of folic acid, a B vitamin that helps prevent birth defects of the brain and spinal cord. Folic acid is available in most multivitamins, as supplements, and in some foods. The March of Dimes (2018) recommends that pregnant women should get 600 mcg of folic acid every day from food and supplements.

An important mineral throughout pregnancy is calcium, which is used in the formation of the fetal skeleton and tooth buds. Calcium is also used to conduct nerve impulses and to form muscle (including cardiac muscle). Maternal calcium absorption increases during pregnancy; thus, the calcium needs of pregnant women are similar to those of nonpregnant women. According to the Dietary Reference Intake (DRI) values set by the Food and Nutrition Board, the recommended calcium intake for pregnant women is the same as before pregnancy; that is, 1,000 mg per day for women aged 19 to 50 years, which is equivalent to about three to four glasses of milk per day (National Institutes of Health, 2017). The recommendation for pregnant women aged 18 years and younger is 1,300 mg per day. Calcium can be found in milk, cheese, yogurt, ice cream, deep green leafy vegetables, and legumes. Phosphorus is also found in foods that are rich in calcium and protein (MedlinePlus, 2018).

Fluoride hardens enamel by converting hydroxyapatite crystals to fluorapatite, thus making enamel less vulnerable to damage from bacterial acids. However, the use of fluoride supplements during pregnancy is controversial. A Cochrane review concluded that fluoride supplements taken during pregnancy did not protect children's teeth from caries (Takahashi et al., 2017). The American Dental Association (ADA) has not made any recommendations for prenatal fluoride supplements for pregnant women. In addition, CDC recommendations for using fluoride to prevent and control dental caries note that the use of fluoride supplements by pregnant women does not benefit their offspring as only a trace amount of fluoride reached the developing fetus (Vogell, 2017). Concern has been expressed over fetal neurotoxicity resulting from too much environmental fluoride (Barrett, 2017).

Drugs and pregnancy

Despite the fact that most clinicians are cautious in prescribing medications to pregnant patients, some patients can potentially receive prescriptions for medications that are contraindicated for use in pregnancy before they realize that they are pregnant or during their pregnancy if the benefit of the use of a contraindicated medication outweighs the risk of fetal development. The FDA has long categorized medications based on their potential for fetal risk (Office on Women's Health, 2018). For many years, the drug categories were represented by a letter system. This system, however, has recently been superseded by a "narrative risk summary" that applies to pregnancy and lactation. The Pregnancy and Lactation Labeling Rule (PLLR) was published by the (FDA) in 2014 and replaced the prior letter-based system guidelines established in 1979. The (PLLR) guidelines features a narrative section and subsections which highlight the effect of a given medication on pregnancy, lactation and includes the effect of a given medication upon male and females with reproductive potential (Meek, 2019; Drugs.com, 2021).

Table 1 presents the letter risk categories for some commonly prescribed agents that may still bear a letter category. Generally, drugs that fall into either category A or B are considered safe and are routinely used. Drugs in category C have been shown to harm fetuses in animal studies, but they have not been adequately studied in humans. Medications with recognized harmful effects to a developing fetus are in categories D and X. Category D medications may provide benefit to the mother in certain medical conditions; however, the benefit must outweigh the risk to the fetus for such drugs to be used. Category X medications are absolutely contraindicated in pregnancy because they are associated with more harm to the fetus than any possible benefit.

Examples of category X medications include HMG-CoA reductase inhibitors (statins), warfarin, and vitamin A derivatives. Examples of category D drugs include ACE inhibitors, lithium, and certain anticonvulsants such as phenytoin and carbamazepine. In addition, all of the benzodiazepines, including diazepam, have been rated as either category D or category X (for the hypnotics temazepam, triazolam, and flurazepam). The selective serotonin reuptake inhibitor (SSRI) paroxetine has been moved to category D because of the increased risk of fetal heart defects if taken during the first trimester. An ACOG Committee on Obstetric Practice opinion indicated that pregnant women, or those planning to become pregnant, should avoid taking paroxetine (Berard, et. al., 2016; Shrestha and Fariba, 2021). Untreated depression during pregnancy can increase the risk of premature birth, low birth weight and a decrease in fetal growth. It can also decrease the risk of postpartum depression. A pregnant woman's use of other SSRIs (e.g., sertraline, fluoxetine, and escitalopram) or medications from other classes of antidepressants should be determined on an individual basis. (Mayo Clinic, 2020).

Lidocaine with epinephrine is the local anesthetic of choice for pregnant women when clinically indicated; however, aspirin, products containing aspirin, erythromycin estolate, and tetracycline should be avoided (Patton and Glick, 2016; Kolen, 2020). In the case of tetracycline, the drug can cause discoloration of the child's teeth (Tobah, 2017).

Table 1: Acceptable and Unacceptable Drugs for Pregnant Women

These Drugs May be Used During Pregnancy	FDA Category	These Drugs Should Not be Used During Pregnancy	FDA Category
Antibiotics			
Penicillin	B	Tetracyclines	D
Amoxicillin	B	Erythromycin in the estolate form	B
Cephalosporins	B	Quinolones	C
Erythromycin (except for estolate form)	B	Clarithromycin	C
Analgesics			
Acetaminophen	B	Aspirin	C
Acetaminophen with codeine	C	Codeine	C
Hydrocodone	C	Meperidine	C
Morphine	B		
After 1st trimester for 24 to 72 hrs. only:			
Ibuprofen	B		
Naproxen	B		

Note. Adapted from Yenen and Atacag, 2019; Patton and Glick, 2016

Drugs excreted in breast milk

Many mothers who breastfeed their infants also take medications to treat a variety of conditions. Almost all drugs transfer into breast milk, and this may pose a risk to a breastfed infant. The nursing mother's use of medication, coupled with advice by her physician to stop nursing, is a common reason for the cessation of breastfeeding. Most medications and immunizations are safe during lactation. A consultation with the infant's pediatrician may be required especially for recently developed medications (Kolen, 2020; Consolini, 2019). Nevertheless, some drugs transfer to breast milk and pose a risk to the nursing infant. Several medications used for systemic diseases such as cytotoxic drugs and some psychoactive drugs used for mental health issues are contraindicated during breastfeeding (Consolini, 2019). Some local anesthetics, analgesics and antibiotics are also contraindicated during breastfeeding (Patton and Glick, 2016). It is prudent for the dental clinician to consult with the mother's physician or the child's pediatrician if there is a concern about the use of any medication which is adjunctive to dental treatment and its effect upon the infant during breastfeeding. A recent Israeli study found no apparent harm to infants from breastfeeding mothers' chronic use of any one of various types of psychotropic medications (Kronenfeld et al., 2018).

To minimize drug exposure to the breastfed infant, clinicians should consider the following before prescribing drugs to lactating women:

- Assess the necessity of drug therapy.
- Select the safest drug (e.g., acetaminophen rather than aspirin for analgesia).
- Monitor the concentration of the drug in the nursing infant if there is a potential risk to the infant.
- Have the mother take the medication immediately after breastfeeding or before the infant is due for a lengthy sleep period (Consolini, 2019; Kolen, 2020).

The U.S. Library of Medicine's *Drugs and Lactation Database (LactMed)* provide guidance regarding specific drugs that are excreted in breast milk (PubChem, 2020; Centers for Disease Control, 2020; U.S. National Library of Medicine, n.d.). Table 2 presents drugs that are frequently used in dentistry and are excreted in breast milk, along with recommended guidelines.

Table 2: Drugs Frequently Used in Dentistry that are Excreted in Breast Milk

Use in Dentistry	Drug	Guidelines
Herpes infections	Acyclovir	Topical acyclovir applied in small amounts away from the mother's breasts should pose no risk. To prevent exp paraffins, only water-miscible cream or gel products should be used.
Pain	Aspirin	High doses of aspirin should be avoided during breastfeeding, especially with very young infants. Low-dose as considered for anti-platelet therapy.
Trigeminal neuralgia	Carbamazepine	Carbamazepine appears at relatively high levels in breast milk but usually below the anticonvulsant therapeutic infant for various symptoms and developmental milestones.
Antibiotic coverage	Clindamycin	Clindamycin can potentially cause adverse effects on the infant's gastrointestinal flora. An alternate drug may infant for diarrhea, candidiasis, or blood in the stool.
Antibiotic coverage	Erythromycin	Erythromycin is acceptable in nursing mothers.
Candida	Fluconazole	Fluconazole is acceptable in nursing mothers because the levels in breast milk are lower than those given to infants.
Nondental pain	Fluoxetine	If fluoxetine is required by the mother, breastfeeding can be continued.
Pain	Ibuprofen	Ibuprofen is a preferred choice as an analgesic or anti-inflammatory agent in nursing mothers.
Pain	Naproxen	Levels of naproxen in breast milk are low, and adverse effects in infants are uncommon.
Antibiotic	Penicillin	Penicillin V and penicillin G are acceptable to use during breastfeeding.
Trigeminal neuralgia	Phenytoin	Because of the low levels of phenytoin in breast milk, no difficulties are usually experienced in breastfed infant alone.
Oral mucosal infections	Tetracyclines	Short-term use of tetracyclines (doxycycline) is acceptable in nursing mothers.

Note: From U.S. National Library of Medicine. (n.d.). *LactMed: A TOXNET database*. Retrieved on June 6, 2018, from http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT

CONCERNS OF MIDDLE-AGED AND OLDER FEMALE DENTAL PATIENTS

Middle age is the period of life beyond young adulthood and before the onset of old age (generally between 45 and 64 years of age). During the middle years, female patients can experience a number of dental concerns, including temporomandibular disorder (TMD), trigeminal neuralgia, and other atypical facial pain. Temporomandibular disorders affect at least twice as many women as men (National Institute of Dental and Craniofacial Research [NIDCR], 2018). Temporomandibular disorder is the second most common musculoskeletal disorder second only to lower back pain. Approximately 33% of the population has had at least one (TMD) symptom and about 3.6% to 7.0% of the population had enough symptoms for which they sought treatment. Females have an increased prevalence of in the 25-44 year-old age range had an 18% prevalence of TMD compared to a 10% prevalence of males in the same age range (Huggins and Wright, 2021). The prevalence was approximately 7% to 8% in non-Hispanic white women up to age 50, but it decreased after age 55. Overall, age seemed to play a greater role for women than for men.

Patients with TMD may describe the pain as a dull ache or as sharp and shooting; the area may be tender and aching; the pain may vary from mild to severe; and the pain may be bilateral or unilateral (Mayo Clinic, 2017c; Mayo Clinic, 2018). Some patients also complain of clicking joints, tinnitus, popping noises in the ear, vertigo, and deviation of the jaw (NIDCR, 2018; Shahidi et al., 2018). Upon examination, there may be tenderness of the

masticatory muscles and some restriction of opening, with jaw deviations. Crepitus of the joint may be present.

Treatments for TMD include various types of medications (nonsteroidal anti-inflammatory drugs, muscle relaxants, etc.), therapies (occlusal splints, warm and moist packs, cognitive behavioral therapy), and surgical or other procedures (Mayo Clinic, 2017b; NIDCR, 2018).

Menopause

Both clinicians and women identify the approach of menopause by changes in menstrual cycle regularity and the amount of menstrual bleeding or by vasomotor symptoms such as hot flushes or night sweats. Other symptoms, such as vaginal dryness, poor sleep, depressed mood, and decreased libido, are commonly attributed to menopause. Considerable evidence from longitudinal studies has accumulated and highlights the temporal relationship of these symptoms to the menopausal stage and the association with hormonal changes across the menopause transition (Hariri and Alzoubi, 2017).

Oral findings in postmenopausal women may include decreased saliva, increased dental caries, dysesthesia (e.g., burning mouth syndrome), alterations in taste, atrophic gingivitis, periodontitis, and osteoporosis of the mandible or maxilla. The etiology of primary burning mouth syndrome is unknown, but this common condition predominantly affects postmenopausal women (Mayo Clinic, 2017a; Cleveland Clinic, 2019). In idiopathic burning mouth syndrome, palliative care and support are appropriate, although pharmacologic options also exist, including tricyclic antidepressants, benzodiazepines, anticonvulsants, alpha-lipoic acid, and topical capsaicin (Hennessy, 2020).

Osteoporosis

Osteoporosis affects women disproportionately (Sozen, et al., 2017). For women, osteoporosis and low bone mass together rank among the most common chronic conditions in the United States. (Patton and Glick, 2016 HealthyPeople.gov, n.d.; Wang and McCauley, 2016) The prevalence trend of osteoporosis is related, in part, to population trends because the risk of osteoporosis increases with age. The number of adults 50 years of age or older with osteoporosis rose from 10.2 million in 2010 to an estimated 12.3 million in 2020 with a projected number of 13.6 million adults in 2030 in this age range afflicted with osteoporosis (US Preventive Services Task Force, 2018).

Often the first indication of osteoporosis is bone fracture (American Academy of Orthopedic Surgeons, 2016; Patel, 2020). Bone density is an important determinant of fracture risk, especially in women aged 65 and older. Osteoporotic fractures remain a significant source of morbidity (and a contributor to mortality) in postmenopausal women. For an American woman aged 50 years, the risk of suffering an osteoporotic fracture in her remaining lifetime has been estimated at 40%. Hip fractures take a particularly devastating toll, resulting in higher mortality, disability, and cost than all other osteoporotic fracture types combined. Approximately 40% of osteoporotic patients who sustain a hip fracture cannot walk independently after one year and 60% require assistance with at least one activity of daily living. Unfortunately, 21%-30% of these patients die within one year of their hip fracture (US Preventive Services Task Force, 2018).

The generalized bone loss that is typical of systemic osteoporosis may also accelerate the resorption of alveolar bone and make the teeth more susceptible to chronic periodontitis. A number of reports have described a putative relationship between periodontitis and osteoporosis, although its extent remains unclear (Penoni, et al., 2017).

Preliminary data from the oral ancillary study of the pivotal Women's Health Initiative suggested a significant correlation between mandibular basal bone mineral density (BMD) and hip BMD (Penoni, et al., 2017). More recent reports describe a significant association between the BMD of the mandible and the peripheral skeleton in postmenopausal women (Carmo and Medeiros, 2017). Accordingly, there has been an exploration of the potential role of some mandibular panoramic indices, such as mandibular cortical index and mandibular cortical width, for the identification of individuals who are candidates for BMD assessment (Tounta, 2017; Grocholewicz et al., 2018). However, further research is needed before adopting panoramic radiographs as a routine screening tool for osteopenia or osteoporosis.

Treatment guidelines for osteoporosis from various bodies – such as the American Association of Clinical Endocrinologists, ACOG, and NOF – stress that individuals, regardless of osteoporosis risk factors, should be encouraged to take steps to prevent bone loss and fractures. Among their recommendations are eating a balanced diet, obtaining adequate calcium and vitamin D, participating in appropriate exercise, not smoking, avoiding excessive alcohol consumption, and instituting measures to prevent falls (Sozen, et al.,2017; Camacho et al., 2016; National Institute for aging, 2017).

Effective pharmacologic management of osteoporosis requires strategic use of available agents and an understanding of the optimal use of recently approved drugs. Current pharmacologic options for women include the use of estrogen, with or without progestin or progesterone. Other drugs used in the treatment of osteoporosis are:

- Selective estrogen receptor modulators (SERMs) such as raloxifene (Evista).
- Bisphosphonates, such as alendronate (Fosamax), risedronate (Actonel), ibandronate (Boniva), and zoledronic acid (Reclast).
- Calcitonin (Miacalcin).
- The anabolic agent teriparatide (Forteo).
- Bazedoxifene.
- Ospemifene.

A recent meta-analysis found that bazedoxifene was safe and effective in reducing the number of vertebral fractures and increasing spine BMD over periods of 3 and 7 years (Peng, Luo, & Lu, 2017). Since 2013, bazedoxifene has been approved by the FDA in combination with conjugated estrogens for the treatment of menopausal symptoms and osteoporosis and sold under the brand name Duavee (Drugs.com, 2021). However, this medication is for short-term use and can be taken only by women who have an intact uterus (Pfizer, 2017).

A fairly new drug for osteoporosis is denosumab. This medication is effective in reducing bone turnover and fractures and that the benefits of the medication outweighed the risk of the development of (MRONJ) which ranges from 0.04% to 0.3% for those patients who receive the twice-yearly injection of this medication (Chan, et.a l., 2018). A continuation of the study found that the positive results held for at least 10 years (Bone et al., 2017). Denosumab, marketed under the brand name Prolia, has approval from the FDA for use in the treatment of osteoporosis (National Cancer Institute, 2018).

Sometimes calcitonin is prescribed as a nasal spray (Zhang et al., 2018). This medication, though it has its own adverse effects, has not been reported to cause osteonecrosis of the jaw. Concerns have been expressed about cancer risk, but the evidence is weak (Wells, Chernoff, Gilligan, & Krause, 2016; Zhang et al., 2018).

Agents under investigation include cathepsin K inhibitors (Lindström et al., 2018; Tanaka, Hashimoto, Hasegawa, Deacon, & Eastell, 2017) and monoclonal antibodies (Tu et al., 2018).

Bisphosphonates are potent inhibitors of osteoclastic activity and thereby reduce bone remodeling (Khan, et al., 2017). Additionally, they have antiangiogenic properties and thus inhibit the bony microvascular blood supply. Clinical trials have demonstrated that bisphosphonates significantly increase BMD

at the spine and hip in a dose-dependent manner and reduce the risk of fracture at some sites. Bisphosphonate therapy is also reported to have beneficial effects on the periodontium (Muniz, et. al., 2021). Although bisphosphonates are effective as a prophylaxis and intervention for osteoporosis, exposure to them has led to reports of medication-related osteonecrosis of the jaw (MRONJ) (Aldhalaan, et al., 2020). This condition is defined as the "presence of necrotic bone anywhere in the oral cavity in a patient who is taking bisphosphonates, who has not received radiation to the head and neck and in whom the necrotic area does not heal within 8 weeks after diagnosis after receiving proper care" (American College of Prosthodontists, 2018).

Approximately 0.001%-0.01% of patients who take oral bisphosphonate medications will develop MRONJ compared to between 1% and 10% of patients for whom Intravenous (IV) bisphosphonates are utilized (American Dental Association, 2019). The use of IV bisphosphonates or denosumab therapy for osteoporosis patients are usually given in much lower doses and a reduced duration of administration compared to those uswed for oncology patients (Chan,et.al., 2018). However, in a systematic literature review of MRONJ in osteoporotic patients treated with oral bisphosphonates, the most common characteristics of those who developed ONJ were being female, being aged 60 years or older, and having had previous invasive dental treatment (Jeong et al., 2017; American Dental Association, 2019). Although Jeong and colleagues caution that in their study the gender disparity may actually be the result of more women than men taking bisphosphonates, women, especially older women, seem more prone to this condition even if only because they are more likely to require the medication.

Conclusion

The oral health of men and women differs for a variety of reasons ranging from biological differences to different roles and perceptions. Oral health issues of female patients also change throughout their life cycle. Most pubertal females with healthy gingiva will not develop gingival inflammation, but some individuals will have gingival inflammation with even minor accumulation of dental plaque. Many oral changes may occur with the start of menses and over the menstrual cycle, including swollen gingival tissues, activation of herpes labialis, aphthous ulcers, prolonged bleeding following oral surgery, and swollen salivary glands. Most evidence does not support a putative association between oral contraceptives and gingivitis or periodontitis, but further research is needed.

During pregnancy, a woman is exposed to significant hormonal changes that, in turn, affect the oral tissues. Importantly, most evidence supports a link between pregnancy outcomes and periodontal disease; however, treating periodontal disease has not been conclusively demonstrated to improve birth outcomes. During the middle years, female patients can experience a number of dental concerns, including temporomandibular joint dysfunction, trigeminal neuralgia, and other atypical facial pain. Oral findings in postmenopausal women may include decreased saliva, increased dental caries, burning mouth syndrome, alterations in taste, atrophic gingivitis, periodontitis, and osteoporosis of the mandible and maxilla.

Because women represent the majority of the population, make the majority of healthcare decisions, and most often live longer than men, it is essential that the dental team continually gain knowledge about women's oral health issues and appropriate interventions.

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ORAL HEALTH ISSUES FOR THE FEMALE PATIENT, 3RD EDITION

Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 100, or complete your test online at **EliteLearning.com/Book**

1. Which of the following statements is correct regarding aggressive periodontitis?
   a. The disease typically appears around the onset of puberty.
   b. The disease most commonly manifests late in life.
   c. Males have been affected to a much greater extent than females.
   d. An absence of bony defects is characteristic of the disease.

2. Aside from their influence on periodontal tissues, sex hormones also affect:
   a. Cardiovascular capacity.
   b. Bone turnover rate.
   c. Tooth mineralization.
   d. Amelogenesis.

3. Puberty-related gingival inflammation and enlargement is:
   a. More common in females.
   b. More common in males.
   c. Equally common in males and females.
   d. Related to the age of onset of puberty.

4. Clinically, puberty-associated gingivitis is commonly characterized by:
   a. Atrophic gingiva.
   b. Radiologic evidence of bone loss.
   c. Pale gingival margins.
   d. Bleeding on probing.

5. Women may experience intraoral recurrent aphthous ulcers and herpetic lesions:
   a. Immediately before the onset of menstrual flow.
   b. During the luteal phase of the menstrual cycle.
   c. Just prior to ovulation.
   d. During the follicular phase of the menstrual cycle.
6. Based upon the sample of 36,309 adults, the percentage of adults who will be afflicted with Anorexia Nervosa (AN) at some point in their lifetime is:
   a. 0.20%.
   b. 0.40%.
   c. 0.60%
   d. 0.80%.
7. Specific oral manifestations in patients with eating disorders include:
   a. Corrugated enamel.
   b. Sialorrhea.
   c. Atrophy of the parotid glands.
   d. Dental caries.
8. Some reports indicate that women taking oral contraceptives experience an increased incidence of localized osteitis following extraction of:
   a. Mandibular incisors.
   b. Maxillary incisors.
   c. Mandibular third molars.
   d. Maxillary third molars.
9. Odontogenic infections in pregnant women:
   a. Are more likely to lead to the development of fistulas.
   b. Can more rapidly develop into deep-space infections.
   c. Occur infrequently due to the enhanced maternal immune system.
   d. Are often masked by fluid retention.
10. Pregnancy tumors (pyogenic granulomas) may occur in some pregnant patients and usually are located on the:
    a. Labial surface of the papilla.
    b. Lingual surface of the papilla.
    c. Mucosa of the soft palate.
    d. Mucosa of the hard palate.
11. An example of inflammatory mediators that can potentially trigger preterm labor are:
    a. Endorphins.
    b. Androgens.
    c. Prostaglandins.
    d. Cannabinoids.
12. The most common donor of cariogenic bacteria to a child is his or her:
    a. Father.
    b. Mother.
    c. Sibling.
    d. Nonrelated playmate.
13. In contrast to the New York State Department of Health guidelines on pregnancy and early childhood, the California Dental Association Foundation guidelines are:
    a. More patient centered.
    b. More provider centered.
    c. For oral health professionals only.
    d. For child health professionals only.
14. To decrease maternal cariogenic bacterial load oral health guidelines for pregnant patients recommend:
    a. Restoring untreated caries.
    b. Replacing amalgams with composite resins.
    c. Using iodophor mouth rinses.
    d. Using chewing gum that contains sucrose.
15. The recommended calcium intake for pregnant women aged 19 to 50 years is:
    a. 500 mg per day.
    b. 1,000 mg per day.
    c. 1,500 mg per day.
    d. 2,000 mg per day.
16. A drug that is absolutely contraindicated in pregnancy is:
    a. Fluconazole.
    b. Penicillin.
    c. Acetaminophen.
    d. Warfarin.
17. To minimize drug exposure in the breastfed infant it is recommended that the mother:
    a. Take medications immediately before breastfeeding.
    b. Take medications immediately after breastfeeding.
    c. Take extended-release medications.
    d. Avoid all oral medications.
18. Oral findings in postmenopausal women may include:
    a. Increased salivation.
    b. Increased dental caries.
    c. Hypertrophic gingivitis.
    d. Retrognathic mandible.
19. Data from the oral ancillary study of the Women's Health Initiative suggest a correlation between hip bone mineral density (BMD) and:
    a. Mandibular basal BMD.
    b. Values of papillary bleeding index.
    c. Gingivitis development.
    d. Subgingival microbiota.
20. Which of the following statements regarding the development of osteonecrosis of the jaw (ONJ) is correct?
    a. ONJ is most common in males.
    b. ONJ occurs in a large proportion of patients after non-invasive dental treatment.
    c. Patients receiving intravenous bisphosphonates are at a significantly higher risk.
    d. Patients receiving low-dose oral bisphosphonates are at a significantly higher risk.

COURSE EVALUATION

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Fill in the circles below the numbers with 0 being the worst and 10 being the best.

	EXCELLENT										POOR
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The course material was presented in a clear, concise and well-organized format	10 ○	9 ○	8 ○	7 ○	6 ○	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
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Please circle yes or no for the following questions.

The material presented met the course's stated objectives	YES	NO
I found this course a good value for my money	YES	NO

Please list any recommendations that you may have for this course: _____

_____

Please list any course subjects you would like to see in the future: _____

_____

Comments: _____

_____

❑ I agree to allow Elite Learning to use my above comments.

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2	Infection Control Standards for California Dental Health Care Workers, 6th Edition (Mandatory)	2	$19.95
3	Dental Ethics and the Digital Age, 2nd Edition	3	$29.95
4	Herbal Drug Interactions Important in Dentistry, 3rd Edition	2	$19.95
5	Maintaining Dental Implants, 2nd Edition	1	$8.95
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Please see the following page for the Final Exam Answer Sheet

Final Examination Questions are located at the end of each course. Unanswered questions will be scored as incorrect.

Course 1: California Dental Practice Act, 6th Edition (Mandatory)

(2 CE Hours)
Exam on pages 20-21

	A	B	C	D
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
4.	❍	❍	❍	❍
5.	❍	❍	❍	❍
6.	❍	❍	❍	❍
7.	❍	❍	❍	❍
8.	❍	❍	❍	❍
9.	❍	❍	❍	❍
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11.	❍	❍	❍	❍
12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
15.	❍	❍	❍	❍
16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍
20.	❍	❍	❍	❍
21.	❍	❍	❍	❍
22.	❍	❍	❍	❍
23.	❍	❍	❍	❍
24.	❍	❍	❍	❍
25.	❍	❍	❍	❍
26.	❍	❍	❍	❍
27.	❍	❍	❍	❍
28.	❍	❍	❍	❍
29.	❍	❍	❍	❍
30.	❍	❍	❍	❍

Course 2: Infection Control Standards for California Dental Health Care Workers, 6th Edition (Mandatory)

(2 CE Hours)
Exam on pages 31-32

	A	B	C	D
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
4.	❍	❍	❍	❍
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7.	❍	❍	❍	❍
8.	❍	❍	❍	❍
9.	❍	❍	❍	❍
10.	❍	❍	❍	❍
11.	❍	❍	❍	❍
12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
15.	❍	❍	❍	❍
16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍
20.	❍	❍	❍	❍

Course 3: Dental Ethics and the Digital Age, 2nd Edition

(3 CE Hours)
Exam on pages 56-57

	A	B	C	D
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
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9.	❍	❍	❍	❍
10.	❍	❍	❍	❍
11.	❍	❍	❍	❍
12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
15.	❍	❍	❍	❍
16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍
20.	❍	❍	❍	❍

Course 4: Herbal Drug Interactions Important in Dentistry, 3rd Edition

(2 CE Hours)
Exam on pages 74-75

	A	B	C	D
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
4.	❍	❍	❍	❍
5.	❍	❍	❍	❍
6.	❍	❍	❍	❍
7.	❍	❍	❍	❍
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9.	❍	❍	❍	❍
10.	❍	❍	❍	❍
11.	❍	❍	❍	❍
12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
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16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍
20.	❍	❍	❍	❍

Course 5: Maintaining Dental Implants, 2nd Edition

(1 CE Hour)
Exam on pages 80-81

	A	B	C	D
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
4.	❍	❍	❍	❍
5.	❍	❍	❍	❍
6.	❍	❍	❍	❍
7.	❍	❍	❍	❍
8.	❍	❍	❍	❍
9.	❍	❍	❍	❍
10.	❍	❍	❍	❍
11.	❍	❍	❍	❍
12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
15.	❍	❍	❍	❍
16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍
20.	❍	❍	❍	❍

Course 6: Oral Health Issues for the Female Patient, 3rd Edition

(2 CE Hours)
Exam on pages 92-93

	A	B	C	D
1.	❍	❍	❍	❍
2.	❍	❍	❍	❍
3.	❍	❍	❍	❍
4.	❍	❍	❍	❍
5.	❍	❍	❍	❍
6.	❍	❍	❍	❍
7.	❍	❍	❍	❍
8.	❍	❍	❍	❍
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12.	❍	❍	❍	❍
13.	❍	❍	❍	❍
14.	❍	❍	❍	❍
15.	❍	❍	❍	❍
16.	❍	❍	❍	❍
17.	❍	❍	❍	❍
18.	❍	❍	❍	❍
19.	❍	❍	❍	❍
20.	❍	❍	❍	❍

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Test Expiration Date: 9/1/2024	Course 1 DCA02DP	Course 2 DCA02IC23	Course 3 DCA03DE	Course 4 DCA02HD	Course 5 DCA01MD	Course 6 DCA02OH