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2023
CONTINUING EDUCATION FOR CALIFORNIA DENTISTS

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Dental Considerations for Geriatric Patients
Men's Health Issues

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NetCE | P.O. Box 997571 | Sacramento, CA 95899 | 800-232-4238 | Fax: 916-783-6067

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P.O. Box 997571
Sacramento, CA 95899
Tel: 800-232-4238 (within the U.S.)
916-783-4238 (outside the U.S.)
Fax: 916-783-6067
Email: Info@NetCE.com
Website: www.NetCE.com

NETCE
Director of Development and Academic Affairs, Sarah Campbell
Director of NetCE, Julie Goodwin
Chief Information Officer, Kevin Bluck
Director of Graphic Services, Kathryn Harris
Director of Operations, Alma Parra

Division Planners
Alice Yick Flanagan, PhD, MSW
Margo A. Halm, RN, PhD, ACNS-BC
John V. Jurica, MD, MPH
John M. Leonard, MD
Ronald Runciman, MD
Shannon E. Smith, MHSC, CST, CSFA
Mark J. Szarejko, DDS, FAGD
James Trent, PhD

Featured Contributing Faculty
Lori L. Alexander, MTPW, ELS, MWC
William E. Frey, DDS, MS, FICD
John M. Leonard, MD
Mark J. Szarejko, DDS, FAGD

The California Dental Practice Act

This course fulfills the California requirement for 2 hours of California Dental Practice Act education.

Audience
This course is designed for all California dentists, dental hygienists, and dental assistants in all practice settings.

Course Objective
The purpose of this course is to provide California dental professionals with a working knowledge of the contents of the California Dental Practice Act, ensuring that they practice legally and safely.

Learning Objectives
Upon completion of this course, you should be able to:

1. Define the scope of practice of dental professionals in California.
2. Describe the standards of licensure of and medication prescription by dental professionals in California.
3. Identify possible victims of violence or neglect and outline the appropriate response.

Faculty
William E. Frey, DDS, MS, FICD, graduated from the University of California School of Dentistry, San Francisco, California, in 1966. In 1975, he completed residency training in Periodontics and received a Master's degree from George Washington University.

Dr. Frey retired from the United States Army Dental Corps in 1989 after 22 years of service. Throughout the course of his professional career, he has continuously practiced dentistry, the first 7 years as a general dentist and the past more than 40 as a periodontist. His military experience included the command of a networked Dental Activity consisting of five dental clinics. In his last assignment, he was in charge of a 38-chair facility. Colonel Frey was selected by the Army to serve on two separate occasions as the Chair of the Periodontal Department in Army General Dentistry Residency Training Programs.

Dr. Frey is the founder and president of Perio Plus, a practice management firm specializing in creating individually-designed hygiene and periodontal care programs for general dentists. He is also the creator of the Inspector Gum patient education series.

Faculty Disclosure
Contributing faculty, William E. Frey, DDS, MS, FICD, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Division Planner
Mark J. Szarejko, DDS, FAGD

Director of Development and Academic Affairs
Sarah Campbell

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AGD Subject Code 563.

This course meets the Dental Board of California's requirements for 2 units of continuing education.

Dental Board of California course #02-3841-00343.

Special Approvals

This course fulfills the California requirement for 2 hours of Dental Practice Act education.

About the Sponsor

The purpose of NetCE is to provide challenging curricula to assist healthcare professionals to raise their levels of expertise while fulfilling their continuing education requirements, thereby improving the quality of healthcare.

Our contributing faculty members have taken care to ensure that the information and recommendations are accurate and compatible with the standards generally accepted at the time of publication. The publisher disclaims any liability, loss or damage incurred as a consequence, directly or indirectly, of the use and application of any of the contents. Participants are cautioned about the potential risk of using limited knowledge when integrating new techniques into practice.

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- A full Works Cited list is available online at www.NetCE.com.

INTRODUCTION

The California Dental Practice Act is the body of laws in the California Business and Professions Code (CBPC) and the California Code of Regulations (CCR) governing all dental professionals, including dentists, oral and maxillofacial surgeons, orthodontists, unlicensed dental assistants, registered dental assistants, and dental hygienists. The Act is intended to serve as a legal guideline for both professionals and the public regarding all aspects of dental practice. As defined in Section 1016.(b)1 of the CCR, continuing education on the California Dental Practice Act is required and must include instruction on utilization, scope of practice, prescribing laws, violations, citations, fines, licensure, the identification of abuse, and mandatory abuse reporting [1]. Of course, the Act is a much larger volume, so much so that it is beyond the scope of this course to elucidate every section. The Dental Practice Act is not intended to replace professional oaths and codes of ethics but does define actions and omissions that may lead to legal action and revocation of a license to practice dentistry in the State of California, the laws of which are continually evolving.

The Dental Board of California (a division of the California Department of Consumer Affairs), which consists of eight practicing dentists, one registered dental hygienist, one registered dental assistant (each practicing for at least five years), and five public members, is responsible for licensure of qualified dental health professionals, enforcement of the California Dental Practice Act, and improving the education of consumers and licensees [19]. The Board's highest priority is to protect the health and safety of the public.

In addition, the practice of dental hygiene is regulated by the Dental Hygiene Board of California, the first of its kind in the United States [20].

DENTISTRY DEFINED: SCOPE OF PRACTICE

According to the American Dental Association, dentistry is defined as "the evaluation, diagnosis, prevention, and treatment of diseases, disorders, and conditions of the oral cavity, the craniomaxillofacial area and the adjacent structures and their impact on the human body. This care is provided by dentists within the scope of their education, training and experience in accordance with the ethics of the profession and applicable law" [2]. The CBPC and the CCR provide specific information regarding utilization and scope of practice for dentists, unlicensed dental assistants, registered dental assistants, and registered dental hygienists, as evidenced in the following sections [1].

DENTISTS

CBPC Section 1625. Dentistry is 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. Without limiting the foregoing, a person practices dentistry within the meaning of this chapter who does any one or more of the following [24]:

(a) By card, circular, pamphlet, newspaper, Internet website, social media, or in any other way advertises themselves or represents themselves to be a dentist.

(b) Performs, or offers to perform, an operation or diagnosis of any kind, or treats diseases or lesions of the human teeth, alveolar process, gums, jaws, or associated structures, or corrects malposed positions thereof.

(c) In any way indicates that the person will perform by themselves or their agents or servants any operation upon the human teeth, alveolar process, gums, jaws, or associated structures, or in any way indicates that the person will construct, alter, repair, or sell any bridge, crown, denture or other prosthetic appliance or orthodontic appliance.

(d) Makes, or offers to make, an examination of, with the intent to perform or cause to be performed any operation on the human teeth, alveolar process, gums, jaws, or associated structures.

(e) Manages or conducts as manager, proprietor, conductor, lessor, or otherwise, a place where dental operations are performed.

The Board requires that dentists ensure that each patient of record receives a copy of the Dental Materials Fact Sheet (provided by the Board) prior to the placement of his or her first dental restoration [25]. The Dental Materials Fact Sheet details the comparative risks and benefits of available dental restorative materials. The patient must sign an acknowledgment of receipt of the fact sheet, and a copy of the acknowledgment must be placed in the patient's record.

DENTAL ASSISTANTS (UNLICENSED)

Although unlicensed dental assistants are not Board approved, their duties and actions are governed by the Act and they are required to complete coursework in the Dental Practice Act, infection control, and basic life support. Failure to follow the regulations set forth by California law can result in fines and/or imprisonment. As defined in CBPC Section 1750.(a), "A dental assistant is an individual who, without a license, may perform basic supportive dental procedures, as authorized by Section 1750.1 and by regulations adopted by the board, under the supervision of a licensed dentist" [1]. Basic supportive dental procedures are those procedures that have technically elementary characteristics, are completely reversible, and are

unlikely to precipitate potentially hazardous conditions for the patient being treated. A licensed dentist is responsible for assuring unlicensed dental assistants' competence and ensuring that they complete required coursework (e.g., two-hour Dental Practice Act, eight-hour infection control, basic life support) and maintain certification in basic life support (if employed for longer than 120 days). Specific duties pertaining to dental assistant practice can be found in CCR Section 1085 [28]. General information regarding regulations pertaining to dental assistants is located in CBPC Sections 1740–1777; although these sections are not discussed in this course, they should be periodically reviewed to ensure self-compliance with the act. The CBPC may include additional duties for various dental assistant professions.

CCR Section 1085. Dental Assistant Duties and Settings.

(a) Unless specifically so provided by regulation, a dental assistant may not perform the following functions or any other activity which represents the practice of dentistry or requires the knowledge, skill and training of a licensed dentist:
   1. Diagnosis and treatment planning;
   2. Surgical or cutting procedures on hard or soft tissue;
   3. Fitting and adjusting of correctional and prosthodontic appliances;
   4. Prescription of medicines;
   5. Placement, condensation, carving or removal of permanent restorations, including final cementation procedures;
   6. Irrigation and medication of canals, try-in cones, reaming, filing or filling of root canals;
   7. Taking of impressions for prosthodontic appliances, bridges or any other structures which may be worn in the mouth;
   8. Administration of injectable and/or general anesthesia;
   9. Oral prophylaxis procedures.

(b) A dental assistant may perform such basic supportive dental procedures as the following under the general supervision of a licensed dentist:
   1. Extra-oral duties or functions specified by the supervising dentist;
   2. Operation of dental radiographic equipment for the purpose of oral radiography if the dental assistant has complied with the requirements of section 1656 of the Code;
   3. Examine orthodontic appliances.

(c) A dental assistant may perform such basic supportive dental procedures as the following under the direct supervision of a licensed dentist when done so pursuant to the order, control and full professional responsibility of the supervising dentist. Such procedures shall be checked and approved by the supervising dentist prior to dismissal of the patient from the office of said dentist.
   1. Take impressions for diagnostic and opposing models, bleaching trays, temporary crowns and bridges, and sports guards;
   2. Apply non-aerosol and non-caustic topical agents;
   3. Remove post-extraction and periodontal dressings;
   4. Placement of elastic orthodontic separators;
   5. Remove orthodontic separators;
   6. Assist in the administration of nitrous oxide analgesia or sedation; however, 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 dentist who shall be present at the patient's chairside at the implementation of these instructions. This regulation shall not be construed to prevent any person from taking appropriate action in the event of a medical emergency.
   7. Hold anterior matrices;
   8. Remove sutures;
   9. Take intra-oral measurements for orthodontic procedures;
   10. Seat adjusted retainers or headgears, including appropriate instructions;
   11. Check for loose bands;
   12. Remove arch wires;
   13. Remove ligature ties;
   14. Apply topical fluoride, after scaling and polishing by the supervising dentist or a registered dental hygienist;
   15. Place and remove rubber dams;
   16. Place, wedge and remove matrices;
   17. Cure restorative or orthodontic materials in operative site with light-curing device.

For the purpose of this section, a supervising licensed dentist is defined as a dentist whose patient is receiving the services of a dental assistant in the treatment facility and is under the direct control of said licensed dentist [1]. Direct supervision is defined as supervision of dental procedures based on instructions given by a licensed dentist who must be physically present in the facility when the procedures are performed.

REGISTERED DENTAL ASSISTANTS

Registered dental assistants (RDAs) are Board-licensed professionals who may perform a greater range of duties than unlicensed dental assistants. Specific information pertaining to RDAs' scope of practice can be found in CCR Section 1086, and general information regarding regulations pertaining to RDAs is located in CBPC Sections 1740–1777, which should be reviewed periodically to ensure self-compliance with the act [28].

CCR Section 1086. RDA Duties and Settings.

(a) Unless specifically so provided by regulation, the prohibitions contained in section 1085 of these regulations apply to registered dental assistants.

(b) A registered dental assistant may perform all functions which may be performed by a dental assistant.

(c) Under general supervision, a registered dental assistant may perform the following duties:

1. Mouth-mirror inspection of the oral cavity, to include charting of obvious lesions, existing restorations and missing teeth;
2. Placement and removal of temporary sedative dressings.

(d) A registered dental assistant may perform the following procedures under the direct supervision of a licensed dentist when done so pursuant to the order, control and full professional responsibility of the supervising dentist. Such procedures shall be checked and approved by the supervising dentist prior to dismissal of the patient from the office of said dentist.

1. Obtain endodontic cultures;
2. Dry canals, previously opened by the supervising dentist, with absorbent points;
3. Test pulp vitality;
4. Place bases and liners on sound dentin;
5. Remove excess cement from supragingival surfaces of teeth with a hand instrument or floss;
6. Size stainless steel crowns, temporary crowns and bands;
7. Fabrication of temporary crowns intra-orally;
8. Temporary cementation and removal of temporary crowns and removal of orthodontic bands;
9. Placement of orthodontic separators;
10. Placement and ligation of arch wires;
11. Placement of post-extraction and periodontal dressings;
12. Apply bleaching agents;
13. Activate bleaching agents with non-laser light-curing device;
14. Take bite registrations for diagnostic models for case study only;
15. Coronal polishing (Evidence of satisfactory completion of a board-approved course of instruction in this function must be submitted to the board prior to any performance thereof). The processing times for coronal polishing course approval are set forth in section 1069.

    This procedure shall not be intended or interpreted as a complete oral prophylaxis (a procedure which can be performed only by a licensed dentist or registered dental hygienist). A licensed dentist or registered dental hygienist shall determine that the teeth to be polished are free of calculus or other extraneous material prior to coronal polishing.
16. Removal of excess cement from coronal surfaces of teeth under orthodontic treatment by means of an ultrasonic scaler. (Evidence of satisfactory completion of a board-approved course of instruction or equivalent instruction in an approved RDA program in this function must be submitted to the board prior to any performance thereof.) The processing times for ultrasonic scaler course approval are set forth in section 1069.

(e) Settings. Registered dental assistants may undertake the duties authorized by this section in a treatment facility under the jurisdiction and control of the supervising licensed dentist, or in an equivalent facility approved by the board.

Registered Dental Assistants in Extended Functions

Registered dental assistants in extended functions (RDAEFs) are Board-licensed dental professionals who have a greater breadth of permitted duties than RDAs. Specifics regarding these allowed duties can be found in CCR Section 1087 [28].

CCR Section 1087. RDAEF Duties and Settings.

(a) Unless specifically so provided by regulation, the prohibitions contained in Section 1085 apply to RDAEFs.

(b) An RDAEF may perform all duties assigned to dental assistants and registered dental assistants.

(c) An RDAEF may perform the procedures set forth below under the direct supervision of a licensed dentist when done so pursuant to the order, control and full professional responsibility of the supervising dentist. Such procedures shall be checked and approved by the supervising dentist prior to dismissal of the patient from the office of said dentist.

1. Cord retraction of gingivae for impression procedures;
2. Take impressions for cast restorations;
3. Take impressions for space maintainers, orthodontic appliances, and occlusal guards;
4. Prepare enamel by etching for bonding;
5. Formulate indirect patterns for endodontic post and core castings;
6. Fit trial endodontic filling points;
7. Apply pit and fissure sealants;
8. Remove excess cement from subgingival tooth surfaces with a hand instrument;
9. Apply etchant for bonding restorative materials.

(d) Settings. Registered dental assistants in extended functions may undertake the duties authorized by this section in a treatment facility under the jurisdiction and control of the supervising licensed dentist, or in an equivalent facility approved by the board.

In addition to the duties outlined in CCR section 1087, section 1753.5 of the CBPC states that RDAEFs may conduct preliminary evaluation of the patient's oral health, including, but not limited to, charting, intraoral and extra-oral evaluation of soft tissue, classifying occlusion, and myofunctional evaluation, and 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 [1]. RDAEFs may hold an orthodontic assistant permit, a dental sedation assistant permit, or both.

DENTAL HYGIENISTS

Registered dental hygienists (RDHs), registered dental hygienists in extended functions (RDHEFs), and registered dental hygienists in alternative practice (RDHAPs) are Board-licensed occupations administered by the Dental Hygiene Committee of California, and the California Dental Practice Act contains the main body of laws and regulations that govern their practice.

The Dental Hygiene Committee of California was created by the Board and consists of nine governor-appointed positions: four public members, four dental hygienists, and one practicing dentist [20]. Responsibilities of the Dental Hygiene Committee include adopting regulations; issuing, reviewing, and revoking licenses; developing and administering examinations; determining fees; and updating continuing education requirements for all dental hygiene licensure categories. The Act contains specific information regarding the permitted duties and settings of RDH practice (CCR Section 1088), RDHEF practice (CCR Section 1089), and RDHAP practice (CCR Section 1090) [28]. Additional laws and regulations pertaining specifically to dental hygiene practice are located in CBPC Sections 1900–1966.6. These sections should be periodically reviewed to ensure self-compliance with the Act.

Registered Dental Hygienists

CCR Section 1088. RDH Duties and Settings.

(a) Unless specifically so provided by regulation, the prohibition contained in Section 1085(a), subsections (1) through (8) of these regulations shall apply to duties performed by a registered dental hygienist.

(b) A registered dental hygienist may perform all duties assigned to dental assistants and registered dental assistants, under the supervision of a licensed dentist as specified in these regulations.

(c) Under general supervision, a registered dental hygienist may perform the following duties in addition to those provided by Section 1760(b) of the Code:

1. Root planing;
2. Polish and contour restorations;
3. Oral exfoliative cytology;
4. Apply pit and fissure sealants;
5. Preliminary examination, including but not limited to:
   A. Periodontal charting;
   B. Intra and extra-oral examination of soft tissue;
   C. Charting of lesions, existing restorations and missing teeth;
   D. Classifying occlusion;
   E. Myofunctional evaluation.
6. Irrigate sub-gingivally with an antimicrobial and/or antibiotic liquid solution(s).
7. The following direct supervision duties of dental assistants and registered dental assistants:
   A. Dental Assistant.
      1. Taking impressions for diagnostic and opposing models;
      2. Applying non-aerosol and non-caustic topical agents;
      3. Removing post-extraction and periodontal dressings;
      4. Removing sutures;
      5. Taking intra-oral measurements for orthodontic procedures;
      6. Checking for loose bands;
      7. Removing ligature ties;
      8. Applying topical fluoride;
      9. Placing elastic separators.
   B. Registered Dental Assistant
      1. Test pulp vitality;
      2. Removing excess cement from supragingival surfaces of teeth;

3. Sizing stainless steel crowns, temporary crowns and bands;
4. Temporary cementation and removal of temporary crowns and removal of orthodontic bands;
5. Placing post-extraction and periodontal dressings.

(d) A registered dental hygienist may perform the procedures set forth below under the direct supervision of a licensed dentist when done so pursuant to the order, control and full professional responsibility of the supervising dentist. Such procedures shall be checked and approved by the supervising dentist prior to dismissal of the patient from the office of said dentist.

1. Placement of antimicrobial or antibiotic medicaments which do not later have to be removed;
2. All duties so assigned to a dental assistant or a registered dental assistant, unless otherwise indicated;
3. Periodontal soft tissue curettage (Evidence of satisfactory completion of a board-approved course of instruction in this function must be submitted to the board prior to any performance thereof);
4. Administration of local anesthetic agents, infiltration and conductive, limited to the oral cavity (Evidence of satisfactory completion of a board-approved course of instruction in this function must be submitted to the board prior to any performance thereof);
5. Administration of nitrous oxide and oxygen when used as an analgesic, utilizing fail-safe type machines containing no other general anesthetic agents. (Evidence of satisfactory completion of a board-approved course of instruction in this function must be submitted to the board prior to any performance thereof.)

(e) A registered dental hygienist may undertake the duties authorized by this section in the following settings, provided the appropriate supervision requirements are met:

1. The treatment facility of a licensed dentist;
2. Licensed health facilities as defined in Section 1250 of the Health and Safety Code,
3. Licensed clinics as defined in Section 1203 of the Health and Safety Code,
4. Licensed community care facilities as defined in Section 1502 of the Health and Safety Code,
5. Schools of any grade level whether public or private,
6. Public institutions, including but not limited to federal, state and local penal and correctional facilities.
7. Mobile units operated by a public or governmental agency or a nonprofit and charitable organization approved by the board; provided, however, that the mobile unit meets the statutory and regulatory requirements for mobile units,
8. Home of a non-ambulatory patient, provided there is a written note from a physician or registered nurse stating that the patient is unable to visit a dental office.
9. Health fairs or similar non-profit community activities. Each such fair or activity shall be approved by the board.

Any other facility must be approved by the board.

Registered Dental Hygienists in Extended Functions

CCR Section 1089. RDHEF Duties and Settings.

(a) Unless specifically provided by regulation, the prohibitions contained in Section 1085(a) (1) through (8) shall apply to RDHEFs.

(b) An RDHEF may perform all duties assigned to dental assistants, registered dental assistants and registered dental hygienists.

(c) An RDHEF may perform the procedures set forth below under the direct supervision of a licensed dentist when done so pursuant to the order, control and full professional responsibility of the supervising dentist. Such procedures shall be checked and approved by the supervising dentist prior to dismissal of the patient from the office of said dentist.

1. Cord retraction of gingivae for impression procedures;
2. Take impressions for cast restorations;
3. Take impressions for space maintainers, orthodontic appliances and guards;
4. Prepare enamel by etching for bonding;
5. Formulate indirect patterns for endodontic post and core castings;
6. Fit trial endodontic filling points;
7. Apply etchant for bonding restorative materials.

(d) Settings. Registered dental hygienists in extended functions may undertake the duties authorized by this section in a treatment facility under the jurisdiction and control of the supervising licensed dentist, or an equivalent facility approved by the Board.

Registered Dental Hygienists in Alternative Practice

CCR Section 1090. RDHAP Duties and Settings.

(a) Unless specifically so provided by regulation, an RDHAP may not perform the following functions or any activity which represents the practice of dentistry or requires knowledge, skill and training of a licensed dentist:

1. Diagnosing and treatment planning;
2. Surgical or cutting procedures on hard or soft tissue;
3. Fitting and adjusting of correctional and prosthodontic appliances;

4. Prescribing medication;
5. Placing, condensing, carving or removal of permanent restorations, including final cementation procedures;
6. Irrigating and medicating canals, try-in cones, reaming, filing or filling of root canals;
7. Taking of impressions for prosthodontic appliances, bridges, or any other devices which may be worn in the mouth;
8. Administering local or general anesthesia, oral or parental conscious sedation.

(b) Under the supervision of a licensed dentist, an RDHAP may perform the duties assigned to registered dental hygienists by Section 1088, under the same levels of supervision and in the same settings as specified in that section, in addition to those duties permitted by Section 1768(b)(3).

(c) Independently and without the supervision of a licensed dentist, an RDHAP may, upon the prescription of a dentist or a physician and surgeon licensed in California, perform the duties assigned to a registered dental hygienist by Section 1088(c).

1. All prescriptions shall contain the following information:
   A. The pre-printed name, address, license number, and signature of the prescribing dentist or physician and surgeon.
   B. The name, address and phone number of the patient.
   C. The date the services are prescribed and the expiration date of the prescription. The prescription shall be for dental hygiene services and, if necessary, include special instructions for the care of that patient.

Prior to the establishment of an independent practice, an RDHAP shall provide to the board documentation of an existing relationship with at least one dentist for referral, consultation, and emergency services [1].

LICENSURE

All individuals practicing dentistry in California, with the exception of unlicensed dental assistants, must hold a current, valid license issued by the Board; California does not grant reciprocity with other states or nations. The Act requires that dental professionals meet certain education requirements, submit the correct applications and fees, pass the appropriate examinations, and submit a set of fingerprints. Fingerprinting is also required for license renewal if not previously conducted by the California Department of Justice (DOJ) or if records no longer exist [21]. Fingerprinting within California must be conducted using the DOJ Live Scan system; fingerprint records from other institutions (e.g., Department of Motor Vehicles) are not suitable, although ink-on-card fingerprints made at a law enforcement agency are acceptable if unable to travel to California. The required fingerprint cards must be requested from the Dental Board by phone or email [21]. The fingerprints will be used to conduct a criminal history record check and a state and federal level criminal offender record information search.

Issuance, review, and revocation of RDH/RDHEF/RDHAP licenses and the development and administration of license examinations for these auxiliaries are handled by the Dental Hygiene Board of California. All other licensure, including that for RDAs/RDAEFs, is handled by the Dental Board (despite the existence of the Dental Assisting Council, whose purpose is to consider matters related to dental assisting practice and make recommendations to the board). Complaints, investigations, and enforcement are handled by either the Dental Hygiene Board or the Dental Board, according to profession, but the governing regulations and laws set forth in the California Dental Practice Act pertain to all dental professionals. Information about application for licensure to practice as a dentist or dental auxiliary can be found in CCR Section 1028 and CCR Sections 1076 – 1079.3, respectively. Specific information about the licensure application requirements and process for dentists and dental assistants can be found at https://www.dbc.ca.gov/applicants and for hygienists at https://www.dhbc.ca.gov/applicants.

Effective July 2012, application for licensure may be denied based on delinquent state tax payments [1]. Similarly, current licenses/certifications/registrations may be revoked for failure to pay taxes.

LICENSE RENEWAL

Licenses for all dental professions must be renewed every two years before the last day of the professional's birth month. Practicing without renewing after this date is considered practicing without a license [1]. It is required that dentists have completed 50 hours of continuing education and dental auxiliaries (excluding RDHAPs) have completed 25 hours of continuing education (maximum of 25 hours and 12.5 hours of home study, respectively) upon renewal submission. The continuing education requirement is 35 hours for RDHAPs. Coursework regarding the Dental Practice Act, infection control, and basic life support is mandatory every two years for all licensees. To receive credit, all courses must be from Board-approved providers. In addition, the Board has identified topics that may only constitute a portion of the full continuing education requirement or that are not acceptable at all. A complete listing of allowable and non-allowable courses is available on the Board website.

Links to information regarding license renewal for dentists and dental assistants can be found at https://www.dbc.ca.gov/licensees, and renewal information for hygienists can be found at https://www.dhbc.ca.gov/licensees/renewals.

ACTS LEADING TO SUSPENSION OF A LICENSE AND IN VIOLATION OF THE DENTAL PRACTICE ACT

Violations of the Act by Board licensees are grounds for suspension of a license/certification and are handled by the Board's Enforcement Program, which is composed of five sections: complaint intake, complaint analysis, inspection, investigation, and probation [22]. Complaints originate from many sources, including dental professionals, healthcare providers, insurance companies, law enforcement agencies, and patients. Complaint intake specialists route these to the appropriate section; for example, an allegation of an unsafe or unsanitary office condition is routed to the inspection section, whereby Board enforcement inspectors may be sent out and are authorized to issue citations and fines. In addition to Board enforcement action, other law enforcement or regulatory agencies are involved when indicated [1]. Dental professionals placed on probation status by the Board for violations of the Act are monitored by the Enforcement Program's probation section. The Board's Enforcement Unit may be contacted at (916) 274-6326. Violations of the Act by hygienists are handled by the Hygiene Board's Complaint Unit, which operates in a similar manner and can be contacted at (866) 810-9899 or by email at DHBCEnforcement@dca.ca.gov.

According to CBPC Section 1670.1, conviction of crimes committed by dental professionals outside of the workplace may also be grounds for Board discipline and can impact licensure status if the crime is "substantially related to the qualifications, functions, or duties of a dentist or dental assistant licensed under this chapter" [1]. These vary considerably on a case-by-case basis. Various lesser convictions, for example, driving under the influence (DUI), illicit drug possession, and prescription drug diversion, may not necessarily lead to license revocation provided the proper steps are taken toward remediation (e.g., entering the Board diversion program, submitting to periodic drug testing) [23]. In general, convictions for assaults, sex crimes, multiple misdemeanors (e.g., second DUI/controlled substance charge), and other egregious violations constitute a basis for denial or revocation of licenses or certifications. In addition to violations outside the workplace, unprofessional conduct, in its many forms, is grounds for Board Enforcement action. Acts and omissions that characterize unprofessional conduct are covered extensively in CBPC Sections 1680, 1681, and 1682 and CCR Section 1018.05.

CBPC Section 1680. Unprofessional conduct by a person licensed under this chapter is defined as, but is not limited to, any one of the following:

(a) The obtaining of any fee by fraud or misrepresentation.

(b) The employment directly or indirectly of any student or suspended or unlicensed dentist to practice dentistry as defined in this chapter.

(c) The aiding or abetting of any unlicensed person to practice dentistry.

(d) The aiding or abetting of a licensed person to practice dentistry unlawfully.

(e) The committing of any act or acts of sexual abuse, misconduct, or relations with a patient that are substantially related to the practice of dentistry.

(f) The use of any false, assumed, or fictitious name, either as an individual, firm, corporation, or otherwise, or any name other than the name under which the person is licensed to practice, in advertising or in any other manner indicating that the person is practicing or will practice dentistry, except that name as is specified in a valid permit issued pursuant to Section 1701.5.

(g) The practice of accepting or receiving any commission or the rebating in any form or manner of fees for professional services, radiograms, prescriptions, or other services or articles supplied to patients.

(h) The making use by the licensee or any agent of the licensee of any advertising statements of a character tending to deceive or mislead the public.

(i) The advertising of either professional superiority or the advertising of performance of professional services in a superior manner. This subdivision shall not prohibit advertising permitted by subdivision (h) of Section 651.

(j) The employing or the making use of solicitors.

(k) The advertising in violation of Section 651.

(l) The advertising to guarantee any dental service, or to perform any dental operation painlessly. This subdivision shall not prohibit advertising permitted by Section 651.

(m) The violation of any of the provisions of law regulating the procurement, dispensing, or administration of dangerous drugs, as defined in Chapter 9 (commencing with Section 4000) or controlled substances, as defined in Division 10 (commencing with Section 11000) of the Health and Safety Code.

(n) The violation of any of the provisions of this division.

(o) The permitting of any person to operate dental radiographic equipment who has not met the requirements of Section 1656.

(p) The clearly excessive prescribing or administering of drugs or treatment, or the clearly excessive use of diagnostic procedures, or the clearly excessive use of diagnostic or treatment facilities, as determined by the customary practice and standards of the dental profession. Any person who violates this subdivision is guilty of a misdemeanor and shall be punished by a fine of not less than one hundred dollars ($100) or more than six hundred dollars ($600), or by imprisonment for a term of not less than 60 days or more than 180 days, or by both a fine and imprisonment.

(q) The use of threats or harassment against any patient or licensee for providing evidence in any possible or actual disciplinary action, or other legal action; or the discharge of an employee primarily based on the employee's attempt to comply with the provisions of this chapter or to aid in the compliance.

(r) Suspension or revocation of a license issued, or discipline imposed, by another state or territory on grounds that would be the basis of discipline in this state.

(s) The alteration of a patient's record with intent to deceive.

(t) Unsanitary or unsafe office conditions, as determined by the customary practice and standards of the dental profession.

(u) The abandonment of the patient by the licensee, without written notice to the patient that treatment is to be discontinued and before the patient has ample opportunity to secure the services of another dentist, registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions and provided the health of the patient is not jeopardized.

(v) The willful misrepresentation of facts relating to a disciplinary action to the patients of a disciplined licensee.

(w) Use of fraud in the procurement of any license issued pursuant to this chapter.

(x) Any action or conduct that would have warranted the denial of the license.

(y) The aiding or abetting of a licensed dentist, dental assistant, registered dental assistant, registered dental assistant in extended functions, dental sedation assistant permitholder, orthodontic assistant permitholder, registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions to practice dentistry in a negligent or incompetent manner.

(z) 1. The failure to report to the board in writing within seven days any of the following: (A) the death of the licensee's patient during the performance of any dental or dental hygiene procedure; (B) the discovery of the death of a patient whose death is related to a dental or dental hygiene procedure performed by the licensee; or (C) except for a scheduled hospitalization, the removal to a hospital or emergency center for medical treatment of any patient to whom oral conscious sedation, conscious sedation, or general anesthesia was administered, or any patient as a result of dental or dental hygiene treatment. 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. Upon receipt of a report pursuant to this subdivision the board may conduct an inspection of the dental office if the board finds that it is necessary. A dentist shall report to the board all deaths occurring in the licensee's practice with a copy sent to the Dental Hygiene Board of California if the death was the result of treatment by a registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions. A registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions shall report to the Dental Hygiene Board of California all deaths occurring as the result of dental hygiene treatment, and a copy of the notification shall be sent to the board.

2. The report required by this subdivision shall be on a form or forms approved by the board. The form or forms approved by the board shall require the licensee to include, but not be limited to, the following information for cases in which patients received anesthesia: the date of the procedure; the patient's age in years and months, weight, and sex; the patient's American Society of Anesthesiologists (ASA) physical status; the patient's primary diagnosis; the patient's coexisting diagnoses; the procedures performed; the sedation setting; the medications used; the monitoring equipment used; the category of the provider responsible for sedation oversight; the category of the provider delivering sedation; the category of the provider monitoring the patient during sedation; whether the person supervising the sedation performed one or more of the procedures; the planned airway management; the planned depth of sedation; the complications that occurred; a description of what was unexpected about the airway management; whether there was transportation of the patient during sedation; the category of the provider conducting resuscitation measures; and the resuscitation equipment utilized. Disclosure of individually identifiable patient information shall be consistent with applicable law. A report required by this subdivision shall not be admissible in any action brought by a patient of the licensee providing the report.

3. For the purposes of paragraph (2), categories of provider are: General Dentist, Pediatric Dentist, Oral Surgeon, Dentist Anesthesiologist, Physician Anesthesiologist, Dental Assistant, Registered Dental Assistant, Dental Sedation Assistant, Registered Nurse, Certified Registered Nurse Anesthetist, or Other.
4. The form shall state that this information shall not be considered an admission of guilt, but is for educational, data, or investigative purposes.
5. The board may assess a penalty on any licensee who fails to report an instance of an adverse event as required by this subdivision. The licensee may dispute the failure to file within 10 days of receiving notice that the board had assessed a penalty against the licensee.

(aa) Participating in or operating any group advertising and referral services that are in violation of Section 650.2.

(ab) The failure to use a fail-safe machine with an appropriate exhaust system in the administration of nitrous oxide. The board shall, by regulation, define what constitutes a fail-safe machine.

(ac) Engaging in the practice of dentistry with an expired license.

(ad) Except for good cause, the knowing failure to protect patients by failing to follow infection control guidelines of the board, thereby risking transmission of bloodborne infectious diseases from dentist, dental assistant, registered dental assistant, registered dental assistant in extended functions, dental sedation assistant permitholder, orthodontic assistant permitholder, registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions to patient, from patient to patient, and from patient to dentist, dental assistant, registered dental assistant, registered dental assistant in extended functions, dental sedation assistant permitholder, orthodontic assistant permitholder, registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions. In administering this subdivision, the board shall consider referencing the standards, regulations, and guidelines of the State Department of Public Health developed pursuant to Section 1250.11 of the Health and Safety Code and the standards, guidelines, and regulations pursuant to the California Occupational Safety and Health Act of 1973 (Part 1 (commencing with Section 6300) of Division 5 of the Labor Code) for preventing the transmission of HIV, hepatitis B, and other bloodborne pathogens in health care settings. The board shall review infection control guidelines, if necessary, on an annual basis and proposed changes shall be reviewed by the Dental Hygiene Board of California to establish a consensus. The Board shall submit any recommended changes to the infection control guidelines for review to establish a consensus. As necessary, the board shall consult with the Medical Board of California, the California Board of Podiatric Medicine, the Board of Registered Nursing, and the Board of Vocational Nursing and Psychiatric Technicians, to encourage appropriate consistency in the implementation of this subdivision.

The board shall seek to ensure that all appropriate dental personnel are informed of the responsibility to follow infection control guidelines, and of the most recent scientifically recognized safeguards for minimizing the risk of transmission of bloodborne infectious diseases.

(ae) The utilization by a licensed dentist of any person to perform the functions of any registered dental assistant, registered dental assistant in extended functions, dental sedation assistant permitholder, orthodontic assistant permitholder, registered dental hygienist, registered dental hygienist in alternative practice, or registered dental hygienist in extended functions who, at the time of initial employment, does not possess a current, valid license or permit to perform those functions.

(af) The prescribing, dispensing, or furnishing of dangerous drugs or devices, as defined in Section 4022, in violation of Section 2242.1.

(ag) 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.

(ah) The failure by the treating dentist, prior to the initial diagnosis and correction of malpositions of human teeth or initial use of orthodontic appliances, to perform an examination pursuant to subdivision (b) of Section 1684.5, including the review of the patient's most recent diagnostic digital or conventional radiographs or other equivalent bone imaging suitable for orthodontia. New radiographs or other equivalent bone imaging shall be ordered if deemed appropriate by the treating dentist.

Section 1681. In addition to other acts constituting unprofessional conduct within the meaning of this chapter, it is unprofessional conduct for a person licensed under this chapter to do any of the following:

(a) Obtain or possess in violation of law, or except as directed by a licensed physician and surgeon, dentist, or podiatrist, administer to himself, any controlled substance, 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) Use any controlled substance, 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, or alcoholic beverages or other intoxicating substances, to an extent or in a manner dangerous or injurious to himself, to any person, or the public to the extent that such use impairs his ability to conduct with safety to the public the practice authorized by his license.

(c) The conviction of a charge of violating any federal statute or rules, or any statute or rule of this state, regulating 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, or the conviction of more than one misdemeanor, or any felony, involving the use or consumption of alcohol or drugs, if the conviction is substantially related to the practice authorized by his license. The record of conviction or certified copy thereof, certified by the clerk of the court or by the judge in whose court the conviction is had, shall be conclusive evidence of a violation of this section; a plea or verdict of guilty or a conviction following a plea of *nolo contendere* is deemed to be a conviction within the meaning of this section; the board may order the license suspended or revoked, or may decline to issue a license, when the time for appeal has elapsed or the judgment of conviction has been affirmed on appeal, or when an order granting probation is made suspending imposition of sentence, irrespective of a subsequent order under any provision of the Penal Code, including, but not limited to, Section 1203.4 of the Penal Code, allowing such person to withdraw his plea of guilty and to enter a plea of not guilty, or setting aside the verdict of guilty, or dismissing the accusation, information or indictment.

Section 1682. In addition to other acts constituting unprofessional conduct under this chapter, it is unprofessional conduct for:

(a) Any dentist performing dental procedures to have more than one patient undergoing moderate sedation, deep sedation, or general anesthesia on an outpatient basis at any given time unless each patient is being continuously monitored on a one-to-one ratio while sedated by either the dentist or another licensed health professional authorized by law to administer moderate sedation, deep sedation, or general anesthesia.

(b) Any dentist with patients recovering from moderate sedation, deep sedation, or general anesthesia to fail to have the patients closely monitored by licensed health professionals experienced in the care and resuscitation of patients recovering from moderate sedation, deep sedation, or general anesthesia. If one licensed professional is responsible for the recovery care of more than one patient at a time, all of the patients shall be physically in the same room to allow continuous visual contact with all patients and the patient to recovery staff ratio should not exceed three to one.

(c) Any dentist with patients who are undergoing deep sedation, general anesthesia, or moderate sedation to fail to have these patients continuously monitored during the dental procedure with a pulse oximeter or similar or superior monitoring equipment and ventilation continuously monitored using at least two of the three following methods:

1. Auscultation of breath sounds using a precordial stethoscope.
2. Monitoring for the presence of exhaled carbon dioxide with capnography.
3. Verbal communication with a patient under moderate sedation. This method shall not be used for a patient under deep sedation or general anesthesia.

(d) Any dentist with patients who are undergoing moderate sedation to have dental office personnel directly involved with the care of those patients who are not certified in basic cardiac life support (CPR) and recertified biennially.

(e) 1. Any dentist to fail to obtain the written informed consent of a patient prior to administering moderate sedation, deep sedation, general anesthesia. In the case of a minor, the consent shall be obtained from the child's parent or guardian.

2. The written informed consent for general anesthesia, in the case of a minor, shall include, but not be limited to, the following information:

"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."

3. Nothing in this subdivision shall be construed to establish the reasonable standard of care for administering or monitoring oral moderate sedation, moderate sedation, deep sedation, or general anesthesia.

Section 1683. (a) Every dentist, dental health professional, or other licensed health professional who performs a service on a patient in a dental office shall identify himself or herself in the patient record by signing his or her name, or an identification number and initials, next to the service performed and shall date those treatment entries in the record. Any person licensed under this chapter who owns, operates, or manages a dental office shall ensure compliance with this requirement.

(b) Repeated violations of this section constitute unprofessional conduct.

Section 1683.1 (a) Any individual, partnership, corporation, or other entity that provides dental services through telehealth shall make available the name, telephone number, practice address, and California state license number of any dentist who will be involved in the provision of services to a patient prior to the rendering of services and when requested by a patient.

(b) A violation of this section shall constitute unprofessional conduct.

Section 1684. In addition to other acts constituting unprofessional conduct under this chapter, it is unprofessional conduct for a person licensed under this chapter to perform, or hold himself or herself out as able to perform, professional services beyond the scope of his or her license and field or fields of competence as established by his or her education, experience, training, or any combination thereof. This includes, but is not limited to, the use of any instrument or device in a manner that is not in accordance with the customary standards and practices of the dental profession. This section shall not apply to research conducted by accredited dental schools or colleges, or to research conducted pursuant to an investigational device exemption issued by the United States Food and Drug Administration.

1684.5. (a) In addition to other acts constituting unprofessional conduct under this chapter, it is unprofessional conduct for any dentist to perform or allow to be performed any treatment on a patient who is not a patient of record of that dentist. A dentist may, however, after conducting a preliminary oral examination, require or permit any dental auxiliary to perform procedures necessary for diagnostic purposes, provided that the procedures are permitted under the auxiliary's authorized scope of practice. Additionally, a dentist may require or permit a dental auxiliary to perform all of the following duties prior to any examination of the patient by the dentist, provided that the duties are authorized for the particular classification of dental auxiliary pursuant to Article 7 (commencing with Section 1740):

1. Expose emergency radiographs upon direction of the dentist.
2. If the dental auxiliary is a registered dental assistant in extended functions, a registered dental hygienist, or a registered dental hygienist in alternative practice, determine and perform radiographs for the specific purpose of aiding a dentist in completing a comprehensive diagnosis and treatment plan for a patient using telehealth, as defined by Section 2290.5, for the purpose of communication with the supervising dentist pursuant to Sections 1753.55, 1910.5, and 1926.05. A dentist is not required to review patient records or make a diagnosis using telehealth.
3. Perform extra-oral duties or functions specified by the dentist.
4. Perform mouth-mirror inspections of the oral cavity, to include charting of obvious lesions, malocclusions, existing restorations, and missing teeth.

(b) For purposes of this section, "patient of record" refers to a patient who has been examined, has had a medical and dental history completed and evaluated, and has had oral conditions diagnosed and a written plan developed by the licensed dentist.

(c) For purposes of this section, if dental treatment is provided to a patient by a registered dental assistant in extended functions, a registered dental hygienist, or a registered dental hygienist in alternative practice pursuant to the diagnosis and treatment plan authorized by a supervising dentist, at a location other than the dentist's practice location, it is the responsibility of the authorizing dentist that the patient or the patient's representative receive written notification that the care was provided at the direction of the authorizing dentist and that the notification include the authorizing dentist's name, practice location address, and telephone number. This provision shall not require patient notification for dental hygiene preventive services provided in public health programs as specified and authorized in Section 1911, or for dental hygiene care when provided as specified and authorized in Section 1926.

(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.

(e) This section shall not apply to dentists providing examinations on a temporary basis outside of a dental office in settings including, but not limited to, health fairs and school screenings.

(f) This section shall not apply to fluoride mouth rinse or supplement programs administered in a school or preschool setting.

Section 1685. In addition to other acts constituting unprofessional conduct under this chapter, it is unprofessional conduct for a person licensed under this chapter to require, either directly or through an office policy, or knowingly permit the delivery of dental care that discourages necessary treatment or permits clearly excessive treatment, incompetent treatment, grossly negligent treatment, repeated negligent acts, or unnecessary treatment, as determined by the standard of practice in the community.

CCR Section 1018.05 Unprofessional Conduct Defined. In addition to those acts detailed in Business and Professions Code Sections 1670, 1680, 1681 and 1682, the following shall also constitute unprofessional conduct:

(a) Failure to provide records requested by the Board within 15 days of the date of receipt of the request or within the time specified in the request, whichever is later, unless the licensee is unable to provide the documents within this time period for good cause. For the purposes of this section, "good cause" includes physical inability to access the records in the time allowed due to illness or travel.

(b) Failure to report to the Board, within 30 days, any of the following:

1. The bringing of an indictment or information charging a felony against the licensee.
2. The conviction of the licensee, including any verdict of guilty, or pleas of guilty or no contest, of any felony or misdemeanor.
3. Any disciplinary action taken by another professional licensing entity or authority of this state or of another state or an agency of the federal government or the United States military.
4. For the purposes of this section, "conviction" means a plea or verdict of guilty or a conviction following a plea of *nolo contendere* or "no contest" and any conviction that has been set aside or deferred pursuant to Sections 1000 or 1203.4 of the Penal Code, including infractions, misdemeanors, and felonies. "Conviction" does not include traffic infractions with a fine of less than one thousand dollars ($1,000) unless the infraction involved alcohol or controlled substances.

VIOLATIONS AND PENALTIES

As discussed, various acts or omissions can be cause for revocation or suspension of a license. Violation of any section of the Dental Practice Act can also lead to civil and criminal prosecution, including [1]:

Section 1700. Any person, company, or association is guilty of a misdemeanor, and upon conviction thereof shall be punished by imprisonment in the county jail not less than 10 days nor more than one year, or by a fine of not less than one hundred dollars ($100) nor more than one thousand five hundred dollars ($1,500), or by both fine and imprisonment, who:

(a) Assumes the degree of "doctor of dental surgery," "doctor of dental science," or "doctor of dental medicine" or appends the letters "DDS," or "DDSc" or "DMD" to his or her name without having had the right to assume the title conferred upon him or her by diploma from a recognized dental college or school legally empowered to confer the same.

(b) Assumes any title, or appends any letters to his or her name, with the intent to represent falsely that he or she has received a dental degree or license.

(c) 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.

(d) Within 10 days after demand is made by the executive officer of the board, fails to furnish to the board the name and address of all persons practicing or assisting in the practice of dentistry in the office of the person, company, or association, at any time within 60 days prior to the demand, together with a sworn statement showing under and by what license or authority this person, company, or association and any employees are or have been practicing dentistry. This sworn statement shall not be used in any prosecution under this section.

(e) Is under the influence of alcohol or a controlled substance while engaged in the practice of dentistry in actual attendance on patients to an extent that impairs his or her ability to conduct the practice of dentistry with safety to patients and the public.

Section 1700.5. Notwithstanding Section 1700, any person who holds a valid, unrevoked, and unsuspended certificate as a dentist under this chapter may append the letters "DDS" to his or her name, regardless of the degree conferred upon him or her by the dental college from which the licensee graduated.

Section 1701. Any person is for the first offense guilty of a misdemeanor and shall be punishable by a fine of not less than two hundred dollars ($200) or more than three thousand dollars ($3,000), or by imprisonment in a county jail for not to exceed six months, or both, and for the second or a subsequent offense is guilty of a felony and upon conviction thereof shall be punished by a fine of not less than two thousand dollars ($2,000) nor more than six thousand dollars ($6,000), or by imprisonment pursuant to subdivision (h) of Section 1170 of the Penal Code, or by both such fine and imprisonment, who:

(a) Sells or barters or offers to sell or barter any dental degree or any license or transcript made or purporting to be made pursuant to the laws regulating the license and registration of dentists.

(b) Purchases or procures by barter any such diploma, license or transcript with intent that the same shall be used in evidence of the holder's qualification to practice dentistry, or in fraud of the laws regulating such practice.

(c) With fraudulent intent, makes or attempts to make, counterfeits or alters in a material regard any such diploma, certificate or transcript.

(d) Uses, attempts or causes to be used, any such diploma, certificate or transcript which has been purchased, fraudulently issued, counterfeited or materially altered, either as a license to practice dentistry, or in order to procure registration as a dentist.

(e) In an affidavit, required of an applicant for examination, license or registration under this chapter, willfully makes a false statement in a material regard.

(f) Practices dentistry or offers to practice dentistry as it is defined in this chapter, either without a license, or when his license has been revoked or suspended.

(g) Under any false, assumed or fictitious name, either as an individual, firm, corporation or otherwise, or any name other than the name under which he is licensed, practices, advertises or in any other manner indicates that he is practicing or will practice dentistry, except such name as is specified in a valid permit issued pursuant to Section 1701.5.

Section 1701.1. (a) Notwithstanding Sections 1700 and 1701, a person who willfully, under circumstances or conditions that cause or create risk of bodily harm, serious physical or mental illness, or death, practices or attempts to practice, or advertises or holds himself or herself out as practicing dentistry without having at the time of so doing a valid, unrevoked, and unsuspended certificate, license, registration, or permit as provided in this chapter, or without being authorized to perform that act pursuant to a certificate, license, registration, or permit obtained in accordance with some other provision of law, is guilty of a public offense, punishable by a fine not exceeding ten thousand dollars ($10,000), by imprisonment pursuant to subdivision (h) of Section 1170 of the Penal Code, by imprisonment in a county jail not exceeding one year, or by both the fine and either imprisonment.

(b) A person who conspires with or aids and abets another to commit any act described in subdivision (a) is guilty of a public offense and subject to the punishment described in subdivision (a).

(c) The remedy provided in this section shall not preclude any other remedy provided by law.

LAWS GOVERNING THE PRESCRIPTION OF DRUGS

The California Dental Practice Act states that only doctors of dentistry are permitted to prescribe drugs, including analgesics, sedatives, and antibiotics, although prescription of oral conscious sedation to children younger than 13 years of age requires a permit. Dental assistants and dental hygienists are not permitted to write prescriptions [1]. There are many federal and state laws and regulations pertaining to prescribing. It is the responsibility of each Drug Enforcement Administration (DEA)-registered prescriber (or those exempted) to be familiar with and maintain knowledge of all applicable laws and regulations. Pertinent citations of federal laws governing the prescription of controlled substances are included in the DEA Practitioner's Manual, available at https://www.deadiversion.usdoj.gov/pubs/manuals. The California Uniform Controlled Substances Act (part of the California Health and Safety Code) can be found at https://leginfo.legislature.ca.gov/faces/codesTOCSelected.xhtml?tocCode=HSC. The Substances Act begins at Section 11000, and information regarding prescriptions begins in Section 11150.

There must be careful consideration when prescribing to addicts or suspected addicts, particularly when patients are requesting specific drugs. As of 2016, California legislation requires that all prescribers of controlled substances register to access CURES, the state prescription drug monitoring program database intended to aid prescribers and dispensers in identifying fraudulent activity, thereby reducing prescription drug abuse and diversion without affecting legitimate medical practice or patient care. As of October 2018, all licensees authorized to prescribe, order, administer, furnish or dispense controlled substances in California must, with some exceptions, check a patient's prescription history in CURES 2.0 before prescribing a Schedule II, III, or IV substance [27].

The following section of the California Business and Professional Code addresses unprofessional conduct related to furnishing prescription drugs and excessive prescribing.

Section 725. (a) Repeated acts of clearly excessive prescribing, furnishing, dispensing, or administering of drugs or treatment, repeated acts of clearly excessive use of diagnostic procedures, or repeated acts of clearly excessive use of diagnostic or treatment facilities as determined by the standard of the community of licensees is unprofessional conduct for a physician and surgeon, dentist, podiatrist, psychologist, physical therapist, chiropractor, optometrist, speech-language pathologist, or audiologist.

(b) Any person who engages in repeated acts of clearly excessive prescribing or administering of drugs or treatment is guilty of a misdemeanor and shall be punished by a fine of not less than one hundred dollars ($100) nor more than six hundred dollars ($600), or by imprisonment for a term of not less than 60 days nor more than 180 days, or by both that fine and imprisonment.

(c) A practitioner who has a medical basis for prescribing, furnishing, dispensing, or administering dangerous drugs or prescription controlled substances shall not be subject to disciplinary action or prosecution under this section.

(d) No physician and surgeon shall be subject to disciplinary action pursuant to this section for treating intractable pain in compliance with Section 2241.5.

The following sections of the Uniform Controlled Substances Act addresses the facilitation of abuse by prescribing practices, including the new CURES reporting requirements.

Section 11150.2. (a) Notwithstanding any other law, if cannabinoids are excluded from Schedule I of the federal Controlled Substances Act and placed on a schedule of the act other than Schedule I, or if a product composed of cannabinoids is approved by the federal Food and Drug Administration and either placed on a schedule of the act other than Schedule I, or exempted from one or more provisions of the act, so as to permit a physician, pharmacist, or other authorized healing arts licensee acting within their scope of practice, to prescribe, furnish, or dispense that product, the physician, pharmacist, or other authorized healing arts licensee who prescribes, furnishes, or dispenses that product in accordance with federal law shall be deemed to be in compliance with state law governing those acts.

(b) For purposes of this chapter, upon the effective date of one of the changes in federal law described in subdivision (a), notwithstanding any other state law, a product composed of cannabinoids may be prescribed, furnished, dispensed, transferred, transported, possessed, or used in accordance with federal law and is authorized pursuant to state law.

(c) This section does not apply to any product containing cannabinoids that is made or derived from industrial hemp, as defined in Section 11018.5 and regulated pursuant to that section.

Section 11153. (a) A prescription for a controlled substance shall only be issued for a legitimate medical purpose by an individual practitioner acting in the usual course of his or her professional practice. The responsibility for the proper prescribing and dispensing of controlled substances is upon the prescribing practitioner, but a corresponding responsibility rests with the pharmacist who fills the prescription. Except as authorized by this division, the following are not legal prescriptions: (1) an order purporting to be a prescription which is issued not in the usual course of professional treatment or in legitimate and authorized research; or (2) an order for an addict or habitual user of controlled substances, which is issued not in the course of professional treatment or as part of an authorized narcotic treatment program, for the purpose of providing the user with controlled substances, sufficient to keep him or her comfortable by maintaining customary use.

(b) Any person who knowingly violates this section shall be punished by imprisonment pursuant to subdivision (h) of Section 1170 of the Penal Code, or in a county jail not exceeding one year, or by a fine not exceeding twenty thousand dollars ($20,000), or by both that fine and imprisonment.

(c) No provision of the amendments to this section enacted during the second year of the 1981–82 Regular Session shall be construed as expanding the scope of practice of a pharmacist.

Section 11164.1. (a) 1. Notwithstanding any other law, a prescription for a controlled substance issued by a prescriber in another state for delivery to a patient in another state may be dispensed by a California pharmacy, if the prescription conforms with the requirements for controlled substance prescriptions in the state in which the controlled substance was prescribed.

2. A prescription for Schedule II, Schedule III, Schedule IV, or Schedule V controlled substances dispensed pursuant to this subdivision shall be reported by the dispensing pharmacy to the Department of Justice in the manner prescribed by subdivision (d) of Section 11165.

(b) A pharmacy may dispense a prescription for a Schedule III, Schedule IV, or Schedule V controlled substance from an out-of-state prescriber pursuant to Section 4005 of the Business and Professions Code and Section 1717 of Title 16 of the California Code of Regulations.

(c) This section shall become operative on January 1, 2021.

Section 11165. (a) To assist health care practitioners in their efforts to ensure appropriate prescribing, ordering, administering, furnishing, and dispensing of controlled substances, law enforcement and regulatory agencies in their efforts to control the diversion and resultant abuse of Schedule II, Schedule III, Schedule IV, and Schedule V controlled substances, and for statistical analysis, education, and research, the Department of Justice shall, contingent upon the availability of adequate funds in the CURES Fund, maintain the Controlled Substance Utilization Review and Evaluation System (CURES) for the electronic monitoring of, and Internet access to information regarding, the prescribing and dispensing of Schedule II, Schedule III, Schedule IV, and Schedule V controlled substances by all practitioners authorized to prescribe, order, administer, furnish, or dispense these controlled substances.

(b) The Department of Justice may seek and use grant funds to pay the costs incurred by the operation and maintenance of CURES. The department shall annually report to the Legislature and make available to the public the amount and source of funds it receives for support of CURES.

(c) 1. The operation of CURES shall comply with all applicable federal and state privacy and security laws and regulations.

2. A. CURES shall operate under existing provisions of law to safeguard the privacy and confidentiality of patients. Data obtained from CURES shall only be provided to appropriate state, local, and federal public agencies for disciplinary, civil, or criminal purposes and to other agencies or entities, as determined by the department, for the purpose of educating practitioners and others in lieu of disciplinary, civil, or criminal actions. Data may be provided to public or private entities, as approved by the department, for educational, peer review, statistical, or research purposes, if patient information, including information that may identify the patient, is not compromised. The University of California shall be provided access to identifiable data for research purposes if the requirements of subdivision (t) of Section 1798.24 of the Civil Code are satisfied. Further, data disclosed to an individual or agency as described in this subdivision shall not be disclosed, sold, or transferred to a third party, unless authorized by, or pursuant to, state and federal privacy and security laws and regulations. The department shall establish policies, procedures, and regulations regarding the use, access, evaluation, management, implementation, operation, storage, disclosure, and security of the information within CURES, consistent with this subdivision.

   B. Notwithstanding subparagraph (A), a regulatory board whose licensees do not prescribe, order, administer, furnish, or dispense controlled substances shall not be provided data obtained from CURES.

3. The department shall, no later than January 1, 2021, adopt regulations regarding the access and use of the information within CURES. The department shall consult with all stakeholders identified by the department during the rulemaking process. The regulations shall, at a minimum, address all of the following in a manner consistent with this chapter:

   A. The process for approving, denying, and disapproving individuals or entities seeking access to information in CURES.

   B. The purposes for which a health care practitioner may access information in CURES.

   C. The conditions under which a warrant, subpoena, or court order is required for a law enforcement agency to obtain information from CURES as part of a criminal investigation.

   D. The process by which information in CURES may be provided for educational, peer review, statistical, or research purposes.

4. In accordance with federal and state privacy laws and regulations, a health care practitioner may provide a patient with a copy of the patient's CURES patient activity report as long as no additional CURES data are provided and the health care practitioner keeps a copy of the report in the patient's medical record in compliance with subdivision (d) of Section 11165.1.

(d) For each prescription for a Schedule II, Schedule III, Schedule IV, or Schedule V controlled substance, as defined in the controlled substances schedules in federal law and regulations, specifically Sections 1308.12, 1308.13, 1308.14, and 1308.15, respectively, of Title 21 of the Code of Federal Regulations, the dispensing pharmacy, clinic, or other dispenser shall report the following information to the department or contracted prescription data processing vendor as soon as reasonably possible, but not more than one working day after the date a controlled substance is released to the patient or patient's representative, in a format specified by the department:

1. Full name, address, and, if available, telephone number of the ultimate user or research subject, or contact information as determined by the Secretary of the United States Department of Health and Human Services, and the gender, and date of birth of the ultimate user.
2. The prescriber's category of licensure, license number, national provider identifier (NPI) number, if applicable, the federal controlled substance registration number, and the state medical license number of a prescriber using the federal controlled substance registration number of a government-exempt facility.
3. Pharmacy prescription number, license number, NPI number, and federal controlled substance registration number.
4. National Drug Code (NDC) number of the controlled substance dispensed.
5. Quantity of the controlled substance dispensed.
6. The International Statistical Classification of Diseases (ICD) Code contained in the most current ICD revision, or any revision deemed sufficient by the State Board of Pharmacy, if available.
7. Number of refills ordered.
8. Whether the drug was dispensed as a refill of a prescription or as a first-time request.
9. Prescribing date of the prescription.
10. Date of dispensing of the prescription.
11. The serial number for the corresponding prescription form, if applicable.

(e) The department may invite stakeholders to assist, advise, and make recommendations on the establishment of rules and regulations necessary to ensure the proper administration and enforcement of the CURES database. A prescriber or dispenser invitee shall be licensed by one of the boards or committees identified in subdivision (d) of Section 208 of the Business and Professions Code, in active practice in California, and a regular user of CURES.

(f) The department shall, prior to upgrading CURES, consult with prescribers licensed by one of the boards or committees identified in subdivision (d) of Section 208 of the Business and Professions Code, one or more of the boards or committees identified in subdivision (d) of Section 208 of the Business and Professions Code, and any other stakeholder identified by the department, for the purpose of identifying desirable capabilities and upgrades to the CURES Prescription Drug Monitoring Program (PDMP).

(g) The department may establish a process to educate authorized subscribers of the CURES PDMP on how to access and use the CURES PDMP.

(h) 1. The department may enter into an agreement with an entity operating an interstate data sharing hub, or an agency operating a prescription drug monitoring program in another state, for purposes of interstate data sharing of prescription drug monitoring program information.

2. Data obtained from CURES may be provided to authorized users of another state's prescription drug monitoring program, as determined by the department pursuant to subdivision (c), if the entity operating the interstate data sharing hub, and the prescription drug monitoring program of that state, as applicable, have entered into an agreement with the department for interstate data sharing of prescription drug monitoring program information.

3. An agreement entered into by the department for purposes of interstate data sharing of prescription drug monitoring program information shall ensure that all access to data obtained from CURES and the handling of data contained within CURES comply with California law, including regulations, and meet the same patient privacy, audit, and data security standards employed and required for direct access to CURES.

4. For purposes of interstate data sharing of CURES information pursuant to this subdivision, an authorized user of another state's prescription drug monitoring program shall not be required to register with CURES, if the authorized user is registered and in good standing with that state's prescription drug monitoring program.

5. The department shall not enter into an agreement pursuant to this subdivision until the department has issued final regulations regarding the access and use of the information within CURES as required by paragraph (3) of subdivision (c).

(j) If the dispensing pharmacy, clinic, or other dispenser experiences a temporary technological or electrical failure, it shall, without undue delay, seek to correct any cause of the temporary technological or electrical failure that is reasonably within its control. The deadline for transmitting prescription information to the department or contracted prescription data processing vendor pursuant to subdivision (d) shall be extended until the failure is corrected. If the dispensing pharmacy, clinic, or other dispenser experiences technological limitations that are not reasonably within its control, or is impacted by a natural or manmade disaster, the deadline for transmitting prescription information to the department or contracted prescription data processing vendor shall be extended until normal operations have resumed.

Section 11165.1. (a) 1. A. (i) A health care practitioner authorized to prescribe, order, administer, furnish, or dispense Schedule II, Schedule III, Schedule IV, or Schedule V controlled substances pursuant to Section 11150 shall, upon receipt of a federal Drug Enforcement Administration (DEA) registration, submit an application developed by the department to obtain approval to electronically access information regarding the controlled substance history of a patient that is maintained by the department. Upon approval, the department shall release to that practitioner or their delegate the electronic history of controlled substances dispensed to an individual under the practitioner's care based on data contained in the CURES Prescription Drug Monitoring Program (PDMP).

(ii) A pharmacist shall, upon licensure, submit an application developed by the department to obtain approval to electronically access information regarding the controlled substance history of a patient that is maintained by the department. Upon approval, the department shall release to the pharmacist or their delegate the electronic history of controlled substances dispensed to an individual under the pharmacist's care based on data contained in the CURES PDMP.

(iii) A licensed physician and surgeon who does not hold a DEA registration may submit an application developed by the department to obtain approval to electronically access information regarding the controlled substance history of the

patient that is maintained by the department. Upon approval, the department shall release to the physician and surgeon or their delegate the electronic history of controlled substances dispensed to a patient under their care based on data contained in the CURES PDMP.

(iv) The department shall implement its duties described in clauses (i), (ii), and (iii) upon completion of any technological changes to the CURES database necessary to support clauses (i), (ii), and (iii), or by October 1, 2022, whichever is sooner.

B. The department may deny an application or suspend a subscriber, for reasons that include, but are not limited to, the following:

(i) Materially falsifying an application to access information contained in the CURES database.

(ii) Failing to maintain effective controls for access to the patient activity report.

(iii) Having their federal DEA registration suspended or revoked.

(iv) Violating a law governing controlled substances or another law for which the possession or use of a controlled substance is an element of the crime.

(v) Accessing information for a reason other than to diagnose or treat a patient, or to document compliance with the law.

C. An authorized subscriber shall notify the department within 30 days of a change to the subscriber account.

D. An approved health care practitioner, pharmacist, or a person acting on behalf of a health care practitioner or pharmacist pursuant to subdivision (b) of Section 209 of the Business and Professions Code may use the department's online portal or a health information technology system that meets the criteria required in subparagraph (E) to access information in the CURES database pursuant to this section. A subscriber who uses a health information technology system that meets the criteria required in subparagraph (E) to access the CURES database may submit automated queries to the CURES database that are triggered by predetermined criteria.

E. An approved health care practitioner or pharmacist may submit queries to the CURES database through a health information technology system if the entity that operates the health information technology system certifies all of the following:

(i) The entity will not use or disclose data received from the CURES database for any purpose other than delivering the data to an approved health care practitioner or pharmacist or performing data processing activities that may be necessary to enable the delivery unless authorized by, and pursuant to, state and federal privacy and security laws and regulations.

(ii) The health information technology system will authenticate the identity of an authorized health care practitioner or pharmacist initiating queries to the CURES database and, at the time of the query to the CURES database, the health information technology system submits the following data regarding the query to CURES:

(I) The date of the query.

(II) The time of the query.

(III) The first and last name of the patient queried.

(IV) The date of birth of the patient queried.

(V) The identification of the CURES user for whom the system is making the query.

(iii) The health information technology system meets applicable patient privacy and information security requirements of state and federal law.

(iv) The entity has entered into a memorandum of understanding with the department that solely addresses the technical specifications of the health information technology system to ensure the security of the data in the CURES database and the secure transfer of data from the CURES database. The technical specifications shall be universal for all health information technology systems that establish a method of system integration to retrieve information from the CURES database. The memorandum of understanding shall not govern, or

in any way impact or restrict, the use of data received from the CURES database or impose any additional burdens on covered entities in compliance with the regulations promulgated pursuant to the federal Health Insurance Portability and Accountability Act of 1996 found in Parts 160 and 164 of Title 45 of the Code of Federal Regulations.

F. No later than October 1, 2018, the department shall develop a programming interface or other method of system integration to allow health information technology systems that meet the requirements in subparagraph (E) to retrieve information in the CURES database on behalf of an authorized health care practitioner or pharmacist.

G. The department shall not access patient-identifiable information in an entity's health information technology system.

H. An entity that operates a health information technology system that is requesting to establish an integration with the CURES database shall pay a reasonable fee to cover the cost of establishing and maintaining integration with the CURES database.

I. The department may prohibit integration or terminate a health information technology system's ability to retrieve information in the CURES database if the health information technology system fails to meet the requirements of subparagraph (E), or the entity operating the health information technology system does not fulfill its obligation under subparagraph (H).

2. A health care practitioner authorized to prescribe, order, administer, furnish, or dispense Schedule II, Schedule III, Schedule IV, or Schedule V controlled substances pursuant to Section 11150 or a pharmacist shall be deemed to have complied with paragraph (1) if the licensed health care practitioner or pharmacist has been approved to access the CURES database through the process developed pursuant to subdivision (a) of Section 209 of the Business and Professions Code.

(b) A request for, or release of, a controlled substance history pursuant to this section shall be made in accordance with guidelines developed by the department.

(c) In order to prevent the inappropriate, improper, or illegal use of Schedule II, Schedule III, Schedule IV, or Schedule V controlled substances, the department may initiate the referral of the history of controlled substances dispensed to an individual based on data contained in CURES to licensed health care practitioners, pharmacists, or both, providing care or services to the individual.

(d) The history of controlled substances dispensed to an individual based on data contained in CURES that is received by a practitioner or pharmacist from the department pursuant to this section is medical information subject to the provisions of the Confidentiality of Medical Information Act contained in Part 2.6 (commencing with Section 56) of Division 1 of the Civil Code.

(e) Information concerning a patient's controlled substance history provided to a practitioner or pharmacist pursuant to this section shall include prescriptions for controlled substances listed in Sections 1308.12, 1308.13, 1308.14, and 1308.15 of Title 21 of the Code of Federal Regulations.

(f) A health care practitioner, pharmacist, or a person acting on behalf of a health care practitioner or pharmacist, when acting with reasonable care and in good faith, is not subject to civil or administrative liability arising from false, incomplete, inaccurate, or misattributed information submitted to, reported by, or relied upon in the CURES database or for a resulting failure of the CURES database to accurately or timely report that information.

(g) For purposes of this section, the following terms have the following meanings:

1. "Automated basis" means using predefined criteria to trigger an automated query to the CURES database, which can be attributed to a specific health care practitioner or pharmacist.

2. "Department" means the Department of Justice.

3. "Entity" means an organization that operates, or provides or makes available, a health information technology system to a health care practitioner or pharmacist.

4. "Health information technology system" means an information processing application using hardware and software for the storage, retrieval, sharing of or use of patient data for communication, decision-making, coordination of care, or the quality, safety, or efficiency of the practice of medicine or delivery of health care services, including, but not limited to, electronic medical record applications, health information exchange systems, or other interoperable clinical or health care information system.

(h) This section shall become operative on July 1, 2021, or upon the date the department promulgates regulations to implement this section and posts those regulations on its Internet website, whichever date is earlier.

Section 11165.2. (a) The Department of Justice may conduct audits of the CURES Prescription Drug Monitoring Program system and its users.

(b) The Department of Justice may establish, by regulation, a system for the issuance to a CURES Prescription Drug Monitoring Program subscriber of a citation which may contain an order of abatement, or an order to pay an administrative fine assessed by the Department of Justice if the subscriber is in violation of any provision of this chapter or any regulation adopted by the Department of Justice pursuant to this chapter.

(c) The system shall contain the following provisions:

1. Citations shall be in writing and shall describe with particularity the nature of the violation, including specific reference to the provision of law or regulation of the department determined to have been violated.
2. Whenever appropriate, the citation shall contain an order of abatement establishing a reasonable time for abatement of the violation.
3. In no event shall the administrative fine assessed by the department exceed two thousand five hundred dollars ($2,500) for each violation. In assessing a fine, due consideration shall be given to the appropriateness of the amount of the fine with respect to such factors as the gravity of the violation, the good faith of the subscribers, and the history of previous violations.
4. An order of abatement or a fine assessment issued pursuant to a citation shall inform the subscriber that if the subscriber desires a hearing to contest the finding of a violation, a hearing shall be requested by written notice to the CURES Prescription Drug Monitoring Program within 30 days of the date of issuance of the citation or assessment. Hearings shall be held pursuant to Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.
5. In addition to requesting a hearing, the subscriber may, within 10 days after service of the citation, request in writing an opportunity for an informal conference with the department regarding the citation. At the conclusion of the informal conference, the department may affirm, modify, or dismiss the citation, including any fine levied or order of abatement issued. The decision shall be deemed to be a final order with regard to the citation issued, including the fine levied or the order of abatement which could include permanent suspension to the system, a monetary fine, or both, depending on the gravity of the violation. However, the subscriber does not waive its right to request a hearing to contest a citation by requesting an informal conference. If the citation is affirmed, a formal hearing may be requested within 30 days of the date the citation was affirmed. If the citation is dismissed after the informal conference, the request for a hearing on the matter of the citation shall be deemed to be withdrawn. If the citation, including any fine levied or order of abatement, is modified, the citation originally issued shall be considered withdrawn and a new citation issued. If a hearing is requested for a subsequent citation, it shall be requested within 30 days of service of that subsequent citation.
6. Failure of a subscriber to pay a fine within 30 days of the date of assessment or comply with an order of abatement within the fixed time, unless the citation is being appealed, may result in disciplinary action taken by the department. If a citation is not contested and a fine is not paid, the subscriber account will be terminated:
   A. A citation may be issued without the assessment of an administrative fine.
   B. Assessment of administrative fines may be limited to only particular violations of law or department regulations.

(d) Notwithstanding any other provision of law, if a fine is paid to satisfy an assessment based on the finding of a violation, payment of the fine shall be represented as a satisfactory resolution of the matter for purposes of public disclosure.

(e) Administrative fines collected pursuant to this section shall be deposited in the CURES Program Special Fund, available upon appropriation by the Legislature. These special funds shall provide support for costs associated with informal and formal hearings, maintenance, and updates to the CURES Prescription Drug Monitoring Program.

(f) The sanctions authorized under this section shall be separate from, and in addition to, any other administrative, civil, or criminal remedies; however, a criminal action may not be initiated for a specific offense if a citation has been issued pursuant to this section for that offense, and a citation may not be issued pursuant to this section for a specific offense if a criminal action for that offense has been filed.

(g) Nothing in this section shall be deemed to prevent the department from serving and prosecuting an accusation to suspend or revoke a subscriber if grounds for that suspension or revocation exist.

Section 11165.4. (a) 1. A. (i) A health care practitioner authorized to prescribe, order, administer, or furnish a controlled substance shall consult the patient activity report or information from the patient activity report obtained from the CURES database to review a patient's controlled substance history for the past 12 months before prescribing a Schedule II, Schedule III, or Schedule IV controlled substance to the patient for the first time and at least once every six months thereafter if the prescriber renews the prescription and the substance remains part of the treatment of the patient.

(ii) If a health care practitioner authorized to prescribe, order, administer, or furnish a controlled substance is not required, pursuant to an exemption described in subdivision (c), to consult the patient activity report from the CURES database the first time the health care practitioner prescribes, orders, administers, or furnishes a controlled substance to a patient, the health care practitioner shall consult the patient activity report from the CURES database to review the patient's controlled substance history before subsequently prescribing a Schedule II, Schedule III, or Schedule IV controlled substance to the patient and at least once every six months thereafter if the prescriber renews the prescription and the substance remains part of the treatment of the patient.

(iii) A health care practitioner who did not directly access the CURES database to perform the required review of the controlled substance use report shall document in the patient's medical record that they reviewed the CURES database generated report within 24 hours of the controlled substance prescription that was provided to them by another authorized user of the CURES database.

B. For purposes of this paragraph, "first time" means the initial occurrence in which a health care practitioner, in their role as a health care practitioner, intends to prescribe, order, administer, or furnish a Schedule II, Schedule III, or Schedule IV controlled substance to a patient and has not previously prescribed a controlled substance to the patient.

2. A health care practitioner shall review a patient's controlled substance history that has been obtained from the CURES database no earlier than 24 hours, or the previous business day, before the health care practitioner prescribes, orders, administers, or furnishes a Schedule II, Schedule III, or Schedule IV controlled substance to the patient.

(b) The duty to consult the CURES database, as described in subdivision (a), does not apply to veterinarians or pharmacists.

(c) The duty to consult the CURES database, as described in subdivision (a), does not apply to a health care practitioner in any of the following circumstances:

1. If a health care practitioner prescribes, orders, or furnishes a controlled substance to be administered to a patient while the patient in any of the following facilities or during an emergency transfer between any of the following facilities, or for use while on facility premises:

A. A licensed clinic, as described in Chapter 1 (commencing with Section 1200) of Division 2.

B. An outpatient setting, as described in Chapter 1.3 (commencing with Section 1248) of Division 2.

C. A health facility, as described in Chapter 2 (commencing with Section 1250) of Division 2.

D. A county medical facility, as described in Chapter 2.5 (commencing with Section 1440) of Division 2.

E. Another medical facility, including, but not limited to, an office of a health care practitioner and an imaging center.

F. A correctional clinic, as described in Section 4187 of the Business and Professions Code, or a correctional pharmacy, as described in Section 4021.5 of the Business and Professions Code.

2. If a health care practitioner prescribes, orders, administers, or furnishes a controlled substance in the emergency department of a general acute care hospital and the quantity of the controlled substance does not exceed a nonrefillable seven-day supply of the controlled substance to be used in accordance with the directions for use.

3. If a health care practitioner prescribes, orders, administers, or furnishes a controlled substance to a patient as part of the patient's treatment for a surgical, radiotheraputic, or diagnostic procedure and the quantity of the controlled substance does not exceed a nonrefillable seven-day supply of the controlled substance to be used in accordance with the directions for use, in any of the following facilities:
   A. A licensed clinic, as described in Chapter 1 (commencing with Section 1200) of Division 2.
   B. An outpatient setting, as described in Chapter 1.3 (commencing with Section 1248) of Division 2.
   C. A health facility, as described in Chapter 2 (commencing with Section 1250) of Division 2.
   D. A county medical facility, as described in Chapter 2.5 (commencing with Section 1440) of Division 2.
   E. A place of practice, as defined in Section 1658 of the Business and Professions Code.
   F. Another medical facility where surgical procedures are permitted to take place, including, but not limited to, the office of a health care practitioner.
4. If a health care practitioner prescribes, orders, administers, or furnishes a controlled substance to a patient who is terminally ill, as defined in subdivision (c) of Section 11159.2.
5. A. If all of the following circumstances are satisfied:
      (i) It is not reasonably possible for a health care practitioner to access the information in the CURES database in a timely manner.
      (ii) Another health care practitioner or designee authorized to access the CURES database is not reasonably available.
      (iii) The quantity of controlled substance prescribed, ordered, administered, or furnished does not exceed a nonrefillable seven-day supply of the controlled substance to be used in accordance with the directions for use and no refill of the controlled substance is allowed.
   B. A health care practitioner who does not consult the CURES database under subparagraph (A) shall document the reason they did not consult the database in the patient's medical record.
6. If the CURES database is not operational, as determined by the department, or cannot be accessed by a health care practitioner because of a temporary technological or electrical failure. A health care practitioner shall, without undue delay, seek to correct the cause of the temporary technological or electrical failure that is reasonably within the health care practitioner's control.
7. If the CURES database cannot be accessed because of technological limitations that are not reasonably within the control of a health care practitioner.
8. If consultation of the CURES database would, as determined by the health care practitioner, result in a patient's inability to obtain a prescription in a timely manner and thereby adversely impact the patient's medical condition, provided that the quantity of the controlled substance does not exceed a nonrefillable seven-day supply if the controlled substance were used in accordance with the directions for use.

(d) 1. A health care practitioner who fails to consult the CURES database, as described in subdivision (a), shall be referred to the appropriate state professional licensing board solely for administrative sanctions, as deemed appropriate by that board.

2. This section does not create a private cause of action against a health care practitioner. This section does not limit a health care practitioner's liability for the negligent failure to diagnose or treat a patient.

(e) All applicable state and federal privacy laws govern the duties required by this section.

(f) The provisions of this section are severable. If any provision of this section or its application is held invalid, that invalidity shall not affect other provisions or applications that can be given effect without the invalid provision or application.

(g) This section shall become operative on July 1, 2021, or upon the date the department promulgates regulations to implement this section and posts those regulations on its internet website, whichever date is earlier.

REPORTING OF ABUSE AND NEGLECT

In accordance with California Penal Code Section 11165.7, dentists, dental assistants, and dental hygienists are mandated reporters of child abuse and neglect [3]. Reporting suspected abuse is not only an ethical duty but is also a legal obligation.

CHILD ABUSE AND NEGLECT REPORTING LAW

Section 11164. (a) This article shall be known and may be cited as the Child Abuse and Neglect Reporting Act.

(b) The intent and purpose of this article is to protect children from abuse and neglect. In any investigation of suspected child abuse or neglect, all persons participating in the investigation of the case shall consider the needs of the child victim and shall do whatever is necessary to prevent psychological harm to the child victim.

Section 11166. (a) Except as provided in subdivision (d), and in Section 11166.05, a mandated reporter shall make a report to an agency specified in Section 11165.9 whenever the mandated reporter, in the mandated reporter's professional capacity or within the scope of the mandated reporter's employment, has knowledge of or observes a child whom the mandated reporter knows or reasonably suspects has been the victim of child abuse or neglect. The mandated reporter shall make an initial report by telephone to the agency immediately or as soon as is practicably possible, and shall prepare and send, fax, or electronically transmit a written follow-up report within 36 hours of receiving the information concerning the incident. The mandated reporter may include with the report any nonprivileged documentary evidence the mandated reporter possesses relating to the incident.

Section 11165.9. Reports of suspected child abuse or neglect shall be made by mandated reporters, or in the case of reports pursuant to Section 11166.05, may be made, to any police department or sheriff's department, not including a school district police or security department, county probation department, if designated by the county to receive mandated reports, or the county welfare department. Any of those agencies shall accept a report of suspected child abuse or neglect whether offered by a mandated reporter or another person, or referred by another agency, even if the agency to whom the report is being made lacks subject matter or geographical jurisdiction to investigate the reported case, unless the agency can immediately electronically transfer the call to an agency with proper jurisdiction. When an agency takes a report about a case of suspected child abuse or neglect in which that agency lacks jurisdiction, the agency shall immediately refer the case by telephone, fax, or electronic transmission to an agency with proper jurisdiction. Agencies that are required to receive reports of suspected child abuse or neglect may not refuse to accept a report of suspected child abuse or neglect from a mandated reporter or another person unless otherwise authorized pursuant to this section, and shall maintain a record of all reports received.

IDENTIFYING, DOCUMENTING, AND REPORTING ABUSE AND NEGLECT

Preventing serious morbidity and mortality involves intervening at the first suspicion or indication of abuse and/or neglect. Dentists and dental hygienists are often the healthcare professionals who have the most frequent interactions with children and should be attentive to any signs of neglect and physical abuse—as abusive injuries commonly involve the face, jaw, mouth, teeth, and tongue [4]. One study found that orofacial trauma was concurrent with 49% of documented cases of child physical abuse [5]. Other studies show that craniofacial and neck injuries occur in 50% to 65% of child abuse victims and that the lips are a site for abusive injury in 54% of cases [6; 7].

Clinical Signs of Abuse

The American Academy of Pediatrics (AAP) Committee on Child Abuse and Neglect and the California Dental Association have published useful articles regarding the identification of the orofacial signs of abuse and particular injuries of concern. According to these sources, possible signs of abuse include [6; 7; 12]:

- Forced feeding injuries caused by eating utensils, bottles, hands, fingers, and other objects; scalding liquids; or caustic substances. These may be responsible for burns, contusions, or lacerations of the lips, tongue, buccal mucosa, gingival alveolar mucosa, frenum, or palate (soft and hard). Objects forced into the face/mouth may also cause facial bone and jaw fractures and avulsed, displaced, or fractured teeth.
- Mouth gagging injuries resulting in bruises, lichenification, or scarring at the corners of the mouth
- Strangulation injuries resulting in bruising, a hoarse or raspy voice, and difficulty breathing
- Discolored teeth from previous trauma
- Serious trauma (e.g., retropharyngeal abscesses, posterior pharyngeal injuries) resulting from caregivers with factitious disorder (i.e., Münchausen syndrome) by proxy
- Injury to the petechiae of the palate (particularly at the junction of soft and hard palate) resulting from forced oral sex
- Sexually transmitted oral/perioral infections (e.g., gonorrhea, human papillomavirus warts), although these can be transmitted by other means as well
- Bite marks or bruises on the head or face, strangulation marks, or black eyes
- Missing hair from hair pulling
- Welts in the shape of objects (e.g., belt buckle, clothes iron)
- Other suspicious trauma/bruises indicative of abuse (e.g., rope marks)

During examination, excessive caries, gingivitis, and oral infections/diseases should be noted as possible signs of neglect. (Parents or caretakers with an ignorance of proper oral care, who have no perceived value of oral health, with limited access to health care or insurance, and/or geographic isolation should be differentiated from those with a willful disregard for the child's health [6].) Perioral and intraoral injuries and infections in various stages of healing, especially those that seem inappropriate for the child's developmental age, should be documented. Additionally, abuse and neglect are more prevalent (up to four times more common) in individuals with developmental or physical disability [12].

Although accidental injuries are common in pediatric patients, the history of trauma, including mechanism and timing, must be weighed against the injury features. Characteristics of the injury that do not seem to match the reported history should spur suspicion of abuse. The acronym RADAR is commonly used to assist in the routine abuse screening of patients [29]:

- **R**outinely screen for signs and symptoms of abuse/neglect
- **A**sk direct, non-judgmental questions with compassion
- **D**ocument your findings
- **A**ssess patient safety before the patient leaves the medical setting
- **R**eview, refer, report

A parent or primary caretaker may be genuinely unaware of the abuse or injuries and may not be able to offer information relevant to the history. It is important not to make judgments of family members (either innocent or guilty), apportion blame, or attempt to personally undertake a criminal investigation. The scope of dental practice does not include these actions, and they may interfere with a law enforcement investigation. The AAP notes that the dental professional's role in a criminal investigation is to interpret medical information for nonmedical professionals in an understandable manner that accurately reflects the medical evidence [8]. Identify the medical problem, document the suspected abuse (e.g., names, photos, body map, preserve evidence), treat the injuries, and offer honest, factual medical information to parents, families, law enforcement, and justice officials.

Reporting Abuse

As noted in the California Dental Practice Act, dental healthcare professionals have a legal and ethical responsibility to report suspected child abuse to the proper authorities, not to punish perpetrators of abuse but to protect the abuse victims. One author writes, "The dentist must view himself as a child advocate. Simply treating dental and facial injuries of abused children while ignoring the social needs of the child and family is unacceptable" [9].

Nonetheless, the decision of whether or not to report suspected abuse is ethically challenging. Although healthcare professionals are obligated to report suspected abuse, suspicion of abuse is somewhat of a judgment call and certain biases may influence the decision to report. It has been noted that well-intentioned professionals in all fields are swayed by both negative and positive social biases (e.g., sex, race, socioeconomic status, physical appearance, job status), and it is advisable to challenge personal biases and weigh only the facts of the case. A 2008 prospective, observational AAP study found that, "clinicians did not report 27% of injuries considered likely or very likely caused by child abuse and 76% of injuries considered possibly caused by child abuse" because of various biases and experiences [10]. However, patients who had an injury that was not a laceration, who had more than one family risk factor, who had a serious injury, who had a child risk factor other than an inconsistent injury, who had a parental history of substance abuse, or who were unfamiliar to the clinician were more likely to be reported.

Professionally mandated reporters are protected from civil or criminal prosecution in consequence of a good-faith report of abuse, and no clinician in the aforementioned AAP study was sued for malpractice as a result of reporting abuse [7; 10]. However, it is possible for dental professionals to be sued, and a state petition for up to $50,000 in recompensatory legal fees is available for dentists having to defend themselves in court [7]. On the other hand, civil or criminal penalties for willfully not reporting abuse or impeding a report when abuse has been found to have occurred include 6 months in jail and/or a fine of $1,000 or, in cases of serious injury/death following a failure to report, 12 months in jail, and/or a fine of $5,000.

ELDER AND DEPENDENT ADULT ABUSE AND NEGLECT

Abusive injuries to the mouth and oral cavity of elder or dependent (e.g., developmentally or physically disabled) adults are similar in type and causation to those sustained by pediatric patients, including trauma from forced feeding, object insertion, mouth gagging, and being slapped, hit, or strangled, but also include damage to and from prostheses. The number of new elder and dependent adult abuse cases is usually about 18,000 per month in California alone, with family members constituting two-thirds of perpetrators [11; 26]. However, researchers estimate that for each incident of reported abuse there are at least five (and perhaps up to 14) unreported incidents [11]. Studies have shown that dental professionals are reluctant to report elder or dependent abuse/neglect and that they have a low index of suspicion of this category of abuse [13].

The national frequency of elder abuse is estimated at up to 10%, with a steady increase in reporting over the last few decades [14]. Contrary to popular belief, the overwhelming majority of abuse and neglect occurs in domestic, rather than institutional (e.g., residential care) settings, largely due to the shift in care in the last 50 years from state institutions to the home (particularly for younger disabled individuals) [12; 14]. Women are the victims of elder abuse two-thirds of the time.

Elder and dependent adults are also at risk for poor oral health due to caretaker neglect. In fact, neglect is one of the most common causes of elder injury reporting (roughly 500,000 cases per year in the United States) [14]. These populations are also at a high risk for self-neglect, accounting for more than 500,000 additional reported cases in the United States per year. A 2010 study revealed that 40% of individuals 65 years of age or older suffer from some form of neglect [15].

Elder and Dependent Adult Abuse Laws

Laws pertaining to mandatory elder and dependent adult abuse reporting are found in the California Welfare and Institutions Code Sections 15600 to 15632 [16].

Section 15600. (a) The Legislature 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.

(i) Therefore, it is the intent of the Legislature in enacting this chapter to provide that adult protective services agencies, local long-term care ombudsman programs, and local law enforcement agencies shall receive referrals or complaints from public or private agencies, from any mandated reporter submitting reports pursuant to Section 15630, or from any other source having reasonable cause to know that the welfare of an elder or dependent adult is endangered, and shall take any actions considered necessary to protect the elder or dependent adult and correct the situation and ensure the individual's safety.

Section 15630. (a) Any person who has assumed full or intermittent responsibility for the care or custody of an elder or dependent adult, whether or not he or she receives compensation, including administrators, supervisors, and any licensed staff of a public or private facility that provides care or services for elder or dependent adults, or any elder or dependent adult care custodian, health practitioner, clergy member, or employee of a county adult protective services agency or a local law enforcement agency, is a mandated reporter.

(b) (1) Any mandated reporter who, in his or her professional capacity, or within the scope of his or her employment, has observed or has knowledge of an incident that reasonably appears to be physical abuse, abandonment, abduction, isolation, financial abuse, or neglect, or is told by an elder or dependent adult that he or she has experienced behavior, including an act or omission, constituting physical abuse, abandonment, abduction, isolation, financial abuse, or neglect, or reasonably suspects that abuse, shall report the known or suspected instance of abuse by telephone or through a confidential Internet reporting tool, as authorized by Section 15658, immediately or as soon as practicably possible. If reported by telephone, a written report shall be sent, or an Internet report shall be made through the confidential Internet reporting tool established in Section 15658, within two working days.

INTIMATE PARTNER VIOLENCE

Intimate partner violence is defined as violence directed at a "spouse, former spouse, cohabitant, former cohabitant, or person with whom the suspect has had a child or is having or has had a dating or engagement relationship" [7]. In the United States in 2011, severe physical violence by an intimate partner (including acts such as being hit with something hard, being kicked or beaten, or being burned on purpose) had been experienced by an estimated 22.3% of women and 14.0% of men during their lifetimes [17].

Dental professionals should be vigilant in recognizing signs of abuse among adolescent and adult patients. One-half to two-thirds of abusive injuries occur to the head (particularly areas covered with hair) and neck, and facial injuries occur in 94% of intimate partner violence cases and are similar to those already discussed [7; 18]. Again, dental visits may be a patient's only contact with healthcare professionals, making identification of abuse an important part of dental visits [7]. A history of intimidation, fear, isolation, and dependency is often present in victims of abuse, so it is especially important to determine the origin of orofacial or craniofacial injuries through the use of nonjudgmental questions. The Stanford School of Medicine recommends the following lines of indirect questioning for most age groups [31]:

- How is everything going at home?
- Is there anything going on at work/school or at home that's difficult for you to talk about or is stressful for you?
- Are you having any problems with your parents/caretakers/partner/husband?

Alternately, lines of direct questioning may be used [31]:

- Did someone kick, hit, hurt, or threaten to hurt you? Was it your parent/caretaker or partner/husband?
- Are you in a relationship with (or do you live with) someone who hits, kicks, or threatens to hurt you?
- Have you ever been slapped, pushed, or shoved by your parent/partner?
- Have there been times when you felt afraid at home being around another person?
- Have you been hit or scared since the last time I saw you?
- Is it safe for you to go home today?

It is up to the practitioner's judgment which line of questioning to employ. Remember that the objectives are to advocate for and protect the patient. The questions can be framed in a way that does not cause a patient to feel singled out [31]:

- I don't know if this is (or has ever been) a problem for you, but many of the patients I see are dealing with abuse/abusive relationships. Some are too afraid or uncomfortable to bring it up themselves, so I have started asking everyone about it.
- From past experience with other patients, I'm concerned that some of your medical problems or injuries may be the result of someone hurting you. Is that happening?

When working cross-culturally, it is helpful to learn the colloquialisms used to describe abuse. For example, in some Latino cultures "disrespected me" refers to intimate partner violence or sexual assault [30]. If abuse is suspected and there is a cultural disconnect, consider the assistance of a knowledgeable co-worker, who may be able to act as a cultural broker.

CONCLUSION

Although its primary objective is to safeguard the public, the California Dental Practice Act is an excellent resource for dental professionals to ensure compliance with state law. Dental professionals with a good knowledge of the Dental Practice Act and its effects on dental care will practice legally and safely.

RESOURCES

California Dental Practice Act
https://www.dbc.ca.gov/about_us/lawsregs/laws.shtml

California Dental Association
https://www.cda.org

Dental Hygiene Board of California
https://dhbc.ca.gov

Customer Information/Answer Sheet/Evaluation insert located between pages 88–89.

COURSE TEST - #51293 THE CALIFORNIA DENTAL PRACTICE ACT

This is an open book test. Please record your responses on the Answer Sheet.
A passing grade of at least 70% must be achieved in order to receive credit for this course.

This 2 CE Credit Hour activity must be completed by January 31, 2025.

Accreditations & Approvals: NetCE is an ADA CERP Recognized Provider.

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10/1/2021 to 9/30/2027
Provider ID #217994.

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Designations of Credit: NetCE designates this activity for 2 continuing education credits.

AGD Subject Code: 563.

This course meets the Dental Board of California's requirements for 2 units of continuing education.

Dental Board of California course #02-3841-00343.

1. **When employed continuously for 120 days or more, an unlicensed dental assistant's employer is responsible for ensuring that they have completed which of the following courses?**
   A) *Infection control*
   B) *Basic life support*
   C) *The California Dental Practice Act*
   D) *All of the above*

2. **A dental hygienist may perform all of the following procedures under general supervision, EXCEPT:**
   A) *Root planing*
   B) *Periodontal charting*
   C) *Oral exfoliative cytology*
   D) *Periodontal soft tissue curettage*

3. **Of the following, who may legally provide dental care in California?**
   A) *An unlicensed dental assistant*
   B) *A dentist with an expired license*
   C) *A dental hygienist with a valid license in another state*
   D) *A dentist who has not recorded his or her fingerprints through the Department of Justice Live Scan system*

4. **All of the following are grounds for having a license suspended, EXCEPT:**
   A) *Employing an unlicensed dentist*
   B) *Unsanitary or unsafe office conditions*
   C) *Practicing dentistry with an expired license*
   D) *Alteration of a patient record without an intent to deceive*

5. **What is the maximum fine and term of imprisonment for a first offense misdemeanor violation of the Dental Practice Act?**
   A) *$200 and 3 months*
   B) *$200 and 6 months*
   C) *$3,000 and 6 months*
   D) *$30,000 and 12 months*

6. **Which of the following dental professionals are permitted to prescribe drugs?**
   A) *Dental assistants*
   B) *Dental hygienists*
   C) *Doctors of dentistry*
   D) *All of the above*

7. Which of the following are mandated reporters of child abuse?
- *A) Dental assistants*
- *B) Dental hygienists*
- *C) Doctors of dentistry*
- *D) All of the above*

8. What percentage of child abuse injuries involve the lips?
- *A) 14%*
- *B) 34%*
- *C) 54%*
- *D) 74%*

9. All of the following are clinical signs of physical child abuse, EXCEPT:
- *A) Excessive caries*
- *B) Welts in the shape of household objects*
- *C) A hoarse or raspy voice with evidence of strangulation injury*
- *D) Lacerations of the lips, tongue, buccal mucosa, gingival alveolar mucosa, frenum, or palate*

10. What percentage of individuals 65 years of age or older suffer from some form of neglect?
- *A) 20%*
- *B) 40%*
- *C) 60%*
- *D) 80%*

Be sure to transfer your answers to the Answer Sheet located on the envelope insert.
DO NOT send these test pages to NetCE. Retain them for your records.
PLEASE NOTE: Your postmark or facsimile date will be used as your test completion date.

COURSE #58583 — 2 CE CREDIT HOURS RELEASE DATE: 02/01/22 EXPIRATION DATE: 01/31/25

Infection Control for Dental Professionals: The California Requirement

This course fulfills the California requirement for 2 hours of Infection Control education.

Audience
This course is designed for all dentists, dental hygienists, and dental assistants in all practice settings, particularly those practicing in California.

Course Objective
The purpose of this course is to familiarize dental professionals with infection control techniques in order to minimize the risks of microbial transmission in the dental healthcare setting.

Learning Objectives
Upon completion of this course, you should be able to:

1. Outline OSHA and Cal/OSHA regulations that impact the provision of dental care.
2. Analyze potential modes of transmission and pathogens that can result in infection in dental facilities.
3. Discuss potential prevention strategies for infection control, including the use of precautions, hand hygiene, and personal protective equipment.
4. Describe effective environmental control measures that should be applied in dental care.
5. Identify steps that should be taken to protect dental professionals, including vaccination, education, and exposure responses.

Faculty
William E. Frey, DDS, MS, FICD, graduated from the University of California School of Dentistry, San Francisco, California, in 1966. In 1975, he completed residency training in Periodontics and received a Master's degree from George Washington University.

Dr. Frey retired from the United States Army Dental Corps in 1989 after 22 years of service. Throughout the course of his professional career, he has continuously practiced dentistry, the first 7 years as a general dentist and the past more than 40 as a periodontist. His military experience included the command of a networked Dental Activity consisting of five dental clinics. In his last assignment, he was in charge of a 38-chair facility. Colonel Frey was selected by the Army to serve on two separate occasions as the Chair of the Periodontal Department in Army General Dentistry Residency Training Programs.

Dr. Frey is the founder and president of Perio Plus, a practice management firm specializing in creating individually-designed hygiene and periodontal care programs for general dentists. He is also the creator of the Inspector Gum patient education series.

Faculty Disclosure
Contributing faculty, William E. Frey, DDS, MS, FICD, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Division Planner
Mark J. Szarejko, DDS, FAGD

Director of Development and Academic Affairs
Sarah Campbell

Division Planner/Director Disclosure
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Designations of Credit
NetCE designates this activity for 2 continuing education credits.

AGD Subject Code 148.

This course meets the Dental Board of California's requirements for 2 units of continuing education.

Dental Board of California course #02-3841-00344.

Special Approvals
This course fulfills the California requirement for 2 hours of infection control education.

About the Sponsor
The purpose of NetCE is to provide challenging curricula to assist healthcare professionals to raise their levels of expertise while fulfilling their continuing education requirements, thereby improving the quality of healthcare.

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- Read the following course.
- Complete the test and evaluation.
- Return your Customer Information/Answer Sheet/Evaluation and payment to NetCE by mail or fax, or complete online at www.NetCE.com/CADN23.
- A full Works Cited list is available online at www.NetCE.com.

INTRODUCTION

In 2018, there were more than 750,000 jobs in dental occupations in the United States [1]. In California alone there are approximately 91,000 dental healthcare professionals (DHCPs), including dentists, dental hygienists, and dental assistants. Most of these dental workers come in daily contact with a variety of infectious diseases in their workplace and are at risk for both transmitting and contracting these diseases. In California, there are three regulatory agencies involved in infection control in the dental healthcare setting: the Dental Board of California (DBC), which sets the minimum standards, the California Division of Occupational Safety and Health (Cal/OSHA), which publishes the Bloodborne Pathogens Standard, and the California Department of Public Health, which established the Waste Management Act.

To address the issue of infection control and reduce the potential for harm, the DBC established a requirement that dental healthcare licensees in California complete a course on infection control and prevention. DBC regulations also require that licensees comply with and enforce precautions and workplace practices that minimize the transmission of pathogens in dental settings. "Standard Precautions" is the DBC term for infection control measures that encompasses both "Universal Precautions"—a term the Occupational Safety and Health Administration (OSHA) uses—and the Cal/OSHA mandate for bloodborne pathogen transmission. The DBC mandates that Standard Precautions must be practiced in the care of all patients. The same infection control precautions apply to all patients, and all body fluids, except sweat, are considered potentially infectious. Universal Precautions are measures taken when exposed to blood, while Standard Precautions apply to all potentially infectious materials. While most elements of Standard Precautions evolved from Universal Precautions, developed for protection of healthcare personnel, additional elements of Standard Precautions focus on protection of patients. Contact Precautions are used to prevent transmission of an infectious agent associated with environmental contamination (e.g., treating all environmental surfaces as potentially contaminated) that is not interrupted by Standard Precautions alone.

A written protocol should be developed for proper instrument processing, operatory cleanliness, and management of injuries, and a copy of infection control regulations should be conspicuously posted in each dental office [2]. The DBC Standard Precaution guidelines are reviewed annually. Current guidelines may be downloaded at https://govt.westlaw.com/calregs/Document/I3F75D9A0B95D11E0A3CAA6663E6464AA and are found at the conclusion of this course. Significant changes in the 2011 revision include application of the guidelines to all dental healthcare professionals (not just "registered" professionals) and specific steps for disinfection [2]. The goal of these guidelines is to reduce the number of healthcare-associated infections in California dental practice settings.

OSHA AND CAL/OSHA REGULATIONS

Legal issues first began to impact infection control practices at the beginning of the acquired immunodeficiency syndrome (AIDS) epidemic in the early 1980s. The need to protect healthcare workers from bloodborne exposures resulted in the publication of the Bloodborne Pathogens Standard by OSHA in 1991 [3]. The OSHA Standard requires employers whose employees have exposure to blood or other potentially infectious material to implement safe work practices, education, and barriers to exposure. The Standard was later amended to cover the safe use of sharps.

BLOODBORNE PATHOGENS STANDARD

The OSHA Bloodborne Pathogens Standard requires that every healthcare worker who may have contact on the job with blood or other bodily fluids (referred to as other potentially infectious material or OPIM) must receive specific annual education, which includes instruction in the basics of infection control and prevention. Training must also cover bloodborne pathogens, modes of transmission, the proper use of needles, and Contact Precautions.

CALIFORNIA AEROSOL TRANSMISSIBLE DISEASE STANDARD

In 2009, Cal/OSHA adopted the nation's first aerosol transmissible disease (ATD) standard, which remains in effect today. The standard is designed to protect healthcare workers from diseases spread by an airborne or droplet route. The ATD standard requires healthcare employers to develop exposure control procedures and train employees to follow those procedures [4; 5]. Basic exposure precautions, such as source screening, infection control, hand hygiene, and cleaning and decontamination procedures, are a fundamental part of the standard. Employees must be included in the periodic review and assessment of these procedures.

California dental offices whose patients have suspected or confirmed illnesses that require Airborne or Droplet Precautions, such as tuberculosis (TB) or other respiratory illnesses, must comply with the ATD standards [4]. Key points include:

- Dental employees must be trained to screen patients for ATDs.
- The screening process must be described in a written office procedure.
- Screening must be consistently implemented.
- Elective dental treatment should be deferred until the patient is non-infectious for TB or other diseases requiring Airborne or Droplet Precautions.

A simple screening procedure can be done by the first person who comes in contact with a patient. For example, the patient may be asked "How are you feeling today?" or "Do you have any coughs, fever, or flu-like symptoms?" If the patient is not feeling well or gives a positive answer to any part of the second question, the dental treatment should be rescheduled.

Outpatient dental clinics or offices are not required to comply with this standard if they meet all of the following conditions [4; 6; 7]:

- Dental procedures are not performed on patients identified as ATD cases or suspected ATD cases (e.g., persons with TB or other respiratory illnesses).
- The clinic's injury and illness prevention program includes a written procedure for screening patients for ATDs that is consistent with the Centers for Disease Control and Prevention (CDC) guidelines for infection control in dental settings. This procedure must be followed before performing any dental work on a patient.
- Employees have been trained in the screening procedure in accordance with state law.
- Aerosol-generating dental procedures are not performed on a patient identified through the screening procedure as presenting a possible ATD exposure risk unless a licensed physician determines that the patient does not currently have an ATD.

MODES OF TRANSMISSION

Almost all pathogens are transmitted by being carried from one place to another. The mode or means of transmission is the weakest link in the chain of infection, and it is the only link that can be eliminated entirely. Most infection control efforts are aimed at preventing transmission of pathogens from a reservoir to a susceptible host. Both Standard and Contact Precautions are designed to interrupt the mode of transmission.

The most common modes of transmission in the healthcare setting are the hands of healthcare workers and items that move from patient to patient, both of which are examples of indirect transmission (***Table 1***). Items moving between patients should be cleaned and sterilized after each use to avoid indirect transmission of pathogens. Because it addresses the weakest link in the chain of transmission, hand hygiene is still the single most important procedure for preventing the spread of infection.

AEROSOLS, DROPLETS, AND SPLATTER

Aerosols, droplets (produced by the respiratory tract), and splatter contaminated with blood and bacteria are produced during many dental procedures [8]. Devices such as dental handpieces, ultrasonic and sonic scalers, air polishers, air-water syringes, and air abrasion units produce visible aerosol clouds and possible airborne contamination. Splatter generated by dental procedures such as drilling is a primary risk for transmission of bloodborne pathogens. In general, because of their smaller size, aerosols pose the greatest risk for airborne infection.

COMMON MODES OF INFECTION TRANSMISSION	
Category	**Definition**
Direct	Person-to-person transmission of pathogens
Indirect	An intermediate person or item (e.g., an instrument) acts as a transport between the portal of exit in one person and the portal of entry to the next person (e.g., unwashed hands)
Fomites	Contact with soiled objects, such as used gloves, pens, used tissues, and soiled laundry

Source: Compiled by Author *Table 1*

Several studies have shown that aerosol or droplet nuclei may extend up to 6 feet away from the source and can remain airborne for up to 30 minutes after a procedure. TB is of special concern because it is a large particle that can remain airborne or can dry on a surface and become airborne again as part of a dust particle.

The American Dental Association recommends that in addition to using standard barriers, such as masks, gloves, and eye protection, the proper sterilization of instruments and treatment of dental unit waterlines is necessary to reduce or eliminate this source of potentially contaminated dental aerosols. Preprocedural rinsing with an antimicrobial mouthwash such as chlorhexidine is also recommended, although it is only effective for oral bacteria found in saliva and those adhering to mucous membranes. It does not penetrate subgingivally and likely has no effect on bacteria in the nasopharynx [9].

Diseases known to spread by aerosols or droplet include:

- TB
- Pneumonic *Yersinia pestis* infection (plague)
- Influenza
- Legionellosis (Legionnaires disease)
- Severe acute respiratory syndrome (SARS)

Procedures or equipment aimed at eliminating the means of transmission include [9]:

- Universal preprocedural rinses
- Dental dams for certain procedures
- High-volume evacuator (HVE) at the treatment site (An HVE can only remove airborne contamination if it removes a large volume of air. A saliva ejector does not remove enough air to be classified as an HVE.)
- High-efficiency particulate arresting and ultraviolet filters in the ventilation system
- Gloves to minimize contamination of hands, discarded after each patient
- Cleaning, disinfection, and sterilization of equipment used by more than one patient
- Environmental cleaning and disinfection, especially of high-touch surfaces

FOMITE TRANSMISSION

Devices can transmit pathogens if they are contaminated with blood or bodily fluids or are shared without cleaning, disinfecting, and sterilizing between patients; these are classified as fomites. Surgical instruments that are inadequately cleaned between patients or that have manufacturing defects that interfere with the effectiveness of reprocessing may transmit bacterial, fungal, and viral pathogens. Clothing, uniforms, laboratory coats, or gowns used as personal protective equipment (PPE) may become contaminated with potential pathogens after care of a patient colonized or infected with an infectious agent [10].

Contaminated clothing and laboratory coats can potentially transmit infectious agents to successive patients. A 2007 study in a Maryland teaching hospital revealed that 27% of the white coats worn by 109 physicians and other healthcare professionals were colonized with *Staphylococcus aureus* and 6% were colonized with methicillin-resistant *S. aureus* (MRSA). In a follow-up questionnaire, 65% of the healthcare workers reported they had last washed their white coat more than a week ago and nearly 16% had last washed their coat more than 30 days ago [11]. A study presented at the American Society of Microbiology Conference in 2012 identified clothing and household linens (e.g., cotton towels) as a significant transmission source of infectious pathogens [12]. However, evidence linking clothing to hospital infection rates is lacking, and additional research is necessary to determine the actual extent of this risk [13].

Dental equipment and dental unit waterlines are both potential sources of transmission and potential reservoirs. Routine cleaning and sterilization and adherence to the American Dental Association's recommended procedures for treating dental unit waterlines have been shown to be effective in eliminating transmission of infectious organisms via these devices. If a surgical procedure involves soft tissue or bone, California regulations require the use of sterile coolants or irrigants, delivered using a sterile delivery system. In addition, a new infection control standard that took effect on January 1, 2019, requires that water or other methods for irrigation must be sterile or contain recognized disinfecting or antibacterial properties when performing procedures on exposed dental pulp. This requirement is in response to a 2016 outbreak of

mycobacterial infection from a Southern California dental clinic that led to the hospitalization of more than 60 children. The cause was determined to be bacteria introduced through water during pulpotomies [14].

BLOODBORNE PATHOGENS

Healthcare employees can be exposed to blood through needlestick and other sharps injuries, damaged mucous membranes, and broken skin exposures. The pathogens of primary concern to dental professions are human immunodeficiency virus (HIV), hepatitis B virus, and hepatitis C virus.

HEPATITIS B VIRUS

Healthcare personnel who have received the hepatitis B vaccine and developed immunity to the virus are at virtually no risk for infection. For a susceptible person, the risk from a single needlestick or cut exposure to hepatitis B-infected blood ranges from 6% to 30%, depending on the hepatitis B antigen status of the source individual [8; 15]. While there is a risk for hepatitis B infection from exposures of mucous membranes or nonintact skin, there is no known risk for infection from exposure to intact skin [16].

HEPATITIS C VIRUS

Hepatitis C is transmitted primarily through percutaneous exposure to infected blood. The average risk for infection after a needlestick or cut exposure to hepatitis C virus-infected blood is approximately 1.8% [17]. The risk following a blood exposure to the eye, nose, or mouth is unknown but is believed to be very small; however, hepatitis C virus infection from blood splashes to the eye has been reported [17]. There also has been a report of hepatitis C virus transmission that may have resulted from exposure to nonintact skin, but there is no known risk from exposure to intact skin [8]. Documented transmission of hepatitis C or hepatitis B virus has resulted from using the same syringe or vial to administer medication to more than one patient, even if the needle was changed.

The prevalence of hepatitis C virus infection among dentists and surgeons is similar to that among the general population, approximately 1% to 2% [15]. No studies of transmission from hepatitis C virus-infected dental healthcare personnel to patients have been reported, and the risk for such transmission appears limited [6].

HIV/AIDS

The average risk of HIV infection after a needlestick or cut exposure to HIV-infected blood is 0.3%; 99.7% of needlestick or cut exposures do not lead to infection [8; 17]. The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be 0.1%. There have been no documented cases of HIV transmission due to an exposure involving a small amount of blood on intact skin (i.e., a few drops of blood on skin for a short period of time) [8; 17].

In the United States, the risk of HIV transmission in dental settings is extremely low. According to surveillance data from 1981 to 2010, a total of 57 cases of HIV seroconversion had been documented among healthcare personnel after occupational exposure to a known HIV-infected source, but none were among dental care personnel [18]. Transmission of HIV to 6 patients of a single dentist with AIDS has been reported, but the mode of transmission could not be determined [19].

Certain factors affect the risk of HIV transmission after an occupational exposure. Laboratory studies have determined if needles that pass through latex gloves are solid rather than hollow-bore or are of small gauge (e.g., anesthetic needles), less blood is transferred. In a retrospective, case-control study of healthcare personnel, an increased risk for HIV infection was associated with exposure to a relatively large volume of blood, as with a deep injury with a device that was visibly contaminated with the patient's blood or a procedure that involved a needle placed in a vein or artery [20]. The risk was also increased if the exposure was to blood from patients with terminal illnesses, possibly reflecting the higher titer of HIV in late-stage AIDS patients.

PREVENTION STRATEGIES

In 1986, California became the first state to pass a comprehensive bloodborne pathogen standard [9]. The California standard provided a model for federal legislation, and in 1991, OSHA published its Bloodborne Pathogens Standard. Since then, regulatory and legislative activity has focused on implementing a hierarchy of prevention and control measures to improve infection control in healthcare settings. Respiratory hygiene, safe injection practices, aseptic technique, hand hygiene, and the use of PPE are now accepted as essential components of an effective infection prevention strategy. The Cal/OSHA ATD standard passed into law in 2009 was expected to be a blueprint for federal standards addressing aerosol transmissible diseases [5; 9]. Although permanent federal standards have not come to fruition, in June 2021, OSHA issued an emergency temporary standard addressing occupational exposure to severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), commonly referred to as COVID-19, including patient screening and management, use of Standard and Transmission-Based Precautions, PPE, and controls for aerosol-generating procedures [21].

STANDARD PRECAUTIONS

The gradual acceptance of various infection prevention standards has changed the way we work in the provision of dental care. The use of Standard Precautions reduces the risk of infection to staff and patients and ensures that the right precautions are used with both known and unknown carriers of diseases due to bloodborne pathogens. Standard Precautions apply to contact with:

- Blood
- All bodily fluids, secretions, and excretions (except sweat), regardless of whether they contain blood
- Intact or nonintact skin
- Mucous membranes

A central tenet of Standard Precautions is to consider all patients to be potentially infected with a bloodborne pathogen. Saliva has always been considered a potentially infectious material in dental infection control; thus, no operational difference exists in clinical dental practice between Universal Precautions and Standard Precautions. For organisms other than bloodborne pathogens, early identification and prompt isolation are critical.

When adhering to Standard Precautions, always:

- Use good hand hygiene.
- Use gloves for contact with blood, bodily fluids, nonintact skin (including rashes), mucous membranes, used equipment, linens, and trash.
- Use a gown any time your clothing is soiled and if a patient has uncontained bodily fluids (e.g., blood, saliva).
- Use a mask and eye protection if you may be splashed or be exposed to droplets; glasses do not adequately protect you.
- Change gloves if they become heavily soiled when working on a patient or if you must go from a potentially more infective area to a lesser one.

In addition, never:

- Wear artificial fingernails.
- Touch a second patient with the same pair of gloves used on the first patient.
- Reuse gowns, even for repeated contacts with the same patient.
- Contaminate the environment with dirty gloves.
- Wear gloves outside the treatment area unless you can say why you are wearing them.

RESPIRATORY HYGIENE

If dental clinics and offices comply with state regulations for screening of patients with ATDs, they are not required to comply with the new standards for prevention of transmission of ATDs [4]. However, because no screening process is universally effective, dental professionals should be aware of the potential dangers associated with transmission of pathogens via the airborne and droplet routes.

Respiratory droplets can transmit infection when they travel directly from the respiratory tract of the infected individual to the mucosal surfaces of the recipient, generally over short distances (i.e., 6 feet or less). Airborne transmission occurs with only a few organisms that can survive the drying of respiratory droplets. When the droplets evaporate, they leave behind droplet nuclei, which are so small they remain suspended in the air and can travel over longer distances. Respiratory droplets and droplet nuclei are generated when an infected person coughs, sneezes, or talks during procedures. Facial masks or shields generally provide direct protection from droplet transmission. Some pathogens transmitted via the airborne route (e.g., TB) require the use of an N95 respirator or better (e.g., N99, N100) due to the small particle size.

ASEPTIC TECHNIQUE

Aseptic technique involves the handling, preparation, and storage of medications in a manner that prevents microbial contamination. It also applies to the handling of all supplies used for injections and infusions. To avoid contamination, medications should be drawn in a clean medication preparation area. Any item that may have come in contact with blood or other potentially infectious material should be kept separate from medications.

SAFE INJECTION PRACTICES

In 2000, the Federal Needlestick Safety and Prevention Act authorized OSHA to revise its Bloodborne Pathogens Standard to require the use of safety-engineered sharp devices in healthcare settings [22]. Guidelines on the design, implementation, and evaluation of a sharps injury prevention program have been developed by the CDC.

Safe injection practices are designed to prevent disease transmission within the healthcare setting. The absence of visible blood or other signs of contamination in a used syringe does not mean the item is free from potentially infectious agents. Bacteria and other microbes can be present without any visible evidence of contamination. All used injection supplies and materials should be considered potentially contaminated and should be discarded.

To ensure safe injection practices, use aseptic technique throughout all aspects of injection preparation and administration. A new, sterile syringe and needle should be used to draw up medications while preventing contact between the injection materials and the nonsterile environment. Practice proper hand hygiene before handling medications, and discard medication vials upon expiration or any time there are concerns regarding the sterility of the medication.

Never leave a needle or other device inserted into a vial or bottle for multiple uses. This provides a direct route for microorganisms to enter the vial and contaminate the fluid. Medications should never be administered from the same syringe to more than one patient, even if the needle is changed.

Dental professionals should follow proper technique when using and handling needles, cannulae, and syringes. Whenever possible, use sharps with engineered sharps injury protections (e.g., non-needle or needle devices with built-in safety features or mechanisms that effectively reduce the risk of an exposure incident). Do not disable or circumvent the safety feature on devices.

Cases of bloodborne pathogen transmission as a result of improper injection practices have common themes [22]. Often, aseptic technique and Standard Precautions were not carefully followed. Infection control programs may be lacking or responsibilities unclear. In several instances, failure to recognize an infection control breach has led to prolonged transmission and a growing number of infected patients. In all cases, investigations were time-consuming and costly and required the notification, testing, and counseling of hundreds and sometimes thousands of patients.

HAND HYGIENE

Despite the simplicity and effectiveness of hand hygiene in preventing the spread of infectious disease, adherence to hand hygiene practice remains unacceptably low [23]. Adherence varies among professional categories of healthcare workers but is usually estimated as less than 50%, a rate that has not changed in more than a decade [23; 24; 25]. Healthcare providers might need to clean their hands as many as 100 times in a 12-hour shift, depending on the number of patients and intensity of care [25]. For dental healthcare workers, strict adherence to hand hygiene protects both the patient and the worker. Hand hygiene should be done when you first come to work, before you touch your first patient or clean equipment, and before and after every patient contact—including after touching intact skin. In addition, perform hand hygiene:

- After contact with any bodily fluids, including your own
- Before any non-invasive or invasive procedure
- Each time you remove your gloves
- When your hands feel or look dirty
- After contact with contaminated things or environments, such as charts
- After handling used equipment or linen
- After using the bathroom
- Before contact with any portal of entry, your patient's or your own
- Before and after eating

A number of conditions restrict dental healthcare professionals from participating in direct patient care. These include weeping dermatitis, exudative lesions, or any hand conditions that increase the risk of disease transmission.

Good handwashing is difficult to practice, is rarely known or taught, and is one of the single most effective ways to prevent transmission of many diseases, including influenza. Everyone knows to wash their hands before eating and after using the restroom. However, few do little more than remove obvious dirt. Good handwashing involves removing the skin oils where organisms can remain even when the hands look clean. A quick pass under the water faucet and fast dry with a towel may remove visible dirt, but the oils and organisms remain.

To effectively remove the oils and organisms, the process should take at least 20 seconds, or the amount of time it takes to sing "Twinkle, Twinkle Little Star." The hands should be soaped and rubbed vigorously for 15 seconds to create a good lather and to assure that all parts of each hand are soaped and rubbed well. Then, the hands should be rinsed thoroughly and dried, preferably with a paper towel. The towel should be used to turn off the water faucet and then properly thrown away. Such handwashing removes the oils that harbor the organisms. However, 20 seconds is a long time in the busy life of a healthcare provider, and this 20 seconds has been identified as a major barrier to handwashing, particularly among those who consider themselves "too busy" to wash their hands [23]. If there is no visible dirt or contamination, a waterless hand sanitizer with at least 60% alcohol can be used between patients. However, nothing is as good as washing well with soap and water. Some mistakenly think that hot water must be used to kill the organisms. Water hot enough to kill organisms would be too hot to touch. Warm water softens oils but mainly adds to comfort and encourages better washing technique (i.e., longer duration). Careful attention to handwashing and cleansing may result in chapped skin, so the dental professional must find effective lotions to care for his/her hands.

Certain soaps contain stronger antiseptic compounds, such as chlorhexidine, and these soaps may be considered in cases in which exposure to potentially infectious material is likely. Antiseptic soaps or surgical preparation liquids have been found more effective than plain soap in removing bacteria from healthcare workers hands both pre- and postprocedure [26; 27]. In addition, antiseptics may be added to alcohol-based handrubs in order to achieve persistent germicidal activity [6]. Possible side effects associated with frequent use of antiseptic hand scrubs include skin irritation, dermatitis, allergic reactions, and potential development of microbial resistances. Chlorhexidine products are considered safe for regular use in dental practice; however, if associated side effects are bothersome, they may result in decreased hand hygiene compliance.

In summary, start and end each work day using an antibacterial soap. Gloves provide a breeding ground for microbial growth, and washing before and after use is encouraged. If hands are not visibly soiled, a waterless hand sanitizer (at least 60% alcohol) may be used. For surgical procedures, wash hands with antimicrobial soap prior to gowning and gloving.

PERSONAL PROTECTIVE EQUIPMENT

PPE is defined as special coverings designed to protect healthcare personnel from exposure to or contact with infectious agents [28]. Cal/OSHA regulations require use of PPE in dental care settings to protect personnel from exposure to bloodborne pathogens. Under OSHA's General Duty Clause, PPE is also required for any potential infectious disease exposure. Employers must provide their employees with appropriate PPE and ensure its proper disposal. If reusable, it must be properly cleaned or laundered, repaired, and stored after use [29]. PPE must fit the individual user, and it is up to the employer to ensure that PPE is available in sizes appropriate for all their workers. Employees are prohibited from taking PPE home to launder.

In addition to the familiar gloves and gowns, PPE includes a variety of barriers and respirators used alone or in combination to protect skin, mucous membranes, and airways from contact with infectious agents. The selection of PPE is based on the nature of the patient/provider interaction and the likely mode of transmission. Primary PPE used in oral healthcare settings includes gloves, surgical masks, protective eyewear, face shields, and protective clothing.

Procedures that generate splashes or sprays of blood, bodily fluids, secretions, excretions, or chemical agents require either a face shield (disposable or reusable) or mask and goggles. The wearing of masks, eye protection, and face shields in specified circumstances (when blood or other potentially infectious material exposures are likely to occur) is mandated by the OSHA Bloodborne Pathogens Standard. Sterile barriers for invasive procedures and masks or respirators for the prevention of droplet contamination are also required.

The use of PPE is not a substitute for safe work practices. Avoid contaminating yourself by keeping your hands away from your face and not touching or adjusting equipment. PPE is a potential means of transmission if not changed between patients. All PPE should be removed when leaving patient care areas.

Gloves

Dental personnel should wear gloves to prevent contamination of their hands when touching mucous membranes, blood, saliva, or other potentially infectious material. Gloves reduce the likelihood that micro-organisms present on the hands will be transmitted to patients during surgical or other patient-care procedures. Gloves used in the healthcare setting are subject to U.S. Food and Drug Administration (FDA) evaluation and clearance. Nonsterile, disposable medical gloves made of latex or nitrile should be available for routine patient care. Dental professionals should always use gloves when [28; 30]:

- Anticipating direct contact with blood or bodily fluids, mucous membranes, nonintact skin, and other potentially infectious material
- Engaging in direct contact with patients who are colonized or infected with pathogens transmitted by the contact route, such as vancomycin-resistant enterococci or MRSA
- Handling or touching visibly or potentially contaminated patient care equipment and environmental surfaces

Studies have repeatedly shown that vinyl gloves have higher failure rates than latex or nitrile gloves. For this reason, either latex or nitrile gloves are preferable for clinical procedures that require manual dexterity or those involving more than brief patient contact. Heavier, reusable utility gloves should be used for non-patient-care activities, such as handling or cleaning contaminated equipment or surfaces, handling chemicals, or disinfecting contaminated tools [28; 30].

During dental procedures, patient examination gloves commonly contact multiple types of chemicals and materials, such as disinfectants and antiseptics, composite resins, and bonding agents, and these materials can compromise the integrity of latex, nitrile, and other synthetic glove materials. In addition, latex gloves can interfere with the setting of vinyl polysiloxane impression materials. Given the diverse selection of dental materials on the market, dental practitioners should consult glove manufacturers regarding the chemical compatibility of glove materials [6].

Wearing sterile surgeon's gloves during surgical procedures has a strong theoretical rationale. Sterile gloves minimize transmission of micro-organisms from the hands of surgical personnel to patients and prevent contamination of the hands of surgical personnel with the patient's blood and bodily fluids. In addition, sterile surgeon's gloves are more rigorously regulated by the FDA and may provide an increased level of protection for the provider if exposure to blood is likely [6].

Gloves should be removed and replaced if torn or punctured and discarded between patients to prevent transmission of infectious material. They should never be washed and reused, as micro-organisms cannot be removed reliably from glove surfaces. Glove reuse has been associated with transmission of MRSA and gram-negative bacilli [28; 30].

When gloves are worn in combination with other PPE, they should be put on last. Gloves that fit snugly around the wrist are preferred for use with a gown because they will cover the gown cuff and provide a more reliable continuous barrier for the arms, wrists, and hands. Removing gloves properly also prevents hand contamination. Hand hygiene following glove removal ensures that the hands will not carry potentially infectious material that might have penetrated through unrecognized tears or contaminated the hands during glove removal [28; 30]. When processing contaminated sharp instruments, needles, and devices, heavy utility gloves should be used to prevent puncture injuries.

Cover Garb

Gowns are intended to protect the arms and exposed body areas and prevent contamination of clothing with blood, bodily fluids, and other potentially infectious material. The type of gown selected is based on the nature of the patient/provider interaction, including the anticipated degree of contact with infectious material and potential for blood and bodily fluid penetration of the barrier. Laboratory coats or jackets worn over personal clothing for comfort or purposes of identity are not considered PPE [28; 30].

California regulations require that dental personnel wear reusable or disposable protective attire when their clothing or skin is likely to be soiled with blood or other potentially infectious material. Gowns must be changed daily or between patients if they become moist or visibly soiled. Protective attire must be removed when leaving laboratories or areas of patient care activities. Reusable gowns should be laundered in accordance with Cal/OSHA Bloodborne Pathogens Standards [2].

Masks, Protective Eyewear, and Face Shields

In California, dental professionals are required to wear surgical masks that cover both the nose and mouth, in combination with either chin-length plastic face shields or protective eyewear when there is potential for splashing or spattering of blood or other potentially infectious material. After each patient and during patient treatment (if applicable), masks must be changed if moist or contaminated. After each patient, face shields and protective eyewear shall be cleaned and disinfected, if contaminated [2].

Masks should fit snuggly and fully cover the nose and mouth to prevent fluid penetration. For this reason, masks that have a flexible nose piece and can be secured to the head with string ties or elastic are preferable. Surgical masks protect against micro-organisms generated by the wearer and also protect dental personnel from large-particle droplet spatter that might contain bloodborne pathogens or other potentially infectious material. If the mask becomes wet or contaminated, it should be changed between patients or even during patient treatment. For employees at increased risk of exposure to ATDs, such as those working in endemic areas (e.g., Southeast Asia) or in areas designated for isolation or quarantine, the employer must provide a respirator at least as effective as an N95 respirator.

Most surgical masks are not National Institute for Occupational Safety and Health (NIOSH)-certified as respirators, do not protect the user adequately from exposure to TB, and do not satisfy OSHA requirements for respiratory protection. However, certain surgical masks (i.e., N95 respirators) do meet the requirements and are certified by NIOSH. The level of protection a respirator provides is determined by the efficiency of the filter material for incoming air (e.g., 95% for N95) and how well the face piece fits or seals to the face. N95 respirators are required to be labeled as such on the device.

Respirators are used when treating patients with diseases requiring Airborne Precautions and should be used in the context of a complete respiratory protection program. This program should include training and fit testing to ensure an adequate seal between the edges of the respirator and the wearer's face.

Goggles with side shields provide barrier protection for the eyes and should fit snuggly over and around the eyes or personal prescription lenses. Personal prescription lenses do not provide optimal eye protection and should not be used as a substitute for goggles. If goggles or face shields are reusable, they must be placed in a designated receptacle for subsequent reprocessing. If they are not reusable, they may be discarded in a designated waste receptacle.

Face shields extending from chin to crown provide better face and eye protection from splashes and sprays than goggles. Shields that wrap around the sides may reduce splashes around the edge. Removal of a face shield, goggles, and mask can be performed safely after gloves have been removed and hand hygiene performed. The ties, ear pieces, or headband used to secure the equipment to the head are considered clean and therefore safe to touch with bare hands. The front of the face shield is considered contaminated [30].

ENVIRONMENTAL CONTROL MEASURES

As discussed, contaminated surfaces and objects can serve as the means of transmission for potential pathogens. The transfer of a micro-organism from an environmental surface to a patient is largely via hand contact with the surface. Although hand hygiene is important to minimize the impact of this transfer, cleaning and disinfecting environmental surfaces is fundamental in reducing their potential contribution to the incidence of infections [31].

ENVIRONMENTAL CLEANING

All work areas, including contact surfaces and barriers, must be maintained in a clean and sanitary condition. Employers are required to determine and implement a written schedule for cleaning and disinfection based on the location, type of surface to be cleaned, type of soil present, and tasks or procedures being performed. All equipment and environmental and working surfaces must be properly cleaned and disinfected after contact with blood or other potentially infectious material.

If items or surfaces likely to be contaminated are difficult to clean and disinfect, they must be protected with disposable impervious barriers. 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 disinfectant after each patient. The low-level disinfectants used must be

labeled effective against hepatitis B virus and HIV. Use disinfectants in accordance with the manufacturer's instructions. Clean all housekeeping surfaces (e.g., floors, walls, sinks) with a detergent and water or a Cal/EPA-registered, hospital-grade disinfectant. Chemical-resistant utility gloves should be worn when handling hazardous chemicals [31].

MEDICAL WASTE MANAGEMENT

Federal, state, and local guidelines and regulations specify the categories of medical waste subject to regulation and outline the requirements associated with treatment and disposal. Regulated medical waste is defined as [6; 31]:

- Liquid or semi-liquid blood or other potentially infectious materials
- Contaminated items that would release blood or other potentially infectious material in a liquid or semi-liquid state if compressed
- Items that are caked with dried blood or other potentially infectious material capable of releasing these materials during handling
- Contaminated sharps (e.g., needles, burs, scalpel blades, endodontic files)
- Pathologic and microbiologic wastes containing blood or other potentially infectious material

Regulated medical waste accounts for only 9% to 15% of total waste in hospitals and 1% to 2% of total waste in dental offices [6]. Examples of regulated waste found in dental practice settings are solid waste soaked or saturated with blood or saliva (e.g., gauze saturated with blood after surgery), extracted teeth, surgically removed hard and soft tissues, and contaminated sharp items such as needles, scalpel blades, and wires [6].

Medical waste requires careful disposal and containment before collection and consolidation for treatment. A single, leak-resistant biohazard bag is usually adequate for containment of regulated medical wastes, provided the bag is sturdy and the waste can be discarded without contaminating the bag's exterior. Contamination or puncturing of the bag requires placement into a second biohazard bag. All bags should be securely closed for disposal.

Medical waste requiring storage should be kept in labeled, leak-proof, puncture-resistant containers under conditions that minimize or prevent foul odors. The storage area should be well-ventilated and inaccessible to pests. Any facility that generates regulated medical waste should have a regulated medical waste management plan to ensure health and environmental safety in accordance with federal, state, and local regulations [31].

DENTAL UNIT WATERLINES, BIOFILM, AND WATER QUALITY

The following information is taken from the Centers for Disease Control and Prevention publication Guidelines for Infection Control in Dental Health-Care Settings [6].

Studies have shown that dental unit waterlines, such as narrow-bore plastic tubing that carries water to high-speed handpieces, air/water syringes, and ultrasonic scalers, can become colonized with micro-organisms, including bacteria, fungi, and protozoa. Protected by a polysaccharide layer known as a glycocalyx, these micro-organisms colonize and replicate on the interior surfaces of the tubing and form a biofilm. This biofilm serves as a reservoir that can increase the number of micro-organisms in the water used during dental treatment.

In 1993, the CDC recommended that dental waterlines be flushed at the beginning of the clinic day to reduce the microbial load. Dental unit water that remains untreated or unfiltered is unlikely to meet drinking water standards.

Commercial devices and procedures shown to improve the quality of water used in dental treatment include self-contained water systems with chemical treatment, in-line microfilters, and combinations of these treatments. Simply using tap, distilled, or sterile water will not eliminate bacterial contamination in treatment water if biofilms in the system are not controlled. Removal or inactivation of dental waterline biofilms requires use of chemical germicides. California law defines "germicide" as a chemical agent that can be used to disinfect items and surfaces based on the level of contamination [2].

Patient material, such as oral micro-organisms, blood, and saliva, can enter the dental water system during treatment. Devices connected to the dental water system that enter the patient's mouth should be flushed to discharge water and air for a minimum of 20 to 30 seconds after each patient to remove patient material that might have entered the turbine, air, or waterlines.

Manufactured dental units are now engineered to prevent retraction of oral fluids, but some older units are equipped with antiretraction valves that require periodic maintenance. Users should consult the owner's manual or contact the manufacturer to determine whether testing or maintenance of antiretraction valves or other devices is required. Even with antiretraction valves, flushing devices for a minimum of 20 to 30 seconds after each patient is recommended. The DBC standards require that, at the beginning of each work day, dental lines and devices must be purged with air or flushed with water for at least two minutes prior to attaching handpieces, scales, air/water syringe tips, or other devices [2].

ENGINEERING AND WORK PRACTICE CONTROLS

The following information is taken from the OSHA Bloodborne Pathogens Standard, 1910.1030.

Engineering controls such as sharps disposal containers, self-sheathing needles, and safer medical devices (e.g., sharps with engineered sharps injury protections and needleless systems) isolate or remove the bloodborne pathogens hazard from the workplace. On the other hand, work practice controls reduce the likelihood of exposure by specifying the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

Engineering and work practice controls are intended to work synergistically to eliminate or minimize employee exposure. These controls must be examined and maintained or replaced on a regular basis to ensure their effectiveness. To maintain a safe workplace, employers must provide handwashing facilities that are readily accessible to employees.

Contaminated needles and other contaminated sharps should not be bent, recapped, or removed unless the employer can demonstrate that there is no alternative or that such action is required by a specific procedure. Necessary bending, recapping, or needle removal must be accomplished through the use of a mechanical device or a one-handed scoop technique. Shearing or breaking of contaminated needles is prohibited. Immediately, or as soon as possible after use, contaminated reusable sharps (e.g., scalpels, dental knives) must be placed in appropriate containers until properly reprocessed. These containers must be:

- Puncture resistant
- Labeled or color-coded
- Leak-proof on the sides and bottom
- Maintained in accordance with OSHA requirements for reusable sharps
- Designed so personnel are not required to reach by hand into the container
- Located as close as possible to the point of use

Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure. Food and drink should not be kept in refrigerators, freezers, shelves, or cabinets or on countertops where blood or other potentially infectious material is present.

All procedures involving blood or other potentially infectious material must be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances. Splatter shields should be used on medical equipment associated with risk-prone procedures.

Equipment that may become contaminated with blood or other potentially infectious material must be examined before servicing or shipping and should be decontaminated as necessary, unless the employer can demonstrate that decontamination of such equipment or portions of such equipment is not feasible. A readily observable label should be attached to the equipment stating which portions remain contaminated. The employer must ensure that this information is conveyed to all affected employees, the servicing representative, and the manufacturer before handling, servicing, or shipping, so appropriate precautions may be taken.

CLEANING, DISINFECTION, AND STERILIZATION

Application of accepted infection control principles helps maintain a safe environment for both patients and dental care workers. This includes proper use of Standard Precautions and application of approved techniques for cleaning, disinfection, sterilization, and reprocessing of dental equipment. Healthcare policies must identify—primarily on the basis of an item's intended use—whether cleaning and disinfection or sterilization is indicated (***Table 2***) [7].

Cleaning is defined as the removal of visible soil (organic and inorganic material) from objects and surfaces; normally, it is accomplished manually or mechanically using water with detergents or enzymatic products. Decontamination reduces the number of pathogenic micro-organisms on objects, usually with a 0.5% chlorine solution [7]. Thorough cleaning and decontamination are essential before high-level disinfection and sterilization because inorganic and organic materials that remain on the surfaces of instruments interfere with the effectiveness of these processes.

Disinfection is a process that eliminates many or all pathogenic micro-organisms, except bacterial spores, on inanimate objects. In healthcare settings, objects are usually disinfected using liquid chemicals or wet pasteurization (i.e., the use of hot water to destroy micro-organisms). There are three levels of disinfection:

- High-level disinfection: Used to disinfect patient-care equipment that touches mucous membranes or blood.
- Intermediate-level disinfection: Used mainly to disinfect items that have contact with intact skin, but is appropriate for certain semicritical items (e.g., chair arms).
- Low-level disinfection: Used to disinfect the health-care environment or items that touch intact skin.

Surface disinfection is an important part of environmental cleaning. Most bacteria and mycobacteria (e.g., TB) survive for months on dry surfaces [32]. Respiratory viruses, such as coxsackie or influenza, can persist on surfaces for a few days.

METHODS FOR STERILIZING AND DISINFECTING PATIENT-CARE ITEMS AND ENVIRONMENTAL SURFACES

Process	Result	Method	Examples	Patient Care Items	Environmental Surfaces
Sterilization	Destroys all micro-organisms, including bacterial spores.	Heat-automated, high temperature	Steam, dry heat, unsaturated chemical vapor	Heat-tolerant critical and semicritical	NA
		Heat-automated, low temperature	Ethylene oxide gas, plasma sterilization	Heat-sensitive critical and semicritical	
		Liquid immersion[a]	Glutaraldehyde, glutaraldehydes with phenols, hydrogen peroxide, hydrogen peroxide with peracetic acid, peracetic acid		
High-level disinfection	Destroys all micro-organisms, but not necessarily high numbers of bacterial spores.	Heat-automated	Washer disinfector	Heat-sensitive semicritical	NA
		Liquid immersion[a]	Glutaraldehyde, glutaraldehydes with phenols, hydrogen peroxide, hydrogen peroxide with peracetic acid, ortho-phthalaldehyde		
Intermediate-level disinfection	Destroys vegetative bacteria and most fungi and viruses. Inactivates *Mycobacterium bovis*[b]. Not necessarily capable of killing bacterial spores.	Liquid contact	EPA-registered hospital disinfectant with label claim of tuberculocidal activity (e.g., chlorine-containing products, quaternary ammonium compounds with alcohol, phenolics, bromides, iodophors, EPA-registered chlorine-based product)	Noncritical with visible blood	Clinical contact surfaces, blood spills on housekeeping surfaces
Low-level disinfection	Destroys most vegetative bacteria and certain fungi and viruses. Does not inactivate *Mycobacterium bovis*.	Liquid contact	EPA-registered hospital disinfectant with no label claim regarding tuberculocidal activity. OSHA also requires label claim of HIV and HBV potency for use of low-level disinfectant for use on clinical contact surfaces (e.g., quaternary ammonium compounds, some phenolics, some iodophors)	Noncritical without visible blood	Clinical contact surfaces, housekeeping surfaces

[a]Contact time is the single critical variable distinguishing the sterilization process from high-level disinfection with FDA-cleared liquid chemical sterilants. High-level disinfection uses shorter submersion times.
[b]Inactivation of the more resistant *Mycobacterium bovis* is used as a benchmark to measure germicidal potency.

Source: [6] *Table 2*

Hepatitis viruses and HIV can persist for more than one week, and herpes viruses have been shown to persist from only a few hours up to seven days [32]. All surfaces in patient care areas should be cleaned then disinfected according to the manufacturer's instructions and allowed to dry completely.

Sterilization is a process that destroys or eliminates all forms of microbial life and is carried out in healthcare facilities by physical or chemical methods. Sterile and nonsterile are absolute concepts. If a sterile item is touched by anything nonsterile, the formerly sterile item is contaminated.

The sterilization area should be separate from any patient care or staff break areas. The sterilization section of the processing area should include the sterilizers and related supplies, with adequate space for loading, unloading, and cool down [6]. The area can also include incubators for analyzing spore tests and enclosed storage for sterile items and single-use items. Manufacturer and local building code specifications will determine placement and room ventilation requirements.

According to the CDC guideline, heat-tolerant dental instruments usually are sterilized by steam under pressure (autoclaving), dry heat, or unsaturated chemical vapor [6]. All sterilization should be performed by using medical sterilization equipment cleared by the FDA. The sterilization times, temperatures, and other operating parameters recommended by the manufacturer of the equipment used, as well as instructions for correct use of containers, wraps, and chemical or biological indicators, should always be followed [6]. Sterilization most often fails due to overloading.

Devices being sterilized should first be cleaned, as debris interferes with the sterilization process. If an ultrasonic unit is utilized, it should be covered while actively in use. Instruments should be fully dry prior to packaging and storage.

Storage practices for wrapped sterilized instruments can be either date- or event-related. Packages containing sterile supplies should be inspected before use to verify barrier integrity and dryness. Although some facilities continue to date every sterilized package and use shelf-life practices, other facilities have switched to event-related practices [6]. This approach recognizes that the product should remain sterile indefinitely, unless an event causes it to become contaminated (e.g., torn or wet packaging). Even for event-related packaging, the date of sterilization should be placed on the package, and if multiple sterilizers are used in the facility, the sterilizer used should be indicated on the outside of the packaging material to facilitate the retrieval of processed items in the event of a sterilization failure [6; 7]. If packaging is compromised, the instruments should be re-cleaned, sterilized again, and packaged in new wrap [7].

Categorizing Patient-Care Items

Patient-care items (e.g., dental instruments, devices, and equipment) are categorized using the Spaulding classification system as critical, semicritical, or noncritical, depending on the potential risk for infection associated with their intended use. Critical items are those items that enter sterile spaces, such as soft tissue or bone. These items pose the greatest risk of transmitting infection and require sterilization.

Semicritical items touch intact mucous membranes and have a lower risk of transmission. Because the majority of semicritical items in dentistry are heat-tolerant, they should be sterilized using heat. If a semicritical item is heat-sensitive, it should, at a minimum, be processed with high-level disinfection, which kills all microbial life except spores [6; 7].

Noncritical items pose the least risk of transmission of infection, contacting only intact skin, an effective barrier to most micro-organisms. In the majority of cases, cleaning and disinfection with an EPA-registered hospital disinfectant is adequate. When the item is visibly contaminated with blood or other potentially infectious material, an EPA-registered hospital disinfectant with a tuberculocidal claim (i.e., intermediate-level disinfectant) should be used [6; 7].

High-speed dental hand pieces, low-speed hand piece components used intraorally, and other dental unit attachments (e.g., reusable air or water syringe tips and ultrasonic scaler tips) must be heat-sterilized between patients. Single-use disposable instruments such as prophylaxis angles, cups, brushes, tips for high-speed evacuators, saliva ejectors, and air and water syringe tips must be used for one patient only and discarded. Proper functioning of the sterilization cycle must be verified at least weekly through the use of a biologic indicator (such as a spore test). Test results should be maintained for 12 months [2]. Studies have demonstrated variability among dental practices in meeting sterilization standards. In one study, 49% of respondents did not challenge autoclaves with biological indicators. Other studies using biologic indicators found a high proportion (15% to 65%) of positive spore tests after assessing the efficacy of sterilizers used in dental offices [7].

Dental unit water lines must be anti-retractive. At the beginning of each workday, dental unit lines should be purged with air or flushed with water for at least two minutes prior to attaching handpieces, scalers, and other devices. The dental unit line must be flushed between each patient for a minimum of 20 seconds [2]. Single-use barriers may be used on those environmental surfaces that are difficult to clean and disinfect.

Laboratory Areas

According to California regulations, splash shields and equipment guards must be used on dental laboratory lathes. Fresh pumice and a disinfected, sterilized, or new ragwheel should be used for each patient. Devices used to polish, trim, or adjust contaminated intraoral devices must be disinfected or sterilized [2].

Intraoral items, such as impressions, bite registrations, and prosthetic or orthodontic appliances, must be cleaned and disinfected with an intermediate-level disinfectant before manipulation in the laboratory and before placement in the patient's mouth. Such items should be thoroughly rinsed prior to placement in the patient's mouth [2].

Reprocessing Reusable Medical Equipment

Reusable instruments, medical devices, and equipment should be managed and reprocessed according to recommended and appropriate methods. Industry guidelines as well as equipment and chemical manufacturer recommendations should be used to develop and update reprocessing policies and procedures. Written instructions should be available for each instrument, medical device, and equipment reprocessed. The FDA has issued guidance on ensuring the safety of reusable medical devices [33].

Single-Use Devices

A single-use device is a device that is intended for use on a single patient during a single procedure. An unused single-use device is referred to as an original device. A reprocessed single-use device is an original device that has previously been used on a patient and has been subjected to additional processing and manufacturing for the purpose of an additional single use on a patient [34].

PROTECTING DENTAL HEALTHCARE WORKERS

Protecting dental professionals is an integral part of every dental organization's general program for infection prevention and control. The objectives usually include [35; 36]:

- Educating personnel about the principles of infection control and emphasizing individual responsibility
- Providing care to personnel for work-related illnesses or exposures
- Identifying work-related infection risks and implementing appropriate preventive measures
- Containing costs by preventing infectious diseases that result in absenteeism and disability

OCCUPATIONAL EXPOSURES

An occupational exposure is defined as a percutaneous injury or contact of mucous membrane or nonintact skin with blood, tissue, or other potentially infectious material, most commonly a needlestick injury. The risk of infection depends on several factors, including:

- Whether the exposure was from a hollow-bore needle or other sharp instrument
- Whether the exposure was to nonintact skin or mucous membranes
- The amount of blood involved
- The amount of contagion present in the source person's blood

If a sharps injury occurs, wash the exposed area with soap and water. Do not "milk" or squeeze the wound. There is no evidence that using antiseptics will reduce the risk of transmission for any bloodborne pathogens; however, the use of antiseptics is not contraindicated. In the event that the wound needs suturing, emergency treatment should be obtained. The risk of contracting HIV from this type of exposure is extremely rare. Only 58 cases of confirmed occupational HIV transmission to healthcare personnel have been reported in the United States, with an additional 150 possible transmissions reported to the CDC [37]. There are no documented cases of a dental healthcare professional contracting HIV from an occupational exposure.

OSHA's final rule for occupational exposure to bloodborne pathogens requires dental employers to arrange a confidential medical evaluation and follow-up for any employee reporting an exposure incident [3]. An exposure incident is any eye, mouth, mucous membrane, nonintact skin, or other parenteral contact with blood or other potentially infectious material. Saliva in dental procedures is treated as potentially infectious material.

Following an exposure, the dental employer must refer the exposed employee to a licensed healthcare professional who can provide information and counseling and discuss how to prevent further spread of a potential infection. The exposed employee is entitled to appropriate follow-up and evaluation of any reported illness to determine if the symptoms may be related to HIV or hepatitis B infection.

Prompt response is necessary whenever an occupational exposure occurs. If possible, the patient should be interviewed to determine if any risk factors or bloodborne pathogens not previously disclosed are present. The patient may be tested along with the employee, if he or she agrees, in order to obtain the most information possible. Testing and postexposure prophylaxis may be conducted at an occupational injury clinic. All events leading up to and after the exposure should be documented in a written report.

Postexposure Prophylaxis

Postexposure prophylaxis (PEP) involves the provision of medications to someone who has had a substantial exposure, usually to blood, in order to reduce the likelihood of infection. PEP is available for HIV and hepatitis B virus. Although there is no PEP recommended for hepatitis C virus, limited data indicate that antiviral therapy might be beneficial when started early in the course of infection [38]. For employees who have not received the hepatitis B vaccine series, the vaccine (and in some circumstances hepatitis B immunoglobulin) should be

offered as soon as possible (within seven days) after the exposure incident. The effectiveness of hepatitis B immunoglobulin administered more than seven days after exposure is unknown. PEP has been the standard of care for healthcare providers with substantial occupational exposures since 1996 and must be provided in accordance with the recommendations of the U.S. Public Health Service [38].

TUBERCULOSIS PREVENTION

California has one of the highest incidence rates of TB in the country, primarily because of its large immigrant and other high-risk populations (e.g., homeless persons) [39]. The TB infection rate is 14 times higher among foreign-born individuals than among those born in the United States. The rates among Asian and Black individuals born outside the United States were 50 and 51 times higher, respectively, than that of U.S.-born White persons [39]. To prevent the transmission of *Mycobacterium tuberculosis* in dental care settings, infection-control policies should be developed based on the community TB risk assessment and reviewed annually. The policies should include appropriate screening for latent or active TB disease in dental care providers, education about the risk for TB transmission, and provisions for detection and management of patients who have suspected or confirmed TB disease.

The CDC recommends that all dental care providers be screened for TB upon hire, using either a tuberculin skin test or blood test [40]. In addition, the California Department of Public Health requires that healthcare facilities in California perform initial and annual TB screening of employees [41].

Patients with symptoms of TB should be identified by screening; dental treatment should be deferred until active TB has been ruled out or the patient is no longer infectious following treatment. The potentially active TB patient should be promptly referred to an appropriate medical setting for evaluation of possible infectiousness and should be kept in the dental care setting only long enough to arrange for referral. Standard Precautions are not sufficient to prevent transmission of active TB.

A diagnosis of active respiratory TB should be considered for any patient with the following symptoms:

- Coughing for more than three weeks
- Loss of appetite
- Unexplained weight loss
- Night sweats
- Bloody sputum or hemoptysis
- Hoarseness
- Fever
- Fatigue
- Chest pain

A person with latent TB (positive skin test and no symptoms) can be treated in a dental office using standard infection control precautions [42]. This person has no symptoms and cannot transmit TB to others as there are no spores in his or her sputum.

The American Dental Association recommends that all patients be asked about any history of TB or exposure to TB, including signs and symptoms and medical conditions that increase their risk for TB disease. The Health History Form, developed by the U.S. Department of Health and Human Services, can be used to ask these questions.

If a patient with suspected or confirmed infectious TB disease requires urgent dental care, that care should be provided in a setting that meets the requirements for California ATD standards and airborne infection isolation. Respiratory protection (with a fitted N95 disposable respirator) should be used while performing procedures on such patients. Standard surgical masks are not designed to protect against TB transmission [42].

VACCINATION

Hepatitis B

Cal/OSHA guidelines require that healthcare workers who perform tasks that may involve exposure to blood or bodily fluids must have hepatitis B vaccination made available to them within 10 working days of initial assignment. The employee must also be given free information about the efficacy, safety, and benefits of vaccination [43].

The hepatitis B vaccine is given in a series of three injections at 0, 1, and 6 months. If one of the injections is missed, the series does not need to be restarted. The CDC recommends if the series is interrupted, the second or third dose should be administered as soon as possible; the second and third doses should be separated by an interval of at least eight weeks [44]. No booster is necessary. Follow-up serologic testing two months after vaccination (to ensure efficacy) is recommended. The provision of employer-supplied hepatitis B vaccination may be delayed until after probable exposure for employees whose sole exposure risk is the provision of first aid.

The high risk of hepatitis B virus exposure among healthcare personnel makes it imperative that clinical dental personnel be vaccinated. Vaccination can protect both workers and patients from hepatitis B virus infection and, whenever possible, should be completed when dentists or other dental care personnel are in training [6].

Influenza

Influenza is primarily transmitted from person to person via large, virus-laden droplets generated when infected persons cough or sneeze. These large droplets can settle on the mucosal surfaces of the upper respiratory tracts of susceptible persons who are within 3 feet of infected persons. Transmission may also occur through direct contact or indirect contact with respiratory secretions, such as when touching surfaces contaminated with influenza virus and then touching the eyes, nose, or mouth. The CDC strongly recommends that all healthcare personnel, especially those who have contact with patients at high risk, who have high-risk medical conditions, or who are older than 50 years of age, receive an annual (seasonal) influenza vaccination [45].

TRAINING AND EDUCATION

Dental professionals should also fulfill all federal and state requirements for infection control training. New employees, or employees being transferred into jobs involving tasks or activities with potential exposure to blood or other potentially infectious material, must receive bloodborne pathogen training before assignment to tasks in which an occupational exposure may occur. Retraining is required annually or when changes in procedures or tasks affecting occupational exposure occur. Employees should be provided access to a qualified trainer to answer questions during the training session.

CONCLUSION

Effective infection control techniques are critical to reducing the incidence of infections in dental facilities. Antiseptic techniques and antibiotics will kill micro-organisms, while proper hand hygiene will block their transmission. Gloves, gowns, and masks remove dental professionals from the transmission cycle by protecting them from contact with micro-organisms. Contact Precautions and isolation techniques help patients avoid being vectors of transmission. Engineering controls help to make the workplace safer, while administrative controls ensure that written protocols are in place and followed. Lastly, ensuring that dental professionals are immune or vaccinated can help decrease the availability of potential hosts.

DENTAL BOARD OF CALIFORNIA GENERAL PROVISIONS: SECTION 1005. MINIMUM STANDARDS FOR INFECTION CONTROL

The Dental Board of California General Provisions: Section 1005. Minimum Standards for Infection Control is available online at https://govt.westlaw.com/calregs/Document/I3F75D9A0B95D11E0A3CAA6663E6464AA.

CAL/OSHA COVID-19 STANDARD

In light of the ongoing COVID-19 pandemic, Cal/OSHA has developed an Emergency Temporary Standard to help protect healthcare providers and patients. The Standard must be re-authorized (and revised, if necessary) every six months. It may be accessed online at https://www.dir.ca.gov/oshsb/documents/Dec162021-COVID-19-Prevention-Emergency-txtcourtesy-2nd-Readoption.pdf.

Customer Information/Answer Sheet/Evaluation insert located between pages 88–89.

COURSE TEST - #58583 INFECTION CONTROL FOR DENTAL PROFESSIONALS: THE CALIFORNIA REQUIREMENT

This is an open book test. Please record your responses on the Answer Sheet.
A passing grade of at least 70% must be achieved in order to receive credit for this course.

This 2 CE Credit Hour activity must be completed by January 31, 2025.

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AGD Subject Code: 148.

This course meets the Dental Board of California's requirements for 2 units of continuing education.

Dental Board of California course #02-3841-00344.

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1. The California Division of Occupational Safety and Health (Cal/OSHA) adopted the nation's first aerosol transmissible disease (ATD) standard in
- *A) 1981.*
- *B) 1991.*
- *C) 2003.*
- *D) 2009.*

2. California dental offices must comply with the ATD standard if they
- *A) do not treat patients with identified ATD cases.*
- *B) treat patients with suspected or confirmed illnesses that require Airborne or Droplet Precautions.*
- *C) refrain from performing aerosol-generating dental procedures on patients identified as a possible ATD transmission risk.*
- *D) All of the above*

3. Of the following, which generally poses the greatest risk for airborne infection?
- *A) Splatter*
- *B) Droplets*
- *C) Aerosols*
- *D) Unwashed hands*

4. The average risk for infection after a needlestick or cut exposure to hepatitis C virus-infected blood is approximately
- *A) 0.3%.*
- *B) 1.8%.*
- *C) 3%.*
- *D) 18%.*

5. Standard Precautions apply to contact with all of the following, EXCEPT:
- *A) Blood*
- *B) Aerosols*
- *C) Intact skin*
- *D) Mucous membranes*

6. The OSHA Bloodborne Pathogens Standard mandates the wearing of masks, eye protection, and face shields
- *A) without removal all day for all patients.*
- *B) only for invasive procedures, such as surgery.*
- *C) for all forms of patient contact, regardless of risk.*
- *D) when blood or other potentially infectious material exposures are likely.*

7. Studies have shown that which of the following types of gloves have the highest failure rates?
- *A) Vinyl*
- *B) Latex*
- *C) Nitrile*
- *D) Surgeon's gloves*

8. Which of the following is NOT a regulated waste found in dental practice settings?
- *A) Extracted teeth*
- *B) Contaminated sharp items*
- *C) Gauze saturated with blood*
- *D) Paper towels used after handwashing*

9. Devices connected to the dental water system that enter the patient's mouth should be flushed for how long after each patient?
- *A) 10 to 15 seconds*
- *B) 20 to 30 seconds*
- *C) 2 minutes*
- *D) 20 minutes*

10. Postexposure prophylaxis, or the provision of medications after a substantial exposure in order to reduce the likelihood of infection, is available for
- *A) HIV.*
- *B) hepatitis B.*
- *C) hepatitis C.*
- *D) Both A and B*

Be sure to transfer your answers to the Answer Sheet located on the envelope insert.
DO NOT send these test pages to NetCE. Retain them for your records.
PLEASE NOTE: Your postmark or facsimile date will be used as your test completion date.

Dental Considerations for Geriatric Patients

Audience
This course is designed for dental professionals involved in the care of geriatric patients.

Course Objective
The purpose of this course is to provide dental professionals with information regarding oral manifestations of the aging process and their relationship with oral and systemic health to ensure the maintenance of optimum quality of life in older patients.

Learning Objectives
Upon completion of this course, you should be able to:

1. Discuss how the changing population demographics of the United States will feature a growing geriatric population.
2. Identify the correlation between oral health and systemic disease.
3. Describe common cardiovascular and cerebrovascular diseases in the geriatric population and their effects on oral health.
4. Outline the implications of common chronic diseases on geriatric oral health.
5. Discuss the impact of oral and systemic cancers and various treatment modalities on the provision of dental care.
6. List common physiologic changes that occur during the aging process and their influence upon oral hygiene and oral health.
7. Cite the issues associated with cognitive impairment and oral health.
8. Describe how various issues create problems for access to dental care for older Americans.

Faculty
Mark J. Szarejko, DDS, FAGD, received his dental degree from the State University of New York at Buffalo in 1985. He received fellowship from the Academy of General Dentistry in 1994.

Faculty Disclosure
Contributing faculty, Mark J. Szarejko, DDS, FAGD, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Division Planner
William E. Frey, DDS, MS, FICD

Director of Development and Academic Affairs
Sarah Campbell

Division Planner/Director Disclosure
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AGD Subject Code 750.

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Dental Board of California course #05-3841-00323.

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Sections marked with this symbol include evidence-based practice recommendations. The level of evidence and/or strength of recommendation, as provided by the evidence-based source, are also included so you may determine the validity or relevance of the information. These sections may be used in conjunction with the study questions and course material for better application to your daily practice.

INTRODUCTION

The demographics of the United States reflect an increasing number of citizens that have attained the age of 65 years or older. There is no specific age assignment at which a person is categorized as "geriatric." Because most individuals qualify for Medicare at 65 years of age, it is this age or older that will be the defining age for geriatric classification for this course.

A significant factor that will increase the number of people within this group is the aging of 78 million "baby boomers," those Americans born between 1946 and 1964 [1]. The year 2011 marked the point at which the first wave of these citizens turned 65, and this will continue in succession through the year 2029. Thus, while approximately one out of every eight people was 65 years of age or older in 2001, by 2030 all baby boomers will be older than 65 years of age [2].

The aging process affects each person differently. Approximately 60% of individuals 65 years of age or older are afflicted with at least one chronic illness, while 25% have two or more chronic illnesses [3]. Chronic illnesses are those that last longer than six months and can be treated but not cured. Both the medications used in the treatment of these diseases and the disease process itself may have deleterious oral manifestations. When evaluating dental health, care should be taken to obtain a comprehensive medical history for each patient to determine if a given medical problem will allow dental treatment to be initiated and completed.

Some patients may require deferral of dental treatment if there is an acute exacerbation of an existing medical issue. Severe medical problems may require dental treatment to be performed in a hospital setting. Any medications used for dental concerns before, during, or after dental treatment should not interact negatively with those prescribed to treat any chronic disease(s).

Poor oral health, especially periodontal disease, may be a concern in the development of some of these chronic diseases, particularly cardiovascular disease. Because many patients within this group are retired and do not have dental insurance, the financing of even basic dental care to improve periodontal health and minimize it as a concern in the development of some chronic diseases can be a prohibitive issue.

This course will discuss some of the most common systemic diseases that afflict geriatric citizens and the manner by which they influence oral and overall health for these patients.

POPULATION TRENDS AND DEMOGRAPHICS

While the number of Americans who are 65 years of age or older will increase dramatically in the coming years, it is predicted that another age group will more than double. The number of Americans older than 85 years of age is expected to more than double from 6.5 million in 2018 to 14.4 million by the year 2040 [4].

At one time, advancing age was synonymous with complete edentulism and the placement of dentures. Based on studies by the U.S. Department of Health and Human Services, this trend is decreasing. The National Health and Nutrition Examination Survey (NHANES) 1 study (1971–1974) was followed by the NHANES 2 study conducted from 1988–1994. Statistics from the first study indicated 45.6% of Americans 65 to 74 years of age were completely edentulous. The second study indicated a decrease to 28.6% for those in the same age range [5]. The findings of a 2010 study show the rate has dropped to 24% [6]. Better awareness of oral hygiene and preventive dentistry have contributed to this encouraging trend.

Advances in medical science and in preventive dentistry have allowed patients to live longer and to retain their teeth while doing so. Therefore, more geriatric citizens will seek dental care to maintain and restore their teeth as part of a desire for a better quality of life. Many of these patients will contend with at least one chronic disease and will take the required medication(s). Dental treatment should only be undertaken for these patients when their medical conditions allow for a favorable outcome. Similarly, medications that are prescribed for any aspect of dental treatment should be in harmony with any medication that is prescribed for a chronic disease. Collaboration between the patient's medical and dental care providers should occur if there is any concern about the patient's ability to undertake dental treatment, especially that of a surgical nature.

EVIDENCE-BASED PRACTICE RECOMMENDATION

The National Institute for Health and Care Excellence recommends that the mouth-care needs of all residents should be assessed as soon as they start living in long-term care, regardless of the length or purpose of their stay.

(https://www.nice.org.uk/guidance/ng48. Last accessed May 18, 2021.)

Level of Evidence: Expert Opinion/Consensus Statement

THE ASSOCIATION BETWEEN ORAL HEALTH AND SYSTEMIC DISEASE

The dental profession has long advocated a preventive approach for the problems of dental caries and periodontal disease. If the preventive approach does not yield the desired results, an early and proactive stance should be used to restore carious teeth to their proper function and to correct periodontal defects to allow for the retention of teeth. The goals are to decrease the pain, morbidity, and potential for local or disseminated infections of dental origin.

These ideals for optimal dental health reflect the highest aspirations of the dental profession. However, research has discovered another benefit to oral health that is appropriately maintained; many studies have found strong correlations between patients with periodontal disease and some systemic diseases [7; 8; 9].

The suggestion of a correlation between the inflammatory nature of periodontal disease and systemic illness is not new. An 1891 publication, *The Human Mouth as a Focus of Infection*, advocated that adverse oral conditions could influence bodily functions in a negative fashion [10]. Some proponents advocated the extraction of all teeth as a means of preventing varied systemic illnesses. The theories presented in this publication found a new audience in the late 1980s, when a new group of researchers began to investigate the correlations between periodontitis and systemic conditions, particularly cardiovascular disease [11].

PERIODONTITIS AND CARDIOVASCULAR DISEASE

Classic risk factors for the development of cardiovascular disease include high levels of total cholesterol, high serum triglyceride levels, smoking, and a family history of cardiovascular disease. Historically, periodontitis has not been categorized among these risk factors. However, research has identified a strong correlation between this oral health problem and the development of cardiovascular disease. In particular, one study indicated that patients with periodontitis were 1.6 times more likely to experience stroke [12].

Periodontal disease is usually a slowly-progressing pathologic process in which the gingival tissues and the alveolar bone that support the teeth are infiltrated by oral bacterial pathogens. Loss of tissue attachment and irreversible destruction of the alveolar bone can proceed to the extent that teeth are lost. The host response to this bacterial challenge is to increase the blood flow to the affected areas such that varied cells of the immune system can begin to mount a defense against the periodontal pathogens. Tissue inflammation is generally commensurate with the degree of the disease process.

The increased circulation can allow periodontal bacteria and their toxins systemic access, at which point they or agents associated with the inflammatory process can influence vascular and cardiac tissues. Actions as simple as masticating and tooth brushing can cause a bacteremia proportionate to the degree of periodontal involvement [13].

Some studies have found periodontal microbes in arterial plaques associated with the narrowing of vessels, the beginning of atherosclerosis, and even the initiation of blood clots [14]. Chronically inflamed gingival tissues can increase the amount of C-reactive protein found in the blood, an indicator of systemic inflammation [15]. This compound is also elevated in patients with cardiovascular disease.

Another substance that is elevated amidst the chronic inflammatory process of periodontitis is fibrinogen [15]. This is a high-molecular-weight compound that, in the presence of thrombin and clotting factors, is converted to fibrin, which is the basis for the coagulation of blood. While a necessity for hemostasis, this mechanism can become problematic within blood vessels when a thrombus, or localized clot, develops and occludes a blood vessel. Depending on the vessel involved, a stroke or myocardial infarction can develop. The periodontal bacterial species *Porphyromonas gingivalis* has the potential to initiate the clotting process [16].

Patients with chronic periodontitis also exhibit increased levels of tumor necrosis factor-alpha. Heightened amounts of this substance in the body can cause the liver to increase the production of triglycerides and decrease the amount of high-density lipoprotein, the beneficial cholesterol [15]. The elevation of one known risk factor and the lowering of a beneficial cardioprotective compound can increase the risk of the development of cardiovascular disease.

The correlation between the presence of periodontal disease and the development of cardiovascular disease has undergone much study, and it will continue to be scrutinized in the future. Although periodontal disease cannot be assigned the designation of an absolute risk factor for cardiovascular disease, continued research may eventually prove otherwise. A large study published in 2014 including more than 15,000 patients with chronic coronary heart disease who provided dental health information found that indicators of periodontal disease were common in this patient group and associated with numerous cardiovascular risk factors [17]. Given that many people within the geriatric population are afflicted with cardiovascular disease, the control of this oral health condition is essential.

SYSTEMIC DISEASES COMMON AMONG THE GERIATRIC POPULATION

HYPERTENSION

Hypertension, also known as high blood pressure, affects approximately 46% of adults in the United States [18]. Many patients with hypertension are unaware that they have the disease, as initial cases may be asymptomatic. Early diagnosis and treatment is essential, because without medical intervention, irreversible damage to the heart, blood vessels, kidneys, eyes, brain, and other organs and systems can gradually occur.

The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure classified systolic and diastolic blood pressure numerical values with categories that reflect a philosophy for earlier intervention; these defined values were supported by a 2014 update [19]. In 2018, the American College of Cardiology, in conjunction with the American Heart Association and many other organizations, released updated guidelines for the prevention, detection, evaluation, and management of high blood pressure in adults [20]. In this guideline, the values assigning various stages of hypertension were significantly lowered. Elevated blood pressure is defined as a sustained systolic blood pressure between 120 – 129 mm Hg and a sustained diastolic blood pressure less than 80 mm Hg. When the systolic levels range from 130 – 139 mm Hg and the diastolic levels are 80 – 89 mm Hg, the categorization of stage 1 hypertension is assigned. Stage 2 hypertension occurs when the systolic blood pressure exceeds 140 mm Hg and the diastolic blood pressure exceeds 90 mm Hg. Certain co-existing diseases can modify this scale [20; 21]. As many patients with high blood pressure also have other cardiovascular or cerebrovascular problems, proper medical management of this disease is essential to preventing associated morbidity and mortality.

Approximately 90% of hypertension cases have no known exact etiology; this is referred to as essential hypertension. The remaining cases are classified as secondary hypertension; in these patients, an underlying medical problem or a prescribed medication is the cause of elevated blood pressure levels [22]. Oral contraceptives, renal disease, and endocrine problems such as hyperthyroidism are among the most common causes of secondary hypertension. Certain tumors, such as a pheochromocytoma, although uncommon, can also be the basis for secondary hypertension. Pheochromocytoma is a tumor of the adrenal medulla that can cause the secretion of large amounts of the vasoconstrictors epinephrine and norepinephrine, which can cause a profound elevation in blood pressure.

Blood pressure has a tendency to rise with age; approximately 50% of those 65 years of age or older have chronic hypertension [23]. Many cases of hypertension are diagnosed during routine medical examinations. There is no specific symptom of hypertension that prompts patients to seek medical treatment. However, some patients who seek medical consultation for occipital headaches, blurred vision, ringing in the ears, dizziness, and tingling in the extremities are subsequently diagnosed with hypertension.

Medical Management

The goals for the management of hypertension are to lower the blood pressure to a range in which the cardiovascular risks are decreased and to minimize the side effects of any medications utilized. Lifestyle modifications are the cornerstone to management of hypertension, and pharmacotherapeutic regimens may supplement these changes. Risk factors such as smoking, a high-sodium diet, excessive weight, and a lack of physical activity are all modifiable items that patients can change to lower their blood pressure and their overall risk for cardiovascular disease.

Some patients become noncompliant with antihypertensive therapy as a result of problematic side effects. Further, patients who do not have symptoms of high blood pressure may consider such therapy of minimal benefit.

Numerous medications are used in the treatment of hypertension. The degree of blood pressure elevation will dictate the type of medication used, either individually or in combination with other agents, to achieve therapeutic goals.

Most dental treatment and many medical procedures are performed with the patient in a reclined position. Upon the conclusion of an appointment and the resumption of a sitting or standing position, orthostatic hypotension can occur with any patient, but especially those taking blood pressure medications. Fainting and potential injury can occur. The incidence of orthostatic hypotension can be minimized by raising the chair gradually and allowing the patient to remain in an upright seated position for some time before attempting to stand. A staff member should be ready to assist the patient if necessary.

Diuretics

Diuretics are a group of drugs that decrease blood pressure by decreasing the resorption of sodium, chloride, or both, within the kidneys. Along with the decrease in resorption of these elements is a decrease of the resorption of water. This leads to decreased extracellular volume and cardiac output, with a resultant decrease in blood pressure.

There are several different types of diuretics. Hydrochlorothiazide, a thiazide diuretic, acts to increase sodium and water excretion in the distal tubules of the kidneys. This medication and other thiazides can also decrease the plasma concentration of potassium, which can lead to arrhythmias. A potassium supplement may be needed.

Loop diuretics, such as furosemide, inhibit resorption of sodium and chloride in the ascending loop of Henle and distal renal tubule within the kidneys. The increased excretion of water will achieve the same therapeutic goal as hydrochlorothiazide. Medications within this category have been used in the management of treatment-resistant hypertension. Potassium-sparing diuretics, such as spironolactone, work at the kidney's distal tubules to increase sodium excretion and minimize the excretion of potassium.

Nonsteroidal anti-inflammatory drugs (NSAIDs) are a group of medications frequently used as an analgesic for dental problems. Ibuprofen and naproxen are commonly used analgesic agents within this category. These medications can decrease the efficacy of any of the thiazide diuretics and should be avoided as dental analgesics for such patients.

Because the principle mechanism by which diuretics work is a decrease in water volume, xerostomia (dry mouth) can develop. This can be a problem for those who wear prostheses, such as dentures or partial dentures, as oral tissues that are less lubricated are more prone to sore spots and ulcerations.

The increase in the frequency of urination (polyuria) that accompanies the use of thiazide diuretics will usually require that the patient be given restroom breaks during longer appointments.

Beta-Adrenergic Blockers (Beta Blockers)

Another group of medications utilized to treat hypertension are beta-adrenergic blockers, more commonly referred to as beta blockers. These medications compete with endogenous epinephrine for available receptor sites, thus diminishing the stimulatory effect. The goal is to prevent the heart from an excessive response to physical strain and emotional stress by decreasing the heart rate and causing dilation of the arterioles in the skeletal muscle and the liver.

Beta blockers such as atenolol and metoprolol are cardioselective in that they selectively bind with beta-1 receptor sites in the cardiac tissue. Propranolol is a non-selective beta blocker and can interact with beta-1 receptors in cardiac tissue and beta-2 receptors within the arterioles of skeletal muscle and the bronchiolar smooth muscle. The cardiac effect is to reduce the rate of firing of the sinoatrial node, which slows conduction through the atrioventricular node. The contractile strength of the heart is reduced as is the pressure with which the blood is pumped. The arterioles are dilated, which causes a decrease in diastolic blood pressure [24].

NSAIDs can decrease the efficacy of these medications. Patients who take propranolol may be more sensitive to the epinephrine used in local anesthetics, resulting in a pronounced increase in blood pressure followed by reflex bradycardia. Anesthetic preparations without vasoconstrictors, such as epinephrine or levonordefrin, are preferable for these patients.

Similar to thiazide diuretics, beta blockers can also cause xerostomia. Use of beta blockers can also result in side effects involving the central nervous system, such as insomnia, depression, and nightmares, which can discourage patients from continuing their use [25]. Healthcare professionals should verify compliance with prescribed medication regimes. Measuring blood pressure for all patients with hypertension before the initiation of any treatment is mandatory.

Angiotensin-Converting Enzyme (ACE) Inhibitors

Angiotensin-converting enzyme (ACE) inhibitors, such as lisinopril and enalapril, prevent the conversion of angiotensin I to angiotensin II, a potent vasoconstrictor. A decrease in vasoconstriction leads to a decrease in blood pressure via decreased peripheral vascular resistance [26]. These medications can be given alone or in combination with other antihypertensive drugs.

As a group, ACE inhibitors are generally well-tolerated by the patients for whom they are prescribed. However, some patients can develop a dry cough that can range from a minor irritation to severe spasms of coughing. Other potential side effects related to the oral tissues include xerostomia, taste alterations, oral ulcerations, and glossitis. These problems subside with discontinuation of the drug.

Calcium Channel Blockers

Calcium channel blockers (e.g., nifedipine) exert their effects by decreasing the entry of calcium into the smooth muscle within arteriolar walls. The ensuing muscular relaxation and vessel dilation causes a reduction in blood pressure. Calcium channel blockers can also cause a decrease in sodium, which decreases water resorption, blood volume, and blood pressure.

A unique oral side effect of nifedipine, seen in approximately 10% of patients, is gingival hyperplasia. This can occur within a few weeks to several months after nifedipine therapy is begun. Gingival tissues should begin to regress after the drug is discontinued, with full resolution in approximately 15 days [25]. However, resuming use of the drug generally results in recurrence of the disorder unless additional steps are taken.

If nifedipine cannot be discontinued, surgical removal of the excessive tissues may be necessary to restore optimal tissue contours. If excellent plaque control is maintained, the hyperplasia usually does not recur [25]. Oral hygiene instructions should be tailored to the degree and location of any area of nifedipine-induced hyperplasia.

The evaluation of a patient's overall health and of any medications being taken, either for hypertension or any other coexisting chronic illnesses, should be undertaken before any dental treatment is initiated. Consultation with the patient's physician may be necessary to establish a parameter in which dental treatment can be performed safely. Patients' stress during dental procedures can cause the release of endogenous epinephrine and norepinephrine, with a commensurate rise in blood pressure. This can be problematic for patients with hypertension, especially those for whom blood pressure is difficult to control. For these patients, profound anesthesia should be achieved, as a procedure perceived as being free of painful stimuli will decrease the amount of endogenous catecholamine release. Oral sedatives that do not interact with any of the patient's prescribed medications and nitrous oxide inhalation sedation can also be used to reduce stress. Extensive oral surgical procedures may need to be done in a hospital setting under general anesthesia. If the pre-procedural blood pressure measurement is high enough to be of concern to the staff, deferral of the procedure may be needed in the interest of patient safety.

ISCHEMIC HEART DISEASE

Cardiovascular disease affects one-third of people 65 years of age or older [27]. Of all deaths caused by ischemic heart disease, approximately 64% are in individuals older than 75 years of age [27]. Ischemia occurs when an obstruction within a blood vessel interrupts the flow of oxygenated blood needed to meet the metabolic demands in a given tissue, such as the myocardium of the heart. If the reduction of oxygenated blood weakens the myocardial cells but does not cause their necrosis, the resulting chest pain is known as angina pectoris. If the degree of ischemia is enough to cause necrosis of the myocardial cells, then a myocardial infarction occurs.

Angina Pectoris

Angina is classified according to the degree of cardiac stability with which the patient presents. Stable angina refers to chest pain that occurs infrequently, usually when physical exertion and/or emotional stress cause the metabolic demand of the myocardial tissues to exceed the available supply of oxygenated blood provided by the cardiac circulation. The pain is relieved by a sublingual spray or tablet of nitroglycerin. If the frequency and/or intensity of angina attacks increases when the patient is at rest, unstable angina has developed.

Patients with unstable angina are at increased risk for acute myocardial infarction and arrhythmias, including ventricular tachycardia and fibrillation. Patients with suspected unstable angina should have dental treatment deferred until their cardiac condition is stabilized. A patient with a known history of angina who presents with chest pain that is not relieved by nitroglycerin should be sent to the emergency department.

Another variant of angina pectoris is Prinzmetal angina. Spasms of the coronary artery caused by this type of angina usually occur when the patient is at rest. This type of angina is a manifestation of atherosclerosis, which is caused by atheromatous plaques developing on the inner wall of the coronary arteries. The vessel lumen narrowed in this fashion will result in a decreased flow of oxygenated blood for the cardiac myocardium.

Treatment

Angina pectoris is treated by one or more drugs that aim to decrease cardiac workload and facilitate vasodilation, the result of which is increased perfusion of the myocardium. Some medications used to treat hypertension, including nifedipine, can cause vasodilation of the coronary arteries. Furthermore, beta blockers can decrease the oxygen demand of the myocardium. Immediate-acting nitrates, such as nitroglycerin, are potent direct-acting vasodilators that decrease myocardial workload and commensurate demand for oxygen. Isosorbide dinitrate and isosorbide mononitrate are both extended-acting vasodilators with longer action as compared to the immediate vasodilation effects of nitroglycerin.

When undergoing any medical or dental procedures, patients who are afflicted with angina for whom nitroglycerin has been prescribed should have nitroglycerin with them. This medication should also be a staple of every medical emergency kit. Because the anxiety associated with a medical or dental appointment can precipitate an angina attack, stress reduction techniques may be utilized. Morning appointments are beneficial for cardiac patients as they allow the patient to arrive in a rested condition and preclude their ability to worry throughout the day about a late afternoon appointment.

Before any dental treatment is initiated, the dentist should record the vital signs and discuss any change in the frequency or duration of angina pectoris attacks. If there is a trend toward more frequent and intense angina pectoris attacks, dental treatment should be deferred and the patient should be referred to a cardiologist.

If ACE inhibitors and/or calcium channel blockers are utilized to treat angina, NSAIDs should not be utilized for pain management. Opioid-based analgesics can accentuate the hypotensive effect of nitroglycerin and should be prescribed cautiously or avoided. Epinephrine or levonordefrin, two vasoconstrictors utilized in local anesthetics, should be used sparingly. Dental surgical procedures may need to be done in an outpatient hospital setting.

Nitroglycerin and isosorbide dinitrate can diminish normal salivary flow and cause xerostomia. This problem will resolve when the medications are discontinued.

Myocardial Infarction

As noted, ischemic heart disease is common among patients older than 65 years of age, and myocardial infarction is a leading cause of death in this age group [28]. An infarction is defined as a localized area of necrotic tissue that develops when the oxygenation of that tissue is inadequate. Within the myocardium of the heart, this can occur rapidly and without any previous symptoms; the presence of angina does not always precede myocardial infarction. The substernal pain of an acute myocardial infarction can radiate to the left mandible, which may be a presenting symptom.

Because many myocardial infarctions occur without warning, initial treatment is often of an emergency nature. Within the dental office, all staff members should be trained in the current regimens of cardiopulmonary resuscitation. Requirements for offices that provide deeper levels of sedation can require training in advanced cardiac life support as well.

Many states require dental offices to have an automated external defibrillator and also require staff members to be trained in its use. A supply of oxygen, nitroglycerin, chewable aspirin (for a conscious patient), and an analgesic that can be administered intramuscularly are among the core items that should be available in the event of a cardiac emergency. All staff members should have designated assignments in the case of a medical emergency in order to ensure stabilization of the patient. One staff member should have the responsibility of contacting emergency medical services. Additionally, each office should have a protocol to practice simulated medical emergency situations, and all medications utilized for medical emergencies should be routinely inspected to ensure that they have not expired.

A myocardial infarction can have an acute onset, yet the underlying pathophysiologic causes of an infarction may be present for years before the event. The lumen of the coronary arteries can be gradually narrowed by the accumulation of atherosclerotic lesions within the walls, caused by the formation of small cholesterol-containing aggregates, or plaques, in the walls of blood vessels. This also causes the surface texture of the blood vessel to become rough and conducive to the adhesion of platelets. This process of clotting in an undamaged blood vessel is called thrombosis. The clot, or thrombus, impedes the supply of oxygenated blood to the myocardium, and when circulation is diminished enough to cause necrosis of the myocardial cells, a myocardial infarction occurs. Surgical procedures, such as the placement of stents or balloon angioplasty, may be undertaken to widen lumen narrowed by atherosclerotic plaques and to re-establish circulation appropriate for the metabolic demands of the cardiac tissue.

Hypertension and/or angina may be precursor conditions to myocardial infarction. If a patient is taking medications for these conditions and experiences a myocardial infarction, the drugs are usually continued, although the amount, dose schedule, or agent may be modified. Many patients who experience myocardial infarction are placed on anticoagulant therapy in order to minimize platelet adhesion and blood clot formation within blood vessels.

Anticoagulant Therapy

Anticoagulant medications exert their effects either by modifying platelet function or by interfering with the synthesis of coagulation factors. Aspirin and clopidogrel are examples of medications used in antiplatelet therapy. By contrast, warfarin is an anticoagulant and minimizes coagulation by interfering with the synthesis of vitamin K-dependent clotting factors II, VII, IX, and X within the liver [29].

The most frequently utilized platelet-inhibiting medication for prophylaxis against ischemic heart disease or a cardiovascular or cerebrovascular incident is aspirin [30]. As a single agent or combined with clopidogrel, aspirin acts to prevent the aggregation of platelets and increases bleeding time. Aspirin ultimately interferes with the release of thromboxane A2, a substance that is responsible for platelet aggregation [30]. This effect lasts for the 10-day average life span of any platelet affected. Clopidogrel acts by blocking adenosine diphosphate (ADP) receptors on the platelet membrane, inhibiting platelet aggregation [30].

Prior to any dental treatment, especially oral surgery or periodontal treatment, the reason for which the patient has been placed on anticoagulant therapy should be discerned. If a dental procedure may affect hemostasis, the best route of action should be discussed with the patient's physician. The patient's prothrombin time should be noted. Prothrombin time is reported as an international normalized ratio (INR). The INR is a ratio of the prothrombin time for the patient and a control and is based on a scale of 1.0 – 5.0 [31]. An INR of 1.0 indicates a patient who clots normally. The target INR of patients who take anticoagulants depends upon the goals of treatment and underlying medical condition and can range from 2.0 to 3.5 [31]. If a surgical procedure is planned, an INR value should be obtained as close to the time of surgery as possible. Higher values are associated with more difficulty in obtaining hemostasis. It is important to determine if the patient's status allows for a temporary discontinuance of anticoagulant medication. In some cases, this is an option. However, the cardiovascular or cerebrovascular status of some patients may preclude the discontinuance of anticoagulant therapy due to the potential risks of a thromboembolic event. Those patients who cannot cease anticoagulant therapy may require that invasive treatment modalities, such as oral surgery, be performed in a hospital environment, especially when numerous teeth are involved. It is imperative that only a cardiologist or primary care physician with knowledge of the patient's condition direct the patient to stop anticoagulant or antiplatelet therapy. Patients should never stop taking anticoagulants on their own volition to expedite the completion of a surgical procedure.

Before any oral surgery or periodontal treatment is begun, compliance with the agreed upon regimen (e.g., discontinuance of anticoagulants) should be verified. Anticoagulant medications can interact with many medications. As noted, many medications prescribed for dental pain, including NSAIDs, can accentuate the anticoagulant effect of clopidogrel and warfarin. Additionally, macrolide antibiotics, such as erythromycin and clarithromycin, can attenuate the anticoagulant effect of clopidogrel but enhance this same activity for warfarin. It is essential that analgesics and/or antibiotics used for dental conditions do not enhance or detract from the intended effect of any anticoagulant medication.

STROKE AND CEREBROVASCULAR ACCIDENTS

Approximately 8% of Americans older than 65 years of age have a history of stroke, and 75% of all strokes occur in people older than 65 years of age [23; 27]. Strokes are usually caused by atherosclerosis of the cerebral arteries, an aneurysm, or an embolism. Emboli or atherosclerotic plaques of the cerebral arteries can reduce or completely block the flow of oxygenated blood to brain cells. Similarly, a ruptured aneurysm causes damage to neurons by blood seeping into neural cells with a commensurate rise in intracranial pressure. These events may occur with no prior symptoms. However, some patients may experience transient ischemic attacks, which are characterized by sudden-onset, reversible neurologic deficits. Most transient ischemic attacks last less than five minutes. Approximately 9% to 17% of patients who experience transient ischemic attacks progress to having an actual stroke within 90 days [32].

Management

The degree of recovery from a stroke depends upon the area(s) of the brain involved and the extent of neural cells lost. Many patients experience permanent motor, cognitive, and sensory impairment. When the dominant side is affected, the ability to maintain oral hygiene can become an arduous task. Patients may require toothbrushes mounted in special hand grips to facilitate proper cleansing techniques. Flossing devices may be needed to assist in flossing. The assistance of a caregiver may be necessary to maintain ideal oral hygiene. If plaque control becomes problematic, more frequent recall appointments should be considered.

The ability to comprehend and remember instructions related to oral hygiene may be difficult for patients who have suffered a stroke. Written instructions that can be relayed to a family member or caregiver may assist in the ability for stroke victims to maintain oral health. Patients who wear prostheses such as partial dentures or complete dentures may need assistance with their placement and maintenance. Dentists should consult with patients' physicians when oral surgery or periodontal therapy is necessary. Blood pressure levels should be recorded before the start of any dental procedure, and treatments should be deferred if these levels are elevated.

Because hypertension is a contributing factor to the development of cerebrovascular accidents, many patients who have had a stroke take medication for the condition. Anticoagulant medications may also be used if a thromboembolic event was the precipitating event. The impact of these medications on oral health and the delivery of oral care have been discussed in this course.

DIABETES

Two types of diabetes comprise the majority of diabetes cases in the United States: type 1 diabetes, previously referred to as insulin-dependent diabetes mellitus, and type 2 diabetes, which was previously known as non-insulin-dependent diabetes mellitus. Type 2 diabetes is responsible for more than 90% to 95% of all diabetes cases [33]. Approximately 24% of patients who present with type 2 diabetes are 65 years of age or older [34]. There are numerous systemic complications of diabetes, all of which contribute to it being the seventh leading cause of death in the United States [34; 35].

The physiologic basis for type 1 diabetes is a total deficiency in insulin due to destruction or impaired function of the insulin-producing beta cells within the pancreas. Most cases are diagnosed at an early age, and patients within this population have a lifelong dependence upon insulin. Type 2 diabetes is characterized by insulin resistance and defects in the secretion of insulin. Patients with either type of diabetes require special oral care.

Management

Varied formulations of insulin are used to treat type 1 diabetes; type 2 diabetes is often managed with oral hypoglycemic agents, which may or may not be supplemented with insulin.

As a hormone, insulin is the only compound that lowers blood glucose levels. Insulin acts by hastening the transport of glucose into the cells, particularly skeletal muscle cells, and stimulating the formation of glycogen, the storage form of glucose, in the cells of the liver and skeletal muscle. It also decreases the rate by which glycogen is converted into glucose. The dosage schedule of insulin will depend upon the degree of hyperglycemia experienced by the patient.

Insulin is compatible with most medications prescribed for dental problems. However, there are some medications that may result in untoward effects. Extended doses of NSAIDs and salicylates can enhance the hypoglycemic effect of insulin and should be used sparingly. Epinephrine can decrease the hypoglycemic effect of insulin, and the minimum possible dose should be used in conjunction with local anesthetics [36]. Extensive surgical cases, such as full-mouth extractions, may need to be completed in a hospital environment, especially for patients with type 1 diabetes with uncontrolled blood glucose levels.

Metformin, a biguanide oral hypoglycemic agent, may be used in patients with type 2 diabetes to decrease glucose release and production and to reduce insulin resistance of the liver cells [37]. Another agent used in the management of type 2 diabetes, rosiglitazone, improves the target cell response to insulin without increasing the beta-cell production of insulin [38]. Due to findings of an increased risk of stroke and heart attack, in 2010 the U.S. Food and Drug Administration (FDA) recommended rosiglitazone be used only if all other medications are ineffective in controlling diabetes [39]. However, following review of data from a large, long-term clinical trial and a re-evaluation of the elevated risk of heart attack, the FDA removed the prescribing and dispensing restrictions for rosiglitazone in 2013 [40]. Sulfonylurea oral hypoglycemic agents, such as glyburide, act by stimulating the release of insulin from the pancreatic beta cells and by reducing hepatic glucose production; the response of peripheral target cells to insulin is also heightened [25]. Metformin and rosiglitazone have no reported interactions with medications used for dental treatment. Due to the action of glyburide, an increase in hypoglycemic effect similar to the reaction with insulin may be noted with extended concomitant use of NSAIDs and salicylates. Similarly, the tablet form of the antifungal agent ketoconazole, which is used for some cases of oral candidiasis, can also enhance glyburide's hypoglycemic effect.

Diabetes is a treatable disease, but it is not curable. Patients who exhibit good glycemic control can usually tolerate dental treatment. However, one complication that may arise when treating patients with diabetes is hypoglycemia. This can occur when patients take the prescribed dose of insulin and/or oral hypoglycemic agent and eat either minimally or not at all prior to their dental appointment. Before dental treatment is initiated for patients with diabetes, it is important to verify that they have taken their prescribed dose of medication and have eaten appropriately. Even with these precautions, hypoglycemia may still develop. Initial signs of a hypoglycemic crisis can include hunger, sweating, pallor, tachycardia, and tremors. This can progress very rapidly to incoherence, disorientation, and unconsciousness. It is important to treat patients immediately at the onset of symptoms of insulin shock. Glucose (in paste form) or sugar-containing beverages can be given to conscious patients. Patients who have lapsed into unconsciousness may require intravenous glucose or an injection of glucagon; emergency medical services may be contacted. After the patient is stabilized, any remaining dental treatment should be deferred until after consultation with the patient's physician.

Patients with diabetes should be given specific instructions to avoid insulin shock. Patients who have extensive oral surgery or placement of prostheses may have difficulty eating for several days. A pureed or liquefied diet can be planned in order to maintain appropriate blood glucose levels. Adjustments in the dosage of insulin or hypoglycemic medications should only be made by a physician.

Patients with diabetes are vulnerable to the same odontogenic infections as those unaffected by the disease. However, the effects may be greater among patients with diabetes. The generalized systemic defense against infections causes an increased metabolic demand, with a commensurate increase in the need for glucose to provide the energy source. Therefore, patients with type 1 diabetes with infections may require increased insulin dosages. Patients with type 2 diabetes, alternatively, may require temporary supplementation with insulin until the infection is resolved.

Patients with chronic poor glycemic control may be immunocompromised as a result of problems with neutrophil dysfunction, T-lymphocyte dysfunction, and decreased bactericidal activity of immune system cells [41]. Problems related to immunosuppression can also increase the risk of developing oral candidiasis, aphthous ulcers (canker sores), and oral lichen planus [42]. Infections in all patients with diabetes should be treated aggressively, and some within this group may require intravenous antibiotics and even hospitalization.

Gingivitis, periodontal disease, and alveolar bone loss occur with increased frequency in patients with diabetes with poor glycemic control [43]. Variances in the host response to periodontal pathogens and the production of collagen along with diabetes-associated vascularity problems may contribute to the heightened prevalence of the spectrum of periodontal problems in this patient population [44].

It is important to stabilize patients with diabetes and chronic periodontal problems as mounting evidence demonstrates a correlation between poor glycemic control and periodontal pathology [45]. If periodontal problems cannot be rectified by nonsurgical and/or surgical periodontal therapy, extractions may be necessary. Patients with generalized periodontal problems who are not motivated to maintain optimal oral hygiene may require drastic interventions, including full-mouth extractions and the placement of dentures. Dental treatment for patients with diabetes should be done in a way that does not compromise their ability to maintain glycemic control.

Consultations with the interdisciplinary healthcare team should be made if there is doubt about the ability of a patient with diabetes to withstand any form of dental treatment. Referral to an oral surgeon with hospital privileges may be necessary for patients with poor control of their diabetes for whom oral surgery is planned. The goal of maintaining optimal oral health amidst proper diabetic control should be shared by the patient and by the allied healthcare professionals involved in his or her care.

ARTHRITIS

Arthritis affects approximately 50% of individuals 65 years of age and older [46; 47]. Osteoarthritis is the most common form of the disease, affecting approximately 32.5 million people in the United States [48]. Rheumatoid arthritis affects about 1.5 million people in the United States; 70% are women [49]. The etiology of each form of arthritis is unknown.

The types of arthritis manifest in different ways. Osteoarthritis usually occurs in weight-bearing joints such as the spine, hips, and knees; for this reason it is considered "wear-and-tear" arthritis. Cartilage in the arthritic joint degenerates over time, allowing two adjacent bones previously separated by a disc of cartilage to have direct bone-to-bone contact. Pain, joint stiffness, and restricted mobility can result.

Rheumatoid arthritis occurs when the synovial lining of a joint becomes swollen and thickened. Inflamed cells within the area can release enzymes that cause degeneration of the bone and cartilage. The shape of the involved joint can change with accompanying loss of function and pain. This disease can have periods of remissions and painful exacerbations, with the majority of the destruction occurring in the initial years. Most patients require long-term pharmacologic treatment to provide pain relief and allow for some function of the involved joints. The joints of the hands and wrists are most commonly affected [50]. Some patients with rheumatoid arthritis may develop arthritic degeneration of the temporomandibular joint. Treatment of rheumatoid arthritis of any joint may include splint therapy, physical therapy, and surgery. Unlike osteoarthritis, rheumatoid arthritis is a systemic disease and can result in generalized manifestations such as lethargy, malaise, and weakness.

The medications used to treat rheumatoid arthritis and osteoarthritis may have interactions with medications used for dental treatment. Additionally, some medications used in the treatment of arthritis may have adverse effects upon the oral mucosa.

Several NSAIDs are utilized to treat the inflammation characteristic of both forms of arthritis. Long-term administration of NSAIDs may prolong the ability to attain hemostasis after surgical procedures. Determination of prothrombin time may be helpful prior to planned surgical procedures.

Methotrexate is another medication used in the management of arthritic symptoms. When methotrexate is combined with NSAIDs for a sufficient duration, problems such as bone marrow suppression and aplastic anemia may develop [51]. Therefore, care should be taken to avoid the use of NSAIDs in these patients, if possible. Methotrexate may also cause oral ulcerations in some patients; ulcerations should resolve with discontinuance of the medication. The medication carries a boxed warning due to the increased risk for fetal abnormalities, bone marrow suppression, and hepatic and pulmonary side effects [51]. Gold sodium thiomalate, which is used to treat progressive rheumatoid arthritis, can cause gingivitis, glossitis, and stomatitis in some patients. This medication can also decrease both the white blood cell and platelet counts [25]. Therefore, a complete blood count should be obtained for patients using gold sodium thiomalate prior to surgical or periodontal procedures. Antibiotic prophylaxis is no longer recommended for all patients with prosthetic joint implants prior to dental procedures [52].

Hands and wrists that have been damaged by rheumatoid arthritis may have impaired dexterity, which can affect proper oral hygiene. Custom-modified toothbrushes and flossing aids can assist patients in maintaining oral health. If plaque accumulation is excessive, more frequent recall appointments will be necessary to minimize periodontal involvement and decrease the development of caries. If partial dentures are

made for patients with arthritis, the design and placement of the clasps should be such that the placement and removal of these prostheses is facilitated. Because most patients with arthritis have joint stiffness and decreased mobility upon arising in the morning, appointments should be scheduled for late in the morning or the afternoon. Long appointments may be difficult for patients with arthritis to withstand, so those with extensive treatment plans may require a series of shorter appointments. The preventive approach to dental problems will assist in the maintenance of oral health, which will positively impact quality of life.

OSTEOPOROSIS

The National Institutes of Health defines osteoporosis as a disease characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and an increased risk of fractures [53]. The hip, spine, and wrist are the most common sites of osteoporotic fracture [53; 54].

There is a significant gender differential in the occurrence of osteoporosis, as women are eight times more likely to develop osteoporosis than men [55]. Hormones appear to be a factor. Women may lose up to 20% of their bone mass in the five to seven years after the onset of menopause [56]. More than 54 million Americans 50 years of age and older have osteoporosis, a number that is expected to increase to 64.4 million by 2030 [57].

Osteoporosis is often an asymptomatic disease process, and it may be first identified by a bone mineral density test [58]. Fractures in patients with osteoporosis can occur from minor injury, the magnitude of which would not fracture a non-osteoporotic bone.

In terms of oral health, the bone density of the mandible may be significantly decreased and at an increased risk for fracture in patients with osteoporosis. However, this is not the most significant osteoporosis-related concern for the oral and maxillofacial complex. The primary concern is with the adverse effects of osteoporosis medications upon the bone of the maxillary or mandibular arch.

Healthy bone metabolism is characterized by a delicate balance between bone formation and bone resorption. Osteoblasts are responsible for the formation of new bone during growth and repair; osteoclasts are the large multi-nucleated cells responsible for the resorption of bone. During the aging process, osteoblastic activity decreases, with an associated decrease in bone mass and an increased susceptibility to the fracture. Thus, bone metabolism will have a tendency toward bone resorption and bone weakening via osteoclastic activity. Oral bisphosphonates, such as risedronate and ibandronate, suppress the activity of osteoclasts and increase bone mineral density, thereby reducing the risk of fractures [59; 60]. Intravenously administered bisphosphonates such as pamidronate and zoledronic acid are used to treat the pathologic resorption of bone that occurs with systemic malignancies such as multiple myeloma and metastasized breast cancer. More than 50% of intravenously administered bisphosphonate agents reach the bone. Due to the physiologic pH of the intestinal mucosa, only about 1% of oral bisphosphonates localize in the bone [61].

With the increased use of these agents has come a pathologic entity called medication-related osteonecrosis of the jaw (MRONJ), which develops in a small segment of patients who have taken bisphosphonates, antiresorptive (i.e., denosumab), or antiangiogenic treatments [60; 62]. The exact process by which this condition develops is unknown. One possible explanation is that the decrease in osteoclastic activity with bisphosphonates may be of such magnitude that localized areas of damaged bone do not undergo the usual resorptive repair, resulting in necrotic sequestra of bone [63]. The true incidence of bisphosphonate-related MRONJ is unclear [62]. Although it is possible, patients with osteoporosis rarely require the high-dose IV bisphosphonates associated with the development of MRONJ. Patients undergoing treatment for multiple myeloma or metastasized breast cancer are much more likely to be administered bisphosphonates at the level required to initiate MRONJ [64].

The exact causal relationship between bisphosphonate medications and MRONJ has not been definitively established [64]. However, the FDA and the pharmaceutical companies that manufacture these medications have identified enough of a risk to include osteonecrosis of the jaw as a potential adverse effect in package inserts [25; 65]. Dental trauma and dental surgery are among the most common predisposing factors for MRONJ. Osteonecrosis of the jaw appears more frequently in the mandibular arch than it does in the maxillary arch [62].

Surgical sites associated with MRONJ experience a delay in closure, as exposure of alveolar bone may not be followed by the usual pattern of tissue migration and closure. Ultimately, bone exposed in this manner can develop into a necrotic sequestrum. Suppuration, pain, and swelling often accompany the necrosis. Some cases respond to antibiotic therapy, antimicrobial rinses, discontinuation of bisphosphonate therapy, and no or minimally invasive dental therapy [62]. Surgical intervention remains limited due to impaired ability of the bone to heal [62]. Some cases seem to be refractory to any form of treatment, even hyperbaric oxygen [62].

Patients who require dental surgery and have a history of taking bisphosphonates should be appraised of the risk of MRONJ prior to the initiation of any treatment. Patients beginning bisphosphonate therapy should have a comprehensive dental examination to identify areas for which oral or periodontal surgery is required so the procedures may be completed prior to initiation of the bisphosphonate therapy. As an increasing number of patients in the aging population will be affected by osteoporosis, pharmaceutical research into the causes of MRONJ and modalities to treat this problem successfully should be pursued.

ORAL AND SYSTEMIC CANCERS

Within the United States, cancer of all types is the second leading cause of death [66]. The following section will highlight the initial and long-term oral effects of oral malignancies and the surgery and radiotherapy that are used for their treatment. The oral effects that can develop after chemotherapy will also be discussed. Dental treatment considerations before, during, and after oral and systemic cancer therapy treatment will be provided, with a focus on interventions that can positively impact the oral and overall health of these patients.

ORAL CANCER

The average age of the patient diagnosed with the most common oral malignancy, squamous cell carcinoma, is 66 years of age. An estimated 30.9% of patients with oral malignancies are 55 to 64 years of age, 26.7% are 65 to 74 years of age, and another 14.2% are 75 to 85 years of age and older [67].

Approximately 54,000 new cases of oral cancer will be diagnosed in 2021, with a 20% mortality rate. The five-year survival rate of 67.8% reflects the late stage at which many of these lesions are diagnosed [67; 68]. Oral malignancies can remain asymptomatic for long periods, during which time direct extension into the surrounding tissues and metastasis will occur. Many oral squamous cell carcinoma lesions form on the floor of the mouth and the ventral and lateral surfaces of the tongue, where a rich vascular network is conducive to metastasis [69; 70]. Surgical removal and subsequent radiotherapy are the usual means by which these oral malignancies are treated. Earlier diagnosis and treatment of these lesions improves prognosis and is associated with fewer initial and long-term complications. Unfortunately, many oral malignancies are discovered in an advanced stage, and extensive surgical resection of oral mucosa, muscle layers, and bone is often required. The loss of tissue mass can present a difficult challenge in reconstruction of the affected areas for appropriate form and function.

Surgical Treatment

Surgical excision of oral malignancies consists of removal of the lesion, the adjacent tissues, and any lymph nodes suspected of being involved in the metastasis of cancerous cells. As noted, most lesions are diagnosed in advanced stages, requiring extensive surgery to remove the tumor and the contiguous tissues damaged by direct growth of the malignancy.

Mucosal, muscular, osseous, and neural tissues can be destroyed by an infiltrating lesion and by the surgery that is used to remove lesions, especially those for which the boundaries are extensive and/or difficult to delineate. Functions as basic as speaking, eating, swallowing, and masticating can become arduous tasks when surgical intervention requires the removal of the muscles, nerves, bone, and supporting connective tissue. Reconstructive surgery may not be successful in restoring the patient to presurgical form and function. Physical therapy may be required to help patients adjust to an oral and maxillofacial environment that functions in a vastly different fashion. In some cases, specialized prostheses may be needed to replace lost teeth, gingival tissues, mucosa, and alveolar bone. Dentures and partial dentures can be difficult to wear by any patient, but the level of difficulty is often magnified for patients with oral cancer who have a substantial loss of supporting tissue. Again, the emphasis should be on the early identification of oral malignancies. This would allow the lesion(s) to be diagnosed and treated in an early stage of development, and the excision could be as conservative as possible.

Radiotherapy

Surgical excision of an oral malignancy, the affected adjacent tissue, and ipsilateral and contralateral lymph nodes, where applicable, is followed by several sessions of radiation therapy, or radiotherapy. Some malignant cells may remain in tissues in close proximity to the site from which the tumor was removed. Radiotherapy is designed to irradiate the affected area with tumoricidal doses of radiation to kill the remaining malignant cells. Doses of radiation are measured in gray (Gy) or centigray (cGy). The cumulative dose of radiation is dependent upon tumor size and location; doses are fractionated on a daily basis for several weeks. Despite improvements in shielding techniques, radiotherapy will kill healthy cells of any oral structure within the primary beam of radiation. These deleterious effects can be temporary or permanent and can have a profound influence upon the patient's quality of life.

Patients undergoing radiotherapy can experience a wide range of complications within and around the oral and maxillofacial complex. The associated morbidity can vary from annoying to life-threatening. The most common complications will be discussed in the following sections.

Mucositis

Most patients with oral cancer receive a cumulative dose of 66–72 Gy (6,600–7,200 cGy) during radiotherapy [71]. The cumulative radiation dose at which mucositis develops varies, but the majority develop with a dose of 10–30 Gy (1,000–3,000 cGy) [72]. Therefore, most patients with oral cancer will develop mucositis during treatment [73].

Radiation impairs the ability of the basal cell layer to provide new cells for the renewal of the outermost surface of the multilayered oral epithelium. Because the external surface of the oral epithelium has a lifespan of two to three days, ulcerative mucositis generally develops during the second week of therapy. These ulcerative lesions can vary from singular areas of mild erythema to multiple areas of hemorrhage and necrosis in the deep layers of connective tissue.

Some cases may advance to such severity that the scheduled treatment regimen of radiotherapy should be interrupted until the initial epithelial healing has occurred. Patients with more severe forms of mucositis may be unable to eat, requiring hospitalization to provide intravenous therapy for nutrition, analgesia, and prophylactic antibiotic therapy. Patients who wear dentures or partial dentures may be unable to do so if the supporting tissues have been afflicted with any degree of mucositis. A pureed or liquid diet may be required in order for these patients to maintain adequate nutrition. Oral lesions of mucositis of any degree are potential areas of bacterial, fungal, or viral entry and systemic dissemination of infections.

Mucositis will resolve after radiotherapy is completed, with healing time proportionate to the extent of the lesions [73]. Only emergency dental treatment should be attempted while the patient is undergoing radiotherapy, and even this should be discussed with the patient's oncologist and surgeon.

Treatment for mucositis, as determined by the extent of the lesions, usually involves palliative care with non-narcotic or narcotic analgesics. Oral rinses such as benzydamine hydrochloride can provide limited temporary topical anesthesia for mucositis lesions. Oral rinses work best if they are initiated the day before radiotherapy begins. Patients should rinse, hold the analgesic against the afflicted areas for 30 seconds, then expectorate the excess. This protocol can be repeated three to four times daily, as needed [73]. Viscous lidocaine in a 2% solution may also be used three to four times daily. A dose of 5 cc of this solution is placed in contact with afflicted areas for 30 seconds to 1 minute, followed by the expectoration of any excess. Patients should be cautioned to avoid biting or traumatizing any tissue that is anesthetized; traumatic ulcers can develop and prolong the healing time. Patients with mucositis should be advised to remain on a cooler, softer diet that excludes foods with sharp edges. Hot, spicy, and acidic foods should not be consumed until the mucositis has resolved. Patients should be instructed to maintain optimal oral hygiene [73]. However, alcohol-based mouth rinses should be avoided due to the potential to irritate the lesions of mucositis. Established guidelines for oral care for patients in whom mucositis has developed include twice daily oral assessments (for hospitalized patients) and frequent oral care (i.e., minimum every four hours and at bedtime) that increases in frequency as the severity of mucositis increases [73].

Salivary Gland Problems

The major salivary glands, including the bilateral parotid, submandibular, and sublingual, are very sensitive to ionizing radiation. Damage can occur to these glands with a cumulative dose of 10 Gy (1,000 cGy) radiation. When the cumulative dose of 54 Gy (5,400 cGy) has been reached, the secretory elements of the major salivary glands will have sustained irreversible damage [74]. If the malignancy occurs in the area of the parotid gland, which is a pure serous (watery secretion) gland, shielding techniques may not be able to prevent its subsequent damage. A higher degree of damage to this gland, with a subsequent loss of the serous component of saliva, causes the remaining saliva to be increasingly viscous. Patients with oral malignancies in which the primary beam of radiation minimizes or avoids damage to any or all of these glands are rare.

Unlike mucositis, salivary gland dysfunction, which is associated with higher cumulative doses of radiation, will not resolve after the cessation of radiotherapy. Eating, swallowing, speaking, and enjoying a good quality of life become difficult when the quantity and quality of saliva is diminished.

Serous secretions are important in the lubrication of the tissues. Oral soft tissues become more prone to damage when long-term desiccation occurs. Patients may have difficulty or be unable to wear dental prostheses on tissue that has become inadequately lubricated.

Interventions for xerostomia (dry mouth) include artificial saliva substitutes, frequent sips of water, or cholinergic medications, such as pilocarpine [74]. Unfortunately, cholinergic medications have minimal or no effect on salivary flow when severe damage from higher cumulative doses of radiotherapy has occurred. Immunoglobulins and other compounds present in saliva that support immune functions will have a decreased output and can subject patients to recurring opportunistic infections, such as oral candidiasis. Impaired salivary flow will also cause a decrease in saliva's cleansing action upon the teeth. Further, the ability of salivary components to maintain the pH of saliva as a mild base is altered, which causes the oral environment to become more acidic. This combination of effects can have devastating effect on teeth, resulting in radiation caries [74].

Radiation caries are characterized by a pattern of aggressive progression of dental caries on surfaces of teeth that are usually considered to be at a low risk for caries, such as the buccal (outer) and lingual (inner) surfaces of posterior teeth and the labial (outer) and lingual (inner) surfaces of anterior teeth. The incisal edges of anterior teeth and the cusp tips of the posterior teeth are also at increased risk for these caries. Teeth that are affected in this manner need not have pre-existing decay or existing restorations. Unfortunately, teeth afflicted with radiation caries can be difficult to restore and may eventually be extracted.

Osteoradionecrosis

Among the deleterious effects of radiotherapy, the most severe is osteoradionecrosis. Ionizing radiation can cause deterioration of the vessels that supply oxygenated blood to the bones of the maxillary and mandibular arches. The resultant hypoxia can lead to the necrosis of osseous tissue unable to be protected from the primary beam of radiation. Osteoradionecrosis occurs more frequently on the mandibular arch, which has less of a blood supply as compared to the maxillary arch [74].

Risk of osteoradionecrosis is directly related to radiation dose and the volume of tissue irradiated [74]. However, osteoradionecrosis can occur at any time after radiotherapy, and passage of time does not decrease the risk [74; 75]. Patients who have received high-dose radiation are at lifelong risk of osteoradionecrosis, with an overall risk of approximately 15% [74]. Necrotic pieces of bone, which can have a considerable range in size, often break away from the affected bone and may emerge though the tissues. Small segments of bone can be removed with conservative surgical techniques, but large segments require extensive surgical resection. The development of osteoradionecrosis may be precipitated by trauma to the alveolar bone, as encountered with oral or periodontal surgery, odontogenic infections from periapical or periodontal pathology, or tissue irritation and subsequent ulceration that extends toward the bone. Patients who wear dentures or partial dentures may require the fabrication of new prostheses if this pathologic process dramatically alters the shape of the underlying supporting alveolar bone.

CHEMOTHERAPY

In 2021, an estimated 1.9 million new cases of cancer will be diagnosed, and approximately 608,570 patients will die as a result of the disease [70]. These figures do not include those patients who already had cancer and were in varying stages of treatment. Many patients older than 65 years of age are diagnosed with cancer and will receive chemotherapy as part of their cancer treatment.

Unlike the localized effects of radiotherapy, chemotherapeutic drugs are administered systemically. These medications are utilized to target the rapidly dividing cells found in malignant lesions. Unfortunately, these medications also target healthy, rapidly dividing cells, such as those of the oral mucosa and the hematopoietic cells of the bone marrow. The resultant problems of mucositis and a compromised immune system can develop. Approximately 40% of patients who receive chemotherapy will develop mucositis [76]. About one-half of these patients will experience mucositis that is severe enough to postpone or modify the chemotherapeutic regimen [77].

Management of chemotherapy-related oral complications include oral debridement and decontamination, topical and systemic pain management, prophylaxis (e.g., sucking ice chips), antiviral medications, and control of bleeding [78]. Medications used to treat the mucositis of patients with oral cancer can also be used for those undergoing chemotherapy.

Upon the cessation of chemotherapy, most cases of mucositis will resolve and, in general, the production of normal levels of hematopoietic cells will resume. However, some patients may experience chronic problems with either or both of these issues. Those who have had a bone marrow transplant will take immunosuppressive medications for the balance of their lives and can face chronic long-term problems with their immune system.

ORAL CONSIDERATIONS FOR PATIENTS BEING TREATED FOR CANCER

Patients who have been diagnosed with any type of cancer should have a comprehensive clinical and radiographic dental examination completed as far in advance as possible of any surgical and/or chemotherapeutic treatments. Oncologists and physicians who treat patients with cancer should be cognizant that optimal oral health will minimize the potentially serious oral complications that may develop after surgery, radiotherapy, and chemotherapy. Further, many patients do not receive routine preventive dental treatment and should be referred to a dentist prior to the initiation of treatment.

The American Cancer Society recommends that primary care clinicians should refer survivors of head or neck cancer to a dentist or periodontist for thorough evaluation and should counsel survivors to seek regular treatment from and follow recommendations of a qualified dental professional and reinforce that proper examination of the gingival attachment is a normal part of ongoing dental care.

(https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21343. Last accessed May 18, 2021.)

Level of Evidence: 0 (Expert opinion, observational study, clinical practice, literature review, or pilot study)

It is imperative to extract teeth that cannot be restored or those with periodontal problems that cannot be rectified. Teeth in these categories may cause minor problems for healthy patients, but they can cause life-threatening infections for patients being treated for any form of cancer. Custom trays for fluoride gels should be provided for patients who receive radiotherapy for oral cancer or head and neck malignancies in order to minimize radiation caries. Patients who develop xerostomia secondary to radiation require more frequent dental appointments to optimize oral hygiene and evaluate the patient for the onset of radiation caries. To prevent infection, supplemental rinses with 0.12% chlorhexidine should be considered, as the rinse has the ability to remain bound to hard and soft tissue for several hours while retaining its antibacterial properties. However, it should not be used if mucositis has developed. If alcohol-based products cannot be used, a suitable alternative should be prescribed.

Dental emergencies can arise at any point during cancer therapy. The patient's oncologist should be consulted prior to the initiation of any emergency dental treatment while the patient is receiving chemotherapy or is in the midst of radiotherapy. Laboratory values for platelets and white blood cells should be determined to evaluate if the values are of an appropriate range for hemostasis and if white blood cells are present in sufficient levels to successfully mount a defense against pathogenic

organisms. Extracting teeth after oral radiotherapy can cause osteoradionecrosis. Prostheses with any rough surfaces should be smoothed. Those that are a poor fit against the supporting tissues should be relined or remade.

Patients undergoing cancer treatment are often taking medications for other chronic conditions in addition to chemotherapy. Medications prescribed for dental concerns should be selected carefully to prevent negative reactions with any medication currently prescribed for the patient.

PHYSIOLOGIC CHANGES DURING THE AGING PROCESS

The process of aging at the cellular, tissue, organ, and systemic levels can vary widely. Changes that result from the aging process may impact immune function, drug absorption, drug distribution, drug metabolism, and drug excretion, all of which have effects on dental health and treatment.

Medications prescribed to elderly patients often require modification in the dosage, the duration of the prescription, and the frequency with which they are taken. When chronic disease is present, the ability to withstand any dental treatment, especially that of a surgical nature, may be compromised. The type of procedures performed and the number and duration of appointments involved are influenced by the cumulative biologic changes associated with the aging process.

Muscle mass and total body water both decrease during the aging process, while total body fat increases. Thus, the distribution of water-soluble medications decreases, but distribution increases for lipid-soluble medications. Because water-soluble medications, such as acetaminophen, are distributed in a smaller volume of water, they are more concentrated in older patients as compared to the same dose in a younger patient. This results in an amplified effect of water-soluble medications in geriatric patients [79]. Lipid-soluble medications, such as diazepam and lidocaine, are distributed throughout the greater volume of adipose tissue in older adults as compared to younger adults. This will have the effect of prolonging the actions of these medications, and dosages may need to be adjusted for optimal outcomes [80; 81].

Age-related changes in the liver and the kidneys can also influence the metabolism and clearance of medications used in dentistry. The mass of the liver decreases approximately 1% per year in patients older than 40 years of age. Furthermore, the blood flow to the liver can decrease by 40% to 45% as the aging process continues [82]. These two conditions lead to a decrease in the hepatic metabolism of specific medications.

Chronic diseases, such as hepatitis and cirrhosis, that damage the hepatocytes can further complicate the ability of the liver to metabolize medications properly. Slower metabolism and decreased clearance can lead to accrual of the medication in the plasma, increasing the concentration and potentially leading to toxicity. When addressing dental concerns, care should be taken in prescribing medications for geriatric patients with impaired liver function, especially those who take prescribed medications for other chronic disease(s).

As an individual ages, the functional unit of the kidney, the glomerulus, decreases in overall size and filtration rate [82]. Medications that are excreted through the kidneys, including NSAIDs such as ibuprofen and naproxen, may take longer to achieve proper clearance. This effect is amplified for patients who have chronic kidney disease and for whom other prescribed medications also rely on renal clearance. A physician should be consulted if there is any concern about the ability of the patient to metabolize and excrete standard doses of medications in the presence of hepatic or renal disease.

XEROSTOMIA

Increasing age is not automatically equated with decreasing salivary gland production and xerostomia, and secretions from the major salivary glands do not generally undergo a significant decrease in output during the aging process [83]. However, nearly 30% of patients 65 years of age or older experience xerostomia, most commonly medication-induced xerostomia [84]. There are more than 15,000 prescription and over-the-counter medications available in the United States, and many list dry mouth as a possible side effect [85]. Medication-induced xerostomia can be a long-term problem for older patients, as they are more likely to be taking multiple medications for longer periods of time or indefinitely. Medications that decrease salivary production usually affect the unstimulated flow of saliva; saliva produced in response to a stimulus, such as food, remains unaffected [86].

Xerostomia can also be associated with certain diseases and their treatment modalities. The permanent problems that radiotherapy can directly cause to saliva production have been discussed. Similarly, chemotherapy can cause temporary disruptions to normal salivary flow. Systemic and autoimmune diseases, such as diabetes and Sjögren syndrome, can cause disruptions in the normal production of saliva.

The preventive measures outlined for use in the reduction of dental caries and maintenance of optimal oral health for postradiotherapy patients with oral cancer may be utilized for any patient with xerostomia. There are many saliva substitute products available to decrease the discomfort associated with chronic xerostomia. Cholinergic medications designed to stimulate salivary production may be useful as long as there is functional salivary gland tissue. Sugar-free gum and sugar-free candy can provide a more conservative approach to salivary gland stimulation [73]. Treatment of xerostomia may involve a team approach to identify the cause(s) and to provide treatment to induce salivary production, provide improved oral comfort, and maintain oral health.

EVIDENCE-BASED PRACTICE RECOMMENDATION

The HealthPartners Dental Group asserts that patients who have xerostomia due to radiation therapy to the head and neck area or Sjögren syndrome should be considered at high risk of future caries. Also, patients who are taking medications with a known side effect of xerostomia should be considered at an elevated risk.

(https://www.guidelinecentral.com/summaries/healthpartners-dental-group-and-clinics-caries-guideline. Last accessed May 18, 2021.)

Level of Evidence: Expert Opinion/Consensus Statement

PHYSICAL AND COGNITIVE DEFICITS AND ORAL HYGIENE

The prevention of dental caries and periodontal disease requires appropriate diagnosis and treatment from the dental team, but it also requires that patients adhere to the use of proper oral hygiene techniques on a daily basis. Effective brushing and flossing are essential in maintaining periodontal health and minimizing the development of caries, but these home-care procedures require persistence and an average degree of dexterity. The latter can be an issue to some members of the geriatric population for whom medical problems may impair the neuromuscular coordination required for even the most basic of oral hygiene techniques. As discussed, this can be particularly pronounced in patients with rheumatoid arthritis, with its predilection to afflict the joints of the hands and the wrists. Rheumatoid arthritis flare-ups can make brushing and flossing a difficult task and result in a decrease in the quality of the patient's oral hygiene, leading to periodontal disease and caries. The healthcare team should evaluate the patient's ability to brush and floss properly and make appropriate recommendations if these skills are lacking. The use of a toothbrush with a custom grip and flossing aids can be excellent adjuncts for the daily oral hygiene of patients with physical impairments. For some patients, supplemental items, such as antibacterial mouth rinses, including 0.12% chlorhexidine, prescription-strength fluoride gels, and custom fluoride trays, may be required to meet their oral hygiene requirements.

If plaque accumulation remains a problem despite the best of concerted efforts, prophylaxis appointments should be made at a more frequent interval. Caretakers should be given the necessary information to assess the ability of patients to provide for their own oral hygiene, if applicable. In some instances, caretakers may need to take an active role in assisting patients with oral hygiene regimens. These physical impairments can occur as a result of many conditions, including stroke, connective tissue disease, and joint conditions. It may be an issue for stroke victims when the dominant side is involved. Connective tissue diseases, such as scleroderma and fibromyalgia, may affect the dexterity of geriatric patients and make attempts to maintain an appropriate level of oral hygiene difficult.

Cognitive impairment may also cause oral hygiene problems. Estimates indicate that about 5% to 8% of individuals 65 years of age and older and 50% of patients 85 years of age and older have dementia [87]. Alzheimer disease is the origin of 50% to 75% of all dementia cases [87]. Dementia is the general term for a condition of progressive deterioration of brain function and eventual decline in intellectual capacity. In patients with dementia, abilities related to memory, thinking, and speaking all worsen over time. Individuals afflicted with Alzheimer disease often live for many years after the diagnosis. The initial stages of Alzheimer disease are characterized by subtle mild cognitive impairment that may not be readily apparent, even to family members.

The disease progresses at variable rates but ultimately leads to the inability to speak coherently or respond appropriately to stimuli within the local environment. Eventually, ambulation, mastication, and swallowing will become extremely difficult or impossible. Death usually ensues as a result of complications of the condition, such as aspiration pneumonia [88].

The oral health of patients diagnosed with Alzheimer disease can vary considerably. Patients who have maintained optimal oral health prior to their diagnosis will require minimal specialized dental treatment. Treatment to preserve oral health should reflect patients' ability to maintain proper oral hygiene, optimal periodontal health, and control of the development of carious lesions. Patients who have poor periodontal health and a high incidence of dental caries upon diagnosis of Alzheimer disease require a comprehensive dental exam and a specialized treatment plan.

Progression of Alzheimer disease usually leads to deterioration in oral health as the cognitive and neuromuscular elements essential for the basic skills for brushing and flossing continually diminish. Caregivers of patients with Alzheimer disease may have difficulty in performing these tasks. Further, with the advancement of the disease, patients may become less tolerant of and less cooperative with dental treatment. There will come a time when only emergency dental treatment performed under sedation is possible. Clinicians involved in the care of patients with Alzheimer disease may need to establish a protocol of more frequent periodic visits to monitor oral health.

If clinical presentation indicates poor oral hygiene and the rapid development of periodontal problems and dental caries between appointments, extractions should be considered; costly restorative treatment and periodontal therapy have a poor prognosis for success. If a patient is fitted for new dentures, the prosthesis should have the name of the patient placed in the acrylic. This is particularly important for institutionalized patients, as this step can help in the recovery of

misplaced prostheses. Before surgical procedures are initiated, the patient's capacity to give informed consent should be determined and/or the healthcare proxies should be located.

Treatment of Alzheimer disease is generally palliative. However, patients in the initial stages of the disease may take antidepressants or antipsychotics to attenuate symptoms. Some of these medications can cause xerostomia and, by extension, oral hygiene problems.

Two medications often prescribed for Alzheimer disease, donepezil and rivastigmine, do not have known interactions with vasoconstrictors used in local anesthesia. However, tricyclic antidepressant medications can interact with vasoconstrictors. Therefore, patients taking tricyclic antidepressants should have their dental treatment completed with nonvasoconstrictive anesthetics. All dental treatment should be aimed at proactive early intervention to prevent dental complications. During the latter stages of Alzheimer disease, the provision of complicated treatment will be a daunting challenge.

ACCESS TO DENTAL CARE: ISSUES FOR GERIATRIC PATIENTS

Numerous socioeconomic issues can present obstacles for patients of any age who wish to obtain dental care. However, geriatric patients may experience additional barriers in their attempts to maintain dental health.

Financing of dental care is the primary obstacle for many older adults. Most patients older than 65 years of age are retired and therefore no longer have dental insurance as an employee benefit. Without this option and income limited to retirement savings, social security income, and any pension plan benefits, the costs associated with dental treatment may not be easily accommodated. Funding from federal, state, and county sources is often limited, both in available funds and treatment coverage.

Available financial resources among the geriatric population vary considerably. Unfortunately, many older adults live near or even below the poverty level and have difficulty in affording basic preventive dental care.

Medical problems can also present as a major obstacle in the provision of dental care for geriatric patients. As discussed, many older adults are afflicted with at least one chronic disease and most have experienced medical problems. Even with Medicare insurance, the cumulative costs of medical treatment and medications can escalate and contribute to budgetary concerns, making it difficult to afford dental care.

Coping with serious medical problems may leave older adults without the motivation and ability to seek dental care. Some medical problems may also lead to one spouse assuming the role of caretaker for the other. If this is the case, both can have difficulties in obtaining dental care. The caregiver spouse may have difficulty setting aside time for a dental appointment, while the morbidity of the medical problem and transport issues make dental appointments difficult for the infirmed. Patients in long-term care facilities may also face obstacles in obtaining dental care [89]. The cost of long-term care is often a strain and may limit patients' ability to afford dental treatment. Difficulties with transportation, especially to an outside dental office, may also be a barrier to seeking dental care. In order to overcome this barrier, some long-term care facilities may contract with a private dentist to provide care within the facility. However, the fees associated with this level of service are prohibitive to many.

While there are other barriers in the provision of dental treatment of geriatric patients, including the availability of clinicians specializing in treating older patients, financial and transportation issues are the most frequently encountered. Because oral health is such an important component to overall health and quality of life, efforts should be made toward the improvement of access to dental care for all within the geriatric population.

CONCLUSION

The growth of the geriatric population in the United States will have a significant impact on all aspects of society, especially in the healthcare system. The dental and medical needs of this heterogeneous group will be vast and diverse.

A wide range of medical problems can affect geriatric patients. This course has considered a select group of the most frequently occurring diseases and conditions among the geriatric population and the manner in which they and associated treatments can influence the course of dental care and treatments. Clinicians should consider all of the unique health issues of each patient to allow for safe and efficient treatment. The goal for geriatric patients is to achieve optimal oral health, thus enhancing overall health. This begins with a concerted effort between the patient and the healthcare and dental teams. When medical problems exist, the physician and other involved healthcare professionals should be consulted, as these diseases can affect the safety and efficacy of dental treatments. This unified approach should assist geriatric patients to maintain optimal oral health and a high quality of life.

Customer Information/Answer Sheet/Evaluation insert located between pages 88–89.

COURSE TEST - #59563 DENTAL CONSIDERATIONS FOR GERIATRIC PATIENTS

This is an open book test. Please record your responses on the Answer Sheet.
A passing grade of at least 70% must be achieved in order to receive credit for this course.

This 5 CE Credit Hour activity must be completed by May 31, 2024.

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Dental Board of California course #05-3841-00323.

1. By the year 2040, population demographic estimates forecast that there will be how many individuals 85 years of age and older in the United States?
- A) *2.3 million*
- B) *4.6 million*
- C) *14.4 million*
- D) *24.3 million*

2. The factors that suggest a link between cardiovascular disease and periodontal disease include all of the following, EXCEPT:
- A) *Tumor necrosis factor-alpha is absent in patients with periodontal disease.*
- B) *Periodontal pathogenic bacteria have been recovered from atherosclerotic plaques.*
- C) *C-reactive protein (CRP) levels are increased in patients with periodontal disease.*
- D) *The periodontal pathogenic bacteria Porphyromonas gingivalis is capable of initiating the clotting process.*

3. Stage 1 hypertension is defined by a systolic blood pressure between
- A) *110–129 mm Hg.*
- B) *130–139 mm Hg.*
- C) *140–159 mm Hg.*
- D) *160–179 mm Hg.*

4. Most cases of hypertension
- A) *are curable with medications.*
- B) *are considered essential hypertension.*
- C) *have pronounced symptoms which prompt patients to seek treatment.*
- D) *are usually caused by underlying medical problems such as pheochromocytomas.*

5. Which classification of medications used in the treatment of hypertension is most likely to cause gingival hyperplasia?
- A) *ACE inhibitors*
- B) *Thiazide diuretics*
- C) *Beta-adrenergic blockers*
- D) *Calcium channel blockers*

Test questions continue on next page →

6. Cardiovascular disease affects what proportion of people 65 years of age and older?
- A) *One-sixth*
- B) *One-quarter*
- C) *One-third*
- D) *One-half*

7. Chest pain that occurs infrequently, usually as a result of physical or emotional stress, is referred to as
- A) *stable angina.*
- B) *unstable angina.*
- C) *Prinzmetal angina.*
- D) *undifferentiated angina.*

8. Which of the following statements about anticoagulant therapy is TRUE?
- A) *Warfarin decreases platelet aggregation.*
- B) *Lower values of the INR are associated with more bleeding.*
- C) *Aspirin interferes with vitamin K-dependent clotting factors.*
- D) *Nonsteroidal anti-inflammatory drugs (NSAIDs) may enhance the effect of anticoagulant medications.*

9. Which of the following statements is FALSE regarding stroke and cerebrovascular accidents?
- A) *They may occur with no prior symptoms.*
- B) *They are always preceded by transient ischemic attacks.*
- C) *They are usually caused by atherosclerosis, an aneurysm, or an embolism.*
- D) *Approximately 8% of people 65 years of age and older in the United States have a history of stroke.*

10. Which of the following statements is TRUE with regard to diabetes?
- A) *Insulin is never used to treat these patients.*
- B) *Type 2 diabetes comprises about 20% of all diabetes cases.*
- C) *Metformin is the medication most commonly used to treat type 1 diabetes.*
- D) *Complications from diabetes contribute to it being the seventh leading cause of death within the United States.*

11. Which of the following statements about insulin is FALSE?
- A) *It is used to treat type 1 diabetes.*
- B) *It reduces the formation of glycogen.*
- C) *It is the only hormone to lower blood glucose.*
- D) *It hastens the transport of glucose into the cells.*

12. Which of the following statements about arthritis is FALSE?
- A) *Osteoarthritis affects the weight-bearing joints.*
- B) *Rheumatoid arthritis is more common than osteoarthritis.*
- C) *Arthritis affects approximately 50% of people 65 years and older.*
- D) *Methotrexate, a medication used to treat arthritis, can cause oral ulcerations.*

13. Which of the following can help patients afflicted with rheumatoid arthritis improve their oral hygiene?
- A) *More frequent dental recall appointments*
- B) *Specially modified toothbrushes and flossing aids*
- C) *Simplified designs for removable partial dentures*
- D) *All of the above*

14. Medications used to treat osteoporosis
- A) *target osteoblastic activity.*
- B) *enhance osteoclastic activity.*
- C) *decrease bone mineral density.*
- D) *can cause medication-related osteonecrosis of the jaw in a small segment of patients.*

15. Which of the following statements concerning the effects of radiotherapy in the treatment of oral cancer is FALSE?
- A) *Mucositis lesions will heal after the cessation of radiotherapy.*
- B) *Osteoradionecrosis can occur long after radiotherapy is completed.*
- C) *Salivary gland dysfunction always resolves after the cessation of radiotherapy.*
- D) *A rapidly advancing pathologic form of dental caries known as radiation caries can occur.*

16. Which of the following statements is TRUE regarding chemotherapy?

A) Medications in this class have localized effects.
B) About 40% of patients who receive chemotherapy will develop mucositis.
C) Oral effects of chemotherapy usually do not resolve after the cessation of chemotherapy.
D) Medications in this class do not affect the hemopoietic cells of the bone marrow.

17. During the aging process,

A) muscle mass increases.
B) total body fat increases.
C) total body water increases.
D) liver mass and blood flow to the liver remain unchanged.

18. Which of the following can cause xerostomia (dry mouth)?

A) Numerous medications
B) Radiation therapy for oral cancer
C) Some autoimmune diseases, such as Sjögren syndrome
D) All of the above

19. Which of the following statements is FALSE regarding dementia and Alzheimer disease?

A) Treatment is usually palliative.
B) Alzheimer disease is the cause of about 50% to 75% of the cases of dementia.
C) Dental treatment should reflect patients' abilityto maintain proper oral hygiene.
D) About 50% of the people 65 years and older in the United States have dementia.

20. For geriatric patients, access to dental care may be impaired by

A) financial constraints.
B) transportation problems.
C) medical problems for one or both spouses.
D) All of the above

Be sure to transfer your answers to the Answer Sheet located on the envelope insert.
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Men's Health Issues

Audience
This course is designed for dental professionals seeking to enhance their knowledge of issues related to men's health.

Course Objective
The purpose of this course is to provide dental professionals with necessary information regarding conditions and health issues that affect men in order to facilitate more effective diagnosis, treatment, and care. As male-specific factors influence the provision and compliance to therapy, tools to ensure effective patient education for men are provided to increase the likelihood of positive outcomes.

Learning Objectives
Upon completion of this course, you should be able to:

1. Identify diseases that are more prevalent among men than among women.
2. Describe the health implications of male gender identity and identify strategies to improve communication with male patients.
3. Explain the diagnosis and treatment of benign prostate conditions and prostate cancer.
4. Apply guideline recommendations for prostate cancer screening.
5. Describe treatment options and assist patients in selecting a management strategy for localized prostate cancer.
6. Distinguish among benign testicular conditions.
7. Discuss the diagnosis and treatment options for testicular cancer.
8. Discuss the differences between male and female breast cancer.
9. Discuss diagnosis and treatment options, and assist patients in selecting a treatment strategy for sexual dysfunction (premature ejaculation and erectile dysfunction).
10. Devise a strategy for diagnostic testing and treatment of late-onset hypogonadism.
11. List factors affecting male infertility.
12. Promote patient education and disease prevention, implement effective screening, and select guideline-appropriate treatment of sexually transmitted infections.
13. Identify issues of particular concern for men who have sex with men.
14. Discuss the effects of substance misuse, depression, and stress/anger on the physical and psychosocial well-being of men.
15. Discuss the importance of educating men about the need for screening, routine health maintenance, and healthy lifestyle.

Faculty
Lori L. Alexander, MTPW, ELS, MWC, is President of Editorial Rx, Inc., which provides medical writing and editing services on a wide variety of clinical topics and in a range of media. A medical writer and editor for more than 30 years, Ms. Alexander has written for both professional and lay audiences, with a focus on continuing education materials, medical meeting coverage, and educational resources for patients. She is the Editor Emeritus of the *American Medical Writers Association (AMWA) Journal*, the peer-review journal representing the largest association of medical communicators in the United States. Ms. Alexander earned a Master's degree in technical and professional writing, with a concentration in medical writing, at Northeastern University, Boston. She has also earned certification as a life sciences editor and as a medical writer.

John M. Leonard, MD, Professor of Medicine Emeritus, Vanderbilt University School of Medicine, completed his postgraduate clinical training at the Yale and Vanderbilt University Medical Centers before joining the Vanderbilt faculty in 1974. He is a clinician-educator and for many years served as director of residency training and student educational programs for the Vanderbilt University Department of Medicine. Over a career span of 40 years, Dr. Leonard conducted an active practice of general internal medicine and an inpatient consulting practice of infectious diseases.

Faculty Disclosure
Contributing faculty, Lori L. Alexander, MTPW, ELS, MWC, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Contributing faculty, John M. Leonard, MD, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

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Mark J. Szarejko, DDS, FAGD

Director of Development and Academic Affairs
Sarah Campbell

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Sections marked with this symbol include evidence-based practice recommendations. The level of evidence and/or strength of recommendation, as provided by the evidence-based source, are also included so you may determine the validity or relevance of the information. These sections may be used in conjunction with the study questions and course material for better application to your daily practice.

INTRODUCTION

There are many reasons to be concerned about health issues that are unique to or more common in men. In 1900, women outlived men by an average of two years; that gap widened to seven years in 1970 through 1990 [1]. Advances in diagnosis and treatment, as well as heightened awareness of disparities in men's and women's health, led to a narrowing of the gap to slightly less than five years in 2014 [1]. Still of concern, however, is the high number of men's deaths that are potentially avoidable. Many factors contribute to the disparity in mortality and morbidity between men and women, but the factor thought to have the most significant impact on the health of men relates to male gender identity, including a tendency for risky behavior [2; 3; 4; 5].

The concept of men's health was established to focus on the high rates of morbidity and mortality. Thus, men's health encompasses both male-specific conditions, such as those related to the prostate, as well as diseases that affect men at a higher rate compared with women. A discussion of all diseases that affect men is beyond the scope of this course. However, the leading causes of death among men are presented and discussed in the context of how they compare with the causes of death in women.

Among the male-specific conditions addressed are prostate disease (e.g., prostatitis, benign prostatic hypertrophy [BPH], cancer), testicular conditions (e.g., testicular torsion, epididymitis, varicocele, cancer), premature ejaculation, erectile dysfunction, late-onset hypogonadism, infertility, and sexually transmitted infections (STIs). Prostate cancer is discussed in considerable detail. Prostate screening and treatment have been controversial issues in health care, and the most recent recommendations for how to discuss screening and treatment options are included. Also provided are brief overviews of male breast cancer, a rare disease but one that is rising in prevalence, and health issues of specific concern for men who have sex with men (MSM), a growing population seen in the primary care setting.

The psychosocial well-being of men is integral to overall health. The link between anger and stress and disease is mentioned, as is the major role of substance misuse in mortality and morbidity. Alcohol misuse and depression have both been underdiagnosed in men, especially older men, and strategies for screening are explored.

The course closes with suggestions for fostering enhanced healthy behaviors among men, with recommendations for reaching out to men, ensuring appropriate health screening, and encouraging healthy behaviors.

OVERVIEW OF MEN'S HEALTH ISSUES

The concept of men's health emerged in response to the documented trends in greater mortality rates for men compared with women. Over the past decade, attention to the causes of death and disease in men has increased, and a growing body of scientific literature has begun to elucidate gender differences in physiologic, psychologic, and sociologic aspects of disease. These differences have a strong influence on the health of men as well as on the response to treatment and health behaviors.

Men's health lacks the same type of clinical focus as women's health; that is, men's health does not have the equivalent of a specialist (gynecologist) to provide care for the reproductive tract. Care of the male reproductive tract is assumed by primary care physicians, urologists, endocrinologists, reproductive specialists, and possibly, oncologists. The discipline of andrology is in its early stages, and some have proposed that this discipline should be expanded beyond the reproductive tract to include all men's health issues, with a goal of developing appropriate training programs and establishing a distinct specialty [6]. Men's health programs at large academic centers as well as freestanding centers in large cities are providing multidisciplinary diagnostic and management services targeted to men.

As defined by most organizations around the world, the field of men's health encompasses a broad range of health issues, including diseases that are more prevalent among men than women or that differ with regard to risk factors, diagnosis, and treatment. Men's health also addresses the psychologic and social influences on men and acknowledges the need to model healthier attitudes beginning in boyhood.

Several initiatives have helped to promote awareness of men's health among the public, policy arena, and scientific community, including establishment of the Men's Health Network, a nonprofit organization based in Washington, DC, and targeted peer-review journals such as the *Journal of Men's Health* and the *American Journal of Men's Health*.

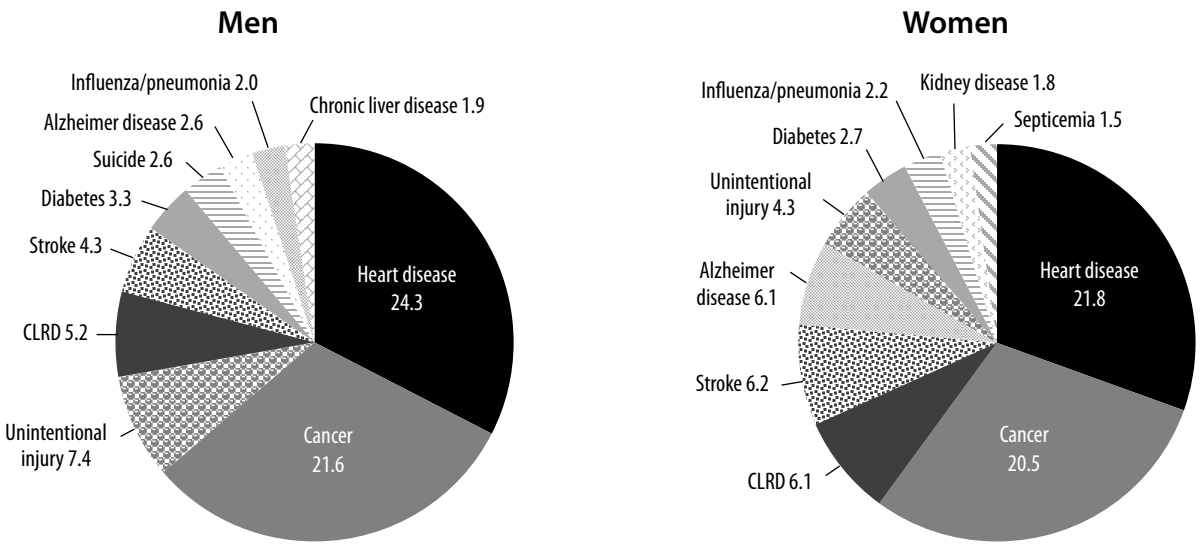
MORBIDITY AND MORTALITY AMONG MEN

In general, the leading causes of death among men and women are the same; what differs are the age at the time of death, the number of deaths caused by each disease, and the ranking of the causes (***Figure 1***) [7; 8]. The overall death rate in 2019 was higher for male than female individuals (all ages) (846.7 vs. 602.7 per 100,000) [9; 10]. Cardiovascular disease and cancer are the two leading causes of death for both men and women, but a greater percentage of men die of each cause [9; 10]. Deaths related to cardiovascular disease and cancer account for approximately 46% of the total number of deaths among all men [7]. In 2019, the death rate from Alzheimer disease was 30% lower among men than women; the death rates from cerebrovascular diseases, influenza/pneumonia, and chronic lower respiratory diseases were approximately the same for each biologic sex [7; 8]. The causes of death differ within the male population according to age and race/ethnicity, highlighting disparities related to socioeconomic status, cultural differences, access to care, and possibly, genetic predisposition for specific diseases (***Table 1***) [11].

Review of the leading causes of death demonstrates that many men's deaths are potentially avoidable. Most notable is the third leading cause of death for all men: unintentional injuries [11]. Unintentional injuries cause substantially more deaths among men than women, for whom it is the sixth leading cause of death [12]. Suicide is the eighth leading cause of death among all men; this cause of death is not included in the top 10 causes for women. In addition, homicide is among the ten leading causes of death for Black, Hispanic/Latino, and American Indian/Alaska Native men [13; 14; 15]. Several of the other leading causes of death among men are associated with chronic diseases, for which modification of risk factors and early detection can improve outcomes.

Gender differences exist in the prevalence of specific cancers and in deaths related to cancers [16]. The lifetime probability of being diagnosed with invasive cancer is higher for men than women (***Table 2***) [16]. The rate of deaths associated with cancer of the colon/rectum, urinary bladder, esophagus, and liver and intrahepatic bile duct are higher among men than among women (***Figure 2***) [16]. Although prostate cancer is the most prevalent cancer in men and receives widespread attention, lung cancer is responsible for a greater percentage of cancer-related deaths among men (23% vs. 11%) [16].

THE LEADING CAUSES OF DEATH AMONG MEN AND WOMEN, 2018



CLRD = Chronic lower respiratory disease.

Source: [7; 8] *Figure 1*

TEN LEADING CAUSES OF DEATH FOR MEN ACCORDING TO RACE/ETHNICITY, 2018

Leading Causes of Death	Mortality Rate and Rank					
	All Men	White	Black/ African American	Hispanic/ Latino	Asian/Pacific Islander	American Indian/ Alaskan Native
Cardiovascular diseases	24.4% (1)	24.8% (1)	24.1% (1)	20.2% (1)	23.1% (2)	18.9% (1)
Cancer	22.2% (2)	22.2% (2)	19.7% (2)	19.4% (2)	24.7% (1)	15.9% (2)
Unintentional injuries	6.8% (3)	6.9% (3)	__	11.3% (3)	5.3% (4)	13.7% (3)
Chronic lower respiratory diseases	5.3% (4)	5.8% (4)	3.2% (7)	3.3% (6)	3.2% (6)	3.6% (7)
Stroke	4.2% (5)	4.1% (5)	5.0% (4)	4.7% (4)	6.7% (3)	2.9% (8)
Diabetes mellitus	3.1% (6)	2.9% (6)	4.4% (6)	4.2% (5)	4.2% (5)	5.7% (5)
Suicide	2.5% (7)	2.7% (8)	–	3.1% (8)	2.6% (8)	4.2% (6)
Alzheimer disease	2.5% (8)	2.9% (7)	7.9% (3)	2.3% (9)	2.3% (9)	–
Influenza and pneumonia	2.0% (9)	2.0% (9)	1.7% (10)	3.2% (7)	3.2% (7)	2.2% (10)
Chronic liver disease	1.9% (10)	1.7% (10)	–	4.1% (6)	–	6.1% (4)
Assault (homicide)	–	–	4.5% (5)	2.2% (10)	–	2.3% (9)
Kidney disease	–	–	2.7% (8)	–	2.0% (10)	–
Septicemia	–	–	1.7% (9)	–	–	–

Source: [11] *Table 1*

COMPARISON FOR LIFETIME RISK FOR CANCERS FOR MEN AND WOMEN		
Cancer Type	Lifetime Risk	
	Men	Women
All sites	40.2%	38.5%
Lung and bronchus	6.4%	6.0%
Colon and rectum	4.2%	4.0%
Melanoma of the skin	3.7%	2.5%
Non-Hodgkin lymphoma	2.4%	1.9%
Kidney and renal pelvis	2.2%	1.3%
Leukemia	1.9%	1.3%

Source: [16] *Table 2*

TEN LEADING CANCER TYPES FOR THE ESTIMATED NEW CANCER CASES AND DEATHS BY SEX, UNITED STATES, 2022

Estimated New Cases

Males			Females		
Prostate	268,490	27%	Breast	287,850	31%
Lung & bronchus	117,910	12%	Lung & bronchus	118,830	13%
Colon & rectum	80,690	8%	Colon & rectum	70,340	8%
Urinary bladder	61,700	6%	Uterine corpus	65,950	7%
Melanoma of the skin	57,180	6%	Melanoma of the skin	42,600	5%
Kidney & renal pelvis	50,290	5%	Non-Hodgkin lymphoma	36,350	4%
Non-Hodgkin lymphoma	44,120	4%	Thyroid	31,940	3%
Oral cavity & pharynx	38,700	4%	Pancreas	29,240	3%
Leukemia	35,810	4%	Kidney & renal pelvis	28,710	3%
Pancreas	32,970	3%	Leukemia	24,840	3%
All Sites	**983,160**	**100%**	**All Sites**	**934,870**	**100%**

Estimated Deaths

Males			Females		
Lung & bronchus	68,820	21%	Lung & bronchus	61,360	21%
Prostate	34,500	11%	Breast	43,250	15%
Colon & rectum	28,400	9%	Colon & rectum	24,180	8%
Pancreas	25,970	8%	Pancreas	23,860	8%
Liver & intrahepatic bile duct	20,420	6%	Ovary	12,810	4%
Leukemia	14,020	4%	Uterine corpus	12,550	4%
Esophagus	13,250	4%	Liver & intrahepatic bile duct	10,100	4%
Urinary bladder	12,120	4%	Leukemia	9,980	3%
Non-Hodgkin lymphoma	11,700	4%	Non-Hodgkin lymphoma	8,550	3%
Brain & other nervous system	10,710	3%	Brain & other nervous system	7,570	3%
All Sites	**322,090**	**100%**	**All Sites**	**287,270**	**100%**

Source: Reprinted with permission of Siegel RL, Miller KD, Fuchs HE, et al. Cancer statistics, 2022. CA Cancer J Clin. 2022;72(1):7-33. *Figure 2*

COMPARISON OF RISKY BEHAVIORS IN YOUTH (9th THROUGH 12th GRADES)		
Behavior	**Male Respondents**	**Female Respondents**
Did not always wear a seat belt	43.3%	42.7%
Rode with a driver who had been drinking alcohol	15.6%	17.5%
Texted or e-mailed while driving	39.6%	38.4%
Drove after drinking alcohol	7.0%	3.6%
Carried a weapon (gun, knife, or club)	19.5%	6.7%
Was in a physical fight in the previous 12 months	28.3%	15.3%
Currently smoke cigarettes daily	6.9%	4.9%
Currently use smokeless tobacco	5.8%	1.6%
Currently use electronic vapor product (e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, hookah pens)	32.0%	33.5%
Had >5 drinks of alcohol within a couple of hours on >1 of the previous 30 days	12.7%	14.6%
Ever used marijuana	37.0%	36.5%
Drove after using marijuana	14.6%	11.3%
Ever misused prescription opioids	12.4%	16.1%
Ever used cocaine	4.9%	2.7%
Ever used heroin	2.3%	1.0%
Ever used methamphetamines	2.7%	2.7%
Source: [23]		*Table 3*

MALE GENDER IDENTITY AND IMPLICATIONS FOR HEALTH

An increasing amount of research is supporting a relationship between men's risk for disease and death and male gender identity, and the traditional male role has been shown to conflict with the fostering of healthy behaviors [4; 17]. Male gender identity is related to a tendency to take risks, and the predilection for risky behavior begins in boyhood [17; 18; 19]. In addition, boys are taught that they should be self-reliant and independent and should control their emotions, and societal norms for both boys and men dictate that they maintain a strong image by denying pain and weakness [4; 18; 19].

Issues related to male gender identity have several important implications for health. First, risky behavior is associated with increased morbidity and mortality. Second, the concept of masculinity leads to inadequate help- and information-seeking behavior and a reduced likelihood to engage in behavior to promote health [4; 18; 19]. These behaviors appear to be rooted in a decreased likelihood for men to perceive themselves as being ill or at risk for illness, injury, or death [4]. Third, male gender identity, coupled with lower rates of health literacy, creates special challenges for effectively communicating health messages to men [5; 20; 21]. Gender differences in health-related behaviors are consistent across racial/ethnic populations, although specific behaviors vary according to race/ethnicity [17].

Risky Behavior

Risky behavior affects health and well-being beginning at a young age. The overall rate of fatal injuries is approximately two times higher among boys than girls (0 to 19 years of age) [22]. Motor vehicle accidents are the leading cause of death for both genders, especially in the age category of teenage drivers (15 to 19 years of age). Although not all of these injuries and deaths are related to risky behavior, Youth Risk Behavior Surveillance (YRBS) data indicate that many of them are related; other risky behaviors identified in this survey are related to morbidity and mortality in adolescence and are also contributors to habits that affect health in adulthood. The 2019 YRBS showed that the rate of risky behaviors is predominantly higher among male respondents (***Table 3***) [23]. The rates of many of these behaviors continued to be higher among male adults (***Table 4***), which plays a role in premature deaths among men [1; 24].

Men's predilection for risky behavior is reflected in the high rate of unintentional injury, which accounts for 7.4% of deaths among men (compared with 4.3% for women) [7; 8]. There is wide variation in this rate across race/ethnicity, with much higher rates among American Indian/Alaska Native men (13.7%) and Hispanic/Latino men (11.3%) [11]. The trend of more fatal unintentional injuries among men is evident in countries around the world; an analysis of accidental deaths

RISKY BEHAVIOR AMONG ADULTS		
Behaviors[a]	**Men**	**Women**
Non-seat belt use	11.6%	7.2%
"Heavy" drinking (five or more drinks on the same occasion on at least five days of the last month)	8.2%	4.0%
Five drinks or more in a day at least one day within the previous month	28.5%	20.7%
Current smoking	15.6%	12.0%
Use of illicit drugs[a]		
Any illicit drug (past month)	14.0%	9.5%
Cannabis (past month)	12.3%	8.0%
Psychotherapeutic drug (nonmedical use in past month)	2.1%	1.9%
[a]Data for behaviors are based on individuals 18 years of age and older; the data on use of illicit drugs are based on individuals who were 12 years of age and older.		
Source: [1; 24]		*Table 4*

among men and women in 36 countries showed higher rates for men [2]. Across all age-groups, the rates were higher in the United States than the median rate for all countries. Accidental deaths are related primarily to motor vehicle injuries, violence, and occupation, and the rates in all categories are higher for men than for women. The rate of death related to motor vehicle injuries for men is slightly higher than for women (16.0 vs. 6.3 per 100,000), and the percentage of fatal unintentional firearm-related injuries deaths occur overwhelmingly more often among men (82.7%) than women (17.3%) [25]. Similarly, fatal occupational injuries occur predominantly in men (57% vs. 6%) [26].

Substance misuse plays a significant role in both risky behavior and the development of chronic diseases. As demonstrated by the YRBS data, the use of tobacco, alcohol, and illicit drugs begins in the teenage years, with more boys than girls engaging in such behavior [23]. One exception appears to be prescription opioids, which are more likely to be misused by female adolescents than male adolescents. Among adults, substance misuse continues to be more prevalent among men than women [27]. Misuse of tobacco, alcohol, and drugs are associated with high rates of unintentional injuries, violence, STIs, and masking of depression [25; 28; 29; 30].

The rate of tobacco use among men has declined over the past decade, but the rate continues to be higher than that among women [31]. The Centers for Disease Control and Prevention (CDC) estimates that men who smoke increase their risk of death from lung cancer by 25 times, with tobacco being the cause of approximately 90% of all lung cancer deaths in men [32]. In addition, smoking is a significant risk factor for many cancers, especially those that are more prevalent among men, and is linked to a two to four times greater likelihood of cardiovascular disease or stroke [32].

Excessive alcohol use is the third leading lifestyle-related cause of death for both men and women, and long-term use of alcohol is a well-recognized contributor to several chronic diseases [33]. Even consumption that is considered to be less than "hazardous" (three to five drinks per day) has been associated with increased morbidity and mortality [34].

Help- and Information-Seeking Behavior

Help- and information-seeking behavior related to male gender identity is another factor that affects men's health. In general, men are reluctant to seek health care or talk about their health because they see such help-seeking as a sign of weakness or vulnerability and a threat to their masculinity [4; 35; 36]. These reports are substantiated by data on utilization of healthcare resources, which indicate that men have fewer office visits to doctors or other health care professional than women; in 2018, 23.9% of men had no office visits, compared with 12.5% of women [37]. In addition, men are more likely to lack a usual source of health care (18.6% vs. 10.7%) [37]. Men have reported several reasons for not having a usual source of care, and the reasons vary among racial/ethnic populations [39]. The reason given most often is that they are seldom or never sick, and this may be related to men's perceptions of invulnerability [39; 40]. Other reasons given include not finding time and not being able to take time away from work [38]. Cultural values, such as *machismo*, lead many Hispanic men to avoid health care until there is no other choice [40]. This may contribute to the low rate of healthcare use among Hispanic men, which is the lowest across racial/ethnic populations [40]. Other reasons for the low use of healthcare services among Hispanic men are lack of health insurance, low understanding of the healthcare system, fear of poor functional outcomes, and a low perception of the quality of the patient-clinician interaction [40]. In the Black population, men have reported to avoid healthcare services because of fears and concerns about their negative health behaviors and history [41].

Lower rates of healthcare use among men have a negative impact on preventive care, and rates of routine health assessments and recommended vaccinations and screening procedures have been lower among men than among women [42]. Several factors contribute to the avoidance of screening tests, including men's belief that they are healthy; their focus on their present, rather than future, health; the need for more information about the screening procedure; and other issues related to masculinity [42]. For example, Black men have reported avoiding screening for prostate and colorectal cancer because they see these procedures as "violating their manhood" [41; 43].

Among men who do have physician office visits, many are not forthcoming about symptoms or information they seek [44]. Because of their traditional discomfort with expressing feelings and emotions, they are less likely to seek help for psychosocial problems or emotional symptoms [17; 45]. Men tend to be more motivated to seek health care for male-oriented conditions, such as erectile dysfunction or sports-related injuries, or when their health or symptoms interfere with their routine activities [45].

Communicating Effectively with Men

Effective communication is essential in the healthcare setting but can be challenged by several factors. Specific challenges in communicating with men are related to male gender identity as well as to low health literacy and language and cultural barriers.

Male Gender Identity

Men's beliefs about masculinity and traditional male roles affect health communication, and healthcare practitioners should consider male-specific beliefs and perceptions when communicating with male patients. For example, because men tend to focus on present rather than future health, concepts of fear, wellness, and longevity often do not work well in health messages [40]. Instead, healthcare practitioners should focus more on "masculine" concepts, such as strength, safety, and performance, all of which tie into men's perceptions of their roles as providers and protectors. To address men's reluctance to admit pain, practitioners should avoid asking questions such as "Do you have pain?" and instead use phrases such as "Most men I see with this condition say they have quite a bit of pain—what about you?" Using numbers/statistics and metaphors relating the body to a machine may also help to communicate effectively by addressing male gender identity. In addition, practitioners should be nonjudgmental about their male patients' health and risk behaviors and develop open lines of communication to encourage them to express their health concerns.

Health Literacy, Language, and Culture

According to the National Assessment of Health Literacy, 14% of individuals in the United States have "below basic" health literacy, which means they lack the ability to understand health information and make informed health decisions [21; 46]. The findings of the assessment demonstrated that the rate of "below basic" literacy was higher among men than women (16% vs. 12%) [21]. Although the rate of "basic" health literacy was similar for men and women, rates of "intermediate" and "proficient" health literacy were lower for men [21]. Similar rates of health literacy have been found in subsequent studies, with rates of adequate health literacy consistently lower among men and even lower among non-White men [47; 48]. In one study, the rate of adequate health literacy was 48% among White men (compared with 63% among White women) and 23% among non-White men (compared with 30% among non-White women) [48].

Recognition of the importance of adequate health literacy to good health outcomes has led to assessment of health literacy being deemed "the newest vital sign," with development of an assessment tool by that name [48; 49]. The Newest Vital Sign (NVS) tool has been shown to demonstrate the health literacy status in fewer than three minutes, with results that are comparable to those of more extensive literacy tests [48]. Clinicians are encouraged to use this tool to assess the literacy of their patients, especially those of racial/ethnic minorities, and to adapt discussions to literacy levels and provide low-literacy educational resources. Compounding health literacy are language and cultural barriers, which have the potential for far-reaching effects, given the growing percentages of racial/ethnic populations. According to U.S. Census Bureau data from 2020, 21.5% of the American population speak a language other than English, and of those, 8.2% speak English less than "very well" [50]. Clinicians should ask their patients what language they prefer for their medical care information, as some individuals prefer their native language even though they have said they can understand and discuss symptoms in English [51]. Translation services should be provided for patients who do not understand the clinician's language. "Ad hoc" interpreters (family members, friends, bilingual staff members) are often used instead of professional interpreters for a variety of reasons, including convenience and cost. However, clinicians should check with their state's health officials about the use of ad hoc interpreters, as several states have laws about who can interpret medical information for a patient [52]. Even when allowed by law, the use of a patient's family member or friend as an interpreter should be avoided, as the patient may not be as forthcoming with information and the family member or friend may not remain objective [52]. Children should especially be avoided as interpreters, as their understanding of medical language is limited and they may filter information to protect their parents or other adult family members [52]. Individuals with limited English language skills have actually indicated a preference for professional interpreters rather than family members [53].

Most important, perhaps, is the fact that clinical consequences are more likely with ad hoc interpreters than with professional interpreters [54]. A systematic review of the literature showed that the use of professional interpreters facilitates a broader understanding and leads to better clinical care than the use of ad hoc interpreters, and many studies have demonstrated

that the lack of an interpreter for patients with limited English proficiency compromises the quality of care and that the use of professional interpreters improves communication (errors and comprehension), utilization, clinical outcomes, and patient satisfaction with care [55; 56].

Clinicians should use plain language in their discussions with their patients who have low literacy or limited English proficiency. They should ask them to repeat pertinent information in their own words to confirm understanding, and reinforcement with the use of low-literacy or translated educational materials may be helpful.

MALE-SPECIFIC DISORDERS

Among male-specific disorders, prostatic conditions are perhaps of most concern to men and have raised the most questions in the healthcare community about diagnosis, screening, and treatment. Sexual health issues, such as premature ejaculation and erectile dysfunction, are also of substantial concern to men, and treatments for these conditions gained increased attention beginning in the late 1990s. The prevalence of many STIs is on the rise, especially among younger men, posing a significant public health problem [57]. Infertility is an issue for many younger men, and interest in late-onset hypogonadism has increased, primarily because of the debate about the use of testosterone replacement therapy. Much attention has also been focused on the unique healthcare needs of a minority population—MSM. (This term has become preferred as a more accurate description because of the variation in how such men identify themselves sexually [58].) Another minority population is that of men with breast cancer, a disease that has become more prevalent since the 1980s. The diseases and conditions noted here by no means represent all of those related to the health care of men. Topics were chosen on the basis of their impact on the overall health of men and the implications for care.

Primary care and family medicine physicians and other general healthcare providers are at the forefront of managing all of these male-specific conditions. Consultation with and referral to specialists, such as urologists, endocrinologists, reproductive specialists, and oncologists, should be carried out as appropriate, and follow-up should be continued with the primary healthcare provider.

DISEASES AND CONDITIONS OF THE PROSTATE

Prostate tissue undergoes changes as men age, and as such, prostatic conditions predominantly occur in older men. The three primary problems related to the prostate are prostatitis, BPH, and prostate cancer. These conditions can be challenging to diagnose because lower urinary tract symptoms, such as frequency, urgency, and dysuria, can be associated with all three conditions. Furthermore, the most serious of the prostate conditions—prostate cancer—usually produces no symptoms in the early stage of the disease. In addition to the diagnostic challenge created by similar, or no, symptoms, the interpretation of prostate-specific antigen (PSA) levels is difficult, and decisions regarding who and when to screen for prostate cancer are not easy.

PROSTATITIS

Inflammation of the prostate is classified into four categories according to a system developed by the National Institutes of Health (NIH) International Prostatitis Collaborative Network [59]. These categories are:

- Acute bacterial prostatitis
- Chronic bacterial prostatitis
- Chronic prostatitis (nonbacterial)/chronic pelvic pain syndrome (subcategorized as A [inflammatory] and B [noninflammatory])
- Asymptomatic inflammatory prostatitis

Both acute and chronic bacterial prostatitis occur in approximately 5% to 10% of men with symptoms related to prostatitis. Chronic nonbacterial prostatitis/chronic pelvic pain syndrome is the most common type, occurring in approximately 90% of symptomatic men [60]. These three types of prostatitis are addressed here; asymptomatic inflammatory prostatitis is an incidental finding during evaluation of another genitourinary condition such as prostate cancer or infertility [61].

It has been estimated that prostatitis accounts for approximately 2 million outpatient visits per year in the United States, with a direct cost of care of nearly $4,000 per patient per year [61]. The condition can have a substantial impact on the quality of life, causing pain and sexual dysfunction, as well as decreased libido and erectile and ejaculatory dysfunction [62; 63].

Chronic prostatitis/chronic pelvic pain syndrome has the greatest impact on the quality of life of all types of prostatitis. Studies have found that the effect of chronic pelvic pain syndrome on the quality of life is similar to that of angina, congestive heart failure, diabetes mellitus, and Crohn disease [61]. Symptoms fluctuate over time; one study showed that 43% of men had symptoms within 11 months of follow-up, and another showed that 31% of men had moderate or marked improvement during two years of follow-up [64; 65]. Chronic prostatitis/chronic pelvic pain syndrome also causes patient anxiety at the initial visit. Most men with symptoms worry that they have an infection (71%) or cancer (68%), and concerns at one-year follow-up have included worsening symptoms without treatment, cancer, infection, and need for surgery [65]. These concerns have led to an increased number of physician visits [65].

Prevalence

The prevalence of prostatitis has been reported to be approximately 8%, ranging from about 2% to 10% [66]. In patients younger than 35 years of age, the most common variant of the syndrome is acute bacterial prostatitis. Among older patients, nonbacterial prostatitis (NIH types II and IV) is the most common [67]. The results of studies have suggested that the symptoms of prostatitis increase the risk for BPH, lower urinary tract symptoms, and prostate cancer [66].

Etiology

The cause of acute and chronic bacterial prostatitis is usually lower urinary tract infection with gram-negative organisms, most notably *Escherichia coli* [60; 61]. Most men with prostatitis, however, have no evidence of urinary tract infection [61]. Other causes may include a primary voiding dysfunction problem; presence of *Chlamydia trachomatis*, *Ureaplasma* species, or *Trichomonas vaginalis*; uncommon organisms (e.g., *Mycobacterium tuberculosis*); HIV; cytomegalovirus; and inflammatory conditions (e.g., sarcoidosis) [67].

The risk factors for prostatitis have not been clearly defined. In a study of 463 men with chronic prostatitis/chronic pelvic pain and 121 asymptomatic age-matched controls, the lifetime prevalence of several self-reported medical conditions were significantly greater among men with prostatitis, specifically neurologic disease (41% vs. 14%); hematopoietic, lymphatic, or infectious disease (41% vs. 20%); psychiatric conditions (29% vs. 11%); nonspecific urethritis (12% vs. 4%); and cardiovascular disease (11% vs. 2%) [68]. The authors of that study noted that more research is needed to determine if such conditions contribute to the pathogenesis of chronic prostatitis/chronic pelvic pain. A history of STIs has been noted to be associated with an increased risk for prostatitis symptoms [66].

Diagnosis

Several other urogenital conditions should be considered in the differential diagnosis of prostatitis, including BPH, cystitis, erectile dysfunction, prostate cancer, STI, and urolithiasis [69; 70; 353]. Of the four types of prostatitis, acute bacterial prostatitis is the easiest to diagnose and treat. Patients with acute prostatitis present with irritative symptoms (dysuria, urinary frequency, and urgency), and obstructive voiding symptoms (hesitancy, incomplete voiding, straining to urinate); the syndrome may also include signs of systemic infection, such as chills and fever [70; 353]. Pain most commonly occurs in the prostate/perineum and scrotum and/or testes; pain referred to the penis or lower back also occurs [70]. Urine samples should be cultured to determine the causative micro-organism.

Chronic bacterial prostatitis is distinguished from acute disease by time, being defined by persistence of symptoms for at least three months, and systemic symptoms are usually absent [58; 70]. The condition should be suspected when the patient's history includes recurrent urinary tract infections, usually with the same bacterial strain [61]. The patient should complete an NIH Chronic Prostatitis Symptom Index to obtain a baseline score for the severity of symptoms [59]. This index includes questions related to three domains—pain, urinary symptoms, and quality-of-life impact—and has been shown to be a valid, reliable tool for measuring prostatitis symptoms [70; 71]. Computed tomography (CT) can determine if there are structural or functional abnormalities of the urinary tract [60; 61].

The diagnostic evaluation for acute or chronic bacterial prostatitis includes a urinalysis and urine culture [61; 70]. When acute prostatitis is suspected, digital rectal exam should be performed gently so as not to precipitate bacteremia and sepsis. The prostate will usually be enlarged, boggy, and tender, though absence of tenderness on initial examination does not exclude the diagnosis of prostatitis. There are no standardized criteria for the diagnosis of chronic prostatitis/chronic pelvic pain syndrome [61; 69]. The Meares-Stamey four-glass test was developed in the late 1960s to screen for prostatitis; the test involves collecting urine samples before and after prostatic massage, as well as collecting prostatic fluid during the massage [72]. Cultures are done on the specimens, and the presence of micro-organisms in the prostatic fluid indicates chronic prostatitis [61; 72]. The accuracy and reliability of the test has not been established, and studies have shown that the test is not used often, even by urologists [61; 69]. There is also a two-glass version of the test that has correlated well with the four-glass version, but that, too, is not often used [61]. The Meares-Stamey test is not helpful for diagnosing chronic pelvic pain syndrome. Men who have substantial lower urinary tract symptoms and pelvic pain may be candidates for urodynamic evaluation, as voiding dysfunction is common in such cases [61].

Treatment Options

No U.S.-based guidelines have been developed, to date, for the treatment of prostatitis, but the European Association of Urology included recommendations for the treatment of prostatitis in its 2008 guidelines on the management of urinary and male genital tract infections [70]. Most patients with bacterial prostatitis can be managed as outpatients with oral antibiotics (e.g., a fluoroquinolone or trimethoprim-sulfamethoxazole) and close follow-up. Hospitalization and broad-spectrum parenteral antibiotics (e.g., piperacillin/tazobactam or ceftriaxone plus ciprofloxacin) should be considered in patients who are systemically ill, are unable to urinate voluntarily, or have risk factors for antimicrobial resistance [70; 353]. An aminoglycoside may be added to any of these antibiotics as initial therapy [70]. A fluoroquinolone is the preferred choice for oral therapy because of the spectrum of antibacterial activity and good penetration into prostatic tissue. Duration of antibiotic treatment should be individualized in relation to duration of symptoms and clinical response; 10 to 14 days will suffice for most acute cases of prostatitis, but 21 to 28 days may be required for those with a more subacute onset or slow resolution of symptoms.

For chronic bacterial prostatitis, the choice of antibiotic depends on the sensitivity of the micro-organism, and the antibiotic should be one that penetrates the prostate [61]. The typical first-line treatment is a four- to six-week course of a fluoroquinolone, and treatment is usually more effective if begun soon after symptoms begin [61; 70; 73; 74]. Trimethoprim-sulfamethoxazole may also be considered [70].

Treatment for chronic prostatitis/chronic pelvic pain syndrome is complex; evidence on the effect of traditional treatment options has been conflicting, and treatment options are often not effective in managing symptoms. The most commonly studied pharmacologic options are antibiotics, alpha-blockers, anti-inflammatory agents, steroid inhibitors, and muscle relaxants, and often, a combination of these agents provides the most effective management [74]. Antibiotics, particularly fluoroquinolones, have improved symptoms, even in some patients in whom a bacterial cause has not been identified [74]. Studies have shown that an antibiotic and an alpha-blocker is more effective than an antibiotic alone [70]. A meta-analysis showed that alpha-blockers, antibiotics, and a combination of the two all significantly improve symptoms (according to scores on the NIH Chronic Prostatitis Symptom Index), with the combination providing the greatest benefit [75]. However, another meta-analysis showed that these same agents—alone and in combination—were not associated with a statistically or clinically significant decrease in symptom scores [76]. The combination of an alpha-blocker (doxazosin) with an anti-inflammatory agent (ibuprofen) and a muscle relaxant (thiocolchicoside) led to a statistically and clinically significant reduction in the total score on the NIH Chronic Prostatitis Symptom Index in one systematic review; according to the findings of another systematic review, the three-agent combination was not superior to monotherapy [74; 76]. Researchers have cautioned that publication bias may cause overestimation of the beneficial effects of alpha-blockers and that the placebo effect has been significant in many studies [75; 76]. Addressing a hypothesis that the pain related to chronic prostatitis may have a neuropathic origin, pregabalin has been evaluated as a management strategy, but a systematic review found that the drug did not improve symptoms and caused side effects in a large percentage of men [77].

Trigger point release/paradoxical relaxation training to release trigger points in the pelvic floor musculature was found to significantly improve symptoms in men who had chronic prostatitis/chronic pelvic pain syndrome [63]. Seventy percent of the men in the study had a significant decrease in the score on the NIH Chronic Prostatitis Symptom Index, with improvement in pelvic pain, urinary symptoms, libido, ejaculatory pain, and erectile and ejaculatory dysfunction [63].

BENIGN PROSTATIC HYPERPLASIA

Benign prostatic hyperplasia (BPH), also referred to as benign prostatic hypertrophy, is a histologic diagnosis that refers to the proliferation of smooth muscle and epithelial cells within the prostatic transition zone [78]. BPH is one of the most common conditions among aging men. The onset of lower urinary tract symptoms usually begins after 40 years of age, increasing in prevalence and severity with age [78]. Serious complications and mortality are rare, but the condition has an impact on the quality of life, with symptoms that interfere with normal daily activities and sleep [78]. Complete evaluation is necessary for an accurate diagnosis of BPH; the condition must be differentiated from prostate cancer, which is associated with similar early symptoms. In addition, early detection of BPH leads to early treatment, which can control progression of the disease, preventing such complications as urinary tract infection, acute urinary retention, and obstructive nephropathy [79].

Prevalence and Etiology

The prevalence of BPH increases with age, from approximately 8% of men 31 to 40 years of age to approximately 90% of men in their 80s [80; 81]. Risk factors identified in one study included increased age, prostatic volume, and peak urinary flow rate [82]. Other factors, including some that are modifiable, include obesity, diet, dyslipidemia, hypertension, alcohol use, and smoking [83]. The relative risk for BPH (and common comorbidities) may be higher for Black and Hispanic men than for White men and is thought to be related in part to genetic differences based on race/ethnicity; however, observational studies have produced variable results [81; 84].

Diagnosis

As previously noted, distinguishing BPH from other prostate-related diseases is often difficult, as lower urinary tract symptoms are similar for a variety of conditions. The American Urological Association (AUA) evidence-based guidelines for the management of BPH, updated in 2021, recommend the following tests [78]:

- Medical history
- Assessment of lower urinary tract symptoms
- Determination of severity and bother of symptoms
- Physical examination
- Urinalysis

Determination of a serum PSA level is also recommended if the patient has a life expectancy of more than 10 years (and the diagnosis of prostate cancer will alter management), and a frequency-volume chart is recommended if substantial nocturia is a predominant symptom [78]. Routine measurement of a serum creatinine level is not recommended as part of the initial evaluation of men with lower urinary tract symptoms related to BPH [78].

EVIDENCE-BASED PRACTICE RECOMMENDATION

The National Institute for Health and Care Excellence recommends offering men with lower urinary tract symptoms information, advice, and time at initial assessment to decide if they wish to have prostate-specific antigen (PSA) testing if their symptoms are suggestive of benign prostatic enlargement.

(https://www.nice.org.uk/guidance/cg97. Last accessed June 6, 2022.)

Level of Evidence: Expert Opinion/Consensus Statement

In obtaining a history, clinicians should ask about urinary tract symptoms, sexual function, previous surgical procedures, and general health issues in an attempt to identify other causes of voiding dysfunction or comorbidities that may complicate treatment. Diabetes, cerebrovascular disease, and Parkinson disease can cause urinary symptoms secondary to neurogenic bladder, and STIs or trauma may cause urethral stricture [85]. It may be appropriate to have the patient keep a diary of voiding habits (frequency, volume, etc.) [78].

Assessment of symptoms is an integral aspect of the initial evaluation for BPH, as it helps to determine the severity of disease. The International Prostate Symptom Score (IPSS) (previously called the AUA Symptom Index) is a validated, self-administered symptom frequency and severity assessment questionnaire originally developed by the AUA Measurement Committee [78]. The IPSS is a widely available, seven-question assessment tool that has been validated for clarity, test/retest reliability, internal consistency, and criteria strength [78; 86]. The IPSS addresses [86]:

- Urinary frequency
- Hesitancy
- Nocturia
- Incomplete emptying
- Urgency
- Weak urinary stream
- Intermittence

Symptoms should be discussed with the patient and questions addressed as necessary [78].

The physical examination should include a digital rectal examination (DRE) to determine the size, consistency, and shape of the prostate [78]. A symmetrically firm and enlarged prostate by DRE is indicative of BPH [79]. The true size of the prostate is often underestimated by DRE compared with transrectal ultrasound [78]. Examination should also include neurologic evaluation to assess the patient's general mental status, ambulatory status, neuromuscular function of the lower extremities, and anal sphincter tone [78].

A urinalysis (dipstick test) to screen for hematuria, proteinuria, pyuria, and other abnormalities can help to rule out such conditions as bladder cancer, carcinoma in situ of the bladder, urinary tract infection, urethral strictures, distal urethral stones, and bladder stones, which are less likely if the results of urinalysis are normal [78].

Optional studies that may be used to confirm the diagnosis or evaluate the presence and severity of BPH include post-voiding residual urine measurement (PVR) and uroflowmetry studies [78]. A PVR is useful in determining a baseline ability of the bladder to empty and detecting severe urinary retention that may not be amenable to medical therapy. Uroflowmetry is a simple, office-based procedure, an adjunct to evaluation of lower urinary tract symptoms and probability of bladder outlet obstruction. Flow rates of <10 mL/second have shown a specificity of 70%, a positive predictive value of 70%, and a sensitivity of 47% for bladder outlet obstruction [78].

Treatment Options

According to the AUA guideline, the benefits, risks, and costs of treatment options should be discussed with patients who have moderate-to-severe symptoms (IPSS score of 8 or more) who are bothered enough by the symptoms to consider therapy [78]. The treatment options for BPH include:

- Watchful waiting
- Medical therapy (minimally invasive procedures)
- Surgical interventions

The AUA guideline recommends watchful waiting as the preferred approach for men who have mild symptoms (a score of less than 8 on the AUA Symptom Index) [78]. This approach may also be taken for men with moderate-to-severe symptoms (score of 8 or more) who are not bothered by the symptoms and have no complications [87]. Watchful waiting should include yearly evaluations similar to the initial one [78]. Lifestyle changes and behavioral interventions are considered reasonable first-line treatments for all patients. Symptoms may be reduced by avoiding decongestants and antihistamines, decreasing fluid intake (and avoiding caffeine and alcohol) prior to bedtime, and increasing physical activity and weight loss [78].

AUA guidelines recommend offering monotherapy with an alpha-blocker as initial preferred option for patients with bothersome -to-severe symptoms [78]. Clinicians should consider performing a PVR measurement or uroflowmetry prior to treatment intervention. Five alpha-blockers have FDA-approved indications for BPH (***Table 5***). Clinical studies show that all five of these drugs—alfuzosin, doxazosin, tamsulosin, terazosin, and silodosin—are equally effective in terms of symptom relief and expected range of improvement in symptom index (IPSS) score [78]. The choice of alpha-blocker should be based on the patient's age and comorbidities, and different adverse event profiles (e.g., ejaculatory dysfunction, changes in blood pressure).

PHARMACOLOGIC THERAPY FOR BENIGN PROSTATIC HYPERTROPHY	
Agent	**Daily Dose**
Alpha-blockers	
Alfuzosin ER (Uroxatral)	10 mg
Doxazosin (Cardura) and doxazosin ER (Cardura XL)	4–8 mg
Silodosin (Rapaflo)	8 mg
Tamsulosin (Flomax)	0.4–0.8 mg
Terazosin (Hytrin)	1–2 mg
5-alpha reductase inhibitors	
Dutasteride (Avodart)	0.5 mg
Finasteride (Proscar)[a]	5 mg
Combination (alpha-blocker and 5-alpha reductase inhibitor)	
Dutasteride/tamsulosin (Jalyn)	1 capsule (0.5 mg dutasteride and 0.4 mg tamsulosin hydrochloride)
Phosphodiesterase 5 inhibitors	
Tadalafil (Cialis)[a]	5 mg
[a]Combination finasteride/tadalafil (5 mg each) may also be used.	
Source: [89; 90; 91]	*Table 5*

The adverse events associated with alpha-blockers are orthostatic hypotension, dizziness, fatigue (asthenia), and ejaculatory problems [78]. These drugs should not be used for men who are taking medication for erectile dysfunction, as the interaction between the two drugs can cause profound hypotension [79]. Alpha-blocker agent use also has been associated with the rare complication of intraoperative floppy iris syndrome; patients anticipating cataract surgery should be informed of the risks and advised to discuss these risks with their ophthalmologist [78].

Two 5-alpha reductase inhibitors, finasteride and dutasteride, are also approved for treatment of BPH-related symptoms and are recommended options in the AUA guideline [78]. This is less effective than therapy with alpha-adrenergic antagonists for relieving lower urinary tract symptoms, leading to an average improvement of 3 points on the AUA Symptom Index [78]. The advantage of 5-alpha reductase inhibitors is that they also act to prevent progression of disease and reduce the size of the prostate. As such, the AUA notes that these drugs should be used only for men who have evidence of prostatic enlargement [78]. Men should be made aware of the need for long-term therapy with either of these drugs, and clinicians should also discuss the possible adverse events, which include decreased libido, ejaculatory dysfunction, and erectile dysfunction. These effects usually resolve within one year [78; 79].

In 2011, the FDA issued a safety announcement that the Warnings and Precautions section of the labels of 5-alpha reductase inhibitors was revised to include new safety information about the increased risk of a diagnosis of high-grade prostate cancer [92]. The revision came after FDA review of two prostate cancer prevention trials, in which finasteride and dutasteride reduced the incidence of lower risk forms of prostate cancer but were associated with an increased incidence of high-grade prostate cancer [92].

The AUA guideline also supports the use of combination therapy with an alpha-blocker and a 5-alpha reductase inhibitor for men with lower urinary tract symptoms and evidence of prostate enlargement, as demonstrated on volume measurement, PSA level as a proxy for volume, or on DRE [78]. A fixed-dose combination of dutasteride (0.5 mg) and tamsulosin (0.4 mg) is available, and the results at four years showed that, for men with a baseline prostate volume ≥40 mL and PSA level of ≥1.5 ng/mL, the combination led to greater reductions in the relative risk of clinical progression, acute urinary retention, or BPH-related surgery than either drug alone [93].

The AUA guideline also notes that anticholinergic agents are appropriate and effective options for managing BPH-related symptoms in men who do not have an elevated post-void residual and when symptoms are predominantly irritative [78].

Phosphodiesterase type-5 inhibitors have also been shown to be effective for reducing the symptoms associated with BPH [94]. This class of drugs also offers advantages over other drugs in its rapid onset of action, fewer adverse events, and enhanced sexual function [94]. Potential adverse events include back pain, dyspepsia, headache, and dizziness [95]. In 2011, the first phosphodiesterase type-5 inhibitor—tadalafil—was approved by the FDA for BPH-related symptoms, with indications for symptoms in men who have prostate enlargement, with or

without erectile dysfunction [95]. Before prescribing tadalafil, clinicians should ensure that patients are not taking drugs that interact with tadalafil, such as nonselective alpha-blockers, nitrates, and cytochrome P450 inhibitors [95].

Saw palmetto, a commonly used alternative therapy for BPH, is not recommended for BPH-related symptoms, as the most recent data have shown no clinically meaningful effect on symptoms [78].

Minimally invasive therapies such as transurethral needle ablation and transurethral microwave thermotherapy are treatment options for men with bothersome moderate or severe symptoms [78]. However, the AUA guideline notes that, although these therapies improve symptoms, flow rate, and quality of life, the outcomes are not as good as those after transurethral resection of the prostate [78].

Surgical interventions are typically reserved for worsening disease and severe symptoms that do not respond to medical treatment. The AUA guideline recommends surgery for patients with renal insufficiency secondary to BPH, refractory urinary retention secondary to BPH, recurrent urinary tract infections, bladder stones, or gross hematuria due to BPH; or symptoms refractory to other therapies [78]. The most common procedure is transurethral resection of the prostate, which comprises 90% of all prostate surgeries done for BPH and is the benchmark for therapy [78; 96]. Open prostatectomy; transurethral laser ablation or enucleation; laser resection; photoselective vaporization; and transurethral incision, vaporization, and resection are other surgical options, and the selection of intervention is based on the surgeon's experience, the patient's anatomy, and a discussion of the benefits and risk of complications [78].

PROSTATE CANCER

Prostate cancer is the most commonly diagnosed cancer among men, accounting for 19% of all cancer diagnoses in men and the second leading cause of cancer-related deaths, responsible for 9% of cancer-related deaths in men [16]. The lifetime risk of a prostate cancer diagnosis is approximately 15% [16].

Prostate cancer is a complex issue for both men and their healthcare providers for many reasons, including variation in tumor biology, lack of specific symptoms, accuracy of levels of PSA and its several derivatives, questions about optimum treatment, and, most notably, controversy surrounding screening.

Prevalence and Etiology

In 2022, the estimated projected number of new prostate cancer diagnoses was 268,490, with 34,500 prostate cancer-related deaths [16]. The majority of newly diagnosed prostate cancers have localized disease. The highest incidence is found among Black men (172.6 per 100,000), and the lowest is among Asian American and Pacific Islander men (55.0 per 100,000) [16]. The death rate related to prostate cancer is also highest for Black men, with a rate that is more than twice that for men of all other races/ethnicities (37.9 per 100,000 vs. 17.8 [White], 21.0 [American Indian and Alaska Native], 15.6 [Hispanic/Latino], and 8.6 [Asian American and Pacific Islander]) [16]. The mortality rate associated with prostate cancer decreased 4.1% per year between 2009 and 2019, in part, because of improvements in early detection and treatment [16].

The known risk factors for prostate cancer are advanced age, Black race, and a family history of the disease (especially when diagnosed at a younger age) [16; 97]. The risk for prostate cancer may also be increased for men with symptoms of prostatitis [66].

Prevention

Several studies have been undertaken to determine the efficacy of chemoprevention agents and dietary supplements to reduce the risk of prostate cancer. The chemoprevention agents evaluated belong to the class of 5-alpha reductase inhibitors, a class of drugs approved for the treatment of BPH. One drug in this class, finasteride, was evaluated in the first large-scale chemoprevention study, the Prostate Cancer Prevention Trial (PCPT), a seven-year study involving nearly 19,000 men 55 years of age or older. In that study, finasteride significantly reduced the prevalence of prostate cancer (18% vs. 24% for the placebo group) [98]. Dutasteride was shown to decrease the risk of prostate cancer in the REDUCE trial, and extended follow-up indicated a low rate of new prostate cancer diagnoses [99; 100]. The initial results of the PCPT and REDUCE trials led the American Society of Clinical Oncology (ASCO) and the AUA to develop a joint guideline recommending finasteride and dutasteride for the prevention of prostate cancer [90]. However, reanalysis of the results of the trials showed that the risk for high-grade prostate cancer was increased and the reduction in prostate cancer risk was seen primarily for less fatal subtypes of prostate cancer that are often not treated [100; 101]. In 2011, the FDA decided against approving the two drugs for the prevention of prostate cancer, noting that the risk-benefit profile is not favorable for chemoprevention [91; 101; 102]. As stated earlier, the FDA revised the labels of all 5-alpha reductase inhibitors to note the increased risk of higher-grade prostate cancer associated with the drugs [92]. The ASCO/AUA guideline was withdrawn, and experts have called for more research to determine whether 5-alpha reductase inhibitors have a role in the prevention of prostate cancer [101; 102; 103].

Dietary supplements have not been shown to substantially reduce the prevalence of prostate cancer. In the Selenium and Vitamin E Cancer Prevention Trial (SELECT), a randomized study of more than 35,000 men, neither of those two vitamins, alone or in combination, prevented prostate cancer in relatively healthy men [104]. A subsequent phase III trial showed that selenium supplementation had no effect on prostate cancer risk among men with high-grade prostatic intraepithelial neoplasia [105]. There is insufficient evidence for the routine recommendation of other dietary supplements, such as soy, milk thistle, omega fatty acids, lycopene, or green tea, to prevent prostate cancer [106; 107; 359].

RECOMMENDATIONS FOR PROSTATE CANCER SCREENING			
Organization	**Year of Publication**	**Screening Recommendation**	**Notes**
American Cancer Society	2010	—	Discuss the potential benefits, risks, and uncertainties associated with prostate cancer screening with men ≥50 years
American Society of Clinical Oncology	2012	Discourage general screening for men with a life expectancy of ≤10 years, as the harms outweigh the benefits	Discuss the individual appropriateness of screening with men who have a life expectancy >10 years
American Urological Association	2013, reconfirmed 2018	No routine screening in men 40 to 54 years of age at average risk	Decisions should be individualized for men younger than 55 years who are at high risk. Shared decision-making should take place for men 55 to 69 years of age, for whom screening is of greatest benefit.
American College of Physicians	2013	No routine screening with PSA for average-risk men younger than 50, men older than 69, or men with a life expectancy of less than 10 to 15 years	Clinicians should inform men 50 to 69 years of age about limited potential benefits and substantial harms of screening and should individualize decision based on patient's general health, life expectancy, and preferences.
U.S. Preventive Services Task Force	2018	No routine screening for men 70 years of age and older. For men 55 to 69 years of age, the decision should individualized.	Clinicians should discuss the potential benefits and harms of screening.
National Comprehensive Cancer Network	2022	—	Offer baseline PSA testing (with DRE) to average-risk men 45 to 75 years of age, or 40 to 75 years of age for Black/African American men and those with germline mutations that increase risk. If serum PSA values <1 ng/mL, repeat screening every 2 to 4 years. Consider PSA testing only in very healthy patients older than 75 years of age.
Source: [97; 102; 108; 114; 115; 116; 117]			*Table 6*

Screening

There is no question that available screening methods and enhanced awareness has led to an increased number of men in whom prostate cancer is diagnosed at an earlier stage. The primary benefit of screening is a lower stage and grade of cancer at the time of diagnosis, and the high rate of localized disease at the time of diagnosis (92% to 96%) reflects, in part, the increased number of cancers that are detected earlier through screening [102; 108; 109]. Despite this benefit, an effect of screening on mortality has not been clearly demonstrated. After 13 years of follow-up in the National Cancer Institute's Prostate, Lung, Colon, and Ovary (PLCO) trial, there was no benefit of annual screening on mortality [110]. A meta-analysis (five randomized controlled trials) similarly demonstrated no effect of screening on prostate cancer-specific or overall mortality [111]. However, data from the European Randomized Study of Screening for Prostate Cancer demonstrated that screening reduced the risk for prostate cancer death by 7% to 9% per year [112].

In addition to a lack of effect on mortality, screening is associated with high rates of false-positive results, overdiagnosis and subsequent overtreatment, and complications. Among men who had four PSA tests, the cumulative risk for at least one false-positive result was 12.9% [102]. Rates of overdiagnosis have been estimated at 17% to 50%, and 23% to 42% of all screen-detected prostate cancers are overtreated [102; 113]. Furthermore, treatment is associated with complication rates of 20% to 50% [102; 114]. These findings led several expert panels to update their screening recommendations (***Table 6***) [97; 102; 108; 114; 115; 116; 117]. Overall, experts recommend against routine screening for most men and emphasize the need to consider life expectancy and the patient's age and risk factors for the disease. The age to start a discussion about screening varies slightly among the guidelines. The AUA guideline notes that decisions about screening should be individualized for men younger than 55 years who are at high risk for the disease (positive family history or Black race) [114]. The guideline also states that the greatest benefit of screening appears to be for men 55 to 69 years of age and strongly recommends shared decision making for men in this age-group. The ACS guideline notes that screening should be discussed beginning at 50 years of age for men at average risk and before 50 years of age for men at higher risk [108]. The NCCN guideline suggests that clinicians talk to patients about the risks and benefits of a baseline DRE and PSA beginning at 40 years of age [97]. The American College of Physicians (ACP) recommends that clinicians inform their male patients, 50 to 69 years of age, about the limited potential benefits and substantial harms of screening [115].

Researchers continue to investigate ways to make screening more effective. Using a higher PSA threshold for biopsy for older men and less frequent screening for men with low PSA levels are strategies that may reduce the risk of overdiagnosis as well as prostate cancer-related mortality [118].

Informed decision making is integral in selecting approaches to screening, with every guideline emphasizing the need to discuss the potential benefits, harms, and limitations associated with screening with their male patients. The American Cancer Society notes that men should receive information about screening directly from their healthcare provider or be referred to reliable and "culturally appropriate" sources [108]. Decision aids can be especially useful in helping men and their healthcare providers weigh the benefits and risks of screening, and studies of decision aids have led to improved knowledge and have increased men's desire for an active role in decision making [108; 114; 119; 120; 121]. The NCCN guideline offers talking points for discussion, and ASCO provides a decision aid tool (https://www.asco.org/sites/new-www.asco.org/files/content-files/practice-and-guidelines/documents/2012-psa-pco-decision-aid.pdf).

Despite the continued emphasis on informed decision making, the percentage of men who report having had a discussion with their healthcare providers about screening has been suboptimal, with a rate of about 63% to 66% of the general male population [122; 123]. Black men were most likely to have had a discussion, and men without a usual source of care were the least likely [123].

For men who choose to have screening for prostate cancer, the combination of DRE and PSA is the preferred method, providing better predictive value than either method alone [102]. The sensitivity of PSA testing is higher than that of DRE, especially for tumors that are more aggressive [109]. However, the PSA level can vary as a result of several factors.

PSA and Its Derivatives

In an effort to enhance the specificity of PSA testing, variations of the PSA test have been developed, including free PSA, PSA density, PSA velocity, and complexed PSA [97]. Each has its benefits and limitations, and the AUA notes that none increases the benefits-harms ratio of screening [114]. Levels of free PSA have been shown to be significantly lower in men with prostate cancer than in men without the disease [97]. The FDA has approved percent-free PSA for the early detection of prostate cancer in men with PSA levels between 4 ng/mL and 10 ng/mL [97].

PSA density is the result of dividing the PSA level by the volume of the prostate, as measured by transrectal ultrasonography, and a higher result suggests a greater likelihood of prostate cancer [97]. Greater PSA density has correlated with the presence of prostate cancer, as well as with the pathologic stage of the tumor and its aggressiveness and progression after treatment [124]. The use of PSA density has been limited by the lack of precision of total PSA, of measurement of prostate volume, and of the need to carry out transrectal ultrasonography [97]. In addition, PSA density does not offer much benefit compared with other PSA derivatives [97]. PSA velocity is the rate at which a PSA level increases over a period of time, and it has been most helpful for longitudinal monitoring of men younger than 50 years of age who have normal PSA levels and no prostate enlargement [97]. A high PSA velocity alone should not prompt biopsy but instead, aid in decision making [97]. The test is not useful for men with PSA values greater than 10 ng/mL [97]. The ratio of complexed PSA to total PSA provides information comparable to the ratio of free to total PSA, and the use of complexed PSA has been approved as a detection aid (in conjunction with DRE) for men 50 years of age or older; however, the test is not widely used in practice [97].

Threshold for Biopsy

Prostate cancer is found in about 25% of biopsy specimens, illustrating a problem regarding a well-defined threshold at which to obtain a biopsy specimen [125]. Although most cancer is detected with use of a PSA threshold of 4 ng/mL, some studies have shown that prostate cancer is subsequently found

CLASSIFICATIONS OF RISK OF BIOCHEMICAL RECURRENCE				
Risk Level	**Tumor**	**Gleason Score**	**PSA Level (ng/mL)**	**Other**
Very low	T1c	≤6	<10	Biopsy cores: <3 positive, ≤50% cancer in any core PSA density: <0.15 ng/mL/g
Low	T1–T2a	≤6	<10	—
Intermediate	T2b–T2c	7 (or PSA level as noted)	10–20 ng/mL	—
High	T3a (or other criteria)	8–10 (or other criteria)	>20	—
Very high	T3b–T4 (locally advanced)	Primary Gleason pattern 5 (or other criteria)	—	Biopsy cores: >4 with Gleason score 8–10
NCCN = National Comprehensive Cancer Network, PSA = prostate-specific antigen.				
Source: [126]				*Table 7*

in men with levels in the range of 2.5–4.0 ng/mL [97]. The NCCN concluded that while these values have been used by many, a level of 3.0 ng/mL is supported by trials and would more robustly limit the risk of overdetection. However, there was not a consensus among NCCN panel members regarding limiting the option to biopsy to prespecified PSA thresholds [126]. The NCCN panel also concluded that DRE alone is not an absolute indication for biopsy in men with low PSA, as the positive predictive value of DRE in this population is poor. However, a very suspicious DRE, independent of PSA, could indicate high-grade cancer in men with normal PSA values, and therefore, biopsy should be considered in these men [126].

Diagnosis and Staging

Men with early prostate cancer are usually asymptomatic. More advanced disease may be associated with changes in urinary habits, such as a slowing of the urinary stream, sense of incomplete voiding, nocturia, and frequency, as well as dysuria, hematuria, or pain in the lower back or pelvis. Because many of these symptoms are similar to those linked to benign prostate conditions, prostate cancer cannot be diagnosed on symptoms alone. The diagnostic methods are the same as those used for screening: PSA, DRE, and transrectal ultrasonography. In performing the DRE, the clinician should focus on the size, consistency, and abnormalities within or beyond the gland. Prostate cancers are characteristically hard, nodular, and irregular.

In its 2013 Best Practice Statement on PSA, the AUA emphasizes the importance of PSA in staging, noting that the PSA level predicts response of prostate cancer to local therapy [127]. Response is most likely in men with a PSA level <10 ng/mL [127].

Biopsy of the prostate with analysis of the tissue provides the most definitive diagnostic procedure. It also gives evidence of the aggressiveness of the tumor when cancer is detected. The pathologist quantifies the aggressiveness of the tumor with use of the Gleason score, assigning a number between 2 and 10 (with 10 representing the most aggressive). Pathologic review involves both staging according to the American Joint Committee on Cancer staging manual and classification of the tumor with the Gleason score [128]. Further staging with imaging (CT, MRI, bone scan) is done only for tumors that are confined to the prostate with a Gleason score of 8 or higher or a PSA level of greater than 20 ng/mL or for tumors that extend beyond the prostate or are symptomatic [97]. As part of the Choosing Wisely campaign, the AUA notes that a routine bone scan is not necessary for men with newly diagnosed prostate cancer with a PSA level <20.0 ng/mL and a Gleason score of ≤6 [127].

Treatment Options

Recognizing that many prostate cancers have an indolent natural history, guidelines recommend utilization of a risk stratification classification for patients with newly diagnosed localized disease [358]. Stratification facilitates patient counseling and should be used with a shared decision-making approach in which treatment decisions are based on the patient's estimated life expectancy and the risk of biochemical recurrence [126]. Risk of biochemical recurrence has been classified by the NCCN into five categories (***Table 7***) [126].

A new prostate cancer grading system was developed during a 2014 consensus conference of the International Society of Urological Pathology (ISUP). The new system resulted in changes to the assignment of Gleason pattern based on pathology. This system assigns grade groups from 1 to 5, derived from the Gleason score. Many experts believe that the ISUP

ADVANTAGES AND DISADVANTAGES OF ACTIVE SURVEILLANCE FOR PROSTATE CANCER	
Advantages	**Disadvantages**
Ensure that small indolent cancers are not treated unnecessarily	Lack of definitive prompt for treatment may lead to missed opportunity for cure
Avoid side effects of treatment that may be unnecessary	Cancer may progress or metastasize before treatment
Maintain quality of life and normal activities	Treatment of larger, more aggressive cancer may be more complex, with increased side effects
Decrease initial costs	Living with an untreated cancer increases anxiety Must carry out frequent medical examinations and biopsies Timing and value of long-term natural history of untreated disease is undetermined Long-term natural history of untreated disease is uncertain
Source: [126]	*Table 8*

grade groups enable patients to better understand their true risk level and limit overtreatment. The NCCN has accepted the new grade group system. Patients remain divided into very-low-, low-, intermediate-, high-, and very-high-risk groups [126].

The primary options for localized prostate cancer are watchful waiting (also known as active surveillance), radiation therapy (either three-dimensional external-beam radiation or brachytherapy), and radical prostatectomy. Other options include androgen-deprivation therapy (ADT, also referred to as hormone therapy), chemotherapy, cryosurgery, and immunotherapy.

Each treatment option is associated with benefits and harms, and clinicians should discuss each option in detail and provide educational resources and decision aids [129; 130; 131]. To gain a true understanding of a patient's preferences, treatment options should be discussed only after the patient has described his preferences [132]. Clinicians should carefully assess their patients' understanding of treatment options; studies of underserved men have shown low comprehension of common terms used in prostate cancer treatment discussions [133; 134]. Attention should also be paid to how to best communicate risk. A study has shown that such terms as "number needed to treat," "odds ratio," and "relative risk reduction" were confusing to men [135]. In that study, men best understood information when it was presented as an absolute risk reduction and in a positive context; men preferred that treatment options be discussed in terms of the probability of an increase in survival (rather than a decrease in mortality) and that the discussion include the impact of treatment on patient-centered quality-of-life outcomes [135].

Active Surveillance

Active surveillance has also been referred to as watchful waiting, but the terms have not always been defined the same way, and researchers are calling for a distinction between the two terms. Active surveillance denotes an approach in which men with localized, low-risk prostate cancer are followed up closely for clinical signs that prompt definitive treatment with curative intent should this become necessary [136; 358]. Watchful waiting refers to the strategy recommended for asymptomatic patients with prostate cancer and limited life expectancy [358]. Some studies draw further distinction, defining watchful waiting as observation and provision of palliative care when prostate cancer becomes symptomatic, and active surveillance as close follow-up (with DRE, PSA levels, and biopsies) and provision of treatment at signs of disease progression [138]. Patients with a life expectancy of less than five years do not benefit from prostate cancer screening, diagnosis, or treatment as prostate cancer treatment does not improve survival within five years of follow-up [358].

For patients with favorable intermediate-risk prostate cancer, clinicians should discuss with patients the options of active surveillance, radiation therapy, or radical prostatectomy [358]. Choosing active surveillance rather than definitive treatment is difficult because of the myriad advantages and disadvantages to the approach (***Table 8***) [126]. Data on active surveillance have also conflicted. In a cohort of 450 men followed up for a median of nearly seven years, the rate of prostate cancer-specific mortality was low [139]. Two later systematic reviews indicated that the evidence was insufficient to determine whether active surveillance with curative intent was an appropriate option for men with localized prostate cancer [136; 137]. Most recently, radical prostatectomy was compared with active surveillance, and the intervention did not significantly reduce all-cause or prostate cancer-specific mortality through at least 12 years of follow-up [140]. In addition, a cost-effectiveness analysis demonstrated that active surveillance was most effective and least expensive compared with several interventions (brachytherapy, intensity-modulated radiation therapy, or radical prostatectomy) [138].

The NCCN Panel recommends active surveillance for all men with very-low-risk prostate cancer and a life expectancy of less than 20 years and believes that surveillance should be considered for men with very-low-risk prostate cancer and a life expectancy of 20 years or more [126]. In addition, the Panel recommends active surveillance for all men with low- and favorable intermediate-risk prostate cancer and a life expectancy of less than 20 years and believes that it should be considered for men with low- and favorable intermediate-risk and a life expectancy of 10 years or more [126]. With active surveillance, recommended monitoring is measurement of a PSA level no more than every 6 months, unless clinically indicated, and physical exam with DRE every 12 months [126]. An increase in PSA should prompt re-testing as transient PSA elevations are common; serial PSA increases, new DRE abnormalities, or other concerns for clinical progression should prompt re-evaluation with prostate MRI and possible prostate biopsy [126; 358].

Radiation Therapy

Radiation therapy is an option for men at various levels of risk for biochemical recurrence, except for men for whom active surveillance is recommended [126]. Radiation to pelvic lymph nodes may be considered for men with intermediate risk and should be done for men at high risk [126]. Radiation therapy offers progression-free survival similar to that of prostatectomy while avoiding the complications associated with surgery [126].

The advent of three-dimensional (3D) CRT, which integrates external-beam radiation with CT images, has allowed for the delivery of higher radiation doses but with a lower risk of side effects because of enhanced precision [126]. About half of men will have temporary bladder or bowel symptoms during treatment with external-beam radiation therapy [126]. The disadvantage to external-beam radiation therapy is the time needed for treatment, as the recommended duration of treatment is eight to nine weeks [126].

Intensity-modulated radiation therapy (IMRT), a second-generation 3D technique, has been used increasingly in clinical practice [141]. IMRT reduced the risk of gastrointestinal toxicities and rates of salvage therapy compared with 3D-CRT in some retrospective, population-based studies, but treatment cost was increased [142; 143]. More recently, moderately hypofractionated image-guided IMRT regimens have been tested in randomized trials, but additional research is needed [126].

Brachytherapy has been used increasingly for men with early localized prostate cancer; however, increasing evidence suggests that technical advancements in brachytherapy may have a role in treatment of high-risk localized and locally advanced prostate cancer [126; 144; 145]. This approach is a recommended option as monotherapy for men at low risk and a life expectancy of at least 10 years and in combination with external-beam radiation therapy for men at intermediate risk, regardless of life expectancy [126; 146]. Complications are increased when the two forms of radiation therapy are used together [126]. Brachytherapy alone yields control rates comparable to those of surgery (approximately 90%), and added advantages are short treatment duration, minimal risk of incontinence, and short-term preservation of erectile function; the seeds are implanted in one procedure, and men typically recover in one day [126]. Disadvantages include the need for general anesthesia and a risk of acute urinary retention [126].

Radical Prostatectomy

Radical prostatectomy is an option for men with a life expectancy of at least 10 years who have clinically localized disease that can be completely excised [126]. It also may be an option for men with high-risk disease and for select patients with very-high-risk disease, although several factors (e.g., PSA >10 ng/mL, stage T2b or higher, Gleason score 9 or 10, higher number of biopsy cores with high-grade cancer, more than 50% core involvement) predict unfavorable outcome in these patients [147]. Radical prostatectomy is a salvage option for patients experiencing biochemical recurrence after primary external beam radiation therapy, but morbidity remains significantly higher than when the treatment is used as initial therapy [148; 149]. This treatment option has been most often associated with the highest survival rates but also with side effects that have been reported to have a significant impact on quality of life, such as impotence, incontinence, urethral stricture, and surgery-related morbidity [126; 150; 151]. Despite the potential side effects, the sense of being cancer free has led men who chose to have radical prostatectomy to be satisfied with their decision [152]. Laparoscopic and robot-assisted procedures have been found to yield results similar to those for open procedures, but rates of incontinence and erectile dysfunction may be higher [126]. The AUA notes that no conclusive benefit to pelvic lymph node dissection has been found [127]. Such dissection for clinically localized disease may not be necessary if the PSA is less than 10 ng/nL and the Gleason score ≤6 [127].

Androgen Deprivation Therapy (ADT)

ADT involves medical or surgical castration (with luteinizing hormone-releasing hormone [LHRH] agonists or orchiectomy, respectively). It is recommended as an adjunct to radiation therapy or prostatectomy for men with local or locally advanced disease and at high or intermediate risk for recurrence [126]. Meta-analyses have shown clinical benefit for adjuvant ADT after either radiation therapy or prostatectomy or neoadjuvant therapy before radiation therapy [153; 154].

Both NCCN and ASCO recommend ADT as initial treatment for metastatic prostate cancer [126; 155]. Researchers have evaluated the timing of ADT—early (before symptoms occur) or delayed—and early therapy has provided no overall survival benefit and only a modest decrease in risk for prostate cancer-specific mortality; because of this, the ASCO guideline does not make a recommendation for early ADT [155]. Several studies have demonstrated that intermittent ADT is as effective as continuous ADT for metastatic or locally advanced disease, with better quality of life and fewer side effects [156; 157; 158].

Use of ADT as a primary therapy for men with localized prostate cancer has increased significantly among men at low and intermediate risk, but this approach should not be considered standard [126; 146]. ADT is associated with several adverse events, including osteoporosis, increased risk for fracture, obesity, insulin resistance, and increased risk for cardiovascular disease and diabetes [126].

Chemotherapy

The use of chemotherapy is typically reserved for men with metastatic castration-resistant prostate cancer, and docetaxel-based regimens have been shown to confer survival benefit [159; 160]. The duration of therapy is not well-defined, but 10 cycles were used in the phase III trials in which these regimens were evaluated.

Cryosurgery

Cryosurgery is a minimally invasive procedure that is an option for prostate cancer (of any grade) that is clinically confined to the prostate in men at low, intermediate, or high risk [161]. The five-year biochemical disease-free survival rates have ranged from 48% to 92%, depending on the risk of recurrence, but long-term data on prostate cancer-specific survival are not yet available and there are no clearly defined guidelines for patient selection for cryosurgery as a salvage procedure [161]. The authors of a meta-analysis published in 2007 and updated in 2018 concluded that it was difficult to determine the relative benefits of this treatment because of the poor quality of the available studies [162].

Options for Metastatic Castration-Resistant Prostate Cancer

Since 2010, three agents, an immunotherapy, and a radiopharmaceutical have been approved for metastatic castration-resistant prostate cancer. Cabazitaxel (Jevtana), enzalutamide (Xtandi), and abiraterone acetate (Zytiga) are indicated for treatment following docetaxel [126]. Sipuleucel-T (Provenge), an autologous cellular immunotherapy, is approved for men with metastatic castration-resistant prostate cancer who are asymptomatic or minimally symptomatic. Lastly, radium 223 dichloride (Xofigo) was approved in May 2013 for the treatment of metastatic castration-resistant prostate cancer with bone metastases (but not visceral involvement) [126].

Prognosis

Survival after treatment of prostate cancer is related to the extent of the tumor at the time of diagnosis, and the relative five-year survival rate is 100% for localized or regional prostate cancer [16]. The five-year survival rate is substantially lower (30%) when prostate cancer is metastatic at the time of diagnosis [16].

Follow-up

Primary care physicians, nurses, and other healthcare professionals who see patients on a regular basis play an important role in the follow-up evaluation for men who opt for active surveillance, as well as for those who have been treated by an oncologist. After treatment for prostate cancer, men should be followed up with an annual DRE and PSA testing every 6 to 12 months for five years and annually thereafter [163]. Primary care clinicians can also aid in the management of the side effects of treatment and screening for secondary cancers.

Case Study

Patient A is an active man, 59 years of age, who missed his yearly DRE and PSA. The results of these tests had been within normal limits in all previous examinations. At his next examination, a firm prostate nodule, approximately 2 mm in diameter, is palpated, and the PSA level is 14 ng/mL. A needle biopsy of the prostate is performed within one week of the PSA measurement. The biopsy shows several sites containing cells indicative of adenocarcinoma of the prostate, with a Gleason score of between 8 and 9.

After carefully evaluating the treatment options for an aggressive tumor, Patient A chooses radical prostatectomy and seeks care at an institution where nerve-sparing surgery is performed with the assistance of a robotic, computer-controlled device, to help reduce the risk of adverse events. According to the pathologic evaluation, the tumor is an adenocarcinoma that has extended beyond the capsule of the gland but has not involved the seminal vesicles.

Staging studies, including an MRI of the pelvis and abdomen and a bone scan, confirm the extent of the tumor and demonstrate lack of lymph node involvement or distant metastasis (T3a, N0, M0). Because of the T3a finding, a course of external-beam radiation therapy to the local site is prescribed.

At the three-month follow-up visit, the PSA level has increased to 20 ng/mL, and a bone scan demonstrates multiple skeletal lesions, primarily in the ribs, pelvis, and skull, none of which had been seen on the previous scan. Due to the rapid progression of disease and the metastatic lesions, the patient's survival is estimated to be less than three years.

After a discussion with his surgeon, oncologist, and urologist, the patient decides to forego ADT, choosing instead to enroll in a clinical trial for treatment consisting of chemotherapy with docetaxel in combination with the angiogenesis inhibitor bevacizumab over a course of several months. The treatment causes some nausea, malaise, and hair loss, but the patient tolerates the effects well. The primary bothersome adverse effect is oral ulcers, which require topical treatment. The PSA level drops steadily during follow-up, reaching a level of 0.4 ng/mL after approximately six months of treatment.

Patient A continues to feel well after two years of follow-up, and the PSA level has remained at 0.2 ng/mL or less. Incontinence that was present after the surgery has ended, but erectile dysfunction remains, despite the use of medications.

DISTINGUISHING BETWEEN TESTICULAR TORSION AND EPIDIDYMITIS		
Sign/Symptom	**Testicular Torsion**	**Epididymitis**
Onset of pain	Sudden (<12 hours)	Insidious
Cremasteric reflex	Absent	Present
Tenderness	Diffuse; spermatic cord	Epididymal area
Appearance of scrotum	Usually normal	Edematous, "orange peel" appearance
Testicular lie	High	Normal

Source: [164; 165; 167; 168] *Table 9*

DISEASES AND CONDITIONS OF THE TESTES

Testicular conditions are fairly uncommon but are more prevalent among younger men than older men [164; 165]. As with conditions of the prostate, testicular conditions may be associated with similar symptoms, creating a challenge for accurate diagnosis. When evaluating a man who has acute scrotal pain, a primary objective is to distinguish benign conditions from those requiring immediate intervention and from testicular cancer.

TESTICULAR TORSION

Testicular torsion occurs in approximately one in 4,000 male individuals younger than 25 years of age each year [164]. In 90% of cases, intravaginal torsion is caused by a congenital malformation of the processus vaginalis [164]. Predisposing factors include increased testicular volume, testicles with horizontal lie, history of cryptorchidism, and a spermatic cord with a long intrascrotal portion [166]. Surgery to repair the torsion is necessary to save the testicle; thus, early diagnosis is critical [164; 165].

The most common misdiagnosis of testicular torsion is epididymitis [164; 167]. The first step should be to determine the onset of pain, as testicular torsion is associated with pain of sudden onset; in contrast, the onset of pain is insidious in epididymitis and other conditions [164; 165]. The physical examination also plays an important role in distinguishing testicular torsion from epididymitis. A key distinction is the absence of the cremasteric reflex in testicular torsion, which has been found to have a sensitivity of at least 99% in two studies of boys [167; 168]. To elicit this reflex, the medial thigh is stroked or pinched, which causes contraction of the cremaster muscle and elevation of the testis. If the testicle moves at least 0.5 cm, the reflex is positive [164]. Other distinguishing features include the area of tenderness, appearance of the scrotum, and testicular lie (***Table 9***) [164; 165; 167; 168].

If the diagnosis of testicular torsion is still in question after physical examination or if the onset of pain was 6 to 12 hours previously, color Doppler ultrasonography should be carried out [164; 165]. This imaging study has been found to have a sensitivity of 88% and a specificity of 90% in detecting testicular torsion in boys [169]. Decreased or absent blood flow and rotation of the spermatic cord on the affected side are indicators of testicular torsion [164; 166]. Scintigraphy with technetium 99m pertechnetate has a higher sensitivity, but this modality is not as readily available as ultrasonography in some institutions [164; 170].

A diagnosis of testicular torsion, whether highly suspected or definitive, requires immediate surgical intervention, and a surgical consultation should be obtained [164; 165]. The success rate for manual detorsion has been low (approximately 26%), so this procedure should be avoided as an alternative to surgical treatment [164; 171].

EPIDIDYMITIS

Inflammation of the epididymis affects a small proportion of men. Few epidemiologic studies are available, but the prevalence has been estimated to be approximately 0.29% to 0.9% and is the same across racial/ethnic populations [172]. Acute epididymitis is usually caused by bacterial infection, and the source of the infection varies. For men who are younger than 35 years of age and sexually active, the source is most commonly an STI. The most frequently identified micro-organisms are *C. trachomatis* and *Neisseria gonorrhoeae* [57; 173]. The diagnosis and treatment of epididymitis caused by STIs are discussed later in this course.

Among men who are older than 40 years of age, epididymitis is usually associated with bacterial infection of the urinary tract. Epididymitis has also been reported as a side effect of the drug amiodarone, used for ventricular arrhythmias [174]. A review of the literature indicated that the time to onset of the condition ranged from 4 to 71 months and developed at a daily dose of 200–800 mg [174; 175]. In many cases, there is no known etiology [176]. When pain, swelling, and/or inflammation persist for more than three months, the condition is considered to be chronic.

Men with acute epididymitis usually present with unilateral pain and tenderness in the testicle [173]. Additional symptoms include dysuria, urinary frequency or urgency, and symptoms related to the source of infection (e.g., fever, chills, or pain). Urinalysis and urine culture should be done to determine the presence of infection [175; 176].

Obtaining a careful history is an important first step in the diagnosis of epididymitis. The practitioner should ask about the sexual history; surgical history, especially in the scrotal area; the location, severity, and frequency of pain; and the presence and duration of symptoms [176]. When symptoms have been present for three months or longer, the Chronic Epididymitis Symptom Index can help determine the impact of symptoms on the quality of life [176].

As stated previously, several findings on physical examination can distinguish epididymitis from testicular torsion [164; 165; 167; 168]. The physical examination should also include evaluation of the abdomen, especially to check for tenderness in the flank and bladder distention, and the inguinal regions [165]. Examination of the scrotum should be carried out bilaterally, assessing the degree of swelling, presence of erythema, and differences in size [165].

Acute infectious epididymitis is treated by addressing the underlying infection, and antibiotics should be chosen according to the causal micro-organism. Symptomatic relief for both infectious and noninfectious epididymitis can be achieved with bed rest, scrotal support and elevation, ice packs, and anti-inflammatory agents or analgesics. If tenderness or swelling persists after treatment with antibiotics or if a mass becomes palpable, further evaluation should be carried out to rule out testicular cancer [173; 177]. Watchful waiting is suggested for chronic epididymitis [176].

Consultation with a urologist may be appropriate for men with complications or with chronic epididymitis [173]. Scrotal exploration may be necessary if abscess, testicular infarction, or pyocele develops. Epididymectomy has been used to treat chronic epididymitis, but the outcomes have varied widely [176].

VARICOCELE

A varicocele is a dilated, tortuous inflammation of the veins of the spermatic cord above the testicle. A prevailing thought has been that the superior mesenteric artery compresses the left renal vein over the aorta, also known as the "nutcracker effect" [178]. This theory has been confirmed by studies that have shown that varicoceles are less common in obese men [178; 179]. It has also been suggested that the condition is caused by damage to the contractile mechanism of the smooth muscle organization of spermatic veins [180]. As a result of anatomic differences, the condition is more common in the left testicle, but advances in imaging have led to reports of high rates of bilaterality [181]. Varicocele can cause discomfort in the scrotal area, but usually the condition is asymptomatic [165].

The frequency of varicocele among adolescents and young adults is approximately 15% to 20%, and the rate is higher among men who have some level of infertility, with reports of 77% and 81% in some studies [181; 182]. A study of older men (mean age: 60.7 years) demonstrated a prevalence of 42% [183].

Varicoceles vary in size, and large ones can be identified through physical examination alone. Varicoceles can have an adverse effect on spermatogenesis, and infertility has been associated with varicoceles that can be palpated [182]. The most significant finding is a feeling of a "bag of worms" when the scrotum is palpated [165; 182]. The varicocele may disappear or be substantially reduced when the patient is recumbent [182]. Smaller varicoceles can be detected by asking the patient to perform the Valsalva maneuver in the standing position [182]. In older men (at least 60 years of age), varicoceles have been associated with significantly smaller and soft testes [183]. Color Doppler ultrasonography is the diagnostic procedure of choice when the findings of the clinical examination are inconclusive [182].

The American Urology Association and the American Society for Reproductive Medicine recommend surgical varicocelectomy be considered in men attempting to conceive who have palpable varicocele(s), infertility, and abnormal semen parameters, except for azoospermic men.

(https://www.auanet.org/guidelines/guidelines/male-infertility. Last accessed June 6, 2022.)

Strength of Recommendation/Level of Evidence: Moderate/B (Applies to most patients in most circumstances but better evidence could change confidence)

The treatment of varicocele depends on several factors, including the age of the patient, the size of the varicocele, the results of semen analyses, and the patient's desire for fertility [182]. Varicoceles in adolescents and young adults have been associated with significant loss of testicular volume and growth arrest of the testes, the risk of which increases with the size of the varicocele [184; 185]. These individuals should be monitored with physical examination and semen analyses to detect changes in testicular function, as earlier treatment will increase the likelihood of recovering normal spermatogenetic function [182; 186]. Advances in minimally invasive procedures and surgeries have led to significant strides in the management of symptomatic varicoceles [187]. Many experts agree that indications for surgical intervention in adolescents are pain, large varicoceles, hypotrophy of the involved testicle, bilateral varicocele, intratesticular varicocele, and abnormal semen parameters on serial evaluation. The ideal method for treating adolescent varicocele has not been clearly established,

but the main task is to decrease the number of recurrences and complications while retaining optimum testicular function. Because of this, many surgeons respect the attitude "catch-up growth" [188]. Treatment approaches and outcomes of therapy are discussed more fully in the section on infertility.

TESTICULAR CANCER

Testicular cancers are primarily germ cell tumors and are classified as seminomas and nonseminomas, the latter type being more clinically aggressive [177]. Testicular cancer is rare, accounting for 0.5% of all malignant tumors [177; 190]. However, the worldwide incidence of this type of cancer has been increasing in the past six decades [177]. As with other testicular conditions, this cancer is most common among male individuals 20 to 34 years of age [177; 189]. Early detection results in a cure rate of approximately 95% [177].

Prevalence

In 2019, there were an estimated 283,792 men living with testicular cancer in the United States [190]. In 2022, there will be an estimated 9,910 new cases of testicular cancer and 460 deaths. According to 2000–2019 SEER data, the incidence is highest among non-Hispanic White men (7.3 per 100,000), followed by American Indian/Alaska Native (10.6 per 100,000) and Hispanic men (5.9 per 100,000), Asian/Pacific Islander men (2.4 per 100,000), and Black men (1.5 per 100,000) [191].

Etiology

Among the several risk factors for testicular cancer, the primary one is cryptorchidism, which can increase the risk 11-fold [177]. Other risk factors include a family history of the disease, testicular dysgenesis, and Klinefelter syndrome [177]. A history of cancer in one testicle confers an increased risk (2% to 5%) of cancer in the contralateral testicle over the 25 years following diagnosis [192].

Screening

The USPSTF does not recommend routine screening for testicular cancer—by either clinician examination or self-examination—for asymptomatic adolescent and adult male individuals, as there is no evidence that screening reduces mortality [193]. The USPSTF notes that instead of screening, men should be advised to report testicular problems promptly, as cure rates are high for any stage of testicular cancer [193].

The European Association of Urology recommends high-frequency (i.e., >10 MHz) testicular ultrasound be used to confirm a testicular tumor even in the presence of a clinically evident testicular lesion.

(https://uroweb.org/guidelines/testicular-cancer. Last accessed June 6, 2022.)

Level of Evidence: Expert Opinion/Consensus Statement

Diagnosis

Testicular cancer usually presents as discomfort or swelling in the testicles that is suggestive of epididymitis or orchitis [177]. Physical examination will demonstrate a palpable mass [177]. Occasionally, the patient may note tender or swollen breasts or loss of sex drive.

According to the NCCN guideline for the treatment of testicular cancer, testicular ultrasonography is optional if a diagnosis is obvious from the physical examination, but the guideline notes that this diagnostic test is usually done to define the lesion [177]. Both the NCCN and ASCO recommend measuring serum levels of alpha-fetoprotein (AFP), human chorionic gonadotropin (beta-hCG), and lactate dehydrogenase (LDH) to help determine if the testicular mass is a germ cell tumor and, if so, whether it is a seminoma or a nonseminoma [177; 194]. A nonseminoma is associated with an elevated AFP level; in contrast, an elevated level of beta-hCG, with a normal AFP level, usually indicates a seminoma [177]. Additional evaluation should include a chest x-ray and CT of the abdomen and pelvis to determine if lymph nodes are involved [177]. If metastatic disease is suspected, further imaging studies, such as bone scan, magnetic resonance imaging, or positron emission tomography, may be necessary. Open biopsy is not usually performed [177].

Treatment Options

Men with suspected testicular cancer should be referred to an oncologist who will discuss treatment options, which include orchiectomy and radiation therapy or chemotherapy, depending on the type of tumor and the stage of disease. Lymph node dissection may also be necessary for metastatic disease. The possibility of sperm banking should be discussed before any type of treatment is initiated [177].

Treatment options for early-stage seminoma (stage I, confined to the testicle and epididymis) are active surveillance (preferred), single-agent carboplatin (one or two cycles), or radiation therapy [177].

Radiation therapy is recommended for stage II seminoma (involvement of nearby lymph nodes), with the treated area extended to include the ipsilateral iliac lymph nodes [177]. If radiation is contraindicated, chemotherapy with three cycles of bleomycin, etoposide, and cisplatin (BEP) or four cycles of etoposide and cisplatin (EP) is recommended. If chemotherapy is given, both regimens are recommended [177]. Chemotherapy with EP or BEP is recommended for stage III seminoma (involvement of distant lymph nodes and/or viscera) [177].

Treatment options for nonseminoma include surveillance, chemotherapy, and retroperitoneal lymph node dissection [177]. Selecting the appropriate therapy involves consideration of many factors, including the extent of disease in the lymph nodes, the levels of serum tumor markers before and during treatment, radiographic findings, and the commitment of the patient to adhere to surveillance protocols that involve frequent blood work and CT [177]. Chemotherapy involves either EP or BEP [177].

The cure rates for testicular cancer are high, even when cancer is at an advanced stage at the time of diagnosis [177]. The overall five-year survival for testicular cancer (all stages) is 95.2% [190].

Follow-Up

Men who have been treated for testicular cancer should be followed up at regular intervals to monitor for signs of recurrence. Follow-up visits typically include a history and physical examination and serum tumor markers. The ASCO guideline on the serum tumor markers for male individuals with germ cell tumors notes that there is insufficient evidence to determine whether monitoring tumor markers improves survival or health outcomes but nonetheless recommends measuring AFP and beta-hCG levels during each surveillance visit, and the NCCN also recommends an LDH as part of surveillance [194]. Evidence is also lacking regarding optimal surveillance intervals, and the intervals vary according to diagnosis (seminoma or nonseminoma) and stage of disease [177]. In general, the recommended intervals are every two months in the first year, every three months in the second year, every six months in the third and fourth years, and annually thereafter [177]. It is recommended that surveillance continue for at least 10 years [177; 194]. Chest x-ray and computed tomography of the abdomen and pelvis are recommended at greater intervals [177].

The follow-up evaluation plays an important role in assessing for the long-term effects of treatment. The primary effect of chemotherapy is oligospermia, but sperm production can be recovered [195; 196]. A population-based study found that 70% of testicular cancer survivors fathered children [197]. Secondary acute leukemias have been reported to develop after chemotherapy and radiation therapy, and other consequences of platinum-based chemotherapy include hearing deficits and impaired renal function [198; 199]. Melanomas and cancers at many sites have been associated with radiation therapy, occurring 10 years or more after treatment [198]. Lastly, the risk of cardiac events has been increased for testicular cancer survivors who had been treated with radiation therapy and/or chemotherapy [200].

MALE BREAST CANCER

Breast cancer in men is rare; an estimated 2,710 new cases will be diagnosed in the United States in 2022, and an estimated 530 men will die of the disease [16]. These figures represent less than 1% of all breast cancer diagnosed in this country. Although the numbers are low, the prevalence has increased 26% since the early 1980s, prompting increased attention and highlighting the need to emphasize to men—and their healthcare providers—that breast cancer is not confined to women [201]. The lack of awareness of the disease has led to a longer time between the development of symptoms and diagnosis and to a later age (mean age: 67 years) and stage of disease at the time of diagnosis compared with women [201; 202].

Male breast cancer has not been extensively studied, and research is difficult because of the small numbers of men with the disease. Reviews of the literature have been helpful in identifying risk factors, clinical and pathologic characteristics, and the role of genetics [201; 202; 203]. Studies have shown that male breast cancer differs from female breast cancer in many ways. For example, some risk factors unique to men include the following [203]:

- Undescended testes
- Orchiectomy
- Infertility
- Gynecomastia
- Mastitis
- Breast trauma
- Infertility
- Klinefelter syndrome
- Radiation to the chest wall

BRCA2 mutation is found in approximately 4% to 16% of men with breast cancer [203].

A painless subareolar lump or swelling is the most common presenting symptom, occurring in approximately 85% of men with breast cancer [201; 204]. Other common symptoms are nipple retraction, localized pain, or nipple ulceration, bleeding, or discharge. About 1% to 2% of men will have no symptoms [201; 204]. In diagnosing male breast cancer, the primary consideration is to distinguish cancer from gynecomastia, which is present in about 30% of healthy men [202].

The approach to the diagnostic evaluation of male breast cancer is the same as for female breast cancer. A history and physical examination will help determine potential risk factors and identify the clinical features. Mammography has good sensitivity and specificity, and ultrasonography may be useful, especially for detecting involvement of the lymph nodes [202]. Biopsy is essential for elucidating the pathologic characteristics. In male breast cancers, the overexpression of estrogen receptor and progesterone receptors is likely [203; 205].

As noted, data on male breast cancer are limited, and recommendations for treatment have been extrapolated from the literature on female breast cancer and from small series of men with the disease. Modified radical mastectomy is used most often, with lumpectomy rarely performed [203]. Sentinel node biopsy has also been effective in men [206; 207]. Adjuvant radiation therapy has been associated with a lower local recurrence rate and a higher survival rate [202; 203]. Adjuvant chemotherapy has been carried out according to guidelines for women at high risk for recurrence. Adjuvant hormone therapy has a clear role in the treatment of men with hormone receptor-positive cancer, with reductions in recurrence and death [204; 208]. In addition, tamoxifen has led to a 50% response rate for metastatic breast cancer [202].

Five-year survival rates for men with breast cancer have been reported to be between 40% and 65% [201; 202]. In one retrospective study, the median survival was 87 months (83 months for men with invasive disease) [203]. Older age, higher stage of disease, and increasing tumor size have been associated with shorter survival [203]. The risk of second cancers (breast and nonbreast) appears to be high [209].

MALE SEXUAL HEALTH

Sexual dysfunction affects more than a quarter of men, yet attention to sexual health is low because of the lack of validated evidence-based guidelines for diagnosis and treatment as well as men's hesitancy to discuss sexual health issues with their primary healthcare providers [210; 211]. Clinicians should include questions about sexual function in routine health evaluations and foster an environment of trust and open dialogue to help elicit information on sexual health from their male patients.

Issues related to sexual health change over the course of a man's lifetime. Early ejaculation is of concern to men across the ages, erectile dysfunction and late-onset hypogonadism are of special concern to older men, and infertility and STIs are more common issues among younger men.

PREMATURE EJACULATION

The AUA definition of premature ejaculation is "poor ejaculatory control, associated bother, and ejaculation within about two minutes of initiation of penetrative sex that has been present since sexual debut" [354]. This definition and others have not been evidence based, however, and the International Society of Sexual Medicine charged a panel of experts with developing an evidence-based definition. According to this definition, premature ejaculation is "a male sexual dysfunction characterized by ejaculation which always or nearly always occurs prior to or within about one minute of vaginal penetration, and the inability to delay ejaculation on all or nearly all vaginal penetrations, and negative personal consequences, such as distress, bother, frustration, and/or the avoidance of sexual intimacy" [213]. The definition is limited to men with lifelong premature ejaculation and those for whom the condition is not caused by another physical, mental, or psychological health condition. Some have called for the condition to be called "early" ejaculation as a more accurate description of the condition [214].

Premature ejaculation is thought to be the most common sexual disorder among men, and the condition is associated with a high rate of psychosocial distress and has a substantial impact on men's relationships with their partners [215; 216].

Prevalence

The reported prevalence of premature ejaculation in the United States has varied widely, ranging from 5% to 40%, depending primarily on the definition [210; 212]. The highest prevalence is found among men who are 60 years of age or older [214].

Diagnosis

There are no established criteria for the diagnosis of premature ejaculation; clinicians should assess medical, relationship, and sexual history and perform a focused physical examination to make the diagnosis [354]. Laboratory studies or physiologic testing is needed only if the history or physical examination suggests a complex cause [212; 354]. Among the details to be elicited from the history are [212]:

- Frequency and duration of premature ejaculation
- Relationship of premature ejaculation to specific partners
- Degree of stimulus resulting in premature ejaculation
- Nature and frequency of sexual activity (foreplay, masturbation, intercourse, use of visual cues)
- Impact of premature ejaculation on sexual activity
- Types and quality of personal relationships and quality of life
- Aggravating or alleviating factors
- Relationship to drug use or misuse

The patient's partner may be helpful in providing a description of the problem, and care should be taken to distinguish premature ejaculation from erectile dysfunction [212]. The AUA recommends that, for men with concomitant premature ejaculation and erectile dysfunction, erectile dysfunction should be treated first [212].

EVIDENCE-BASED PRACTICE RECOMMENDATION

According to the Male Training Center for Family Planning and Reproductive Health, asking men about problems with sexual function is particularly important to identify underlying cardiovascular disease among men who present with symptoms of sexual dysfunction routinely starting at 25 years of age. Specific questions include if the man is experiencing sexual dysfunction such as inability to obtain and maintain an adequate erection for satisfactory sexual activity (impotence, erectile dysfunction), premature or delayed ejaculation, loss of libido, painful intercourse, and also priapism, a prolonged painful erection not associated with sexual desire.

(https://rhntc.org/sites/default/files/resources/mtc_male_prevrhc_2014.pdf. Last accessed June 6, 2022.)

Level of Evidence: Expert Opinion/Consensus Statement

AUA RECOMMENDED PHARMACOLOGIC THERAPY OPTIONS FOR PREMATURE EJACULATION		
Agent	**Daily Dose[a]**	**Pre-Intercourse Dose (On Demand)**
Nonselective serotonin reuptake inhibitor		
Clomipramine (Anafranil)	12.5–50 mg	25–50 mg (4 to 24 hours prior to sexual activity)
Selective serotonin reuptake inhibitors		
Fluoxetine (Prozac)	5–20 mg	—
Paroxetine (Paxil)	10 mg, 20 mg, or 40 mg	20 mg (3 to 4 hours prior to sexual activity)
Sertraline (Zoloft)	25–200 mg	50 mg (4 to 8 hours prior to sexual activity)
Topical agent		
Lidocaine/prilocaine cream (EMLA cream)	—	Lidocaine 2.5%/prilocaine 2.5% (20 to 30 minutes prior to sexual activity)
[a]The lowest dose should be used when beginning therapy, with upward titration based on response.		
Source: [212; 354]		*Table 10*

Treatment Options

The treatment approaches for premature ejaculation include psychologic, behavioral, and pharmacologic therapies, and the risks and benefits of all options should be discussed with the patient and, when possible, his partner [212; 354]. Behavioral therapy was once considered to be the standard therapy, but studies have shown that the best approach may involve a combination of therapies to address the limitations of each approach as well as the multimodal causes of premature ejaculation [210; 217; 218]. The 2022 AUA/Sexual Medicine Society of North America guideline recommends that, in addition to pharmacologic treatment, providers consider referring men with premature ejaculation to a mental health professional with expertise in sexual health [354].

No medication has been approved for the treatment of premature ejaculation, leaving the pharmacologic treatment to involve the off-label use of serotonin reuptake inhibitors or topical anesthetics that act by prolonging the latency of ejaculation [210; 212; 218; 219; 354]. The recommended first-line pharmacotherapeutic options are "on demand" clomipramine; a nonselective serotonin reuptake inhibitor; daily selective serotonin reuptake inhibitor (e.g., fluoxetine, paroxetine, sertraline); and topical penile anesthetics [212; 354]. The doses studied have varied, and dosing is prescribed as either continuous (daily regimen) or situational (taken only before sexual activity); the optimal duration of therapy has not been determined (***Table 10***) [212; 354]. The side effects of these drugs have not been evaluated outside the depression setting, but the effects appear to be similar for men who are not using the drug for depression, with the most common effects being nausea, dry mouth, and drowsiness [212].

Treatment with topical lidocaine/prilocaine has also been shown to be effective in increasing the latency of ejaculation and is another option recommended by the AUA [212; 220; 221]. The drug is typically applied 20 to 30 minutes before sexual activity; earlier application (30 to 45 minutes prior to sexual activity) has led to numbness of the penis and loss of erection in a substantial number of men [221]. Topical treatment avoids adverse events associated with systemic therapy [222]. In 2016, the European Union approved a topical eutectic lidocaine/prilocaine metered-dose spray (Fortacin) for use in the treatment of primary premature ejaculation [223; 224]. The spray has not been approved for this use in the United States [225].

One drug, dapoxetine, a short-acting selective serotonin reuptake inhibitor, is the first drug developed specifically for premature ejaculation, and it has been approved for use in several European countries, but not in the United States or Canada [222]. Several studies and systematic reviews have shown dapoxetine to substantially improve (compared with placebo) intravaginal ejaculatory latency time, perceived control, and patient-reported global impression of change and decrease related personal distress and difficulty [222; 226; 227; 228]. However, the agent is characterized by discontinuation rates of up to 90%, primarily due to side effects, cost issues, efficacy below expectations, and the need for scheduling sexual intercourse [224]. The most common side effects have been nausea, dizziness, diarrhea, insomnia, and headache.

Psychological and behavioral therapies are valuable components of treatment [210; 217; 218]. Relationship counseling and sex therapy can help facilitate communication between the patient and his partner and ease tension surrounding sexual activity. Psychologic and behavioral therapies should focus on gaining confidence, learning control techniques, lessening performance anxiety, overcoming barriers to intimacy, achieving pleasure, and gaining satisfaction [210; 217].

ERECTILE DYSFUNCTION

Erectile dysfunction can be conceptualized as an impairment in the arousal phase of sexual response and is defined by the AUA as "the consistent or recurrent inability to attain or maintain penile erection sufficient for sexual satisfaction, including satisfactory sexual performance" [355]. Erectile dysfunction is primarily a vascular disorder, but hormonal, neurologic, and psychologic factors are also involved. Approximately 70% of cases are organic and not of psychologic origin [229]. The term erectile dysfunction has come to replace "impotence" to more accurately describe a condition that is not associated with a loss of sexual desire or problems with ejaculation or orgasm [230].

Prevalence

Erectile dysfunction is estimated to affect 50 million men in the United States and more than 150 million men worldwide [231]. The prevalence has ranged from 10% to 30% among men 40 to 49 years of age and from 25% to 76% among men older than 70 years of age [232; 233; 234]. Ethnicity has also been a factor, with a higher rate for Black men and a lower rate for Hispanic men compared with White men [232]. However, another study showed that Hispanic men were more likely to report erectile dysfunction [234].

Erectile dysfunction has been reported to be more common among men with comorbidities; independent risk factors include age, diabetes, metabolic syndrome, cardiovascular disease, obesity, and sedentary lifestyle [214; 234; 235]. Among men with no known cardiovascular disease, erectile dysfunction has preceded coronary artery disease, stroke, and peripheral artery disease by an average of three years (range: two to five years) [236]. In addition, a meta-analysis (14 cohort studies; 92,757 men) showed that erectile dysfunction was an independent risk factor for cardiovascular and cerebrovascular events [237]. Other risk factors for erectile dysfunction include hormone disorders, neurologic conditions, psychologic disorders, history of surgery or radiation in the pelvic region, use of illicit drugs, and some prescription drugs (most notably, antihypertension agents) [238]. Encouraging men with these risk factors to modify their lifestyle and/or treating comorbidities may help reduce the risk of erectile dysfunction [239].

Diagnosis

A detailed medical history is integral to diagnosing erectile dysfunction, as the history may elucidate an underlying cause. It is important to also document a psychosocial and sexual history to evaluate the potential of other related or contributing factors [230]. The physical examination should involve assessment of the abdomen, genitals, and pulses in the lower extremity [230]. Validated questionnaires are recommended to assess the severity of erectile dysfunction, to measure treatment effectiveness, and to guide future management [355]. A morning serum total testosterone should be measured routinely; selected laboratory studies to consider are fasting glucose and serum lipid profile, hemoglobin A1c, and thyroid function tests [355].

Treatment Options

Erectile dysfunction is best managed with a combination approach [235]. Because of the strong relationship between erectile dysfunction and modifiable risk factors, lifestyle changes should be a first-line approach to managing the condition. The importance of achieving or maintaining a healthy body mass index, increasing exercise, and smoking cessation should be emphasized, especially given the relationship between erectile dysfunction and cardiovascular disease.

After treatment of erectile dysfunction is initiated, referral to a mental health professional should be considered to promote treatment adherence, reduce performance anxiety, and integrate therapies into a sexual relationship [355]. Both the AUA and the ACP recommend oral phosphodiesterase-5 inhibitors as first-line pharmacotherapy for erectile dysfunction in men for whom this class of drugs is not contraindicated [230; 231; 355]. Four drugs in the class have been approved for use in the treatment of erectile dysfunction: sildenafil (Viagra), tadalafil (Cialis), vardenafil (Levitra), and avanafil (Stendra, Spedra). Sildenafil and vardenafil differ from tadalafil with respect to the time to maximum serum level (1 hour vs. 2 hours) and serum half-life (4 hours vs. 18 hours) [230]. Furthermore, the duration of action is longest for tadalafil (up to 36 hours) [240]. The inhibitory effect of these drugs causes vascular smooth muscle relaxation in the corpus cavernosum, resulting in increased erection hardness and prolonged duration in men with erectile dysfunction who have sufficient intact vasculature [355].

Data from multiple trials and systematic reviews have demonstrated similar efficacy for phosphodiesterase-5 inhibitors in treating erectile dysfunction, particularly for sildenafil, tadalafil, and vardenafil [355]. Each of these drugs substantially improves erectile function and successful sexual intercourse compared with placebo [231]. Relative efficacy is less clear for avanafil because published comparative studies are limited. The ACP notes that there is insufficient evidence for recommending one drug over another and suggests that the choice be made according to the preferences of an individual patient with respect to ease of use, cost, and the adverse effects profile [231]. One systematic review and meta-analysis found evidence that tadalafil is the most effective agent, followed by vardenafil, with no major differences in the safety profile of any of the phosphodiesterase-5 inhibitors [241].

The side effects of all four drugs are similar, with headache, dyspepsia, facial flushing, nasal congestion, and visual disturbances being the most common events [230; 240; 242]. The FDA has issued two mandates to revise labeling of these agents. In 2005, the agency required labels for sildenafil, tadalafil, and vardenafil to reflect the possibility of sudden vision loss after taking the drugs for a period of time [243]. The alert was associated with several case reports suggesting a temporal association between use of one of the drugs and nonarteritic anterior ischemic optical neuropathy (NAION), a rare disorder characterized by sudden loss of vision in one

eye [243; 355]. However, subsequent studies showed that the risk of NAION was similar among men who were and were not taking a phosphodiesterase-5 inhibitor [244; 245]. Risk factors for spontaneous NAION include older age, White race, small optic discs with low cup-to-disc ratio, and vascular disease, leading some investigators to suggest an examination of the fundus be performed on men who may be at higher risk for NAION before a phosphodiesterase-5 inhibitor is prescribed [243].

In 2007, the FDA mandated changes to the labels of phosphodiasterase-5 inhibitors to more prominently display warnings about the potential for sudden hearing loss [246]. A cross-sectional population-based study of more than 11,000 men subsequently demonstrated a higher likelihood of self-reported hearing loss associated with use of any phosphodiasterase-5 inhibitor (odds ratio: 2.23), but the association was significant only for sildenafil [247].

Use of a phosphodiesterase-5 inhibitor is contraindicated in several situations. They should not be taken by men who take organic nitrates (nitroglycerin) or nitrites (amyl nitrite) [248; 249]. Vardenafil should not be used for men with a history of prolonged QT interval (or who take medication to prolong the QT interval) [230]. The use of a phosphodiesterase-5 inhibitor concomitantly with an alpha-blocker for lower urinary tract symptoms may lead to increased systemic vasodilation and hypotension [230].

Men who are being treated with a phosphodiesterase-5 inhibitor should be followed up closely to monitor efficacy and side effects. Attention to changes in health status and other medications is essential to avoid drug interactions. Clinicians should emphasize the importance of men providing information about treatment with a phosphodiesterase-5 inhibitor in case of a cardiovascular emergency [230].

Although the initial treatment option preferred by most men with erectile dysfunction is a phosphodiesterase-5 inhibiter, the AUA Panel notes that it is valid for men to begin with any type of established treatment, and recommends that patients be informed of all treatment options that are not medically contraindicated. The AUA guideline provides data on success rates, patient and partner satisfaction rates, and potential adverse effects for the following treatment options [355]:

- Vacuum erection device: An effective, low-cost option with high rates of patient and partner satisfaction. May have a role as "rescue device" or adjunct to pharmacologic therapy.
- Intraurethral alprostadil: Involves insertion of a delivery catheter into the urethral meatus and depositing an alprostadil tablet in the urethra; requires an in-office trial to insure effectiveness and safety. Variable rates of success (30% to 78%).
- Intracavernosal injection: Administered by injecting medication (i.e. alprostadil) into the corpus cavernosa of the penis to produce an erection; an in-office injection test should be performed. Reported success rates range from 58% to 100%.
- Penile prosthesis implantation: Surgical procedure that requires thorough patient and partner counselling. Available devices include malleable (non-inflatable) models as well as inflatable prostheses. Satisfaction rates vary across models, ranging from 66% to 88%.

Intracavernosal injection of a vasoactive drug is associated with the highest potential for priapism, and clinicians should ensure that men understand the correct technique and the importance of seeking medical intervention for a prolonged erection [230]. Only vacuum erection devices with a limiter (a feature that limits the amount of vacuum pressure and reduces potential for penile injury) should be recommended, whether purchased over the counter or procured by prescription [230; 355]. The AUA advises that for men with erectile dysfunction, low-intensity extracorporeal shock wave therapy and intracavernosal stem cell therapy are considered investigational treatment options [355]. The risks associated with penile prostheses include mechanical failure, erosion, and infection [230]. The AUA guideline does not recommend the use of trazodone, testosterone therapy (for men with normal serum levels), or yohimbine and other herbal therapies [230].

Psychosocial therapy is an important component of treatment for erectile dysfunction. A meta-analysis showed that group psychotherapy in combination with sildenafil significantly improved erectile function and successful sexual intercourse compared with sildenafil alone [250].

LATE-ONSET HYPOGONADISM

In both men and women, levels of sex hormones decline with age. However, the ways in which these levels change and the symptoms associated with the decline differ greatly between men and women. There is no well-defined equivalent of menopause in men, although the phrase "andropause" is used frequently to refer to decreased testosterone and resulting symptoms. Other phrases, most notably androgen deficiency syndrome and late-onset hypogonadism, may be more accurate descriptors of the process. By any name, the condition is a complex of symptoms that includes loss of sexual satisfaction and overall well-being [251]. The condition is related to lower testosterone levels, which begin to decrease 1% to 2% each year beginning at 30 years of age [252].

Late-onset hypogonadism is distinct from hypogonadism in younger male individuals. For boys and young men, hypogonadism is related to testicular failure and is usually associated with a congenital abnormality, most often Klinefelter syndrome [251]. In older men with hypogonadism, testosterone levels are rarely as low as the levels in young men with primary hypogonadism [251].

SYMPTOMS AND SIGNS SUGGESTIVE OF TESTOSTERONE DEFICIENCY IN MEN	
Specific	Incomplete or delayed sexual development, eunuchoidism Loss of body (axillary and pubic) hair, reduced shaving Very small (especially <5 mL) or shrinking testes
Suggestive	Reduced sexual desire (libido) and activity Decreased spontaneous erections Breast discomfort, gynecomastia Inability to father children, low or zero sperm count Height loss, low trauma fracture, low bone mineral density Hot flushes, sweats
Nonspecific	Decreased energy, motivation, initiative, and self-confidence Feelings of sadness or being "blue," depressed mood, dysthymia Poor concentration and memory Sleep disturbance, increased sleepiness Mild unexplained anemia (normochromic, normocytic, in the female range) Reduced muscle bulk and strength Increased body fat, body mass index

Source: Modified, with permission, from Bhasin S, Brito JP, Cunningham GR, et al. Testosterone therapy in men with hypogonadism: an Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2018;103(5):1715-1744. *Table 11*

POTENTIAL BENEFITS AND RISKS OF TESTOSTERONE THERAPY	
Benefits	**Potential Risks**
Improvement in sexual desire and function	Stimulation of growth of prostate cancer
Increase in bone mineral density	Worsening of symptoms related to benign prostatic hypertrophy
Improvements in mood, energy, and quality of life	Liver toxicity and liver tumor
Change in body composition and improvement in muscle mass and strength	Gynecomastia
Improvement in cognitive function	Erythrocytosis Testicular atrophy and infertility Skin diseases Sleep apnea

Source: [262] *Table 12*

Several important questions about late-onset hypogonadism remain unanswered [252; 253]:

- It is unclear whether the symptoms are caused by a reduction in testosterone or are a result of the normal physiologic process of aging.
- There is no consistent level of testosterone to define hypogonadism, and there is confusion about what testosterone levels should be measured.
- There is ongoing debate about the risk-benefit ratio of testosterone therapy for older men.

Prevalence

There is a wide range in the reported prevalence of late-onset hypogonadism. In a population-based observational study, symptomatic androgen deficiency was found in nearly 6% of men 30 to 79 years of age, whereas in the Hypogonadism in Males (HIM) study, the prevalence was nearly 39% among men 45 years of age and older visiting primary care practices [254; 255]. The prevalence increases substantially with age and is similar across racial/ethnic populations [254; 255].

Diagnosis

A diagnosis of late-onset hypogonadism requires both documentation of relevant symptoms and measurement of testosterone levels. The condition is associated with a variety of physiologic, psychologic, cognitive, and sexual symptoms; some signs and symptoms are more specific than others, and no combination of symptoms is typical (***Table 11***) [252; 255].

RECOMMENDATIONS OF THE ENDOCRINE SOCIETY REGARDING TESTOSTERONE THERAPY FOR ADULT MEN WITH HYPOGONADISM	
Diagnosis and evaluation	*Recommendations* Make a diagnosis of hypogonadism only in men with symptoms and signs consistent with testosterone deficiency and unequivocally and consistently low serum testosterone levels and/or free testosterone concentrations (when indicated). Confirm diagnosis by repeating measurement of fasting morning total testosterone. Measure serum luteinizing hormone and follicle-stimulating hormone levels to distinguish between primary (testicular) and secondary (pituitary-hypothalamic) hypogonadism. *Suggestions* Perform further evaluation to identify the etiology of hypothalamic, pituitary, and/or testicular dysfunction in men with hypogonadism. Measure serum testosterone level in men who have specific clinical signs and symptoms and consider measuring serum testosterone level in men who report less specific signs and symptoms. Measure morning total testosterone level by a reliable assay as the initial diagnostic test. Measure free or bioavailable testosterone level, using an accurate and reliable assay, in men in whom total testosterone concentrations are near the lower limit of the normal range and in whom alterations of sex hormone-binding globulin are suspected. Do not evaluate androgen deficiency during an acute or subacute illness. Measure bone mineral density with use of dual-energy x-ray absorptiometry scanning in men with severe androgen deficiency or low trauma fracture.
Treatment	*Recommendations* Use testosterone therapy for men with hypogonadism to induce and maintain secondary sex characteristics and correct symptoms of testosterone deficiency. Do not use testosterone therapy for men planning fertility in the near term or in men with breast or prostate cancer. Do not use testosterone therapy without further urologic evaluation in men with palpable prostate nodule or induration or a prostate-specific antigen (PSA) level of 3 or 4 ng/mL in men at high risk of prostate cancer (e.g., Black race, first-degree relative with prostate cancer). Do not use testosterone therapy for men with a hematocrit greater than 50%, untreated severe obstructive sleep apnea, severe lower urinary tract symptoms, or uncontrolled or poorly controlled heart failure, or in men with type 2 diabetes (as a means of glycemic control) who have low testosterone concentrations. *Suggestions* Initiate testosterone therapy with any of the following regimens, chosen on the basis of an individual man's preference, consideration of pharmacokinetics, treatment burden, and cost: • Testosterone enanthate or cypionate: 75–100 mg IM weekly, or 150–200 mg IM every two weeks • Testosterone patch (nongenital): 5 mg, one or two applied nightly over the skin of the back, thigh, or upper arm (away from pressure areas) • Testosterone gel (1%): 5–10 g applied daily over a covered area of nongenital skin • Testosterone bioadhesive buccal tablet: 30 mg applied to buccal mucosa every 12 hours • Testosterone pellets: SC every three to six months (dose and regimen vary with the formulation used) • Oral testosterone undecanoate, injectable testosterone undecanoate, testosterone-in-adhesive matrix patch, and testosterone pellets, where available Consider short-term testosterone therapy in men with HIV, low testosterone concentrations, and weight loss (when other causes of weight loss have been excluded) to induce and maintain body weight and lean mass gain. Do not routinely prescribe testosterone therapy to all men 65 years of age or older with low testosterone concentrations. Offer testosterone therapy on an individualized basis after discussing the risks/benefits with the patient.
Monitoring	*Recommendations* Evaluate the patient three to six months after the initiation of treatment and then annually. Determine hematocrit at baseline, at three to six months, and then annually. (Stop therapy if the hematocrit is higher than 54%.) Evaluate the patient for signs and symptoms of formulation-specific adverse events at each visit. Obtain a urologic consultation if there is any of the following: • Increase in serum or plasma PSA level >1.4 ng/mL within any 12-month period of testosterone treatment • PSA velocity >0.4 ng/mL/yr using the PSA level after 6 months of testosterone therapy as the reference (PSA velocity should be used only if there are longitudinal PSA data for more than two years.) • Detection of a prostatic abnormality on digital rectal examination • AUA/IPSS score >19 *Suggestions* Monitor testosterone levels three to six months after initiation of testosterone therapy, with an aim of achieving serum testosterone levels during treatment in the mid-normal range. (For men receiving testosterone enanthate or cypionate, the aim should be a testosterone level between 350 and 600 ng/dL at one week after the injection.) Repeat bone mineral density of the lumbar spine, femoral neck, and hip after one to two years of testosterone therapy in hypogonadal men with osteoporosis or low trauma fracture.
Screening	*Recommendation* Do not screen for hypogonadism in the general population.

Source: [252] *Table 13*

Diagnosing late-onset hypogonadism (testosterone deficiency) is challenging because many signs and symptoms are associated with the normal process of aging or can be attributed to coexisting conditions. Two questionnaires that can help to identify late-onset hypogonadism are the Androgen Deficiency in Aging Males (ADAM) questionnaire and the Aging Males' Symptoms (AMS) scale [256; 257; 258; 259; 260]. The ADAM questionnaire consists of 10 questions, and the condition is defined by a positive response to two specific questions: "Do you have a decrease in libido (sex drive)?" and "Are your erections less strong?" or to any three of the other questions [256]. The AMS scale asks men to provide a score of 1 to 5 to each of 17 somatic, psychologic, and sexual symptoms. The ADAM questionnaire has been validated against testosterone levels, whereas the AMS scale was designed to evaluate the quality of life and has not been correlated to testosterone levels [261]. Both have excellent specificity but poor sensitivity [251].

In its updated practice guidelines on the treatment of androgen deficiency, the Endocrine Society recommends making a diagnosis of hypogonadism "in men with symptoms and signs of testosterone deficiency and unequivocally and consistently low serum testosterone and/or free testosterone concentrations (when indicated)" [252]. Serum testosterone level fluctuates in relation to time of day and food intake; peak concentrations occur during the morning hours. Therefore, clinicians should measure total testosterone concentrations on two separate mornings while the patient is fasting [252]. Measured levels should be interpreted with caution as not all laboratories use total testosterone assays harmonized to the national standard [355]. Intercurrent acute illness, nutritional deficiency, and certain medications (e.g., opioids, glucocorticoids) can alter the expected serum testosterone concentration. In general, a total testosterone concentration of 300 ng/dL is the cut-off level below which testosterone replacement therapy is considered for most men with suspected late-onset hypogonadism.

Treatment Options

The increase in treatment with testosterone has been tremendous. Although there are benefits of testosterone therapy, there are also many potential risks (***Table 12***), and the risk-benefit ratio for men with late-onset hypogonadism has not been clearly defined [255; 256; 261]. Because of questions about the benefits and harms of testosterone, the Endocrine Society is specific in its recommendations for testosterone therapy (***Table 13***) and recommends against a general policy of offering testosterone therapy to all older men with low testosterone levels [252].

Testosterone replacement is available in several forms, including oral agents, injectable formulations, transdermal gels and patches, and buccal tablets [252; 263]. In general, a decision on the type of therapy should be made according to the patient's preference, with consideration of several factors, including pharmacokinetics, cost, ease of use, and side effect profile [252; 263].

Follow-Up

Close follow-up is essential for men being treated with testosterone replacement. The clinical response and side effects should be monitored at intervals of three to six months [252]. The treatment target should be a testosterone level in the middle of the normal range [252]. Follow-up should include evaluation of the prostate, through determination of PSA levels and DRE at three to six months for men 40 years of age and older who have a baseline PSA greater than 0.6 ng/mL. In addition, a hematocrit level should be determined at three to six months and then annually; treatment should be discontinued if the hematocrit is greater than 54%.

MALE INFERTILITY

Infertility is clinically defined as the inability to conceive after one year of unprotected intercourse [264]. Approximately 15% of couples are unable to conceive after one year of unprotected intercourse. A male factor is the only cause in approximately 20% of infertile couples and is a contributing factor in another 20% to 40% [264]. Fertility declines with age, and research has shown that men older than 35 years of age are twice as likely to be infertile as men younger than 25 years of age [265; 266]. Approximately 15% of infertile men have azoospermia, the complete absence of sperm in the ejaculate [267].

Etiology

More than half of male infertility or subfertility is potentially correctable; often, the cause is unknown. The causes, both correctable and uncorrectable, include [264; 268]:

- Varicocele
- Obstruction of a duct (epididymal, vasal, or ejaculatory)
- Ejaculatory dysfunction
- Testicular atrophy
- Hypogonadotropic hypogonadism
- Infection
- Side effects of medication
- Environmental toxins
- Bilateral cryptorchidism
- Genetic abnormality (Y chromosome microdeletion)
- Congenital absence of vas deferens

Diagnosis

According to the AUA guidelines, evaluation of suspected male infertility should include a complete medical and reproductive history, physical examination, and one or more semen analyses [264; 356]. Men with one or more abnormal semen parameters or presumed male infertility should be evaluated by a male reproductive expert. It is important not to rely solely on semen analysis, as an underlying medical or genetic cause of infertility may be missed [268]. Other tests may be necessary, depending

on the findings of this initial evaluation. Clinicians should obtain hormonal evaluation including follicle-stimulating hormone (FSH) and serum testosterone for infertile men with any of the following: impaired libido, erectile dysfunction, oligozoospermia or azoospermia, atrophic testes, or evidence of hormonal abnormality on physical examination [356].

The medical history can help to detect an underlying cause of infertility. Factors that can affect fertility include [268]:

- Kallmann, Young, or Kartagener syndrome
- Pituitary disease
- Previous testicular disorders
- History of inguinal, scrotal, or retroperitoneal surgery
- Anticancer chemotherapy

The reproductive history should address the following issues: frequency and timing of intercourse, duration of fertility effort, use of lubricants, and sexual history (including STIs) [264; 267; 268].

Physical examination may identify a varicocele, the most common cause of male infertility [165; 182]. Other findings on physical examination that may suggest a cause of infertility include small testes (less than 4 cm in greatest dimension or less than 20 cm3), signs of ductal obstruction (induration or engorgement of the vas deferens or epididymis), and abnormal distribution of hair and fat, which may indicate endocrinopathy [268].

As noted, the semen analysis should be carried out on at least two specimens, obtained at least one month apart [264]. The specimens should be collected after two to three days of abstinence. The World Health Organization (WHO) first established reference values for semen analysis in 1987 and published its sixth update in 2021 [269]. The 2020 AUA guideline references the 2010 WHO semen parameters and lower reference limit criteria for male infertility [356]:

- Semen volume: 1.5 mL
- Total sperm number: 39 million/ejaculate
- Sperm concentration: 15 million/mL
- Vitality: 58% live
- Total motility (progressive + nonprogressive): 40%
- Morphologically normal forms: 4.0%

Initially, the updated criteria met with controversy, with some noting that the new reference values would lead to fewer men being classified as infertile based on semen analysis alone [271; 272; 356]. No single abnormality among sperm parameters is diagnostic of infertility; the odds ratio for infertility increases with the number of abnormal semen parameters, rising sharply with two or more abnormal parameters [356].

Treatment Options

Treatment options are available for correctable causes of infertility. Varicoceles can be repaired through open or laparoscopic surgery or by percutaneous embolization [182]. Surgical treatment leads to elimination of the varicocele in 90% of men, with improvement in the semen quality, production of testosterone, and rates of subsequent pregnancy [182; 273]. For men with infertility related to obstruction, microsurgical reconstruction of the obstructed duct has led to the appearance of sperm in the ejaculate and higher rates of subsequent pregnancy [267]. Several techniques for retrieving sperm are also available. Options for reproductive assistance and adoption should be explored for men who have uncorrectable infertility. Genetic counseling should be offered to men with nonobstructive azoospermia due to primary testicular failure [267].

The National Collaborating Centre for Women's and Children's Health recommends that men be informed that there is an association between elevated scrotal temperature and reduced semen quality, but that it is uncertain whether wearing loose-fitting underwear improves fertility.

(https://www.nice.org.uk/guidance/cg156. Last accessed June 6, 2022.)

Level of Evidence: Expert Opinion/Consensus Statement

SEXUALLY TRANSMITTED INFECTIONS

STIs are a serious public health concern. There are an estimated 26 million new infections annually and 68 million total STIs in the United States, of which youth 15 to 24 years of age account for about half [357]. In addition to the substantial morbidity associated with STIs, the financial cost is tremendous; nearly $16 billion in direct medical costs annually are associated with the eight major STIs (chlamydia, gonorrhea, hepatitis B virus, HIV, human papillomavirus [HPV], herpes simplex virus type 2 [HSV-2], trichomoniasis, and syphilis) [275]. The large majority of costs are attributable to HIV ($13.7 billion), followed by chlamydia ($691 million), gonorrhea ($271 million), and HSV-2 ($91 million) [57].

The discussion here is confined to STIs having the greatest impact on men: chlamydia, gonorrhea, syphilis, HSV-2, and HPV [57]. Although HSV-2 and HPV infections are more common among women than men, the infections have serious implications for men. For example, nearly one-third of the 22,000 HPV-associated cancers that occur each year in the United States develop in men [276]. Infection with HSV-2 increases the risk for HIV, which is particularly important for Black men, who are at greater risk for both HSV-2 and HIV [277].

RATE OF COMMON SEXUALLY TRANSMITTED INFECTIONS (STIs) AMONG MEN ACCORDING TO RACE/ETHNICITY, 2020							
STI	Prevalence (per 100,000)						
	All Men	Black (Non-Hispanic)	American Indian/ Alaskan Native	Hispanic	White (Non-Hispanic)	Asian	Native Hawaiian/ Other Pacific Islander
Chlamydia	336.7	883.7	315.8	198.0	113.2	72.0	300.6
Gonorrhea	236.3	819.5	272.3	144.8	77.4	46.6	195.8
Syphilis (primary and secondary)	20.7	57.7	32.6	23.4	11.0	8.9	30.7
Source: [57]							*Table 14*

Despite the availability of comprehensive guidelines for the testing and treatment of STIs, studies have shown poor compliance; in one study, fewer than one-third of individuals with an STI seen in an emergency department received recommended antibiotic treatment, and compliance with history-taking, diagnostic testing, and counseling ranged from 14% to 79% [278]. In addition, improvements in rates of HPV vaccination are needed [279].

Prevalence of STIs

The prevalence of STIs according to gender vary with infection; chlamydia, HSV-2, and HPV occur more often among female than male individuals; gonorrhea occurs at similar rates among female and male individuals; and syphilis occurs more often among male than female individuals [57; 277; 280]. Overall, almost two-thirds of all STIs occur in individuals 15 to 24 years of age [57]. Among men, most STIs are far more prevalent in the non-Hispanic Black population than in other ethnic/racial populations and are least prevalent in the Asian population (***Table 14***) [57; 277; 281].

Chlamydia

More than 1.5 million cases of chlamydia were reported to the CDC in 2020 [57]. The 2020 rate of chlamydia infection (481.3 cases per 100,000) represents a decrease of 13% over the rate in 2019. During 2019–2020, rates of reported chlamydia decreased among both men and women. Chlamydial infection occurs more than twice as commonly in women than men, and rates are highest among adolescents and young adults.

Gonorrhea

In 2020, a total of 677,769 cases of gonorrhea were reported to the CDC, making it the second most commonly reported notifiable sexually transmitted disease in the United States [57]. Rates of gonorrhea have increased 111% since the historic low of 98.1 cases per 100,000 in 2009. In 2020, the rate of gonorrhea among men was 236.3 cases per 100,000, compared with 150 cases per 100,000 among women [57].

Syphilis

In 2000–2001, the rate of syphilis (primary and secondary) was 2.1 cases per 100,000; however, the rate has increased almost every year since that time, increasing 6.8% between 2019 and 2020 [57]. In 2020, 133,945 cases of syphilis were reported, including 41,655 cases of primary and secondary syphilis, the most infectious stages of the disease. Rates of syphilis have increased in most racial/ethnic groups, with greatest increases among non-Hispanic American Indian/Alaska Native persons and non-Hispanic persons of multiple races [57]. Young men who have sex with men are disproportionally impacted, accounting for a majority (53%) of all male syphilis cases in 2020 [57].

HSV-2

Genital herpes is a chronic, lifelong viral infection; the prevalence is unknown as the majority of persons infected have not had the condition diagnosed. Many individuals with HSV-2 have mild symptoms or unrecognized infection but shed the virus intermittently in the urogenital area. Consequently, most genital infections are transmitted by persons unaware that they have the infection. Most cases of recurrent genital herpes are caused by HSV-2, and 11.9% of persons 14 to 49 years of age in the United States are estimated to have acquired this infection [173]. In 2020, the CDC estimated the prevalence of HSV-2 at 18.6 million persons, though the actual number is likely to be considerably higher [57; 173]. The seroprevalence of HSV-2 is more than twice as high among female individuals (about 34%) than among male individuals (about 15%) [57]. As with other STIs, HSV-2 infection is more common among non-Hispanic Black men than other racial/ethnic populations [57].

HPV

Data on HPV infection in men are limited. According to a data brief published by the National Center for Health Statistics (NCHS), during 2011–2014, the seroprevalence of any HPV was 7.3% among adults 18 to 69 years of age, with 11.5%

U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATIONS FOR SCREENING FOR SEXUALLY TRANSMITTED INFECTIONS (STIs) IN MALE INDIVIDUALS	
STI	**Recommendation**
Chlamydia and gonorrhea	Insufficient evidence to recommend for or against screening in men
Syphilis	Strongly recommend screening for individuals at increased risk
Genital herpes	No screening for asymptomatic adults and adolescents
Source: [284; 360; 361]	*Table 15*

among men and 3.3% among women [282]. In the HIM study, an ongoing prospective cohort study of the natural history of HPV in men (from the United States, Mexico, and Brazil), the overall prevalence of HPV infection was 65.2%, with the highest rates among White and Black men (71.5% and 66.2%, respectively) and the lowest, among Asian/Pacific Islander men (42.2%) [281; 283]. An estimated 34,800 new HPV-attributable cancers occurred every year during 2012–2016; before introduction of HPV vaccines, approximately 355,000 new cases of anogenital warts occurred every year [173].

Prevention, Control, and Screening

Prevention and control are keys to lowering the prevalence of STIs, and the primary preventive strategies are: risk assessment, education, and counseling; limiting the number of sexual partners; abstinence or the use of condoms and barriers; and, in the case of HPV, with vaccination [173; 276]. The importance of abstaining from sexual activity should be emphasized to individuals with a confirmed STI [173].

Control of STIs involves the identification of asymptomatic individuals and of symptomatic individuals who may not seek health care; effective diagnosis and treatment; and the evaluation, treatment, and counseling of sex partners of infected individuals [173]. The CDC encourages clinicians to promote prevention with patient-centered education that focuses on risk reduction measures directed at an individual patient's personal risk [173]. Obtaining a thorough sexual history is an essential component of prevention, and the CDC suggests asking questions related to [173]:

- Partners (gender and number)
- Protection (from STIs)
- Practices (types of sexual activity)
- Past history of STIs (patient and partners)
- Prevention (of pregnancy)
- Use of injected drugs (patient and partners)
- Exchange of money for sex (patient and partners)
- Other sexual practices

Practical strategies for risk assessment and counseling are provided in the CDC treatment guidelines document [173]. Healthcare providers should use simple, direct language when asking these questions, taking care to exhibit respect, compassion, and a nonjudgmental attitude [173]. Organizations such as the National Network of STI/HIV Prevention Training Centers, a CDC-funded group, can help providers enhance skills in counseling individuals about prevention. Resources can be found on the organization's website, available at https://www.cdc.gov/std/treatment/resources.htm.

The U.S. Preventive Services Task Force recommends behavioral counseling for all sexually active adolescents and for adults who are at increased risk for sexually transmitted infections.

(https://jamanetwork.com/journals/jama/fullarticle/2769474. Last accessed June 6, 2022.)

Strength of Recommendation: B (There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.)

Recommendations for screening vary according to risk and the type of STI (***Table 15***) [284]. The USPSTF also recommends high-intensity behavioral counseling for all sexually active adolescents and for adults at increased risk for STIs and HIV [284]. The USPSTF has not issued recommendations for screening for HPV, but beginning in 2011, the Advisory Committee on Immunization Practices (ACIP) recommended HPV vaccination for male individuals [276]. The ACIP recommends routine use of quadrivalent HPV vaccine for boys 11 or 12 years of age and for male individuals 13 to 26 years of age who have not initiated or completed the three-dose series [276; 286]. The ACIP also notes that men 27 to 45 years of age may also be vaccinated if at high risk, as determined through shared decision-making [276; 285; 286]. In addition, hepatitis B vaccination is recommended for any patient who is being evaluated for an STI [173].

Diagnosis

The symptoms of STIs vary and are often similar to symptoms associated with other conditions of the urogenital tract, and some infected individuals may be asymptomatic.

Infection with chlamydia is often asymptomatic [173]. Diagnosis can be made by testing of a urethral or rectal swab or a urine specimen [173]. Nucleic acid amplification tests are the most sensitive tests and can be used for urine specimens [173].

Primary syphilis usually presents as a solitary chancre that develops at the site of infection approximately three weeks after exposure to the spirochete *Treponema pallidum* [287]. The chancre is typically painless and must be distinguished from other genital lesions, such as genital herpes, venereal warts, chancroid, and lymphogranuloma venereum (caused by *C. trachomatis*) [287].

Dark-field microscopy to detect *T. pallidum* is the optimum method of diagnosing syphilis. Although no such detection tests are commercially available, some laboratories provide locally developed and validated polymerized chain reaction (PCR) tests for the detection of *T. pallidum* [173]. A presumptive diagnosis of syphilis can be made with two types of serologic tests: nontreponemal tests (Venereal Disease Research Laboratory [VDRL] and rapid plasma regain [RPR] tests) and treponemal tests (such as fluorescent treponemal antibody absorbed [FTA-ABS] tests or the *T. pallidum* passive particle agglutination [TP-PA] assay) [173]. The CDC notes that using only one type of serologic test is insufficient for a diagnosis [173].

Gonococcal infection, which is caused by *Neisseria gonorrhoeae* (a gram-negative diplococcus), can lead to either urethritis or epididymitis [288]. Urethritis is accompanied by such symptoms as purulent discharge from the penis, dysuria, or erythema at the meatus [288]. Epididymitis caused by gonococcal infection is usually associated with unilateral testicular pain and no other symptoms [288]. Disseminated infection is rare (1% to 3%) [289]. A diagnosis of gonorrhea is confirmed by Gram stain and culture of urethral discharge or swab specimen for *N. gonorrhoeae*, or by nucleic acid amplification testing done on a urine sample [173; 288]. Both techniques have similar sensitivity and specificity [173].

The CDC recommends that all individuals who are evaluated for gonorrhea should also be evaluated for chlamydia, syphilis, and HIV infection [173]. In one study of more than 3,800 men and women, approximately 10% to 30% of individuals with gonorrhea had concomitant infection with chlamydia [290]. The typical lesions of genital HSV-2 in men appear on or around the penis and are first noted as either a single or multiple erythematosus macular lesion(s). However, these lesions are absent in many infected individuals [173]. Viral culture is the preferred test for the diagnosis of HSV-2, but it requires two to seven days for results. The sensitivity of viral culture depends on the quality of the sample and the time at which the sample is obtained; sensitivity declines as the lesion begins to heal. A PCR test is available and is suggested by the CDC for analysis of cerebrospinal fluid when central nervous system disease is suspected [173]. Type-specific serologic tests are available as laboratory assays and point-of-care tests [173]. These tests have varying degrees of sensitivity for the detection of the HSV-2 antibody (80% to 90%) and specificity of at least 96% [173].

Treatment Options

The treatment of STIs has four main goals [173]:

- Eradicate infection
- Alleviate symptoms and signs
- Decrease complications (infertility, chronic pain, dissemination of disease)
- Prevent transmission

The CDC has developed comprehensive guidelines for the treatment of STIs, last updated in 2021 (***Table 16*** and ***Table 17***) [173]. For chlamydia, gonorrhea, or syphilis, single-dose regimens generally offer an advantage for the treatment of individuals with poor healthcare-seeking or compliance behaviors [173]. The CDC notes that for the treatment of syphilis, neither combinations of benzathine penicillin and procaine penicillin nor oral penicillin preparations are considered appropriate and emphasizes the importance of distinguishing the standard benzathine penicillin product widely used in the United States (Bicillin L-A) from the combination benzathine-procaine penicillin (Bicillin C-R); the latter is not appropriate for the treatment of syphilis [173].

In addition to antibiotic treatment, bed rest, scrotal elevation, and analgesics can help to alleviate symptoms such as fever and local inflammation, which are primarily associated with gonorrhea. Beginning treatment as early as possible decreases the likelihood of complications and spread of infection, especially in the case of syphilis [173]. To prevent the transmission of infection, a patient with a confirmed or suspected STI should be told to avoid sexual contact until therapy is completed and he (and/or his partner) no longer has symptoms [173]. The need for sexual partners to be evaluated for treatment should also be emphasized. State and local health departments may provide assistance in arranging for the evaluation and treatment of sex partners of infected men.

HSV-2

The antiviral medications used to treat HSV-2 can only partially control the signs and symptoms of infection; they cannot eradicate the virus or reduce the risk, frequency, or severity of recurrence after the treatment course has been completed [173]. Men with HSV-2 infection should be given medication for episodic treatment of recurrent infection; treatment should begin within one day after the onset of a lesion [173]. If recurrences are frequent (six or more within a year), long-term suppression therapy may be appropriate; such therapy has been shown to reduce the frequency of recurrence by 70% to 80% [173].

TREATMENT OF CHLAMYDIA, SYPHILIS, AND GONORRHEA AS RECOMMENDED BY THE CENTERS FOR DISEASE CONTROL AND PREVENTION		
Infection	**Recommended Treatment**	**Notes**
Chlamydia	Doxycycline 100 mg orally twice daily for 7 days ALTERNATIVE REGIMENS Azithromycin 1 g orally in a single dose OR Levofloxacin 500 mg orally once daily for 7 days	A meta-analysis showed treatment failure among men was higher for azithromycin than for doxycycline.
Gonorrhea	Ceftriaxone 500 mg IM (single dose) PLUS Doxycycline 100 mg PO twice daily for seven days, unless chlamydia infection has been excluded	For persons weighing >150 kg, 1 g ceftriaxone should be administered. See guideline for alternative cephalosporin selection and dosing if ceftriaxone is not available.
Primary and secondary syphilis	Benzathine penicillin G 2.4 million units IM (single dose)	Additional doses do not enhance efficacy. For patients allergic to penicillin, alternative regimens include doxycycline (100 mg PO, twice daily for 14 days) or tetracycline (500 mg PO, four times daily for 14 days)
Source: [173]		*Table 16*

TREATMENT OF HSV-2 AS RECOMMENDED BY THE CENTERS FOR DISEASE CONTROL AND PREVENTION			
Drug	**Treatment Dosage**		
	Initial Infection	**Episodic Recurrent Infection**	**Long-Term Suppression**
Acyclovir	400 mg three times daily for 7 to 10 days OR 200 mg, five times daily for 7 to 10 days	800 mg two times daily for 5 days OR 800 mg three times daily for 2 days	400 mg twice daily
Famciclovir	250 mg, three times daily for 7 to 10 days	125 mg two times daily for 5 days OR 1.0 g two times (single day)	250 mg twice daily
Valacyclovir	1 g two times daily for 7 to 10 days	500 mg two times daily for 3 days OR 1.0 g once daily for 5 days	500–1,000 mg once daily
Source: [173]			*Table 17*

Follow-Up

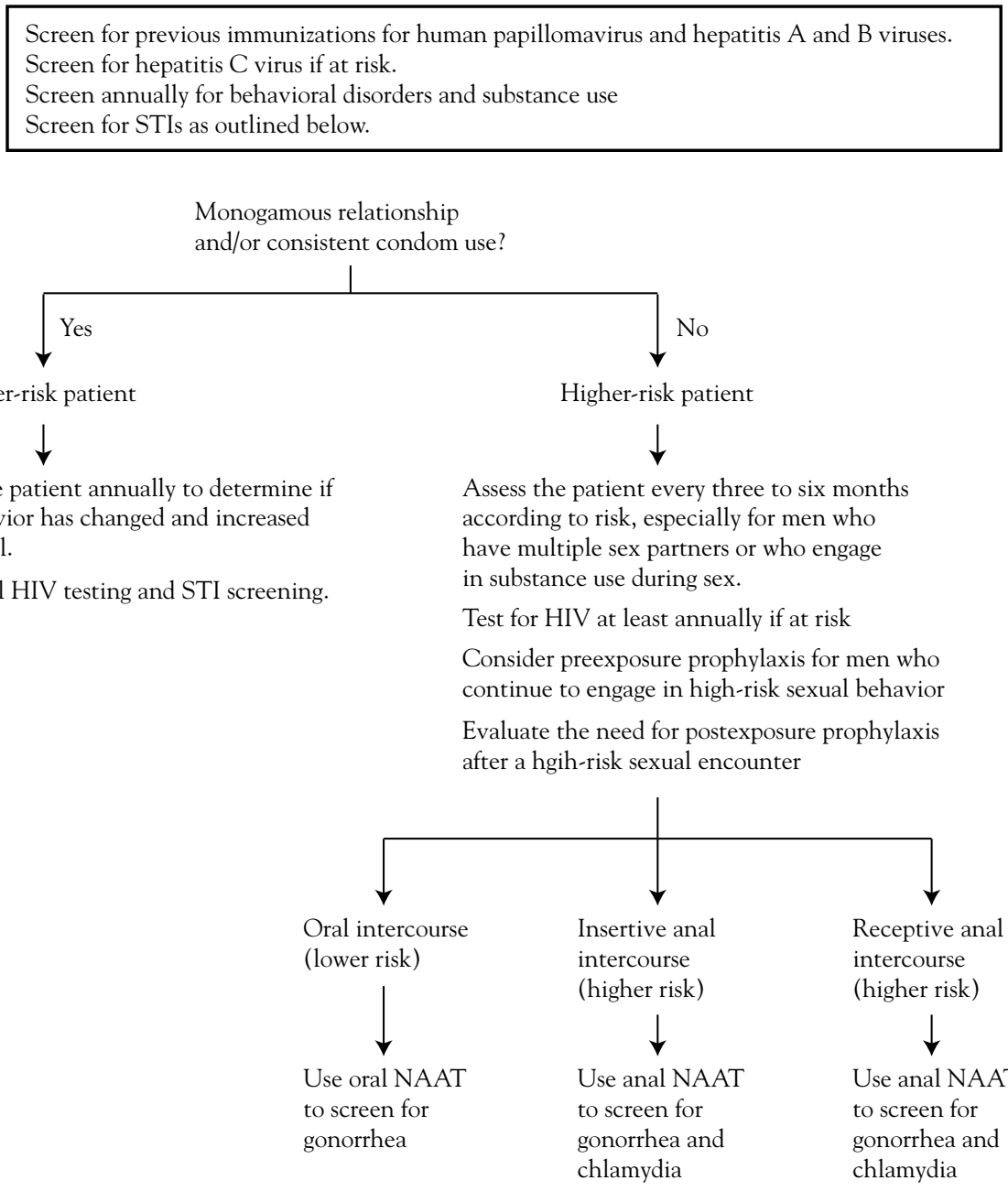
Peterman et al. found a 14.7% rate of reinfection among men during the first year after treatment for an STI [291]. An unexpected finding in the study was the high percentage (66%) of asymptomatic infections. The authors suggested that treated individuals be rescreened at three months. The CDC recommends follow-up with clinical examination and serologic evaluation at 6 and 12 months after treatment [173].

All states require that cases of chlamydia, gonorrhea, syphilis, HIV, and acquired immune deficiency syndrome (AIDS) be reported to local health authorities [173]. Clinicians should seek advice from state or local health departments if reporting requirements are unclear [173].

HEALTH ISSUES FOR MEN WHO HAVE SEX WITH MEN

It is difficult to determine an accurate percentage of MSM in the overall population because of the under-reporting of sexual behavior, but surveys indicate that this group of men represents at least 4% and up to approximately 16% of the population seen by any given healthcare professional [58; 292; 293]. The population that includes MSM (made up of gay, bisexual, and transgender individuals) has been identified as one of the six most underserved groups in the United States, yet medical training and standard resources for healthcare providers lack

ALGORITHM FOR SCREENING MEN WHO HAVE SEX WITH MEN



NAAT = nucleic acid amplification testing.

Source: Reprinted with permission from Preventive health care for men who have sex with men. June 15, 2015, Vol. 91, No. 12, American Family Physician. Copyright © 2015 American Academy of Family Physicians. All rights reserved. *Figure 3*

information on addressing the routine health concerns of this population [292; 294]. MSM have specific healthcare needs that clinicians must understand in order to provide appropriate, comprehensive care.

Perhaps the most important health risk for MSM is their avoidance of routine health care [293]. MSM do not seek routine health care for a variety of reasons. They may have difficulty coming to terms with their sexual identity, fear being judged by healthcare professionals, or be embarrassed to discuss their

sexual behavior. In addition, many MSM do not recognize their health risks or their need for screening and preventive health care [58; 294]. Health risks also may not be recognized by MSM who do seek health care, and they may not be forthcoming about sexual behavior [294; 295]. A study has indicated that less than 20% of MSM had discussed their risk of HIV infection with their healthcare provider [296].

Creating a welcoming clinical environment is the first step in fostering an open dialogue between healthcare providers and MSM [240; 295]. Among the factors that contribute to such an environment are educational materials about specific healthcare needs for gay and lesbian individuals, a posted statement of nondiscriminatory care, and forms that contain more inclusive choices and gender-neutral language [240; 295]. In addition, healthcare professionals and office personnel should maintain a nonhomophobic attitude, communicate clearly and sensitively using gender-neutral terms, and recognize how their own attitudes affect clinical judgments [293; 297]. Confidentiality is an important issue for MSM, and healthcare personnel should assure the patient that some information could be kept out of the medical record [240].

Comprehensive health care for MSM must focus on the population's disproportionate risks for several conditions, including STIs, anal and other types of cancer, substance misuse, eating disorders, suicide, and victimization [294]. Thus, it is essential for clinicians to address several issues with MSM [58; 173; 292; 298]:

- Use of safe sexual practices
- Screening and immunization for hepatitis A and B viruses
- Testing and consideration of pre-exposure prophylaxis for HIV infection
- Routine screening for STIs
- Routine screening for anal HPV-related neoplasia
- Potential risk for specific cancers (testicular, Hodgkin lymphoma, Kaposi sarcoma)
- Assessment of substance misuse (tobacco, alcohol, cocaine, methamphetamine)
- Nutrition and exercise
- Evaluation of psychologic well-being and mental health
- Screening for violence

Health risks should be addressed at the patient's first visit and each subsequent visit [58]. An algorithm has been developed to help guide recommended screening for MSM (***Figure 3***) [58]. In addition, because of an increased risk of HPV-related cancer, the ACIP now recommends HPV vaccination for MSM up to 26 years of age if they did not receive the vaccine when they were younger [276].

EVIDENCE-BASED PRACTICE RECOMMENDATION

The CDC recommends clinicians should evaluate all adult and adolescent patients who are sexually active or who are injecting illicit drugs and offer to prescribe pre-exposure prophylaxis to persons whose sexual or injection behaviors and epidemiologic context place them at substantial risk of acquiring HIV infection.

(https://www.cdc.gov/hiv/pdf/risk/prep/cdc-hiv-prep-guidelines-2021.pdf. Last accessed June 6, 2022.)

Level of Evidence: Expert Opinion/Consensus Statement

Sensitivity should be used in obtaining the medical and sexual history, and the sexual history should be placed in context by emphasizing that an understanding of sexual behaviors is essential to evaluating risks and providing optimal care. It should also be noted that a sexual history is an important component in the care of all patients, regardless of their sexual orientation or behaviors. Because of the various stages a man may be in with respect to his sexual identity, care should be taken to distinguish sexual behavior from sexual identity [295; 297].

It is also vital to have resources readily available to provide to MSM as needed. Such resources include information on STI clinics, substance misuse facilities, services for victims of abuse, and referrals for counseling. The Gay and Lesbian Medical Association (GLMA) has developed resources to help clinicians provide appropriate care to gay, lesbian, bisexual, and transgender individuals. The GLMA also has a guideline for the care of this population, and the brochure (available at http://www.glma.org) includes a variety of additional resources [295].

HEALTH ISSUES FOR TRANSMEN

It is likely that most healthcare providers will encounter transgender individuals in the course of their professional careers, and all healthcare agencies and providers should be prepared to provide competent and compassionate care for gender-variant individuals. Based on data from 2008, the prevalence of female-to-male (FTM) transsexualism (transmen) is 1 in 30,400–200,000 [362]. A transman is a transgender individual who, assigned female at birth, currently identifies as a man. It is important to note that these patients are men and do not require additional description unless medically necessary.

Caring for transgender individuals is complex and requires some preparation and forethought, taking into account knowledge of anatomical reassignments, the effects of therapy, and cultural sensitivity. Very little has been published regarding the unique ongoing healthcare needs of patients who have undergone gender confirmation. In general, health care

should be based on the treatments the patient has received and at what stage he may be in the gender transition. Health promotion awareness and health screening will vary somewhat, but generally the patient will have the same needs as most adult patients in a primary care setting; the patient's gender confirmation process will have little effect on many aspects of health care [363]. Basic preventive services, like sexually transmitted infection testing and cancer screening, can be provided without specific expertise in transgender care [364]. Keep in mind that in some cases, older transmen may not disclose their transgender history to their healthcare providers, as they initially sought treatment at a time when it was common for providers to use very strict guidelines to determine who could and could not receive treatment [365].

For the FTM patient, any residual female organs will require lifelong modified physical exams and risk screenings. These patients may require occasional modified pelvic exams and/or mammograms, and both the provider and the patient may have difficulty finding a comfortable clinical environment [366]. For FTM individuals, gynecologic examinations can heighten their emotional conflict between self-perception and physical anatomy. Respectful communication that maintains dignity, agency, and control is central to mitigating distress during pelvic exams [367]. The routine physical exam should include a breast exam, Pap test, and assessment of bone health and other possible effects of long-term testosterone supplementation.

PSYCHOSOCIAL WELL-BEING OF MEN

Psychosocial well-being is important to men, and many conditions or situations can disrupt the sense of well-being. Among the more common factors that can have a negative effect on well-being for both sexes are everyday stressors (positive as well as negative), personal conflicts, traumatic events, and depression. In general, men lack the social support and interpersonal relationships that help women to cope with stresses [299]. Because of this, men differ in their ability to handle stress, with many men resorting to anger, violence, and substance misuse to deal with stress or depression [28; 300]. As a result, stress/anger, substance misuse, and depression are among the psychosocial conditions with the most serious health implications for men. Most men will not seek help for psychosocial disorders and may not recognize the symptoms of depression [45; 300; 301]. Thus, it is important for healthcare providers to address psychosocial well-being and potential threats to well-being as part of routine health evaluations of men.

STRESS/ANGER

Stress and anger have long been associated with negative health consequences. Most of the earlier research focused on the effects of stress and hostility on coronary heart disease, and additional research has found a link between hostility and a more rapid decline in lung function in older men [302; 303; 304]. Appropriate expression of anger has been suggested as a way to improve health, and controlling anger has been shown to promote well-being in older individuals [305].

Safety is also of concern, as anger has been associated with an increased incidence of injuries and violence. In one study, higher levels of anger (at a given moment) were associated with an increased risk of injury, especially in men [306]. In that study, nearly 32% of individuals who had been injured reported having some degree of irritability before the injury. Men are the usual perpetrators of intimate partner violence causing injury, and these men tend to be younger (18 to 35 years of age), to be from a racial/ethnic minority population, and to have low socioeconomic status [307; 308]. Substance misuse and unemployment are also associated with such violence [307]. However, identifying a perpetrator of intimate partner violence in a clinical setting is difficult [308]. It is important to remember that men can also be victims of intimate partner violence, and this is especially true for MSM [309].

Although the USPSTF found insufficient evidence for or against routine screening for intimate partner violence (including child abuse and elder abuse), a survey of patients within a private family practice network showed that 97% of respondents believed that physicians should ask patients about family stress and conflict [310; 311]. The survey sample included women who had been physically hurt by intimate partner violence as well as men who had admitted perpetrating such injury. These findings support early studies that indicated patient preference for clinicians to ask questions about physical and sexual abuse [312]. The American Academy of Family Physicians (AAFP) notes that family physicians have the opportunity to provide early intervention in family violence through routine screening and identification of abuse; thus, physicians should be alert for the presence of family violence in virtually every patient encounter [313]. It seems reasonable and appropriate for clinicians to include within routine health assessments of men questions about feelings of anger and frustration and urges to strike family members [307; 309]. Suggestions for strategies that focus on anger management and conflict resolution may be helpful, especially for adolescents and young men [309].

SUBSTANCE MISUSE

As noted, substance misuse is higher among men than among women in all age categories, and men are more likely to have psychosocial problems related to the misuse [28; 307]. Although the rate of alcohol misuse is highest among younger men, men older than 65 years of age are of special concern because they are much more likely than women to be "problem" drinkers and to misuse a wide range of illicit as well as prescription drugs [307]. As the general population ages, the misuse of illicit drugs is expected to increase [314]. Adding to this problem is the low rate of screening for alcohol misuse in the older population and the secrecy of many men about drug use [314; 315].

Additional concerns are the use of anabolic steroids among adolescents and young adult men and the use of methamphetamine among MSM. Use of anabolic steroids begins during the teenage years in approximately 25% of cases, and about 10% of all users are teenagers [316]. The prevalence of methamphetamine use among MSM is approximately 10% to 20%, a rate that is 10 times higher than that in the general population [317].

Several professional organizations, including the USPSTF, recommend screening and behavioral counseling intervention to reduce alcohol misuse [318]. However, reported rates of screening have been low [319]. Several screening instruments have been developed, and they vary in the number of questions, the populations for which they are best suited, and their usefulness in specific situations; no one tool is perfect [320; 321; 322; 323]. The CAGE questionnaire, which includes four questions, is best for detecting alcohol dependency and is easy and quick to perform [320; 321]. However, the test may not detect low, but risky, levels of drinking [307; 324]. The Alcohol Use Disorders Identification Test (AUDIT) is the most accurate for detecting problem drinking [319; 322].

Screening in the older population is especially important, as low levels of alcohol use can cause morbidity due to age-related physiologic changes, comorbidities, and the use of prescription medications [325]. Screening tools developed specifically for older individuals should be used, such as the geriatric version of the Michigan Alcohol Screening Test (MAST) or the Alcohol-Related Problems Survey (ARPS) [325; 326; 327]. Clinicians should also ask specific questions about drug use.

A medical history is also helpful, and a family history of alcoholism is a risk factor [319]. Clues to a problem with alcohol can be provided by such symptoms as amnesic episodes, mood swings, chronic fatigue, gastrointestinal symptoms, anxiety, and excessive sweating [319]. Several physical findings can suggest that a patient has a problem with alcohol or drugs, including [319; 324]:

- Mild tremor
- Unsteady gait
- Tachycardia
- Odor of alcohol or marijuana
- Enlarged, tender liver
- Nasal irritation (cocaine use)
- Conjunctival irritation (marijuana use)
- Excessive use of aftershave or mouthwash
- Signs of chronic obstructive pulmonary disease, hepatitis B or C, or HIV infection

Signs that should raise a "red flag" about substance misuse are frequent absences from work or school, history of frequent trauma or accidental injuries, depression or anxiety, other substance misuse, labile hypertension, sexual dysfunction, sleep disorders, poor nutrition, gastrointestinal symptoms, and interpersonal conflicts [307; 319; 324].

Clinicians should provide brief interventions, such as short counseling strategies, for men who are identified to have at-risk drinking. These interventions have been shown to be effective [284; 319; 324]. Alcoholism and drug addiction are best treated by an addiction medicine specialist or through an inpatient or outpatient program [324]. Primary care providers should have referrals for counseling and treatment readily available, as well as resources on support groups, such as Alcoholics Anonymous and Narcotics Anonymous.

To help healthcare professionals carry out the appropriate diagnosis and treatment of patients with alcohol problems, the National Institutes on Alcoholism and Alcohol Abuse (NIAAA) developed the publication *Helping Patients Who Drink Too Much: A Clinician's Guide*, which features an updated guideline on screening and brief intervention. The most recent edition is available on the NIAAA website at https://pubs.niaaa.nih.gov/publications/practitioner/cliniciansguide2005/guide.pdf.

DEPRESSION

Depression is often regarded as a "woman's disease" because it is diagnosed more frequently in women than men. However, researchers and the health community at large now realize that depression is of serious concern in men and is underdiagnosed [28; 328]. According to data from 2020, the prevalence of major depressive episode was 6.2% among men and 10.5% among women [329].

Despite the lower rates of depression in men compared with women, the rate of completed suicide is nearly four times higher for men (25.8 vs. 7.1 per 100,000) [25]. Suicide is a leading cause of death for men in many age groups and across all racial/ethnic populations, except for the Black population [25].

The underdiagnosis of depression in men involves clinician-related and patient-related factors. Clinicians' lack of appropriate training and discomfort with dealing with depression contribute to a low rate of diagnosis, estimated to be about 50% [3; 330]. In addition, no screening instrument for suicide risk has been shown to reliably detect suicide risk in primary care populations [331]. This is unfortunate, as primary care providers appear to be in a position to intervene. As many as 83% of people who died by suicide had contact with their primary care physician in the year before death, with approximately 20% seeing their physician one day before death [330; 332]. In addition, 50% to 66% of individuals who committed suicide saw their primary care physician within one month of their death, with 10% to 40% committing suicide within one week of the visit [331]. Thus, better recognition of depression and suicide risk by primary care providers may help reduce suicide rates.

Many patient-related factors in the underdiagnosis of depression are primarily related to gender issues, including [28; 300; 328; 330; 333; 334]:

- Reluctance of men to seek help
- Lack of men's recognition of the symptoms of depression
- Hesitancy of men to express emotions
- Tendency for men to see depression as a weakness
- Men's misconceptions about mental illness and its treatment

Diagnosis

Because men are less likely to express their emotions, they may recognize and discuss only the physical symptoms of depression, making diagnosis a challenge [300; 301; 333]. A carefully taken history can elicit information about risk factors, which include a family history of depression, the use of some medications (beta blockers, histamine H2-receptor antagonists, benzodiazepines, and methyldopa), chronic illness or other comorbidity, lack of social support, recent life stressor, and single marital status [307; 335]. Substance misuse frequently occurs concomitantly with depression, more often in men than women, but the direction of the causal relationship is not clear [300; 335].

Many of the symptoms of depression reported by women are the same for men: depressed mood, changes in appetite and sleep habits, problems with concentration, and an inability to find pleasure in once pleasurable activities [300]. It has been proposed that the symptoms of depression in men represent a male depressive syndrome, characterized by such symptoms as irritability, acting-out, aggression, low tolerance of stress, low impulse control, tendency to blame others, and a greater willingness to take risk [28; 300; 330; 333]. Men with depression may thus present with a very different symptom profile [328].

Identification of suicide risk is an essential component of the evaluation of patients with depression. Many of the risk factors for suicide are similar to those for depression; when the circumstances surrounding completed suicides were reviewed, the following were found to be factors [25]:

- Loss of a partner (through death or other means)
- Loss of job
- History of mental illness
- Depressed mood
- Previous suicide attempts
- Physical health problems
- Intimate partner problem
- Preceding or impending crisis (within two weeks)
- Financial problem

Clinicians should ask questions to determine the duration of symptoms and explore possible triggers of depression [328]. Because of their lack of experience with discussing emotions, many men may be uncomfortable with open-ended questions such as, "How do you feel?"; rather, discussing emotions in situational contexts can help men better express what they are feeling and why [333]. It may also be helpful to de-emphasize the negative connotation of depression and frame questions within the overall context of health and well-being [314].

Treatment Options

The treatment approach will depend on the severity of symptoms and the patient's preference. In general, a combination of psychotherapy and pharmacologic management provides the best results for most men [328; 335]. Potential psychotherapy approaches include cognitive behavior therapy and interpersonal psychotherapy [300; 307; 328]. First-line pharmacologic treatment involves the use of selective serotonin reuptake inhibitors, such as paroxetine, sertraline, and fluoxetine [307]. This treatment approach has efficacy rates of 30% to 70% [328]. Clinicians should emphasize the importance of taking the medication as prescribed, as it may be two to four weeks before a benefit is evident [328]. Depression that is associated with chronic illness is often seen as an inevitable consequence of the disease, but the depression should be treated. Frequently, the treatment improves the overall outcome [335].

FOSTERING ENHANCED HEALTH BEHAVIORS IN MEN

The strong association between lifestyle choices and men's morbidity and mortality clearly demonstrates the need to foster healthier behaviors among men. Creating a better understanding of the importance of health care requires broad-scale campaigns to heighten awareness of the need for routine and preventive health care and to encourage men to schedule physician visits. Also needed are efforts at the community and practice levels to enhance health-seeking behavior and improve men's understanding of their health. The efficacy of all of these efforts depends on addressing the unique features of the masculine gender identity.

LARGE-SCALE CAMPAIGNS

The Men's Health Network has established International Men's Health Week as the week leading up to Father's Day each June [336]. Highlights of the Week include health fairs, screening, and distribution of educational materials in workplaces and elsewhere in the community. Other Men's Health Network campaigns "speak" to men, with names such as "Men at Work" and "Time Out for Men's Health" maintenance schedule [336].

Some have suggested that large-scale campaigns that feature well-respected athletes and actors can increase appeal to men [45]. However, others have cautioned that, while celebrity endorsement of screening may have a positive effect on men, such campaigns may not target the right audience or address all the pertinent facts [337].

The optimal educational campaigns are those that target men and attempt to challenge men's perceptions of health and the need for preventive care. For example, to heighten awareness about depression in men, the National Institute of Mental Health launched the "Real Men, Real Depression" campaign and produced an accompanying booklet "Men and Depression" [335]. Both the campaign and the booklet feature quotations and vignettes from men who have been treated for depression.

Analysis of data about men who lack a usual source of care indicates that such men are more apt to be younger, Hispanic, single (never married or divorced), without insurance, and living in the southern or western parts of the United States or in urban areas [39]. Education about the importance of health care should be provided through public service announcements, media, schools, and workplaces as appropriate to target these groups of men [39]. Given men's propensity to see a physician only when they are sick or have symptoms, educational messages should emphasize the importance of preventive visits and discourage symptoms as a motivator for seeking health care [338]. Resources should also be culturally appropriate for diseases and conditions that disproportionately affect men of certain races and ethnicities.

As a result of men's reluctance to seek help, educational strategies that provide anonymity may be particularly well-suited for them [45; 339]. Print resources should be distributed through a variety of venues that men frequent, such as the workplace, schools, religious organizations, sports arenas, men's organizations or clubs, pubs, supermarkets, car and motorbike dealerships, and barbershops [45; 339; 340]. In addition, digital media may be effective, especially for younger men. A study showed that 90-second educational video clips on men's health, sent by e-mail, were well-received [341].

Many community-based educational programs targeting men have been successful, especially among men in racial/ethnic minority populations. For example, a culturally tailored, language-concordant navigator program was successful at improving rates of colorectal cancer screening at a healthcare center serving a low-income, ethnically and linguistically diverse community [342]. The Black Barbershop Health Outreach Program (BBHOP) has been an effective program for promoting cardiovascular health, and the program can be used as a model for other health topics [343]. Another barbershop-based program involves training barbers to educate their clients about prostate cancer [344]. Focus groups of men from churches of a variety of denominations have indicated that church-based education may also be effective [35; 345].

PRACTICE-LEVEL STRATEGIES

Men are more likely to use healthcare services that are quick and easy; consequently, making physician visits more convenient may increase the number of men who seek health care [339; 346]. Evening office hours and walk-in appointments may be helpful in addressing this problem, and male-specific group appointments have been effective in enhancing men's education on health issues, with high satisfaction reported by participants [347]. In addition, nontraditional settings for healthcare services have been suggested, such as within workplaces and near sports venues, shopping centers, and men's organizations [45; 339].

Men who are most likely to seek preventive care are those who live with a spouse or partner [348]. In addition, men have been shown to have strong feelings about women as the arbiters of health for the entire family and are likely to be influenced to seek health care by a member of the opposite sex; this is especially true for men in racial/ethnic minority populations [35; 40; 43; 45]. Given these findings, healthcare providers should talk to their female patients to emphasize the importance of encouraging the men in their families to seek routine health care. Additionally, all interactions with male patients should be used to promote routine health assessments. Men who seek help for acute problems should be reminded of the need for screening and be counseled about risk factors [45; 349]. A subsequent visit should be encouraged, and this message may be reinforced by providing a take-home reminder or by scheduling an appointment while the patient is in the office [45].

As noted earlier, fostering open communication in a nonjudgmental manner is essential. Clinicians should take care to raise health issues with their male patients and to overcome some masculine traits in communication, such as a reluctance to ask questions [240]. Asking open-ended questions may be helpful in some cases, and providing a questionnaire before the visit may foster discussion [45]. Assumptions about a man's willingness to share information should be avoided, as men have been more forthcoming when they receive cues that they are expected to provide valuable information [350]. Lastly, men often have a need to feel empowered, and shared decision making is important [351].

Decision aids are available in a variety of formats and literacy levels, and they may be useful in helping men make informed decisions about care [119; 129; 130; 131]. Also, clinicians should review decision aids and educational resources carefully before using them to ensure that the information is comprehensive and accurate [129]. Resources should be available about the risks involved with not wearing a safety belt or motorcycle helmet, driving while intoxicated, speeding, handling firearms, stress/anger management, and safety issues in the home and at work.

ONLINE HEALTH RESOURCES FOR MEN
General
American Heart Association *Information on cardiovascular disease, diabetes, cerebrovascular disease; tools for healthy lifestyle habits (diet, exercise, smoking) ("Getting Healthy" section).* https://www.heart.org
Centers for Disease Control and Prevention Men's Health *Area devoted to men's health issues.* https://www.cdc.gov/nchs/fastats/mens-health.htm
Men's Health Network *Site devoted to men's health issues. Publishes Blueprint for Men's Health: A Guide to a Healthy Lifestyle.* https://www.menshealthnetwork.org
Cancer
American Cancer Society *Cancer prevention and early detection worksheet for men—a tool to help men identify risks and understand preventive measures and early detection strategies for prostate cancer and lung cancer; includes links to information on various types of cancer. Information on prevention, screening, diagnosis, and treatment of all types of cancer.* https://www.cancer.org
National Cancer Institute *Information on prevention, screening, diagnosis, and treatment of all types of cancer.* https://www.cancer.gov
National Comprehensive Cancer Network *Patient guides (based on evidence-based guidelines) on the treatment of a variety of cancers.* https://www.nccn.org/patientresources/patient-resources
Smoking Cessation
Centers for Disease Control and Prevention Smoking and Tobacco Use https://www.cdc.gov/tobacco
National Cancer Institute https://www.cancer.gov/about-cancer/causes-prevention/risk/tobacco
Genitourinary Disorders
Urology Care Foundation, The Official Foundation of the American Urological Association *Information on benign prostatic hypertrophy, prostate cancer, erectile dysfunction, and other urologic conditions.* https://www.urologyhealth.org
Depression
National Institute of Mental Health *Articles on depression in men, as well as personal stories of men with depression.* https://www.nimh.nih.gov/health/topics/depression
Alcohol and Drug Use
National Institute on Alcohol Abuse and Alcoholism *Research-based information on drinking its effect on health.* https://www.niaaa.nih.gov/alcohol-health
National Institute on Drug Abuse https://nida.nih.gov
Sexually Transmitted Infections
Centers for Disease Control and Prevention Sexually Transmitted Diseases https://www.cdc.gov/std
Source: Compiled by Author — *Table 18*

RECOMMENDATIONS AND SUGGESTIONS FOR HEALTH ASSESSMENTS, SCREENING, AND COUNSELING FOR MEN			
Intervention	**Suggested Frequency**	**Relevant Ages (Years)**	**Recommending Body/Source**
Routine physical examination (with determination of height, weight, and body mass index)	Every 3 to 5 years	18 to 39	—
	Every 1 to 2 years	40 to 49	
	Yearly	50 and older	
Blood pressure screening	Every 1 to 2 years, depending on blood pressure	Beginning at 18	USPSTF
Cholesterol level/lipid profile	At least every 5 years	40 to 75 (earlier if at increased risk)	USPSTF
Diabetes (type 2) and prediabetes screening	Every 3 years	35 to 70 in men with overweight or obesity	USPSTF
Cancer-related check-up (for cancer of the thyroid, testicles, lymph nodes, oral cavity, and skin)	At each routine examination	Beginning at 20	ACS
Assessment, Counseling, and Behavioral Interventions as Appropriate			
Tobacco use	At each routine examination	All men	USPSTF
Alcohol use	At each routine examination	All men	USPSTF
Drug (illicit) use	At each routine examination	All men	ASAM
Depression	At each routine examination, when staff-assisted depression care supports are in place	All men	USPSTF
Counseling			
Healthy diet	At each routine examination	Men with risk factors for cardiovascular disease and diet-related chronic diseases	USPSTF
Exercise	At each routine examination	All men	AAFP, AMA, AHA, CDC
Sun avoidance and use of sunscreen	At each routine examination	All men	ACS, AAD, NIH Consensus Panel
Skin examination for melanoma	At each routine examination	All men	ACS
Avoidance of sexually transmitted infections	At each routine examination	All sexually active men at increased risk	CDC
Risk of HIV infection	At each routine examination	All men who have sex with men	AAFP
Risk for hepatitis A and B	At each routine examination	All men who have sex with men and others at high risk	AAFP
Sexual health	At each routine examination	All men	AAFP

Table 19 continues on next page.

Clinicians can help ensure that their patients receive reliable online information by posting the addresses of authoritative websites in their office, in print resources, and within the community (***Table 18***). Healthcare providers should be familiar with established guidelines for screening among men in various age categories and should emphasize the relative benefits and disadvantages of screening (***Table 19***). The Electronic Preventive Services Selector (ePSS) is an application for mobile devices that provides USPSTF information on screening and counseling, as well as preventive medication services. The AUA offers the Men's Health Checklist, a compact, downloadable reference for coordinating care of men; it is available at https://www.auanet.org/publications/mens-health-checklist.

RECOMMENDATIONS AND SUGGESTIONS FOR HEALTH ASSESSMENTS, SCREENING, AND COUNSELING FOR MEN *(Continued)*			
Intervention	**Suggested Frequency**	**Relevant Ages (Years)**	**Recommending Body/Source**
Screening			
Colorectal cancer	Every 1 to 10 years, depending on risk and test used	45 to 75	USPSTF
Osteoporosis	At each routine examination	By 65	ACP
HIV	Not established (encourage men to be tested)	15 to 65 (younger and older men at increased risk)	USPSTF
Visual acuity (comprehensive eye examination)	Yearly	Beginning at 65	AAO
Abdominal aortic aneurysm (ultrasonography)	Once	65 to 75 (men who have ever smoked)	USPSTF
Immunizations			
Tetanus, diphtheria, pertussis (Td/Tdap)	Once (Tdap), with booster (Td or Tdap) every 10 years	All men	ACIP
Influenza vaccine	Yearly	All men	ACIP
Pneumococcal vaccine	Once	65 and older (19 to 64 if risk) (one or two doses, depending on vaccine)	ACIP
Hepatitis A	Once	All men, if risk factors are present (2 or 3 doses, depending on vaccine)	ACIP
Hepatitis B	Once	19 to 59, and 60 and older if risk factors are present (2, 3, or 4 doses, depending on vaccine or condition)	ACIP
Human papillomavirus (HPV)	Once	19 to 26 (2 or 3 doses depending on age at initial vaccination and condition) 26 to 45, if desired based on shared clinical decision making	ACIP
Zoster (shingles)	Once	50 and older or younger if risk factors present (2 doses)	ACIP
Haemophilus influenzae type b (Hib)	Once	All men, if risk factors present (1 or 3 doses depending on indication)	ACIP
Meningococcal A, C, W, Y	Once	All men, if risk factors present (1 or 2 doses depending on indication)	ACIP
Meningococcal B	Once	All men, if risk factors present (2 or 3 doses depending on vaccine and indication)	ACIP

Source: [58; 284; 298; 352] *Table 19*

Routine health assessments should include screening and counseling about lifestyle factors that have an impact on health, such as substance misuse, diet, exercise, safe sex practices, and sun protection. Education about sun protection and self-examination for moles is especially important given the increase in the lifetime risk for melanoma among men [24]. At each routine visit, healthcare providers should assess each male patient's individual lifestyle, psychosocial, and occupational risks. The high rate of unintentional injury as a cause of death for men calls for increased attention to safety issues.

CONCLUSION

In response to high morbidity and mortality rates among men over the past decade, researchers have focused increased attention on men's health issues. Many factors contribute to health-related gender disparities, but male gender identity is thought to have the most significant impact. The characteristics of the traditional male role (self-reliance, independence, and maintenance of a strong image) cause men to seek health care much less often than women, especially for preventive care. As a result, disease in men may remain undiagnosed until more advanced stages. A tendency for risky behavior, another aspect of the traditional male role, also has a significant effect on men's mortality, as evidenced by unintentional injury being the third leading cause of death among all men. Such behaviors as substance misuse and non-use of protective devices (safety belts, helmets) begin in adolescence and continue into adulthood; across all age-groups, the rates of these behaviors are higher for male individuals than for female individuals. These behaviors are strongly associated with both chronic diseases and all-cause mortality in men.

Prostate cancer is a major concern for many men, and the issues of prostate cancer screening and treatment options are complex and confusing for patients as well as healthcare professionals. Informed decision making is also an important aspect of many benign conditions, such as prostatitis, BPH, premature ejaculation, erectile dysfunction, and late-onset hypogonadism. These conditions have a substantial effect on the quality of life for men, yet men are reluctant to initiate conversations on these topics because of embarrassment and a hesitancy to express feelings and symptoms. It is important to create an environment of open dialogue and ask questions to help men discuss these topics.

The psychosocial well-being of men is important for overall health. Alcohol misuse and depression have both been underdiagnosed in men, especially older men, and clinicians should remain diligent in screening for these disorders in their male patients.

Improvement of men's health relies on men gaining a greater understanding of their risk factors and becoming more involved in the health issues that affect them. Healthcare professionals have a critical role in helping to develop strategies to enhance men's utilization of healthcare resources and in encouraging their male patients to engage in screening and preventive care and to adopt healthy behaviors. Health assessments and screening should be carried out according to established guidelines, with consideration given to each individual patient's specific risks.

Customer Information/Answer Sheet/Evaluation insert located between pages 88–89.

COURSE TEST - #53764 MEN'S HEALTH ISSUES

This is an open book test. Please record your responses on the Answer Sheet.
A passing grade of at least 70% must be achieved in order to receive credit for this course.

This 15 CE Credit Hour activity must be completed by June 30, 2025.

Accreditations & Approvals: *NetCE is an ADA CERP Recognized Provider.*

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NetCE is a Registered Provider with the Dental Board of California. Provider number RP3841.
Completion of this course does not constitute authorization for the attendee to perform any services that he or she is not legally authorized to perform based on his or her permit type.

Designations of Credit: *NetCE designates this activity for 15 continuing education credits.*

AGD Subject Code: 149.

This course meets the Dental Board of California's requirements for 15 units of continuing education.
Dental Board of California course #15-3841-00355.

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1. Which of the following causes of death occurs at a higher rate for men compared with women?
- *A) Stroke*
- *B) Suicide*
- *C) Alzheimer disease*
- *D) Pneumonia/influenza*

2. Which of the following causes of death is more prevalent among Black men than men of other races or ethnicities?
- *A) Diabetes*
- *B) Homicide*
- *C) Chronic liver disease*
- *D) Cerebrovascular diseases*

3. The cancer accounting for the greatest number of deaths in men is
- *A) lung cancer.*
- *B) liver cancer.*
- *C) prostate cancer.*
- *D) pancreatic cancer.*

4. Which of the following statements about deaths caused by unintentional injury is TRUE?
- *A) The highest rate is found among White men.*
- *B) The number of occupational deaths is higher for men than women.*
- *C) The number of deaths related to motor vehicle accidents is lower for men than women.*
- *D) The number of deaths caused by unintentional injury among men in the United States is lower than the median for every other country around the world.*

5. Which of the following best describes the effect of male gender identity on men's health?
- *A) Men are more likely than women to have screening tests.*
- *B) Most men seek care as soon as possible when they are sick.*
- *C) Men are more likely than women to lack a usual source of health care.*
- *D) Men are forthcoming about symptoms with their healthcare providers.*

6. Acute bacterial prostatitis is
- A) *the most common type of prostatitis.*
- B) *the easiest type of prostatitis to diagnose.*
- C) *more common in men older than 40 years of age.*
- D) *the type that causes the most significant impact on the quality of life.*

7. When diagnosing prostatitis,
- A) *the evaluation should not include a urinalysis and urine culture.*
- B) *the Meares-Stamey test is helpful for diagnosing chronic pelvic pain syndrome.*
- C) *a history of recurrent urinary tract infections is indicative of acute bacterial prostatitis.*
- D) *the National Institute of Health (NIH) Chronic Prostatitis Symptom Index should be completed to obtain a baseline for the severity of symptoms.*

8. Which of the following statements about the treatment of chronic prostatitis/chronic pelvic pain syndrome is most accurate?
- A) *Trimethoprim should not be used.*
- B) *Pregabalin has improved symptoms.*
- C) *An alpha-blocker alone has provided more benefit than an alpha-blocker plus antibiotic.*
- D) *Fluoroquinolones have improved symptoms even when no bacterial cause has been identified.*

9. An established risk factor for benign prostatic hypertrophy (BPH) is
- A) *Asian race.*
- B) *increased age.*
- C) *a genetic mutation*
- D) *family history of cancer.*

10. According to American Urological Association guidelines, which of the following is the preferred approach for a man who has BPH with mild symptoms (a score of 6 on the AUA Symptom Index) and no prostatic enlargement?
- A) *Silodosin*
- B) *Dutasteride*
- C) *Watchful waiting*
- D) *Transurethral needle ablation*

11. Which of the following has NOT been found to be a risk factor for prostate cancer?
- A) *Black race*
- B) *Advanced age*
- C) *Family history*
- D) *Sexual activity*

12. In regard to the prevention of prostate cancer, finasteride has been associated with
- A) *increased time to onset of disease.*
- B) *decreased risk for all-cause mortality.*
- C) *increased risk for high-grade prostate cancer.*
- D) *increased risk for prostate cancer-specific mortality.*

13. Prostate cancer screening has been shown to lead to
- A) *lower mortality rates.*
- B) *decreased need for biopsy.*
- C) *diagnosis at an earlier stage.*
- D) *higher prevalence of definitive disease.*

14. Which of the following statements about prostate-specific antigen (PSA) is TRUE?
- A) *A PSA level of 1.0 ng/mL is a recommended threshold for biopsy.*
- B) *Free PSA levels are helpful for men with PSA levels greater than 10 ng/mL.*
- C) *PSA density offers significant benefits compared with other PSA derivatives.*
- D) *PSA velocity is helpful for longitudinal monitoring of men younger than 50 years.*

15. According to research on the communication of risk, men best understand risk when it is discussed in the context of the
- A) *odds ratio.*
- B) *absolute risk reduction.*
- C) *number needed to treat.*
- D) *the probability of a decrease in mortality.*

16. A man has clinically localized prostate cancer (T1c), with a Gleason score of 4 and a PSA level of 8 ng/mL. He is 68 years of age and has a life expectancy of more than 10 years. According to NCCN guidelines, which of the following is the recommended approach?
- A) *Radiation therapy*
- B) *Active surveillance*
- C) *Radical prostatectomy*
- D) *Androgen deprivation therapy*

17. The recommended initial therapy for metastatic prostate cancer is
- A) *brachytherapy.*
- B) *chemotherapy.*
- C) *radical prostatectomy.*
- D) *androgen deprivation therapy.*

Test questions continue on next page ➞

18. Which of the following is a distinctive sign of testicular torsion?
- A) *Insidious onset of pain*
- B) *Absence of the cremasteric reflex*
- C) *Increased blood flow on Doppler ultrasonography*
- D) *All of the above*

19. The primary symptom associated with acute epididymitis is
- A) *urinary retention.*
- B) *unilateral tenderness.*
- C) *pain with extended standing.*
- D) *sudden onset of pain in both testicles.*

20. Varicoceles usually are
- A) *more common in infertile men.*
- B) *a source of substantial unilateral pain.*
- C) *more pronounced when the patient is recumbent.*
- D) *associated with a hardness of the testes in older men.*

21. The primary risk factor for testicular cancer is
- A) *cryptorchidism.*
- B) *testicular dysgenesis.*
- C) *family history of cancer.*
- D) *history of cancer in the contralateral testicle.*

22. Nonseminoma testicular cancer is associated with an elevated
- A) *AFP level.*
- B) *LDH level.*
- C) *beta-hCG level.*
- D) *beta-hCG level and a normal AFP level.*

23. The primary adverse effect of chemotherapy for testicular cancer is
- A) *hearing loss.*
- B) *oligospermia.*
- C) *erectile dysfunction.*
- D) *secondary leukemias.*

24. Which of the following statements about male breast cancer is most accurate?
- A) *Lumpectomy is rarely performed.*
- B) *The BRCA2 mutation is found in most cases.*
- C) *Adjuvant hormone therapy has a limited role in treatment.*
- D) *Sentinel lymph node biopsy has not been found to be effective.*

25. Premature ejaculation
- A) *is best treated with behavioral therapy alone.*
- B) *is most common in men who are 60 years of age or older.*
- C) *can be treated with one of several FDA-approved medications.*
- D) *should not be diagnosed on the basis of the sexual history alone.*

26. Which of the following has the strongest association with erectile dysfunction?
- A) *Obesity*
- B) *Depression*
- C) *History of smoking*
- D) *Cardiovascular disease*

27. All four phophodiesterase-5 inhibitors used for treatment of erectile dysfunction are similar with respect to
- A) *serum half-life.*
- B) *side effect profile.*
- C) *duration of action.*
- D) *time to maximum serum level.*

28. Treatment with a phosphodiesterase-5 inhibitor is contraindicated for patients who take
- A) *amyl nitrite.*
- B) *nitroglycerin.*
- C) *an alpha blocker.*
- D) *Any of the above*

29. Late-onset hypogonadism is
- A) *equivalent to menopause in women.*
- B) *well defined by a level of testosterone.*
- C) *similar to hypogonadism in younger male individuals.*
- D) *associated with a loss of sexual satisfaction and overall well-being.*

30. According to guidelines from the Endocrine Society, which of the following statements about testosterone therapy is TRUE?
- A) *All men should be screened for androgen deficiency.*
- B) *A diagnostic testosterone level can be determined at any time of day.*
- C) *Testosterone therapy should not be used for men with a hematocrit of more than 40%.*
- D) *Men receiving testosterone therapy should be monitored three to six months after initiation of treatment and then annually.*

31. Male infertility
- A) *is correctable in most cases.*
- B) *is not affected by prescription medications.*
- C) *is the only cause in most cases of infertile couples.*
- D) *affects men younger than 25 years of age twice as often as older men.*

32. Which of the following statements about the screening and prevention of STIs for men is TRUE?
- A) *Men at increased risk should be routinely screened for chlamydia.*
- B) *Men at low risk for gonorrhea should be screened every three to five years.*
- C) *Screening for herpes simplex virus type 2 should be done for asymptomatic men.*
- D) *Young male individuals (13 to 26 years of age) should receive the HPV vaccine if they have not already.*

33. According to the CDC, men who are evaluated for gonorrhea should also be evaluated for infection with
- A) *chlamydia.*
- B) *hepatitis B.*
- C) *herpes simplex virus 2.*
- D) *human papillomavirus.*

34. Which of the following is recommended by the CDC for the treatment of gonorrhea?
- A) *Acyclovir*
- B) *Benzathine penicillin*
- C) *Ceftriaxone and doxycycline*
- D) *Azithromycin and penicillin G*

35. According to Figure 3, which of the following statements about screening for men who have sex with men is TRUE?
- A) *High-risk patients should be assessed yearly.*
- B) *Annual HIV screening should not be considered for low-risk men.*
- C) *Hepatitis A and B immunization should be assessed in high-risk patients only.*
- D) *Anal NAAT should be considered for men who have receptive anal intercourse.*

36. Which of the following statements about substance misuse is TRUE?
- A) *The misuse of illicit drugs is expected to decrease as the general population ages.*
- B) *The rate of alcohol misuse is higher among younger women than among younger men.*
- C) *Men are less likely than women to have psychosocial problems related to substance misuse.*
- D) *Men older than 65 years are much more likely to be "problem" drinkers than women in that age group.*

37. The alcohol screening tool that is most accurate for detecting problem drinking is the
- A) *CAGE questionnaire.*
- B) *Michigan Alcohol Screening Test.*
- C) *Alcohol-Related Problems Survey.*
- D) *Alcohol Use Disorders Identification Test.*

38. The depression treatment approach that offers the best results for most men is
- A) *pharmacologic therapy alone.*
- B) *cognitive behavioral therapy alone.*
- C) *interpersonal psychotherapy alone.*
- D) *psychotherapy and pharmacologic therapy.*

39. A study has shown that which of the following may be effective for educating younger men about health issues?
- A) *Health fairs*
- B) *Support groups*
- C) *Short video clips*
- D) *Pamphlets emphasizing the importance of prevention*

40. For a heterosexual man 32 years of age with no recognized risk factors, which of the following assessments/screenings should be completed at each routine examination?
- A) *Lipid profile*
- B) *Visual acuity*
- C) *Cancer-related check-up*
- D) *Abdominal aortic aneurysm*

Be sure to transfer your answers to the Answer Sheet located on the envelope insert.
DO NOT send these test pages to NetCE. Retain them for your records.
PLEASE NOTE: Your postmark or facsimile date will be used as your test completion date.

Course Availability List

These courses may be ordered by mail on the Customer Information form located between pages 60–61.
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Additional titles are also available.
www.NetCE.com

ORAL AND MAXILLOFACIAL TRAUMA
#50002 • 5 Hours • $45
Purpose: The purpose of this course is to provide dental professionals with a deeper understanding of and appreciation for oral and maxillofacial trauma.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals, especially those who work in emergency and trauma care.
AGD Subject Code: 070

AIRWAY MANAGEMENT: BASICS FOR HEALTHCARE PROVIDERS


#50010 • 5 Hours • $45
Purpose: Gaining control of the airway in a compromised patient is absolutely crucial. The purpose of this course is to provide dental professionals with the clinical knowledge needed to rapidly and effectively assess the patient's airway and intervene efficiently to begin to ventilate the patient in distress.
Faculty: Richard E. Haas, PhD, CRNA (Retired), LTC US Army Nurse Corps (Retired)
Audience: This course is designed for dental professionals involved in monitoring and maintaining patients' airways.
AGD Subject Code: 142

HIPAA PRIVACY AND SECURITY


#51140 • 5 Hours • $45
Purpose: The purpose of this course is to provide information that will allow dental professionals to more easily comply with the Privacy and Security Rules defined by HIPAA.
Faculty: Carol Shenold, RN, ICP
Audience: This course is designed for all dental professionals.
AGD Subject Code: 566

SMOKING AND SECONDHAND SMOKE


#51784 • 10 Hours • $90
Purpose: The purpose of this course is to provide dental professionals with a formal educational opportunity that will address the impact of tobacco smoking and secondhand exposure in public health and disease as well as interventions to promote smoking cessation among their patients.
Faculty: Mark S. Gold, MD, DFASAM, DLFAPA
Audience: This course is designed for dental professionals who may intervene to stop patients from smoking.
AGD Subject Code: 158

DENTAL CARE FOR SPECIAL NEEDS PATIENTS
#51913 • 5 Hours • $45
Purpose: The purpose of this course is to focus awareness upon the difficult oral health issues that special needs patients face on a daily basis and to provide dental professionals with the necessary information to improve patients' oral and systemic health.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for dental professionals involved in assessing and promoting optimum oral care for special needs patients.
AGD Subject Code: 750

ORAL HEALTH ISSUES DURING PREGNANCY


#53073 • 2 Hours • $18
Purpose: The purpose of this course is to provide dental professionals with the information necessary to appropriately intervene to promote good oral health in pregnant patients, with lasting positive effects to the patient and fetus.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals involved in the care of pregnant patients.
AGD Subject Code: 750

Prices are subject to change. Visit www.NetCE.com for a list of current prices.

Course Availability List *(Cont'd)*

ORAL AND MAXILLOFACIAL INFECTIONS
#54032 • 5 Hours • $45
Purpose: The purpose of this course is to emphasize to dental professionals the importance of quickly identifying and treating oral and maxillofacial infections.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals involved in the identification and treatment of oral and maxillofacial infections.
AGD Subject Code: 310

ORAL MANIFESTATIONS OF SEXUALLY TRANSMITTED INFECTIONS
#54072 • 5 Hours • $45
Purpose: The purpose of this course is to introduce dental professionals to the pathophysiology of STIs, their oral manifestations, systemic complications, available treatment options, and any modifications required for dental treatment.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals.
AGD Subject Code: 148

NUTRITION AND ORAL HEALTH
#54120 • 6 Hours • $54
Purpose: The purpose of this course is to provide clinicians with a better understanding of the impact of nutrition on dental health and care.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals.
AGD Subject Code: 150

THE CORONAVIRUS DISEASE (COVID-19) PANDEMIC


#54151 • 2 Hours • $18
Purpose: This course is designed for dental professionals who may identify or educate patients regarding coronavirus infection.
Faculty: John M. Leonard, MD
Audience: This course is designed for dental professionals who may identify or educate patients regarding coronavirus infection.
AGD Subject Code: 148

MULTIDRUG-RESISTANT MICROBIAL INFECTIONS


#54214 • 5 Hours • $45
Purpose: The purpose of this course is to provide an overview of the basics of antimicrobial resistance mechanisms and to review the classes of multidrug-resistant pathogens currently prevalent in dental facilities and the community, including guidelines for prevention and options for therapy.
Faculty: Carol Shenold, RN, ICP; John M. Leonard, MD
Audience: This course is designed for dental professionals involved in the treatment and care of patients with infections.
AGD Subject Code: 148

ANALGESICS IN DENTISTRY
#55044 • 5 Hours • $45
Purpose: The purpose of this course is to describe new reports and new information on analgesics for the dental professional to use in determining the best pharmacotherapeutic approach in those situations requiring oral analgesics.
Faculty: Richard L. Wynn, BSPharm, PhD
Audience: This course is designed for all dental professionals.
AGD Subject Code: 200

ANTIBIOTICS REVIEW


#55073 • 5 Hours • $45
Purpose: The purpose of this course is to provide a review of the major classes of antibiotics and their characteristics as well as an overview of selected individual agents within each class that are most useful for today's clinical practitioner.
Faculty: Donna Coffman, MD
Audience: This course is designed for dental professionals who prescribe or administer antibiotics to patients.
AGD Subject Code: 148

MEDICAL MARIJUANA AND OTHER CANNABINOIDS
#55172 • 5 Hours • $45
Purpose: The purpose of this course is to provide dental professionals with unbiased and evidence-based information regarding the use of marijuana and other cannabinoids for the treatment of medical conditions.
Faculty: Mark Rose, BS, MA
Audience: This course is designed for dental professionals involved in the care of patients who use or who are candidates for the therapeutic use of marijuana and other cannabinoids.
AGD Subject Code: 149

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Course Availability List *(Cont'd)*

LOCAL ANESTHETICS IN DENTISTRY
#55182 • 5 Hours • $45
Purpose: The purpose of this course is to provide dental professionals with a comparative perspective on the use of local anesthetics.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals whose patients may be administered local anesthetics.
AGD Subject Code: 340

MEDICATION USE IN DENTISTRY
#55253 • 5 Hours • $45
Purpose: As the number of medications and range of uses grow, dental prescribing has become increasingly complex. The purpose of this course is to provide dental professionals with the knowledge necessary to effectively prescribe and to monitor the effects of commonly used drugs.
Faculty: Mark J. Szarejko, DDS, FAGD
Audience: This course is designed for all dental professionals.
AGD Subject Code: 010

COCAINE USE DISORDER
#56944 • 5 Hours • $45
Purpose: The purpose of this course is to provide a current, evidence-based overview of cocaine abuse and dependence and its treatment, in order to allow dental professionals to more effectively identify, treat or refer cocaine-abusing patients.
Faculty: Mark Rose, BS, MA
Audience: This course is designed for dental professionals who are involved in the evaluation or treatment of persons who use cocaine.
AGD Subject Code: 157

DENTAL ETHICS: A BRIEF REVIEW
#57423 • 2 Hours • $18
Purpose: The purpose of this course is to provide dental professionals with a review of ethics and ethical theoretical systems that pertain to their profession. The content of this course is not intended as legal advice for patients or practitioners.
Faculty: William E. Frey, DDS, MS, FICD; Michelle Nichols, RN, BSN, MA
Audience: This course is designed for all dental professionals.
AGD Subject Code: 555

HERBAL MEDICATIONS: AN EVIDENCE-BASED REVIEW
#58394 • 10 Hours • $90
Purpose: Considering the pharmacological interactions between herbal medications (HMs) and conventional medications, it is paramount to increase the awareness and knowledge of dental professionals about HMs. The purpose of this course is to increase dental professionals' awareness of the potential risks and benefits of HMs from an evidence-based perspective and promote the planned inclusion of HM use in patients' medical history. This course should allow dental professionals to discuss HMs in a knowledgeable and succinct manner with patients and colleagues.
Faculty: A. José Lança, MD, PhD
Audience: Considering the widespread availability and increased use of herbal medications, this course is designed for dental professionals who will benefit from the course.
AGD Subject Code: 010

SLEEP DISORDERS
#58883 • 10 Hours • $90
Purpose: Many of the complications associated with sleep disorders are preventable, making early diagnosis and appropriate treatment vital. The purpose of this course is to provide dental professionals with the information necessary to identify and contribute to the treatment of sleep disorders, thereby improving patients' quality of life and preventing possible complications.
Faculty: Teisha Phillips, RN, BSN
Audience: This course is designed for all dental professionals who are involved in the care of patients experiencing a sleep-related disorder.
AGD Subject Code: 730

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	53764	Men's Health Issues / 15 CE Credit Hours	$135

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☐	51140	HIPAA Privacy and Security / 5	$45
☐	51784	Smoking and Secondhand Smoke / 10	$90
☐	51913	Dental Care for Special Needs Patients / 5	$45
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☐	54072	Oral Manifestations of Sexually Transmitted Infections / 5	$45
☐	54120	Nutrition and Oral Health / 6	$54
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#51293 THE CALIFORNIA DENTAL PRACTICE ACT—2 CE CREDIT HOURS Please refer to pages 28–29.

Expiration Date: 01/31/25 *May be taken individually for $18*

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	A	B	C	D		A	B	C	D
1.	❍	❍	❍	❍	6.	❍	❍	❍	❍
2.	❍	❍	❍	❍	7.	❍	❍	❍	❍
3.	❍	❍	❍	❍	8.	❍	❍	❍	❍
4.	❍	❍	❍	❍	9.	❍	❍	❍	❍
5.	❍	❍	❍	❍	10.	❍	❍	❍	❍

#59563 DENTAL CONSIDERATIONS FOR GERIATRIC PATIENTS—5 CE CREDIT HOURS Please refer to pages 65–67.

Expiration Date: 05/31/24 *May be taken individually for $45*

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1.	❍	❍	❍	❍	6.	❍	❍	❍	❍	11.	❍	❍	❍	❍	16.	❍	❍	❍	❍
2.	❍	❍	❍	❍	7.	❍	❍	❍	❍	12.	❍	❍	❍	❍	17.	❍	❍	❍	❍
3.	❍	❍	❍	❍	8.	❍	❍	❍	❍	13.	❍	❍	❍	❍	18.	❍	❍	❍	❍
4.	❍	❍	❍	❍	9.	❍	❍	❍	❍	14.	❍	❍	❍	❍	19.	❍	❍	❍	❍
5.	❍	❍	❍	❍	10.	❍	❍	❍	❍	15.	❍	❍	❍	❍	20.	❍	❍	❍	❍

#53764 MEN'S HEALTH ISSUES—15 CE CREDIT HOURS Please refer to pages 114–117.

Expiration Date: 06/30/25 *May be taken individually for $135*

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1.	❍	❍	❍	❍	11.	❍	❍	❍	❍	21.	❍	❍	❍	❍	31.	❍	❍	❍	❍
2.	❍	❍	❍	❍	12.	❍	❍	❍	❍	22.	❍	❍	❍	❍	32.	❍	❍	❍	❍
3.	❍	❍	❍	❍	13.	❍	❍	❍	❍	23.	❍	❍	❍	❍	33.	❍	❍	❍	❍
4.	❍	❍	❍	❍	14.	❍	❍	❍	❍	24.	❍	❍	❍	❍	34.	❍	❍	❍	❍
5.	❍	❍	❍	❍	15.	❍	❍	❍	❍	25.	❍	❍	❍	❍	35.	❍	❍	❍	❍
6.	❍	❍	❍	❍	16.	❍	❍	❍	❍	26.	❍	❍	❍	❍	36.	❍	❍	❍	❍
7.	❍	❍	❍	❍	17.	❍	❍	❍	❍	27.	❍	❍	❍	❍	37.	❍	❍	❍	❍
8.	❍	❍	❍	❍	18.	❍	❍	❍	❍	28.	❍	❍	❍	❍	38.	❍	❍	❍	❍
9.	❍	❍	❍	❍	19.	❍	❍	❍	❍	29.	❍	❍	❍	❍	39.	❍	❍	❍	❍
10.	❍	❍	❍	❍	20.	❍	❍	❍	❍	30.	❍	❍	❍	❍	40.	❍	❍	❍	❍

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1. Was the course content new or review?
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4. Did the course content support the stated course objective?
5. Did the course content demonstrate the author's knowledge of the subject?
6. Was the course content free of bias?
7. Before completing this course, did you identify the necessity for education on the topic to improve your professional practice?
8. Have you achieved all of the stated learning objectives of this course?
9. Has what you think or feel about this topic changed?
10. Did evidence-based practice recommendations assist in determining the validity or relevance of the information?
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2. _____ Hours	2. _____ Hours	2. _____ Hours	2. _____ Hours
3. ☐ Yes ☐ No	3. ☐ Yes ☐ No	3. ☐ Yes ☐ No	3. ☐ Yes ☐ No
4. ☐ Yes ☐ No	4. ☐ Yes ☐ No	4. ☐ Yes ☐ No	4. ☐ Yes ☐ No
5. ☐ Yes ☐ No	5. ☐ Yes ☐ No	5. ☐ Yes ☐ No	5. ☐ Yes ☐ No
6. ☐ Yes ☐ No	6. ☐ Yes ☐ No	6. ☐ Yes ☐ No	6. ☐ Yes ☐ No
7. ☐ Yes ☐ No	7. ☐ Yes ☐ No	7. ☐ Yes ☐ No	7. ☐ Yes ☐ No
8. ☐ Yes ☐ No	8. ☐ Yes ☐ No	8. ☐ Yes ☐ No	8. ☐ Yes ☐ No
9. ☐ Yes ☐ No	9. ☐ Yes ☐ No	9. ☐ Yes ☐ No	9. ☐ Yes ☐ No
10. ☒ N/A	10. ☒ N/A	10. ☐ Yes ☐ No	10. ☐ Yes ☐ No
11. ☐ Yes ☐ No	11. ☐ Yes ☐ No	11. ☐ Yes ☐ No	11. ☐ Yes ☐ No
12. ☐ Yes ☐ No	12. ☐ Yes ☐ No	12. ☐ Yes ☐ No	12. ☐ Yes ☐ No

#51293 The California Dental Practice Act — If you answered yes to question #12, how specifically will this activity enhance your role as a member of the interprofessional team? _____

_____

#58583 Infection Control for Dental Professionals: The CA Req. — If you answered yes to question #12, how specifically will this activity enhance your role as a member of the interprofessional team? _____

_____

#59563 Dental Considerations for Geriatric Patients — If you answered yes to question #12, how specifically will this activity enhance your role as a member of the interprofessional team? _____

_____

#53764 Men's Health Issues — If you answered yes to question #12, how specifically will this activity enhance your role as a member of the interprofessional team? _____

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