Medical History Evaluation

A Self-Instructional Guide for the Dental Profession
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Introduction

One of the most important responsibilities of the dental professional is obtaining and evaluating a patient’s medical history. Being familiar with a patient’s total health status is essential when providing dental care. Regardless of whether you treat patients in a private practice, group practice, health maintenance organization, or large institution, medical history questionnaires are a necessary component of the care provided. Patients’ current and past medical conditions may have serious implications for dental treatment. It is the ethical and legal responsibility of the dental professional to have this knowledge and to take the necessary precautions to ensure safe and effective treatment.

This portion of the manual provides information for the dental professional relative to medical history evaluation. While questionnaires differ in content detail and organizational structure, most attempt to elicit information about the same potential problems. A questionnaire provides a standardized format acceptable to all members of a dental team and ensures a uniform and adequate health history for each patient. A medical history questionnaire is an adjunct to a medical history interview conducted by a dental professional. The questionnaire is not meant to replace the important interaction of the interview between you and your patient. When properly used the medical history questionnaire will:

1. allow the patient enough time to consider thoroughly his or her health history and current health condition before responding to particular questions;
2. provide an opportunity for the dental professional to review the questionnaire prior to interviewing the patient and organize items that need follow-up;
3. minimize the chance that a dental professional will forget to ask the patient important questions or follow-up on appropriate items; and
4. identify the need for medical consultation prior to dental treatment or the special management of treatment. Medical consultations should be requested in cases where information is incomplete or where dental treatment may impact a patient’s medical condition. Medical consultations requested by a dental professional for follow-up on signs and symptoms of disease may lead to the identification of previously undiagnosed medical conditions.

A sample medical history questionnaire is included in the front of the manual and may be adapted for your use. This same medical history format is used in organizing the content of this manual. The information provided for each question on the health history includes: a description of the condition, necessity for a medical consultation, modifications in dental treatment, necessity for prophylactic antibiotics (premedication), avoidance of drugs, and possible emergency situations.

For specific medical conditions, prophylactic antibiotic coverage prior to dental treatment is required. A patient’s physician should be consulted concerning the need for prophylaxis for a particular patient. For conditions covered by guidelines from the American Heart Association (AHA), their recommended regimens should be applied.
Medications, including over-the-counter (OTC) drugs and herbal medicines, that the patient is taking may be confirmed in the Physicians’ Desk Reference, the Dental Drug Reference, or other appropriate sources for mode of action, side effects, and potential drug interactions with agents used in dentistry. A current listing of medications must be part of the medical history.
Objectives

Upon completion of this manual, you will be able to:

1. Take a complete medical history from a patient.
2. Request the correct follow-up information from the patient for any positive response on the medical history form.
3. Determine whether a medical consultation or referral is necessary prior to initiating dental treatment on a patient with a specific medical condition.
4. Identify any modifications in dental treatment that must be made with respect to a patient’s specific medical condition.
5. Assess the type of premedication needed for a patient with a specific medical condition.
6. Recognize specific drugs or drug types which should be avoided when treating a patient with a specific medical condition.
7. Assess the importance a specific drug or medication has on the dental treatment of a patient taking that drug or medication.
8. Explain the importance of recognizing an allergy to a specific drug or medication with respect to dental treatment.
Identifying Information

General questions serve as cues to request additional information when the dental professional is discussing specific medical problems with the patient.

1. 2. Name, address, and telephone number

The patient’s full name is recorded for legal purposes. The patient’s name, address, and telephone number are also necessary for identification of the information recorded on the medical history form. This ensures that patients’ records will not become confused. Identification information is updated at each appointment.

3. Date of birth

The patient’s date of birth rather than the age is recorded. Age changes each year, whereas date of birth remains constant. Age can easily be computed from the date of birth.

The age of the patient is used in the health evaluation. Older patients may exhibit more physical problems and illnesses. In addition, certain age groups have a higher incidence of specific diseases (e.g., patients over 40 years of age are more prone to heart disease). Since height and weight are better predictors of maturation in pediatric patients, these may also be recorded to determine proper dosages of drugs and medications.

4. Physician’s name, address, and telephone number

The patient’s physician may need to be contacted for consultation and/or verification of the medical history. The physician may also be needed as a resource for further documentation and for possible emergency situations.
Current Health Status

1. *Do you consider yourself to be presently in good health? If not, why?*

   This question will enable the patient to provide an estimation of his or her general health. The dental professional will become aware of the patient’s interpretation of his or her own health and use this information in reviewing the medical history.

2. *Have there been changes in your health during the past year? If so, please describe.*

   This question also allows the patient to evaluate his or her own health status. A positive answer requires further questioning to determine whether the patient’s health has changed for the better or worse, what the nature of the change has been, and to what the patient attributes the change. In the event that the patient’s health has improved, the reasons for previous poor health should be determined. If the patient’s health has deteriorated and the patient has not sought consultation with a physician, doing so may be advisable.

3. *Do you now have or have you had within the past 5 years an illness that required care by a physician or surgeon? If so, what illness?*

   This question elicits valuable information concerning the patient’s health status. Discuss illnesses and surgeries with the patient. Determine whether illnesses and/or surgeries involved any complications. The patient’s physician may need to be consulted if the patient cannot provide specific information.

4. *Have you been hospitalized for an illness or surgical operation? If so, please describe.*

   A history of hospitalizations can provide a good record of past serious illnesses that may have current significance. In addition to past hospitalizations, it is important to know what kind of surgical operations the patient has had, the reasons for the procedures, the duration of the hospital stays, and any complications associated with them (such as anesthetic emergencies, unusual postoperative bleeding, or infections). Recent surgeries may require consultation with the patient’s physician. Special management during dental treatment or the delay of treatment may be indicated.
A. Central Nervous System

1. Do you have epilepsy, seizure disorders, or fainting spells?

The most common seizure disorder is epilepsy. Epilepsy is a disorder of the central nervous system often characterized by change in a person’s consciousness caused by abnormal electrical discharges in the brain. Approximately 10% of the population will have at least one epileptic seizure in a lifetime, and 2% to 4% will have recurrent seizures at some time during their lives.

The etiology of epilepsy is associated with an area of damaged brain tissue. The type of seizure activity indicates which area of the brain is damaged. The specific cause of the seizure is unknown in more than 50% of cases: either the reason for the brain damage cannot be found, or the damage is so small that it cannot be detected. Some possible causes of brain damage are prenatal factors, perinatal factors, infection, trauma, toxicity, tumors, and inherited or degenerative diseases.

The majority of people with epilepsy develop one of two types of seizures: partial (focal, local) or generalized (convulsive or nonconvulsive). **Partial seizures** are characterized by repetitive behavior such as pulling on clothes, lip smacking, chewing, or repeated swallowing. A person having a partial seizure may appear intoxicated or drugged. The repetitive behavior lasts from 1 to 3 minutes. The patient is usually confused after the seizure or unaware that it has occurred. The most severe seizure is the **generalized convulsive (tonic-clonic seizure)** that affects the entire body, causing immediate loss of consciousness, and last from 1 to 3 minutes.

In addition to determining the type of seizure and degree of control, the dental professional must also identify and avoid precipitating factors that trigger seizures. Seizures may be triggered by disturbances in sleep, fatigue, or physical or psychological stress. Anticonvulsant medications are used to control or minimize the occurrence of seizure activity; however, 20-40% of individuals will continue to have seizures on occasion. Anticonvulsant medications are generally safe, and serious side effects are unusual. The most common anticonvulsant medication prescribed for epilepsy is Dilantin (phenytoin). A side effect of Dilantin therapy is gingival hyperplasia. Other drugs used to treat epilepsy include carbamazepine (Tegretol), lamotrigine (Lamictal), valpronic acid (Depakene), clonazepam, (Klonopin), and Phenobarbital (Luminal). These drugs can cause bleeding, infection, delayed healing, and xerostomia. For unknown reasons, patients sometimes discontinue their anticonvulsant medication without the health professional’s knowledge and therefore may be more susceptible to seizures during dental treatment. Preparation for a patient with epilepsy should include a review of medical emergency procedures for management of a generalized convulsive seizure.

**Fainting spells or syncope** are terms commonly used interchangeably to describe a temporary loss of consciousness caused by generalized cerebral ischemia. Syncope is a
symptom and may occur in healthy individuals. Syncope may also be indicative of serious medical disorders such as cardiac complications.

Conditions Indicating Medical Consultation:
1. History of uncontrolled or poorly controlled seizures
2. History of unexplained, repeated episodes of syncope

Dental Treatment Modifications:
Epilepsy:
1. Schedule shorter appointments.
2. Reduce anxiety and stress.
3. Emphasize plaque control to prevent Dilantin hyperplasia.
4. Choose fixed, all-metal prostheses to prevent dislodging and minimize fracture.
5. Alcohol may precipitate a seizure. If alcohol consumption is suspected, the patient should not be treated.

Conditions Indicating Premedication:
Epilepsy:
1. A physician may recommend an oral sedative for a patient who is unduly apprehensive.
2. A physician may recommend an increase in anti-convulsant medication dosage to maintain control during dental treatment.

Potential Emergency Situations:
1. Non-cardiac: Seizure Syncope
2. Cardiac: Cardiac depression and, in rare cases, cardiac arrest

2. Do you have multiple sclerosis, cerebral palsy, or Parkinson's disease?
The etiology for multiple sclerosis (MS) is unknown; however, most experts classify MS as an autoimmune disease. Human herpes virus type 6 has been identified in active demyelinated regions of the Central Nervous System (CNS) in patients who have MS. It is now hypothesized that this neurotropic virus in combination with host genetic factors results in processes that cause immune-mediated attacks on myelin. Autoimmune diseases occur when the body mistakes its own cells for invading bacteria or other antigens and attempts to destroy them. In the case of MS, the body’s white blood cells destroy the myelin sheath within the white matter of the brain and spinal cord. People in temperate or colder climates are affected at higher rates. The initial symptoms of MS usually occur between the ages of 15 and 50. In the course of the disease, remission occurs, and the individual may be free of symptoms. After a recurrence of symptoms, the individual's level of physical function decreases. New attacks of the disease are often coincidental with an infection or stress. About 85% of the patients with MS present with a history of relapsing and remitting
symptoms. Clinical symptoms depend on the affected area of the central nervous system. The symptoms include motor weakness or loss of control of limbs, visual disturbances, numbness in hands and lower extremities, inability to coordinate voluntary muscle movements, and slurring of speech. There is no cure for MS but the disease usually can be managed by drugs such as interferon-β-1a (Avonex), interferon-β-1b (Betaseron), glatiramer acetate (Copaxone) given by injection, or mitoxantron (Vovantrone) infusion. Other drugs are used to manage the complications of MS such as spasticity, poor bladder control, fatigue, and depression. Associated conditions such as trigeminal neuralgia, headache, and optic neuritis are often managed by experts in chronic pain clinics. Some of the adverse reactions to the drugs used to manage MS include flu-like symptoms, anemia, ulcerative stomatitis, salivary gland enlargement, leukopenia, and risk for cardiac complications. Patients with stable disease and little motor spasticity or weakness can receive routine dental care. Patients with more advanced disease may require help in transferring to and from the dental chair, have difficulty maintaining oral hygiene, and be poor candidates for reconstructive and prosthetic procedures. For patients who easily fatigue short morning appointments are advised.

Cerebral palsy (CP) is a broad term used to describe a group of non-progressive disorders that are caused by brain damage. The brain damage occurs either prenatally, perinatally, or postnatally before the central nervous system is fully developed. The disease is characterized by paralysis, muscle weakness, lack of coordination, and other motor function disorders. The degree of involvement and the clinical symptoms depend on the extent and location of the damage to the central nervous system. Of concern to the dental professional are involuntary or uncontrolled (spastic) movements. In addition to motor dysfunction, some patients may also have sensory defects and seizure or behavioral disorders. A primary diagnosis of CP, therefore, may be accompanied by secondary diagnoses of mental retardation; epilepsy; hearing, vision, and speech disorders; and several other handicapping conditions. Depending on the severity of the speech and language disorder, the dental professional may need to establish alternative methods for communication with the patient, such as hand signing or a communication board. Some individuals may be on a soft diet because of abnormal function of the tongue, lips, cheeks or because of difficulty swallowing. In combination with less than adequate oral hygiene, this may result in a higher rate of caries and periodontal disease. Other possible oral findings include hypoplastic enamel and occlusal wear due to bruxism or clenching. Reflexes for gagging, coughing, biting, and swallowing may be impaired. Tongue thrusting and drooling are related to the impairment of these reflexes. Patients may be on several medications which may have implications for dental care.

Parkinson’s disease is a slow, progressive degeneration within the brain of dopaminergic neurons. The cause of the disease is unknown. Genetic mutations of the Parkin gene occur in about 10% of the cases. Other causes include stroke, brain tumor and head injury (boxing). Exposure to agents such as manganese, mercury, carbon disulfide, street heroin can be neurotoxic and give rise to Parkinson’s disease. Parkinson’s disease is characterized
by rhythmic tremors of the extremities, slurred speech, staring, and excessive saliva. The disease usually develops between the ages of 55 and 66. Parkinson’s disease has no cure, but patients have been helped by medications or by injecting trophic factors through lentiviral delivery of a gene that encodes glial cell line-derived neurotrophic factor. Surgical procedures in the brain are sometimes used to treat patients with severe disabling or intractable tremor. Commonly prescribed medications include anticholinergic agents (Artane, Cogentin), dopamine precursors (Sinemet CR, Mgodar CR), dopamine agonists (Parlodel, Mirapex, Requip), and catechol-o-methyltransferase inhibitors (Tasmar, Comtan). These drugs may reduce salivary flow. If salivary flow is severely reduced, a change of medication or an alteration of dosage may be recommended. Salivary substitutes and products to replenish salivary enzymes may also need to be recommended which is a paradox for a patient whose initial symptoms included excessive salivation. Prolonged xerostomia will increase the risk for periodontal disease and dental caries. Due to chewing and swallowing difficulties, some individuals may be on soft diets. This may also affect the periodontal condition and the caries rate. In addition the muscular defect and tremor may make it very difficult for the patient to maintain good oral hygiene. For these patients the use of the Collis curve toothbrush, powered toothbrushes, assisted brushing and flossing or chlorhexidine rinses should be recommended.

Individuals with MS, CP, or Parkinson’s disease may have a personal attendant or family member who will need to be involved when procedures are discussed or home care instructions are provided.

**Conditions Indicating Medical Consultation:**
Parkinson’s Disease: If a patient exhibits an extreme lack of saliva and is taking drugs that cause xerostomia, the dosage may need to be adjusted or an alternative medication prescribed.

**Dental Treatment Modifications:**
1. Schedule shorter appointments.
2. Use mouth props.
3. Transfer by wheelchair.
4. Emphasize oral hygiene and disease prevention to control and eliminate oral infection.
   a. Self-cleansing mechanisms of the tongue and facial muscles may be affected.
   b. Manipulation of oral hygiene adjuncts may be affected.
   c. Personal attendant may need to be instructed in how to provide proper oral hygiene care.
   d. Dental dietary counseling with personal attendant may be needed.
   e. Antimicrobial mouth rinses, such as chlorhexidine, may be beneficial.

**Conditions Indicating Premedication:**
None
Drugs To Avoid:
Multiple Sclerosis: Nitrous Oxide

Potential Emergency Situations:
Non-cardiac: Airway Obstruction
B. Musculo-Skeletal System

Do you have arthritis, rheumatism, or swollen joints?

Arthritis is an inflammatory or degenerative condition within the joint, usually accompanied by pain and frequently accompanied by changes in structure. Arthritis may result from or be associated with various conditions including: infection, rheumatic fever, trauma, degenerative joint disease, metabolic disturbances, allergy and drug reactions, and unknown sources.

Osteoarthritis is the most commonly observed form of arthritis. Osteoarthritis generally occurs as a result of aging, loss of tensile strength, and fatigue resistance of cartilage. Some forms of employment that place a great deal of stress on the joints can also contribute to the early onset of osteoarthritis. The first symptom to appear is pain in the form of mild aching or soreness. Stiffness in the morning or after sitting for long periods is another symptom. Cold, fatigue, and dampness can contribute to stiffness and pain. Typically, osteoarthritis does not severely limit the range of motion of affected joints. Acetaminophen is recommended as a first line drug for the treatment of the pain associated with osteoarthritis. Aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen are commonly employed when acetaminophen is not effective. Narcotic analgesics are generally used only for acute flares for short periods.

Rheumatoid arthritis is a chronic systemic disease characterized by inflammation of multiple joints. Rheumatoid arthritis tends to become chronic and progressive, resulting in deformities and limited function of the involved joints. The onset of this type of arthritis is usually between the ages of 35 and 50. Women are affected 3 times more frequently than men. Clinical signs include swollen and painful small joints of the feet and hands with the overlying skin appearing shiny, red, and smooth. Rheumatoid arthritis starts as an inflammation in the blood vessels supplying the synovium. As a result of the swelling, the synovium begins to enlarge and secretes more fluid, causing an enlargement of the entire joint. The cause of rheumatoid arthritis is unknown, however, rheumatoid arthritis is considered to be an autoimmune disease. Treatment for rheumatoid arthritis can include application of heat, hydrotherapy, bed rest, exercise, splinting of joints, and surgery. Medications commonly include salicylates, analgesics, NSAIDs, steroids, cyclooxygenase (COX)-2 inhibitors, and disease-modifying antirheumatic drugs (antimalarial agents, penicillamine, gold compounds, sulfasalazine and immunosuppressives).

Rheumatism is a general term applied to acute and chronic conditions. Rheumatism is characterized by soreness and stiffness of muscles and pain in joints and associated structures. Rheumatism includes osteoarthritis, arthritis due to rheumatic fever or trauma, degenerative joint disease, and other conditions. The large joints are usually affected and are often slightly reddened, swollen, intensely painful, and tender to touch. The knees, ankles, elbows, and wrists are most commonly involved.

Chair position for patients with arthritis may become a factor in physical comfort. Patients
may also have problems with manual dexterity. Occasionally, arthritis may affect the temporomandibular joint (TMJ).

**Conditions Indicating Medical Consultation:**
Chronic use of large doses of salicylates (aspirin) or nonsteroidal anti-inflammatory medications (ibuprofen) may interfere with platelet function and can lead to bleeding problems that in general are not found to be clinically significant. Patients taking a combination of drugs such as aspirin and a steroid may be at a greater risk for significant bleeding following tissue injury or surgery. The bleeding time (BT) in the past was used to evaluate the risk of increased bleeding in these patients but has been found to be unreliable. The platelet function analyzer (PFA-100), if available, is more accurate in predicting a significant bleeding problem in these patients.

**Dental Treatment Modifications:**
1. Schedule afternoon appointments, since joints may be stiff in the morning with improvement later in the day.
2. Schedule shorter appointments.
3. Change chair position or use additional physical supports to ensure comfort.
4. Mouth props may be necessary if the TMJ is affected and the patient has difficulty in keeping his or her mouth open.
5. A patient may have a limited range of opening the mouth.
6. Home care techniques and adjuncts will need to be modified according to the ability of the individual.

**Conditions Indicating Premedication:**
7. None

**Drugs To Avoid:**
8. None

**Potential Emergency Situations:**
9. None

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2. **Do you have prosthetic replacements of the musculo-skeletal system (i.e., hip, joint)?**

*Prosthetic replacements* of the musculo- skeletal system may be placed within the body to correct an injury, deformity, or degeneration of a joint. The most common replacement occurs in the hip area. Other joints that are replaced include the knee, shoulder, elbow, wrist, and metacarpophalangeal joints. Patients who have an artificial joint are potentially at risk for infection of these prostheses from acute infection elsewhere in the body or very rarely dental treatment bacteremia. Most orthopaedic surgeons believe that prophylactic antibiotics are needed for invasive dental care likely to result in bleeding. It should be noted that the
scientific evidence for this practice is lacking. In 1997 the American Dental Association (ADA) and the American Academy of Orthopaedic Surgeons (AAOS) published an advisory statement for the dental management of patients with joint replacements. In 2003 the organizations made minor changes to the statement. Patients with pins, screws, rods, or plates used to stabilize fractured or diseased bones do not require antibiotic prophylaxis. Patients with joint replacements that have been in longer than two years also do not require prophylaxis. Prophylaxis was suggested for patients with joint replacements that have been in for less than 2 years and those who had a high risk condition such as rheumatoid arthritis, systemic lupus erythematosus, drug- or radiation induced immunosuppression, previous joint infection, malnourishment, hemophilia, HIV infection, insulin-dependant (type 1) diabetes mellitus or malignancy.

The ADA/AAOS published the following recommendations in 2013 regarding management of joint replacement patients receiving dental treatment:

1. The practitioner might consider discontinuing the practice of routinely prescribing prophylactic antibiotics for patients with hip and knee prosthetic joint implants undergoing dental procedures.

2. We are unable to recommend for or against the use of topical oral antimicrobials in patients with prosthetic joint implants or other orthopaedic implants undergoing dental procedures.

3. In the absence of reliable evidence linking poor oral health to prosthetic joint infection, it is the opinion of the work group that patients with prosthetic joint implants or other orthopaedic implants maintain appropriate oral hygiene.

In the previous ADA/AAOS recommendations (1997 and 2003) the statement was that antibiotic prophylaxis could be considered and now in the latest recommendation (2013) the statement is the practitioner might consider discontinuing the practice of routinely prescribing prophylactic antibiotics for patients with hip and prosthetic joint implants undergoing dental procedures.

The Council on Scientific Affairs of the American Dental Association published their evidence-based clinical practice guidelines for dental practitioners regarding the use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints in the Journal of the American Dental Association (JADA 2015;146 (1), pp 11-16) Their recommendations were that prophylactic antibiotics are not recommended prior to dental procedures. The dentist and patient should consider the clinical circumstances that may suggest the presence of a significant medical risk without antibiotic prophylaxis that would offset the known risks of frequent or widespread antibiotic use. These clinical recommendations should be integrated with the dentist’s professional judgment and the patient’s needs and preferences (informed consent).
Conditions Indicating Medical Consultation:
1. Prosthetic replacements

Dental Treatment Modifications:
Position the patient for comfort.

Conditions Indicating Premedication:
Prophylactic antibiotics should no longer be considered:
1. Based on the 2013 ADA/AAOS recommendations and the Council on Scientific Affairs of the American Dental Association, there is little evidence to support the practice of giving patients with knee and hip replacement antibiotic prophylaxis prior to invasive dental procedures and it would be best if this practice was discontinued.
2. If consultation with the patient’s orthopedist is obtained, the most likely recommendation will be to use antibiotic prophylaxis for invasive dental procedures.
3. The dentist should make the decision if prophylaxis is going to be used after a discussion of the issue with the patient (informed consent).

Drugs To Avoid:
None

Potential Emergency Situations:
None
C. Gastrointestinal System

1. Do you have a stomach ulcers or frequent heartburn?

**Stomach ulcer** is an open lesion in the stomach or duodenum. A stomach ulcer is referred to medically as a peptic ulcer. Peptic ulcers develop from chronic acid/pepsin secretions and infection with *Helicobacter pylori*. They affect up to 15% of the population in the United States. Several classes of drugs are used to treat peptic ulcers: H2 histamine antagonists (Tagamet, Zantac, Pepcid), proton pump inhibitors (Prilosec, Prevacid, Nexium), prostaglandin (Cytotec) and antibiotics (usually combination of two, clarithromycin, amoxicillin, metronidazole). First line therapy usually consists of a proton pump inhibitor and two antibiotics. Pain is the most characteristic symptom. The pain is localized and usually occurs from 1 to 3 hours after a meal. The pain is relieved by foods and alkalis. Often, periods of remission occur in which pain is absent. Some of the medications used to treat ulcers may cause xerostomia.

**Heartburn** occurs when acid liquid is raised from the stomach, causing a sensation of burning in the esophagus. In severe cases damage can occur to the lining of the esophagus and cause erosion of enamel from the lingual surfaces of teeth. More serious cardiac conditions may be mistaken for heartburn. If a patient has indicated a recurrence of heartburn, the dental professional should question the patient further to determine if the patient has sought medical care and if treatment has been recommended. If the patient has not sought consultation with a physician, doing so may be advisable. The acid reflux can also cause irritation to the soft tissues of the larynx and surrounding area. If the patient becomes symptomatic (cough, difficulty swallowing, hoarseness, over production of throat mucus) the condition is termed laryngopharyngeal reflux which can be treated with proton pump inhibitors to decrease stomach acid production.

**Conditions Indicating Medical Consultation:**
History of unexplained stomach pain, frequent heartburn, symptoms of laryngopharyngeal reflex, erosion of enamel on lingual surfaces of teeth

**Dental Treatment Modifications:**
1. Reduce anxiety.
2. Salivary substitutes or products designed to replenish salivary enzymes may be necessary.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
1. Do not recommend aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs) that irritates
the gastrointestinal tract.

2. If severe xerostomia (dry mouth) exists, do not recommend over-the-counter or prescription mouth rinses with high alcohol content.

Potential Emergency Situations:
None

2. Do you have or have you had hepatitis, jaundice, or liver disease?

Patients who have a history of viral hepatitis are important to identify since they may be carriers of the disease and as such could transmit the disease to dental personnel or other patients. **Hepatitis** is an inflammation of the liver with viral or toxic origin. Hepatitis is usually manifested by jaundice and, in some cases, liver enlargement. **Jaundice** is characterized by yellowness of the skin, whites of the eyes, mucous membranes, and body fluids. Jaundice is due to the deposition of bile pigment resulting from excess bilirubin in the blood. Jaundice should be identified, not only because it is a symptom of hepatitis, but also because it can relate to other liver diseases or dysfunction.

Of the types of viral hepatitis (A, B, C, D, and E) only B, D, and C have carrier stages. Type A is an infectious hepatitis that is transmitted through the stools and has little significance for the dental practitioner. Types B and C are transmitted through absorption of infective blood or saliva. Fortunately, a vaccine is available for immunization of dental professionals at risk for contracting Hepatitis B. It is strongly recommended that all dental professionals be inoculated with this vaccine. As detection of hepatitis carrier status and other diseases through medical history alone is unreliable, strict infectious disease control protocol for all patients is an essential component of protection. Patients with chronic hepatitis or cirrhosis may have impaired liver function, which could result in prolonged bleeding or the inability to efficiently metabolize certain drugs, including local anesthetics, topical anesthetics, and analgesics.

Conditions indicating medical consultation:
1. Patients with chronic hepatitis or liver damage: obtain information regarding bleeding tendency and metabolism of drugs that may be administered.
2. Patients with active hepatitis.

Dental treatment modifications:
1. Do not perform routine elective care on a patient with active hepatitis.
2. Because most hepatitis carriers are undetectable by medical history, use standard precautions when treating every patient.
3. If liver damage is suspected minimize administration of drugs metabolized by the liver and reduce the dosage if these drugs must be used.
Conditions Indicating Premedication:
None

Drugs To Avoid:
If liver damage exists, avoid the use of acetaminophen, narcotics, barbiturates, and any other drugs or medications specified by the patient’s physician. Minimize the amount of local anesthetic administered.

Potential Emergency Situations:
Non-cardiac: Hemorrhaging in patients with liver damage

3. Have you had a liver transplant?
A liver transplant is a necessary operation for those patients who have end-stage liver disease (extensive liver damage). Organ transplantation has many complications, including suppression of the immune system with several medications, organ rejection, cancer, oral infections, and other medication side effects.

Conditions Indicating Medical Consultation:
All patients who have had a liver transplant need a medical consultation to determine:
1. Need for prophylactic antibiotics. (While there is no indication for the patient with a stable transplant, most transplant surgeons will recommend prophylaxis for invasive dental treatment for all of their patients.)
2. Need to modify medication selection or dosage
3. Bleeding time and prothrombin time
4. Possible need for supplemental steroids during treatment

Dental Treatment Modifications:
1. Prior to transplantation, establish a stable oral and dental status free of active disease. Initiate an aggressive disease prevention program to maintain oral health.
2. Provide emergency treatment only for 3 months following transplantation. After 3 months most patients will have a stable transplant. Reinforce oral hygiene procedures for disease prevention.
3. Monitor blood pressure at each appointment.
4. Maintenance care should include regular recall procedures every 3 to 6 months for prevention of dental disease.

Conditions Indicating Premedication:
Organ transplantation (most transplant surgeons recommend antibiotic prophylaxis for invasive dental treatment although there is no evidence that it is beneficial in patients with stable transplants. There may be benefit in patients with failing transplants or for over...
immunosuppressed patients.)

**Drugs To Avoid:**
Drugs and medications specified by the patient's physician
D. Genito-Urinary System

1. Do you have or have you had kidney disease?
A variety of disorders can affect the kidneys. Symptoms may include lumbar (lower back) pain, disturbances in urination, presence of blood or pus in the urine, enlargement of the kidneys, or edema. A determination of the nature of the disease should be made by the dental professional.

Glomerulonephritis is an inflammation of the renal glomeruli which affects kidney function. Glomerulonephritis occurs most commonly in children and adolescents. Ordinarily, streptococcal throat infection occurs 1 to 3 weeks prior to the onset of disease. In some patients, renal damage may be present as a result of this condition. In addition, the chronic forth of glomerulonephritis can be complicated by hypertension. The etiology of glomerulonephritis is unknown, though the infection frequently follows other infections.

Conditions Indicating Medical Consultation:
1. History of renal failure
2. History of glomerulonephritis

Dental Treatment Modifications:
1. Avoid traumatizing the soft tissues of the mouth as this tissue tends to hemorrhage.
2. Monitor blood pressure.

Conditions Indicating Premedication:
Glomerulonephritis: prophylactic antibiotics may be recommended but little evidence exists that prophylaxis is effective or needed.

Drugs To Avoid:
Tetracycline, aspirin, and NSAIDs will increase the blood urea nitrogen of a patient with severe renal failure.

Potential Emergency Situations:
None

2-4. Are you missing one or both kidneys? Are you on dialysis? Have you had a kidney transplant?
Due to a kidney disease or disorder, one or both kidneys may be nonfunctional or may have been removed. If both kidneys are nonfunctional, the patient requires a transplant. Most patients who have had a transplant often have 3 kidneys: 2 that are nonfunctional and the
functional transplant. These individuals will be more prone to infection because medications necessary to prevent rejection of a transplanted kidney suppress the immune system. Another important potential side effect of these medications is hypertension. An important role for the dental professional is to monitor the blood pressure on these patients. When an elevation in the blood pressure is identified, the patient must be referred for medical evaluation.

If an individual has end-stage renal disease (both kidneys are non-functional), he or she can be kept alive by using an artificial kidney machine (dialysis). A surgically created arteriovenous fistula is used to connect the patient to the artificial kidney machine. This site is at increased risk for an infection similar to bacterial endocarditis (bacterial endarteritis). Most of these infections are caused by skin bacteria and not organisms from the oral cavity by dental procedures or by tooth brushing, flossing, or chewing. Therefore, the American Heart Association (AHA) no longer recommends prophylaxis for these patients.

During dialysis, which takes several hours every 2 to 3 days, the patient is given heparin to stop the blood from clotting. The effect of heparin takes approximately 4 hours to wear off. The process of dialysis may also injure platelets. Therefore, these patients should not receive dental treatment on the day of dialysis because their bleeding and clotting time will be altered. The best time for dental treatment is the day after dialysis.

Being on dialysis also increases the risk of an individual developing hepatitis (B or C). Further questioning of the patient is needed to determine a history of viral hepatitis and possible chronic liver disease.

**Conditions Indicating Medical Consultation:**
1. Organ transplant: Most surgeons recommend prophylactic antibiotics for dental procedures likely to result in bleeding. The effectiveness of this practice has not been established.
2. Dialysis: Selection of medications and dosages

**Dental Treatment Modifications:**
1. Organ Transplant: Refer to liver transplant section.
2. Dialysis: Use standard precautions for hepatitis virus transmission prevention.
3. Emphasize oral hygiene and other factors for disease prevention.

**Conditions indicating premedication:**
Organ transplantation (Recommended by most transplant surgeons but limited evidence that it is effective.)

**Drugs to avoid:**
Drugs metabolized by the kidney or nephrotoxic drugs
Potential Emergency Situations:
Non-cardiac: Excessive bleeding

5. Have you had a venereal disease (such as gonorrhea, syphilis, herpes, etc.)?

Three very common venereal diseases are gonorrhea, syphilis, and genital herpes. **Gonorrhea** is a contagious infection of the genital mucous membranes of both genders. The infection is caused by the organism Neisseria gonorrhoeae. Gonorrhea is usually transmitted through sexual contact; indirect transmission rarely occurs. This disease usually responds well to treatment with cefixime, ceftriaxone, azithromycin, or spectinomycin.

**Syphilis** is caused by the organism Treponema pallidum. Syphilis is transmitted by direct contact with the moist surfaces of the body of a person in an infectious stage, contact with freshly contaminated material, transfusion of infected blood or plasma, or passage of the organism from mother to fetus. In any of these instances, the organism may enter through a broken area in the skin or mucous membrane. Syphilis progresses through 4 stages (primary, secondary, latent and tertiary). Penicillin (single injection of benzathine penicillin) is the treatment of choice for primary and secondary syphilis. Patients with primary or secondary syphilis who are currently being treated or who continue to have positive serologic tests following treatment are potentially infectious. Patients may remain seropositive after treatment for up to 1 year. Syphilis can be a chronic disease. Antibiotics are not effective in the treatment of tertiary syphilis. Patients with tertiary syphilis remain seropositive but are not infective.

**Genital herpes** (herpes simplex type 2) is transmitted by direct sexual contact. Genital herpes can also be transmitted to a newborn from an infected mother. Lesions include fluid-filled vesicles that eventually rupture, leaving an ulcerated or crusted surface. The virus continues to reside in the body creating periodic recurrent infections. Genital herpes has no cure, however, the antivirals acyclovir (Zovirax), famciclovir (Famvir), and valacyclovir (Valtrex) have proven to be of some help in relieving symptoms and shortening the duration of the disease but do not eliminate the virus from the latent state, nor do they affect subsequent risk, frequency, or severity of recurrence after drug use is discontinued.

Conditions Indicating Medical Consultation:
1. Questions concerning the treatment or presence of syphilis, gonorrhea, or genital herpes
2. Tertiary syphilis: presence of significant cardiovascular syphilis.

Dental Treatment Modifications:
1. Syphilis: Since syphilis may be transmitted through infectious blood or saliva, strict adherence to standard precautions is recommended. Identifying the disease through medical history taking is unreliable.
2. Gonorrhea: No contraindication to treatment is indicated if the patient has started
treatment with antibiotics.

3. Genital herpes: Delay elective dental treatment if oral herpetic lesions are present. This is to avoid inoculation to a new site on the patient, infection of the dental professional, and aerosol or droplet contamination of the conjunctivae of the patient or professional.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
None

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**Females:**

6, 9. Are you pregnant? Are you nursing presently?

Systemic alterations occur during pregnancy that may affect the patient’s well being and oral condition. Fatigue, nausea, and syncope often occur during the first trimester; however, most women are free of these symptoms (with the exception of fatigue) for the remainder of their pregnancy. Women often develop a functional heart murmur during pregnancy that disappears shortly after delivery. The hormonal changes of pregnancy create an exaggerated inflammatory response of the gingival tissue to local irritants resulting in pregnancy gingivitis or pregnancy tumors. Therefore, maintaining oral hygiene at an optimal level is essential. Since many myths and inaccuracies surround the role of pregnancy in the development of caries and periodontal disease, the dental professional should provide comprehensive education regarding these disease processes. Women who are pregnant may also need special consideration in the taking of radiographs, administration of drugs, or timing of dental treatment. Chair positioning may need to be altered for women in the third trimester.

A nursing mother may transmit trace amounts of drugs or medications administered during dental procedures. Therefore, the dental professional should carefully select drugs and medications to be used and avoid using any known to be harmful to infants. Since physicians may wish to modify drug dosages during breast-feeding, consultation with the patient’s physician is advisable.

**Conditions Indicating Medical Consultation:**

1. Pregnancy: Prior to prescribing antibiotics or analgesics or if questions exist concerning the patient’s tolerance for the procedures to be performed
2. Nursing: Prior to prescribing antibiotics or analgesics

**Dental Treatment Modifications:**
Pregnancy:
1. Radiographs during pregnancy: The safety of dental radiographs is well documented in the literature. New techniques, fast film, digital imaging, use of filtration, collimation, thyroid shield and lead apron, etc. all keep fetal radiation to a minimum. Radiographs should be used selectively and only when necessary however. Radiographs that minimize patient dose should be prescribed. Additional films can be taken when the patient is no longer pregnant.
2. Timing of dental care during pregnancy: The second trimester and the first part of the third trimester are best for providing elective dental care; other than plaque control, dental care during the first trimester is generally avoided unless emergency care is required. The second trimester is the safest and the first part of the third trimester the patient can still be comfortable.
3. Schedule shorter appointments.
4. The patient may need to be placed in a more upright position, especially during the third trimester. If a pregnant patient is in a supine position for more than 3 to 7 minutes, signs of syncope with potential loss of consciousness may occur. This is due to the pressure of the uterus on the vena cava, which decreases venous return.
5. Avoid use of nitrous oxide during the first trimester; limit use during the second and third trimesters.
7. Provide educational information on dental care, oral development, dental and dietary recommendations and fluoride supplements for the care of newborns and infants.

Nursing: Minimize use of drugs and medications.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
Avoid all medications and drugs during pregnancy unless they are needed to care for urgent needs, confirm their use with the patient’s physician; limit use of drugs and medications during breast-feeding.

**Potential Emergency Situations:**
Pregnancy:
- Non-cardiac: Syncope

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7,8. *Have you had a miscarriage or a stillbirth? Have you had a baby with a low birth weight or a birth weight of more than 10 pounds?*

A positive response to these questions may indicate the beginning stage of an endocrine disorder such as diabetes. Patients need to be informed regarding the connection between these occurrences and systemic disease. If other symptoms are present and the patient has
not sought consultation with a physician, doing so may be advisable.

**Conditions Indicating Medical Consultation:**
1. History of unexplained, repeated symptoms related to systemic disease
2. Refer to the section on the endocrine system.

**Dental Treatment Modifications:**
None

**Conditions Indicating Medical Consultation:**
None

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
None

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10,11. Are you taking oral contraceptives? Do you have problems associated with your menstrual cycle?
A history of menstrual bleeding or use of oral contraceptives (birth control pills) may indicate the possibility of bleeding problems. Repeated loss of blood during menstruation may result in mild anemia or iron deficiency.

12. Are you post-menopausal? Do you have osteoporosis or thinning of your bones? Have you had fractures of any bones? Do you have osteonecrosis of the jaws?
After menopause, many women to experience thinning of their bones called osteoporosis which if severe enough can lead to fractures of the bones. In order to prevent this from occurring women are given supplemental calcium and treated with oral or intravenous bisphosphonates. The oral bisphosphonates most often are Boniva, Fosamax and Actonel. The intravenous bisphosphonate most often given is Zometa. A complication of these medications is a medication related osteonecrosis of the jaw caused by the bisphosphonate. The complication is rare with the oral bisphosphonates but more common with the intravenous drugs. The condition can be caused by dental procedures such as extractions or may occur spontaneously, resulting in an area of necrosis, which is more common in the mandible.

Treatment of osteonecrosis of the jaw may consist of using antimicrobial rinses, systemic antibiotics, systemic or topical antifungals, discontinuation of bisphosphonate therapy, and minimally invasive dental therapy (for example, root canal therapy instead of extraction).
Surgical debridement may be needed in the more severe cases. Long-term data are not available concerning the appropriate management of bisphosphonate-related osteonecrosis of the jaw (BRONJ). Traditional reconstructive efforts are generally not recommended by most experts.

**Conditions Indicating Medical Consultation:**
Questions concerning problems a patient may be having or medication she may be taking

**Dental Treatment Modifications:**
Avoid tissue trauma, and in patients taking IV bisphosphonates, extractions and other surgical procedures should be avoided as osteonecrosis of the jaw may occur.

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
None

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**Males:**

13. **Do you have a penile implant?**

Patients who have a penile implant may be at risk for infection at the site from the spread of bacteria from distant sites of acute infection. There is no scientific evidence indicating that patients with penile implants are at increased risk for infection associated with dental bacteremias. Consultation with the patient’s physician is suggested to determine the need for prophylactic antibiotics.

**Conditions Indicating Medical Consultation:**
Penile Implant

**Dental Treatment Modifications:**
None

**Conditions Indicating Premedication:**
Penile implant if recommended by the patient’s physician (there is no scientific information to support the need for prophylactic antibiotics for invasive dental procedures for patients with penile implants)

**Potential Emergency Situations:**
None
E. Endocrine System

1, 2. **Do you have diabetes? Do you have or have you had: to urinate more than 6 times a day? First much of the day? Dry mouth much of the day? Rapid weight loss?**

Diabetes mellitus is a chronic disorder of carbohydrate metabolism characterized by hyperglycemia (elevated level of glucose in the blood) and chronic, premature macrovascular disease and serious microvascular disease. This condition is a result of inadequate production or utilization of insulin. The etiology is basically unknown, but the direct cause is failure of the beta cells of the pancreas to secrete an adequate amount of insulin. Diabetes has no known cure. Symptoms suggestive of severe diabetes are excessive thirst, hunger, and urination along with weight loss and frequent infections. Women with a history of miscarriages, multiple stillbirths, or large babies at birth (9 pounds or more) may be at risk for diabetes. Diabetes is diagnosed by using several laboratory tests and the clinical course of the disease. The laboratory tests are a fasting blood glucose with a value of 126mg/dL or greater on two occasions being diagnostic of diabetes mellitus. In a patient with symptoms and signs of diabetes plus a random plasma glucose concentration of 200 mg/dL or greater is diagnostic of diabetes. A 2-hour postload glucose concentration of 200 mg/dL during an oral glucose tolerance test is also diagnostic of diabetes. The last test is a glycosylated hemoglobin (by A1C assay) of 6.5% or greater.

Patients with diabetes need to be identified in terms of the type of diabetes and how it is controlled. The most common form of diabetes is type 2 diabetes mellitus accounting for over 90% of all cases. It has been referred to as adult onset diabetes and non-insulin dependent diabetes mellitus (NIDDM). Although most common in adults type 2 diabetes is found among all age groups and is becoming more common in children and adolescents. The etiology is unknown but relates to insulin resistance with a relative insulin deficiency. Symptoms usually consist of slight change in weight, nausea, urination at night, blurred vision, and loss of sensation, impotence, and postural hypotension. In the latter stages of the disease the beta cells of the pancreas fail to produce insulin. Most patients are obese at the time of onset of their diabetes. In general type 2 diabetics are treated by control of diet and physical activity along with oral hypoglycemic, agents. In addition, a number of patients with type 2 diabetes are treated with insulin to gain better control of blood glucose levels which reduce the progression of small vessel vascular complications (retina and kidney) and neuropathies (muscle cramps, burning pain, tingling sensations, numbness, and sexual impotence). In the late stages of type 2 diabetes most patients will require insulin to control their blood glucose levels.

The Mayo Clinic Review lists several classes of type 2 medicines which work in different ways to lower blood sugar. A drug may work by a) stimulating the pancreas to produce and release more insulin, b) inhibiting the production and release of glucose from the liver, c) blocking the action of stomach enzymes that break down carbohydrates, d) improving the sensitivity of cells to insulin, e) inhibiting the reabsorption of glucose in the kidneys, f) slowing
how quickly food moves through the stomach. Each class of medicine has one or more drugs. Some of these drugs are taken orally, while others must be injected.

Examples of oral medications include:

1. Meglitinides (stimulate the release of insulin): Repaglinide (Prandin) and Nateglinide (starlix)
2. Sulfonylureas (stimulate the release of insulin): Glipizide (Glucotrol), Glimepiride (Amaryl), and Glyburide (Diabeta Glynase)
3. Dipeptidyl-peptidase 4 (DPP-4) inhibitors (stimulate the release of insulin and inhibit the release of glucose from the liver): Saxagliptin (Onglyza), Sitagliptin (Januvia) and Linagliptin (Tradjenta)
4. Biguanides (inhibit the release of glucose from the liver and improve sensitivity to insulin): Metformin (Fortamet, Glucophage, and others)
5. Thiazolidinediones (improve sensitivity to insulin and inhibit the release of glucose from the liver; these medications should not be used in people with kidney disease or heart problems): Rosiglitazone (Avandia), Pioglitazone (Actos)
6. Alpha-glucosidase inhibitors (slow the breakdown of starches and some sugars): Acarbose (Precose), Miglitol (Glyset)
7. Sodium glucose transporter 2 (SGLT2) inhibitors (block glucose from being reabsorbed by the kidneys): Canagliflozin (Invokara), Dapagliflozin (Farxiga), Empagliflozin (Jardiance)

Examples of injectable medications include:

1. Amylin mimetics (stimulate the release of insulin and is used with insulin injections): Pramlintide (Symlin)
2. Incretin mimetics (stimulate the release of insulin and is used with metformin and sulfonylureas): Exenatide (Byetta), Exenatide extended release (Bydureon), Liraglutide (Victoza)

The most severe form of diabetes is type 1 diabetes mellitus. The onset is sudden with symptoms of polydipsia (increased thirst), polyuria (increased urination), polyphagia (increased hunger), weight loss and loss of strength. In most cases an autoimmune reaction destroys the beta cells in the pancreas resulting in absolute insulin deficiency. Thus it is referred to as insulin-dependent diabetes mellitus (IDDM). Type 1 diabetes mellitus is most common in children and adolescents but can be found in adults. Anyone with type 1 diabetes requires insulin therapy for the rest of their life. The types of insulin include (from the Mayo Clinic Review):

1. Rapid-acting insulin:
   a. regular insulin (Humulin 70/30, Novolin 70/30 and others)
   b. insulin isophane (Humulin N, Novolin N)
   c. insulin glulisine (Apidra)
   d. insulin lispro (Humalog)
   e. insulin aspart (Novolog)
2. Long-acting insulin:
   a. glargine (Lantus)
   b. detemir (Levemir)

Insulin can’t be taken orally to lower blood sugar because stomach enzymes interfere with insulin’s action. Therefore, it must be given either through injections or an insulin pump. Injections can be given by fine needles or insulin pen which looks like an ink pen. Daily injection of insulin usually involves using several types of insulin such as combining a rapid acting insulin with a long acting insulin. Three or more injections may be needed and then a long acting insulin will be needed to control the glucose level during the night.

An **insulin pump** is about the size of a cellphone and is worn on the outside of the body. The reservoir of insulin in the pump has a tube that is connected to a catheter inserted under the skin of the abdomen. Pumps are programmed to dispense rapid-acting insulin automatically which eliminates the need for long-acting insulin.

An **artificial pancreas** is an emerging treatment approach. It is a closed-loop insulin delivery system that is not yet available in the United States. The device links a continuous glucose monitor to an insulin pump and automatically delivers the correct amount of insulin when the monitor indicates the need for it. Clinical trials have been encouraging but more research is needed before a fully functional artificial pancreas will receive regulatory approval.

**Additional medications** may also be prescribed for people with type 1 diabetes. Pamlintide (Symlin), for example, is an injectable medication used before meals to slow the movement of food through the stomach in order to curb the sharp increase in blood sugar that occurs after meals. High blood pressure medications, aspirin and cholesterol lowering medications may also be required.

**Blood sugar monitoring** is recommended by the American Diabetic Association to be done before meals and snacks, before bed, before exercising or driving, and if a low blood sugar level is suspected.

Both acute and chronic complications may occur for diabetics. Acute complications are hypoglycemia (insulin shock) and hyperglycemia (diabetic coma). Patients taking insulin are prone to hypoglycemia in the dental office. In addition to confirming the patient’s dietary habits, an oral carbohydrate should be readily available. Hyperglycemia results from an insufficient amount of insulin in the body. This condition develops over several days and is usually identified prior to the occurrence of a medical emergency.

Chronic complications of diabetes involve diseases of the large and small blood vessels, peripheral neuropathies, an increased susceptibility to infection, and an impaired healing process. Large blood vessel diseases, which include arteriosclerosis, may affect the heart, the kidneys, and the lower extremities. This is due to an inadequate supply of blood to these areas of the body. Small blood vessel diseases may affect the eyes, kidneys, and lower extremities. These complications can result in blindness, hypertension, kidney failure,
and amputation. Diabetic neuropathy may lead to muscle weakness, muscle cramps, deep burning pain, tingling sensations, numbness, and sexual impotence. The periodontal status of patients with diabetes should be closely monitored. Research studies have indicated that individuals with poorly controlled type 1 or type 2 diabetes may have an increased risk of periodontal disease, infection, and delayed wound healing. Delayed wound healing and increased risk of infection are of particular concern when considering periodontal therapy in these patients. However, patients with well controlled diabetes are not at risk for these complications.

**Conditions Indicating Medical Consultation:**
1. History of uncontrolled diabetes
2. Patients with diabetes who are not under the care of a physician
3. Extensive dental treatment
4. The patient’s insulin dosage may need to be adjusted if normal eating habits will be interrupted by the dental procedures to be performed.

**Dental Treatment Modifications:**
1. Avoid tissue trauma.
2. Minimize stress, since it could have an anti-insulin effect on the patient.
3. Schedule frequent recall appointments with emphasis on disease prevention.
4. Schedule appointments soon after meal time to avoid the possibility of hypoglycemia (insulin shock).
5. Complications of diabetes such as hypertension, angina, kidney failure, and congestive heart failure may require treatment modification. (Find these conditions listed in the Table of Contents under Genito-Urinary and Cardiovascular Systems.)

**Conditions Indicating Premedication:**
Surgical procedures may need prophylactic antibiotics in poorly controlled diabetics.

**Drugs to avoid:**
1. Use of a general anesthetic necessitates the omission of food prior to administration which may interfere with the scheduled use of insulin.
2. Epinephrine in larger doses may produce anti-insulin action.

**Potential emergency situations:**
Non-cardiac: Diabetic Coma (hyperglycemia)
Insulin Shock (hypoglycemia)

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**3. Do you have thyroid disease?**
Abnormalities of thyroid function result from iodine deficiency or from subnormal
(hyperhyroid) or excessive (hyperthyroid) activity of the thyroid gland. The hormones secreted by the thyroid are essential for normal growth and development. A deficiency during childhood may result in dwarfism or mental retardation. The activities of many enzyme systems throughout the body are also modulated by the thyroid hormones. The metabolic rate of the body may be increased. This especially affects the metabolic rates of the heart, kidneys, liver, and diaphragm. Because of these actions, thyroid hormones are important to the proper functioning of many body systems, including the nervous, cardiovascular, renal, reproductive, and temperature regulating systems.

**Hypothyroidism** is due to a deficient secretion of thyroid hormones resulting in a low basal metabolism. Symptoms of hypothyroidism include mental and physical slowness, weight gain, slow pulse, dilation of the heart, weakness of muscles, dry skin and hair, and edema. The causes of hypothyroidism may vary, but most often the condition is a result of inadequate circulation of thyroid hormones. The thyroid gland spontaneously ceases to function at the normal rate for unknown reasons. Patients with hypothyroidism pose minimal management concerns.

**Hyperthyroidism** is due to an excessive amount of thyroid hormones circulating in the body. Hyperthyroidism is characterized by an exaggeration of all functions. The symptoms include rapid pulse, excitement, restlessness, tremors, loss of weight, increased metabolism, and increased sensitivity to pain and heat. Patients with uncontrolled or unidentified hyperthyroidism are potentially sensitive to stress; the use of vasoconstrictors, such as epinephrine, is contraindicated.

Two conditions that result in hyperthyroidism are Grave’s disease and toxic nodular goiter. **Grave’s disease** is seen mainly in young adults and results in an enlarged, highly vascular thyroid gland and protrusion of the eyeballs (exophthalmos). **Toxic nodular goiter** results in nodules forming within the thyroid gland which spontaneously secrete excessive amounts of the thyroid hormones.

**Conditions Indicating Medical Consultation:**
A patient who has had thyroid dysfunction and has not received treatment to establish a normal level of circulating thyroid hormones.

**Dental Treatment Modifications:**
If a large goiter is present, position the patient upright to avoid breathing difficulties.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
Hyperthyroid (poorly controlled):
1. Atropine increases the heart rate and could precipitate a thyroid storm.
2. Epinephrine acts as a cardiovascular stimulant. Hyperthyroidism, already stimulates the cardiovascular system. Therefore, epinephrine could precipitate arrhythmia or thyroid storm.

Hypothyroid (poorly controlled):
Central nervous system depressants such as barbiturates and tranquilizers given in normal doses to a patient with hypothyroidism may be overdoses because of his or her extreme sensitivity to the depressant actions of these drugs.

**Potential Emergency Situations:**
Non-cardiac: Hyperthyroidism—thyroid storm or crisis
Cardiac: Hypothyroidism—congestive heart failure
1, 3. Do you have or have you had tuberculosis?

Tuberculosis (TB), an often unrecognized disease, is an increasing health hazard to dental professionals. A history of exposure to tuberculosis, a continuous cough, blood in the sputum, chronic weight loss, fever, or night sweats may suggest a diagnosis of tuberculosis. Tuberculosis is an airborne disease that may be transmitted through contact with an infected person’s sputum or simply by breathing air which has been contaminated when a person with active tuberculosis coughs or sneezes. For this reason, patients with active TB are rarely treated in the dental office. If treatment is necessary, special masks and negative pressure ventilation are part of the infectious disease control protocol. Therefore, treatment in a hospital setting is preferred.

The primary infection of tuberculosis is characterized by a pneumonic lesion in the lung, which spreads quickly to the lymph nodes. At this point, the patient will demonstrate a positive reaction to the Mantoux test. The lesion may heal spontaneously. It becomes walled off, but bacteria remain trapped and can be reactivated at some future time. The lesion may also increase in size and produce cavities in the lobe of the lung. The infected lymph node may rupture through the wall of the bronchus or grow so large as to collapse the bronchus completely, resulting in tuberculosis bronchopneumonia. The post-primary infection of tuberculosis occurs when the small, early lesion of tuberculosis bronchopneumonia spreads and produces necrosis in the lung. At this point the patient will cough and produce sputum. The infected sputum may be inhaled into other parts of the lung causing new lesions to be formed. The infected sputum may also cause an infection in the trachea, larynx, tongue, or stomach (if swallowed).

The symptoms of chronic tuberculosis include cough-producing sputum, low-grade fever, loss of appetite, progressive weight loss, tiredness, and night sweats. Patients who have tuberculosis or who have a history of tuberculosis need to be identified for infectious disease control purposes, and information concerning the diagnosis and treatment history of the disease needs to be defined.

A history of follow-up care (routine physicals and periodic chest x-rays) is also important. A positive skin test means that the person has been infected with TB, but it does not mean that the patient is actively infectious. Patients with acquired immune deficiency syndrome (AIDS) have a high incidence of tuberculosis and should have a Mantoux test on a regular basis. A major public health concern is the development of multiple-drug resistant forms of TB.

Conditions Indicating Medical Consultation:
1. Patients who have failed to have routine health evaluations which reaffirm an inactive status
2. Patients with active (sputum-positive) TB
3. Signs or symptoms of tuberculosis indicating relapse

**Dental Treatment Modifications:**
1. Because most patients with infectious diseases are undetectable through information revealed by medical history taking, treat all patients using standard precautions.
2. Treat patients with active TB in a hospital setting if possible, and limit treatment to emergency care.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
None

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2, 3. *Do you have chronic obstructive lung disease or emphysema? Do you have or have you had: persistent cough, night sweats, coughing up of blood, difficulty breathing, or chest pain?*

**Chronic obstructive lung/pulmonary disease (COPD)** refers to a clinical syndrome characterized by chronic labored respiration and evidence of obstructed expiratory flow. Included in the classification of COPD are chronic bronchitis, pulmonary emphysema, and bronchial asthma. All of these syndromes involve the obstruction of small bronchi or bronchioles.

In **chronic bronchitis**, the size of the mucous glands of the large bronchi and the number of mucous-secreting epithelial cells of the large and small bronchi are increased. **Emphysema** is characterized by a destruction of the alveolar septa which results in the formation of abnormally large air spaces and less lung surface area available for exchange of gases. This may cause a marked abnormality in blood gases, which may predispose the patient to cardiac arrhythmias and respiratory suppression from various drugs.

Research has demonstrated that a close relationship exists between COPD and cigarette smoking. Other etiologic factors of COPD include atmospheric pollution and genetic factors. COPD is indicated in patients who exhibit a history of smoking, labored breathing upon exertion, chronic cough, pus-containing sputum, and recurrent respiratory infections. Unexplained chest pain may be an indication of several disorders, one of which is pulmonary emphysema. Unexplained chest pain may also indicate angina pectoris, myocardial infarction, pulmonary embolism, TB, pneumonia, pleurisy, or lung cancer. Therefore, recommend a medical consultation for patients with chest pain.
Patients with COPI) may be heavily congested in the early morning; therefore, late morning or afternoon appointments are suggested. Dental care professionals should avoid medications or procedures that might further depress respiratory function. Chair position is frequently a contributing factor, with patients being unable to tolerate a supine position. Use of a rubber dam may not be advisable.

**Conditions Indicating Medical Consultation:**
Patients experiencing unexplained chest pain

**Dental Treatment Modifications:**
1. Schedule late morning or afternoon appointments.
2. Place the patient in an upright position in the dental chair.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
In severe cases, nitrous oxide and respiratory depressants such as darvon, codeine or tranquilizers

**Potential Emergency Situations:**
Cardiac: Chest pain may indicate angina pectoris, myocardial infarction, or pulmonary embolism.

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4. **Do you have asthma or hay fever?**

Asthma is a chronic inflammatory respiratory disease that is associated with increased airway hyperresponsiveness, resulting in recurrent episodes of dyspnea, coughing, and wheezing. Asthma is characterized by hyperactivity of the trachea and bronchi due to various stimuli and spasms in the small bronchi of the lungs. The condition is made evident by the widespread narrowing of the airways that improve either spontaneously or as a result of taking medication. Approximately 2% to 5% of adults and 10% of children in the American population have asthma.

**Allergic** or **extrinsic** asthma is the most common form of asthma. Allergic or extrinsic asthma is generally associated with a family history of allergies and is often seasonal. It may be associated with dust, grasses, animal dander, or pollen. **Idiosyncratic** or **intrinsic** asthma is not associated with any particular antigen but can be caused by more vague factors such as respiratory tract infections or physical irritants such as air pollution, cigarette smoke, and stress. This type of asthma is generally seen in middle-aged and older adults with no prior family history of allergies.
A chronic asthmatic condition is indicated by sudden attacks of shortness of breath and wheezing, occurring commonly at night and often accompanied by a cough. The attacks are variable in length of time and intensity. Very severe attacks, called *status asthmaticus*, are life-threatening and require prompt attention and therapy. Aspirin, NSAIDs, beta blockers, angiotensin-converting enzyme inhibitors, and some food substances (nuts, shellfish, milk, and strawberries) have been shown to precipitate acute asthmatic attacks in susceptible individuals. The presence of an infection, including a dental infection, has also been known to bring on an asthmatic attack. Finally, emotional trauma or anxiety (such as that which may accompany dental treatment) may be sufficient to cause an asthmatic attack in some patients.

Preparation for treating a patient with asthma must include an awareness of the type of asthma, the precipitating substances, frequency and severity of attacks, how the attacks are usually managed, and whether an attack has ever necessitated emergency treatment.

**Conditions Indicating Medical Consultation:**
Uncontrolled or severe asthma

**Dental Treatment Modifications:**
1. Schedule late morning or afternoon appointments.
2. Provide immediate access to a patient’s inhaler.
3. Minimize stress if identified as a precipitating factor.
4. Minimize vasoconstrictors such as epinephrine.

**Conditions Indicating Premedication:**
None

**Drugs to Avoid:**
Aspirin, NSAIDs

**Potential Emergency Situations:**
Non-cardiac: Asthmatic attack
G. Cardiovascular System

1. Do you have or have you had rheumatic fever or rheumatic heart disease?

Acute rheumatic fever is a disease of childhood and adolescence. It is the result of a streptococcal infection of the upper respiratory tract (e.g., tonsillitis, pharyngitis) and can lead to permanent damage of the heart valves. Persons who develop rheumatic fever are at higher risk of developing a recurrent infection. The symptoms of acute rheumatic fever include carditis, inflammation of the joints, chorea, subcutaneous nodules, rash, and fever. Prevention of recurrent rheumatic fever depends upon continuous low-dose prophylactic antibiotics.

Rheumatic heart disease (RHD) is based on a history of rheumatic fever and is accompanied by a structural lesion of the heart which manifests itself as an organic (pathologic) heart murmur. Organic murmurs suggest that there has been damage to the heart valves, and in the past prophylactic antibiotic therapy was mandatory to prevent possible development of an infection of the lining of the heart or its valves (called infective or bacterial endocarditis) caused by dental treatment bacteremia. In 2007 the American Heart Association (AHA) concluded that patients with RHD are not at risk to dental treatment bacteremia and no longer require antibiotic prophylaxis for dental treatment. However, these patients are at risk for endocarditis caused by physiologic bacteremia (toothbrushing, eating, flossing, etc.) This risk is minimized in patients with good oral hygiene. These patients can still develop endocarditis caused by oral bacteria and may present to the dental office with signs and symptoms of endocarditis (fever, murmur, chills, sweats, nausea and vomiting, weight loss, septic emboli, and confusion). If endocarditis is suspected the patient should be referred for medical evaluation and treatment.

Conditions Indicating Medical Referral:
1. History of rheumatic fever if presence or absence of rheumatic heart disease has not been previously determined. Patient should be evaluated for presence of RHD so that it can be managed from a medical standpoint.
2. Patient with signs and symptoms suggesting endocarditis.

Dental Treatment Modifications:
Rheumatic heart disease:
1. Stress the importance of obtaining and maintaining excellent oral hygiene and good dental repair to minimize physiologic bacteremia.

Conditions Indicating Premedication:
none

Drugs to Avoid:
2, 12. Have you had a heart attack, heart failure, angina pectoris, or a stroke? Do you have or have you had: shortness of breath after exercise, shortness of breath when lying down, to sleep with extra pillows, chest pain upon exertion, ankle swelling, palpitations, or fainting spells or seizures?

A heart attack or myocardial infarction is a medical emergency requiring careful management during the acute phase. A heart attack is caused by inadequate coronary blood supply due to the occlusion of the coronary arteries by an emboli or thrombi. The symptoms of a heart attack include sudden onset of severe substernal pain which may persist for hours. The pain may radiate to the neck and arms. Profuse sweating, pallor, rapid pulse, and low blood pressure in conjunction with severe pain are indicative of a heart attack.

No elective dental care should be performed on patients with a history of a heart attack within a previous 4 to 6 week time frame. During this period, patients have an increased susceptibility to repeat heart attack, arrhythmia, ventricular aneurysm, and heart failure. Medications taken by patients with a history of myocardial infarction may alter dental management. After 4 to 6 weeks most patients with uncomplicated myocardial infarction can receive elective dental care. Medical consultation is recommended to establish the nature of the heart attack and the presence of complications that could alter the dental management. (A medical consult is suggested for all patients with a history of MI to confirm medications and the patient’s current status.)

Use of vasoconstrictors should be minimized in order to prevent interactions with other medications that may precipitate arrhythmias. The anticoagulant, warfarin, is of concern because of its effect on the clotting of blood. This is reflected by a laboratory test, the prothrombin time (normal is 11 to 15 seconds) and is expressed for clinical use as the International Normalized Ratio (INR). The normal INR is 1. Most patients taking warfarin are maintained with an INR between 2.0 to 3.0. Patients with mechanical heart valves or to prevent heart attacks are maintained with an INR between 2.5 to 3.5. Most patients with an INR of 3.5 or below can be treated (dental, extractions and periodontal) safely and any excessive bleeding can be managed using local measures. Patients with an INR greater than 3.5 should be referred to their physician to have the dose of the anticoagulant reduced so that the INR will be 3.5 or below. Once the dosage has been modified it takes 3 to 5 days for the INR to be reduced.

Congestive heart failure occurs when the heart is no longer able to circulate the required amount of blood to the body tissues. This condition could be the result of a degeneration of the muscles of the heart, increased demand on a damaged heart, or failure of the peripheral
vessels, causing insufficient return of blood to the heart. The symptoms of congestive heart failure include shortness of breath upon mild exertion, use of extra pillows when sleeping, swollen ankles, coughing which may produce blood, general fatigue, chest pain, and cyanosis of the lips, tongue, and oral mucosa accompanied by a distention of the veins of the tongue (varicosities). Patients with poorly controlled symptoms should not receive routine dental treatment until medical treatment has been initiated. Chair position is frequently a factor with patients being unable to tolerate a supine or semisupine position. Again, use of vasoconstrictors should be limited to minimize interactions with other medications, such as digitalis, which may precipitate arrhythmias.

**Angina pectoris** is a sign of coronary artery disease. Angina pectoris manifests itself as a brief pain in the chest. The coronary arteries do not supply the myocardium with an adequate supply of oxygen (myocardial ischemia). The pain is precipitated by exercise, emotion, or a heavy meal and is relieved by vasodilator medications. The most common drug used to relieve symptoms is nitroglycerin. Patients with angina are candidates for arrhythmias, myocardial infarction, or unexpected, sudden death. In patients with severe or progressive angina, use of local anesthetics containing vasoconstrictors should be minimized. Patients medicated with nitroglycerin or another vasodilator should have the drug immediately available in the event that angina occurs during dental care.

A **stroke** or cerebrovascular accident (CVA) occurs when a shortage of blood is supplied to the brain as a result of arteriosclerosis, hypertension, aneurysm, cerebral thrombosis, hemorrhage, embolism, or diabetes. Consequential brain damage varies in severity. Early symptoms of a stroke include dizziness, transient paresthesia or weakness on one side, and speech defects. More serious symptoms include headache; deep, slow, and labored breathing; paralysis of one side of the body; nausea; vomiting; convulsions; and slow or sudden loss of consciousness. Efforts should be made to minimize stress and to encourage normal breathing in patients with a history of stroke. Identifying associated systemic conditions, such as hypertension or diabetes, and making appropriate management alterations is important. Use of vasoconstrictors should be minimized in many patients. Anticoagulant medications can result in altered INR. Many stroke patients may have hemiplegia or paralysis on half the body, speech difficulties, or other handicapping conditions. These may compromise the patient’s ability to maintain typical oral hygiene standards without modification of home care aids.

**Conditions Indicating Medical Consultation:**
1. Heart Attack
2. Congestive heart failure
3. Stroke
4. Previously untreated angina pectoris
5. Patients taking anticoagulant medication

**Dental Treatment Modifications:**
1. Avoid unnecessary trauma to gingival tissue.
2. For patients with unstable angina, shorter appointments may be necessary. Avoid appointments directly following a meal.
3. Schedule late morning or early afternoon appointments rather than appointments late in the day.
4. A patient taking nitroglycerin should have it readily available at each appointment. One tablet can be taken prior to administration of local anesthetics with vasoconstrictors.
5. Because the risk of recurrence is elevated during the first 6 months following a stroke, perform no elective treatment on patients who have had a stroke within the past 6 months.
6. Perform no elective treatment on patients who have had a heart attack within 4 to 6 weeks. Treat patients with caution for 6 months after a heart attack.
7. Evaluate INR prior to extractions, periodontal therapy, or other surgical dental procedures.
8. If aldomet (methyldopa) or digitalis is being taken, minimize use of local anesthetics with vasoconstrictors.
9. Minimize anxiety- and stress-producing procedures and actions; use of nitrous-oxide oxygen sedation may be beneficial for some patients.
10. If the patient becomes fatigued or overly anxious or if vital signs become elevated, discontinue the procedure.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
1. Vasoconstrictors
2. Other medications or drugs indicated by the physician

**Potential Emergency Situations:**
Cardiac:  Myocardial infarction
          Cardiac arrest
          CVA

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3. **Do you have a heart murmur, or have you been told in the past that you had one?**

A heart murmur is caused by turbulence of blood flow producing vibratory sounds during the beating of the heart. This turbulence may be due to either **physiologic** or **pathologic factors** of the heart valves or vessels. A physiologic or functional heart murmur occurs in the absence of any pathological change in the structure of the heart or heart valves.

A **pathologic** or **organic heart murmur** occurs when there has been a structural change or damage to the heart or its valves as a result of an attack of rheumatic fever or congenital
malformation. The presence of an organic heart murmur may predispose the patient to an infection inside the heart (on or near the heart valves) called bacterial endocarditis. In the past it was thought that this infection could result from bacteria entering the bloodstream during dental treatment that caused bleeding. The AHA now feels that most if not all cases of endocarditis caused by oral organisms result from physiologic bacteremia and not dental treatment bacteremia.

Patients with murmurs of unknown origin should be referred for medical evaluation to establish the nature of the murmur and the need for medical or surgical treatment. Murmurs that occur only during childhood and/or pregnancy are physiologic murmurs and eventually disappear. Patients with a clear history of this type of murmur or other physiologic murmurs usually do not require further medical evaluation or treatment.

**Conditions Indicating Medical Referral:**
Patients with a history of an organic (pathologic) heart murmur who have not seen a physician for some time should be referred for medical evaluation of their cardiac status.

**Dental Treatment Modifications:**
None

**Conditions Indicating Premedication:**
None

**Potential Emergency Situations:**
None

4. Do you have congenital heart disease? Do you have mitral valve prolapse? If so, is there valvular dysfunction?

Congenital heart diseases are a group of genetically determined malformations of the heart frequently associated with other systemic diseases. Some form of developmental cardiovascular defect occurs in an estimated 1% of all births. Most forms of congenital heart disease or defects are thought to put patients at risk for bacterial endocarditis. The AHA (2007) now feels that most of patients with congenital heart disease are not at risk of endocarditis from dental treatment bacteremia. However, those with more severe lesions in which endocarditis results in significant adverse outcomes (valvular dysfunction, congestive heart failure, the need for valvular replacement, multiple embolic events or death) are still recommended for antibiotic prophylaxis for most dental procedures. The only congenital heart diseases still recommended for antibiotic prophylaxis for dental treatment are unrepaired cyanotic lesions including those with palliative shunts and conduits, completely repaired lesions with prosthetic material or device for the first 6 months and repaired lesions
with residual defects (leaks).

In the United Kingdom, guidelines from the National Institute for Health and Clinical Excellence (NICE) recommended complete cessation for antibiotic prophylaxis for prevention of infective endocarditis in March 2008. A recent study done in England found that although the number of prescriptions for antibiotic prophylaxis for invasive dental procedures had fallen greatly from 2004 to 2013 the number of cases of hospital treated infective endocarditis (IE) had increased. The interpretation of this finding does not necessarily mean the increase was due to dental associated cases of IE as it was not possible for the researchers to determine the cause of the IE. The impact of this study on the management of patients at risk for IE when receiving invasive dental treatment has yet to be established.

*Mitral valve prolapse (MVP)* is a congenital heart defect created by a thickening of the connective tissue of the mural valve. As a result, tight closure of the valve may not be possible, resulting in a regurgitation of blood. This condition is called MVP with regurgitation. In the past patients with MVP with regurgitation were recommended for antibiotic prophylaxis for invasive dental procedures. The AHA (2007) no longer recommends prophylaxis for these patients.

However, these patients are at risk for endocarditis caused by physiologic bacteremia (toothbrushing, eating, flossing, etc.) This risk is minimized in patients with good oral hygiene. These patients can still develop endocarditis caused by oral or other bacteria and may present to the dental office with signs and symptoms of endocarditis (fever, murmur, chills, sweats, nausea and vomiting, weight loss, septic emboli, and confusion). If endocarditis is suspected the patient should be referred for medial evaluation and treatment.

**Conditions Indicating Medical Consultation:**

1. Unrepaired cyanotic lesions to establish the need for antibiotic prophylaxis.
2. Repaired congenital heart defects with prosthetic material or device to determine the length of time since surgery (prophylaxis indicated during the first 6 months following surgery) and presence of residual defects (leakage) which would also indicate the need for prophylaxis.

**Dental Treatment Modifications:**

1. If a patient is taking anticoagulants, avoid unnecessary gingival trauma.
2. Evaluate INR prior to extractions, periodontal therapy, or other surgical dental procedures.

**Conditions Indicating Premedication:**

1. Unrepaired cyanotic lesions including those with palliative shunts and conduits.
2. Completely repaired lesions with prosthetic material or device for the first 6 months.
3. Repaired lesions with residual defects (leaks).

**Drugs To Avoid:**
None unless specified by physician

**Potential Emergency Situations:**
Congenital heart disease:
   - Cardiac: Cardiac arrest
   - Non-cardiac: Breathing difficulties

**5. Have you had infective (bacterial) endocarditis?**

*Infective (bacterial) endocarditis (IE)* is caused by a microbial infection of the heart valves or lining of the heart (endocardium). *Infective endarteritis* is a similar disease characterized by a microbial infection of the endothelium of the arteries. Endocarditis or endarteritis occurs when bacteria enter the bloodstream and infect damaged heart or vascular tissue. Patients with congenital or acquired cardiovascular defects are at risk for infective endocarditis or endarteritis. Once a patient has had infective endocarditis they are at greater risk to develop the disease again with increased frequency of adverse outcomes (valvular dysfunction, congestive heart failure, need for valvular replacement, multiple embolic events, and death). The goal of the dental professional is to prevent these infections from occurring in susceptible patients.

**Conditions Indicating Medical Consultation:**
1. History of infective endocarditis or endarteritis
2. Presence of a prosthetic heart valve (mechanical or tissue)

**Dental Treatment Modifications:**
None

**Conditions Indicating Premedication:**
1. History of infective endocarditis
2. Presence of a prosthetic heart valve

**Drugs To Avoid:**
None unless specified by the physician

**Potential Emergency Situations:**
Cardiac: Cardiac arrest
Non-cardiac: Breathing difficulties may be associated with some forms of heart disease.

**7. Do you have an implanted pacemaker or a defibrillator?**
An artificial cardiac pacemaker or defibrillator is an electrical device implanted beneath the skin. Electrodes are placed into the endocardium of the right atrium of the heart. A cardiac pacemaker artificially regulates the beating of the heart by a series of rhythmic electrical discharges. Pacemakers may be present in patients who have a history of irregular heart beats or arrhythmias. Arrhythmias occur when the heart tissue fails to conduct normal impulses from the atrium to the ventricles of the heart. Poorly insulated, older pacemaker units are subject to malfunction when exposed to ultrasonic or sonic scalars, electrosurgery units, and pulp testers. These instruments emit energy that interferes with the electrical impulses of the pacemaker. Newer pacemakers are insulated in such a manner as to ensure minimal threat to pacemaker function from this type of electromagnetic interference.

**Conditions Indicating Medical Consultation:**
None; the AHA does not recommend antibiotic prophylaxis for patients with implanted pacemakers or defibrillators for invasive dental treatment.

**Dental Treatment Modifications:**
Avoid the use of ultrasonic or sonic dental equipment if the pacemaker is an older, less insulated unit.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
None unless specified by the physician

**Potential Emergency Situations:**
Cardiac: Cardiac arrest
Arrhythmias

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8, 9. Do you have a prosthetic heart valve? Do you have any other type of synthetic replacement in the cardiovascular system?

Prosthetic heart valves may be indicated for patients with a history of congestive heart failure, endocarditis, or defective heart valves. A patient may have either a mechanical or tissue valve. Either type of valve is susceptible to infective endocarditis or prosthetic valve endocarditis. Also, patients with mechanical valves often take anticoagulants which may have additional implications for certain dental procedures.

Other synthetic replacements of the cardiovascular system, such as coronary bypass grafts or arterial grafts, dacron grafts or patches, vena cava filters, and hemodialysis grafts may place patients at risk for infective endocarditis caused by skin organisms but
not oral bacteria. The AHA (2003 guidelines for Nonvalvular Cardiovascular devices) does not recommend antibiotic prophylaxis for patients with any of these devices for invasive dental treatment except for patients with lesions repaired by dacron grafts who should take prophylactic antibiotics for indicated dental procedures during the first 6 months following the repair. Also, a patient with any of the synthetic replacements or devices who requires incision and drainage for acute oral infection should take prophylactic antibiotics.

**Conditions Indicating MEdical Consultation:**
1. Prosthetic heart valves

**Dental Treatment Modification:**
If the patient is taking warfarin, have physician obtain an INR before any surgical or periodontal therapy procedures. If the INR is 3.5 or less the surgical or periodontal treatment can be done. If the INR is greater than 3.5 the anticoagulant dosage will have to be reduced by the patient’s physician. It will take 3 to 5 days for the reduction to be reflected in a decreased INR.

**Conditions Indicating Premedication:**
1. Prosthetic heart valves
2. Other synthetic replacements during the first 6 months following surgery or if residual defect (leakage) is present.

**Drugs To Avoid:**
None unless specified by the physician

**Potential Emergency Situations:**
Cardiac: Cardiac arrest

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10. *Have you had open heart surgery? If so, when and what type of surgery did you have?*

Open heart surgery may be required to place a prosthetic valve, bypass an obstruction, or remedy a defect in the heart or its arteries. Heart transplantation is a rare occurrence but has become more common in recent years. Candidates for heart transplantation are generally young (less than 40 years of age) and are usually free of other systemic disease.

**Conditions Indicating Medical Consultation:**
1. Open heart surgery
2. Heart transplantation

**Dental Treatment Modifications:**
1. If the patient is taking anticoagulants, test INR before any surgical or periodontal therapy procedures.
2. See guidelines for liver transplantation in the Gastrointestinal System section of this manual.

**Conditions Indicating Premedication:**

1. Open heart surgery: may only be necessary for the first 6 months following surgery depending on the type of surgery, material used, and other complicating factors
2. Heart transplantation: The AHA does not recommend prophylaxis unless valvulopathy (degeneration of valve function) is present. However, most transplant surgeons will recommend antibiotic prophylaxis for invasive dental treatment. Medical consultation with the transplant surgeon is indicated.

**Drugs To Avoid:**

None unless specified by the physician

**Potential Emergency Situations: Cardiac:**

Cardiac arrest

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11. **Do you have high blood pressure (hypertension)?**

**Hypertension** or high blood pressure occurs when an abnormal amount of pressure is exerted upon the arteries by the pumping action of the heart. The recommendations of the National Joint Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure made in 2003 (JNC 7) have been replaced by the JNC 8 report published in 2014. The new recommendations state that there is strong evidence to support treating hypertensive persons aged 60 years or older to a blood pressure (BP) goal of less than 150/90 mm Hg and hypertensive persons 30-59 years of age to a diastolic goal of less than 90 mm Hg. However, there is insufficient evidence in hypertensive persons younger than 60 years for a systolic goal or in those younger than 30 years for a diastolic goal. The panel recommends a BP of less than 140/90 mm Hg for these groups based on expert opinion. These same thresholds and goals are recommended for hypertensive adults with diabetes or non-diabetic chronic kidney disease (CKD).

Hypertension is the most important factor in the development of cardiovascular disease and affects approximately 30% of the United States population. More females, African Americans, and older adults are affected than others. Potential precipitating factors include genetics, stress, obesity, diabetes, and alcoholism.

Hypertension is usually an asymptomatic condition. The rationale for screening for hypertension in the dental office is that research indicates patients visit their dental professionals more regularly than their physicians. Current blood pressure readings (two readings averaged should be obtained to base recommendations) should be noted at
initial and recall appointments, as should any symptoms that may be associated with hypertension, such as dizziness, headaches, visual problems, tingling in the hands and feet, or ringing in the ears (tinnitus). Uncontrolled hypertension may result in heart attack, heart failure, stroke, or kidney failure.

Patients, with a **diastolic pressure of 110 or greater, a systolic pressure of 180 or greater, or signs and symptoms** of hypertension should be referred immediately for medical evaluation and treatment. No elective dental care should be provided until the patient’s blood pressure has been evaluated and controlled. Hypertension may be controlled through alterations in diet and/or stress reduction techniques. For many individuals, however, medication is necessary to sufficiently control hypertension. The JNC 8 states that there is moderate evidence supporting initiating drug treatment with an angiotensin-converting enzyme inhibitor, angiotensin receptor blocker, calcium channel blocker or thiazide-type diuretic in the non-black hypertensive population, including those with diabetes. In the black hypertensive population, including those with diabetes, a calcium channel blocker or thiazide-type diuretic is recommended as initial therapy.

Additional common medications include beta blockers, vasodilators, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, adrenergic blockers and combined alpha and beta blockers. Some antihypertensive medications may require special consideration during dental treatment. Vasoconstrictors may potentially interact with some of these medications. Medications may also have an adverse effect on the patient’s gingival tissue (creating gingival hyperplasia) or their salivary flow (creating xerostomia). As a result, medications may need to be adjusted, or salivary substitutes may need to be recommended.

Because of these and other side effects of antihypertensive medications, for patients to stop taking their medications without their physician’s knowledge is not uncommon. Therefore, confirm the patient’s compliance with the physician’s recommendations and emphasize the importance of taking medications regularly. Those patients who have not seen their physician for a year or longer should be encouraged to make an appointment so that their condition can be evaluated and medications updated.

**Conditions Indicating Medical Consultation:**
Uncontrolled, undiagnosed hypertension

**Dental Treatment Modifications:**
1. Reduce stress and anxiety.
2. Schedule shorter appointments.
3. Minimize use of local anesthetics with vasoconstrictors.
4. Do not use topical vasopressors to control local bleeding.
5. Do not use gingival packing material that contains epinephrine.
6. Avoid the use of general anesthesia.
7. If necessary, consider using nitrous oxide-oxygen inhalation sedation for stress
reduction.
8. If patient becomes overly stressed, discontinue the procedure.

**Conditions Indicating Premedication:**
The physician may recommend a sedative.

**Drugs To Avoid:**
1. Vasoconstrictors in larger doses (Most patients can tolerate 2 cartridges of 2% lidocaine with 1:100,000 epinephrine).
2. Any other drugs or medications as specified by patient’s physician

**Potential Emergency Situations:**
Cardiac: Cardiac arrest
Heart failure
Stroke
H. Hematologic System

1, 8. Do you have any form of anemia? Have you had pallor (white look)?

Anemia is a symptom of decreased oxygen in the blood due to an abnormality or reduction in the number of red blood cells. Hemoglobin is the iron-containing pigment of the red blood cells that carries oxygen from the lungs to the tissues of the body and carries carbon dioxide from the tissues to the heart. Anemia may result from excessive blood loss (acute or chronic), destruction of red blood cells, or decrease in red blood cell formation.

**Iron deficiency anemia** may result when (1) too few red blood cells are produced in the bone marrow, (2) absorption of iron is impaired, or (3) the patient’s diet is insufficient in iron. The repeated loss of blood associated with menstruation or inadequate intake of iron during pregnancy may also result in a mild state of iron deficiency anemia. **Pernicious anemia** occurs from lack of absorption of vitamin B12 in the intestines due to a failure of the gastric mucosa to produce hydrochloric acid, pepsin, and intrinsic factor. This results in a disorder in the maturation of red blood cells. Pernicious anemia occurs most often in adults of European descent between the ages of 40 and 70. **Aplastic anemia** is caused by failure of the bone marrow to develop naturally, the destruction of the marrow by chemicals such as arsenic and benzene, or physical factors such as ionizing radiation. **Sickle cell anemia** is a hereditary, chronic anemia in which a large number of red blood cells are crescent or sickle-shaped. The hemoglobin molecule of the red blood cells is abnormal. This disease occurs almost exclusively in individuals of African descent. Patients with a history of sickle cell anemia may have delayed eruption of teeth and hypoplastic enamel. Infection may precipitate a crises which can be life threatening. **Glucose-6-phosphate dehydrogenase deficiency (G6PD)** is another form of hereditary anemia that results from enzyme defects in the red blood cells.

The signs and symptoms of anemia include weakness, fatigue, shortness of breath on exertion, palpitations, pallor, burning of the tongue and oral tissues, tingling or numbness of the extremities, brittle nails, and loss of filiform papillae. Patients with anemia may have lowered resistance to infection. Oral lesions, infections, and delayed wound healing are all potential concerns.

**Conditions Indicating Medical Consultation:**
1. Patients with anemia who are not under the care of a physician
2. Patients experiencing unexplained symptoms that may be related to anemia

**Dental Treatment Modifications:**
1. Schedule shorter appointments for patients with weakness or fatigue.
2. Prevent trauma during instrumentation procedures.
3. Lubricate lips if dry or if angular cheilosis is present.
4. Emphasize oral hygiene to promote healthy tissues.
5. Emphasize the importance of a balanced diet; provide dental dietary counseling as
needed.
6. Avoid infection. For patients with a history of sickle cell anemia and G6PD, if infection does occur, treat aggressively with heat, antibiotics, extraction, pulpectomy.

**Conditions Indicating Premedication:**
Prophylaxis can be considered for patients with sickle cell anemia when dental treatment involves areas with chronic or acute infection or for major surgical procedures.

**Drugs To Avoid:**
Sickle Cell Anemia:
1. Avoid barbiturates, strong narcotics, and salicylates.
2. Avoid use of general anesthesia.
3. If nitrous oxide is used, provide 50% oxygen at all times.
4. Avoid use of vasoconstrictor in local anesthetics except for surgical procedures.
G6PD: Avoid drugs containing phenacetin, sulfa, aspirin, and chloraphenicol.

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2. **Do you have leukemia?**

Leukemia is a cancer of the white blood cells. White blood cells are produced in the lymphoid and myeloid tissues of the bone marrow. These cells protect the body from infections with bacterial, viral, and fungal organisms. As a result, patients with leukemia are at risk for developing infections that could overwhelm the body and eventually cause death.

Clinical research evaluates if a medication is safe and effective in treating a particular condition such as leukemia, lung cancer, breast cancer and other forms of cancer. Before a new agent can be approved for use, investigational study medications must go through 3 phases of clinical research: **Phase I**-the medication is given to a small group of healthy volunteers. The study looks to see how much of the medication is safe to take and how the volunteers' bodies reacted to the medication. **Phase II**-the medication is given to a small group of patients with the disease for which the study medication is being tested for its potential role as a treatment. Researchers look at which dose works best, how safe it is and begin to look at whether the medication is effective. **Phase III**-Physicians evaluate the safety and efficacy of the investigational study medication in a much larger group of patients with the condition being studies. In addition, comparisons are sometimes made between the study medication and drugs used to treat the same condition.

**Acute lymphocytic leukemia** is a type of leukemia most commonly found in children. The cause is unknown. However, an increased risk for developing the disease has been associated with chromosomal abnormalities, immune deficiency, and exposure to large doses of ionizing radiation, toxic chemicals, or RNA viruses. Signs and symptoms of acute leukemia include fever, pallor, weakness, recurrent infections, enlargement of the lymph nodes and spleen, easy bruising, and small hemorrhages of the skin. Oral manifestations
include enlargement of the tonsils, gingival hyperplasia, candidiasis, ulcerations, prolonged bleeding, delayed healing, petechiae, and ecchymoses. Treatment of acute lymphocytic leukemia in children has one of the most successful outcomes of cancer chemotherapy. Cure rates now are over 50%.

**Chronic lymphocytic leukemia** is the most common type of leukemia in adults. Onset of the disease may include vague symptoms such as fatigue, weight loss, fever, or lymphadenopathy. These symptoms may be present for a year or more before a diagnosis is determined. The cause of chronic lymphocytic leukemia is unknown. Patients usually survive an average of 3 to 7 years after diagnosis.

Chemotherapy is the primary treatment for leukemia. Chemotherapy is sometimes combined with total body radiation prior to bone marrow transplantation. The goal of chemotherapy is to attack rapidly dividing cancer cells. Unfortunately, rapidly dividing normal cells are attacked as well. As a result, changes in the oral cavity may include mucositis, hemorrhage, xerostomia, and increased risk for bacterial and fungal infections.

**Conditions Indicating Medical Consultation:**
1. History of leukemia
2. Unexplained signs or symptoms that may be related to leukemia

**Dental Treatment Modifications:**
1. Refer to section on radiation and chemotherapy concerning prevention and management of oral and medical complications.
2. Avoid all dental care if possible during acute stages of disease.
3. During states of remission, perform all dental treatment and establish an effective prevention program and maintenance interval.
4. Determine platelet count prior to providing dental care that may involve bleeding. If platelet count is less than 50,000/mm$^3$, postpone dental treatment until replacement restores count to over 50,000/mm$^3$

**Conditions Indicating Premedication:**
1. Consult with an oncologist prior to any dental procedure.
2. Consider use of prophylactic antibiotics to minimize the risk of postoperative infection in patients with a white blood count less than 2000 MM$^3$ and/or a neutrophil count less than 500 MM$^3$. Modification of the AHA regimen for prevention of endocarditis, can be used following medical consultation:
   a. One hour prior to the appointment give 2 g Pent/; 500 mg Pent/ every 6 hours for the remainder of the appointment day and for the next 5 to 7 days.
   b. For patients allergic to penicillin, administer 300 mg clindamycin 1 hour prior to the appointment; 150 mg clindamycin every 6 hours for the remainder of the appointment day and for the next 2 to 5 days.
Drugs To Avoid:
As specified by the patient’s physician

Potential Emergency Situations:
Non-cardiac: Hemorrhage

3-6, 8. Do you have hemophilia or other bleeding problems? Do you have relatives who have bleeding problems? Have you had spontaneous bleeding from the nose, mouth, or ears? Have you had pallor (white look)?

Excessive bleeding or bleeding problems in relatives may indicate a history of hemorrhagic disease. There are several types of hemorrhagic diseases. Classic hemophilia (Hemophilia A) and Christmas disease (Hemophilia B) are two hereditary hemorrhagic diseases. Classic hemophilia is caused by a deficiency of a factor in plasma necessary for coagulation of blood (Factor VIII) and occurs almost exclusively in males. Christmas disease is caused by a deficiency in plasma thromboplastin (Factor IX).

Patients with bleeding disorders such as these are at increased risk for spontaneous gingival bleeding or excessive, prolonged bleeding following minor trauma to the oral tissues. Patients are at even greater risk if surgical procedures are performed without special preparations. Therefore, diagnosed hemophilia and bleeding disorders such as thrombocytopenia or von Willebrand’s disease will require a complete blood work-up prior to dental treatment.

Oral tissues in patients with bleeding disorders may show petechiae, ecchymoses, hematomas, jaundice, pallor, or ulcers. Patients may complain of spontaneous gingival bleeding. Due to neglect, many of these patients may have severe periodontal disease or caries. Effective, daily, oral hygiene should be stressed to the patient to achieve and maintain oral health. Throughout dental treatment, reinforce brushing and flossing techniques. Assure the patient that personal oral hygiene will not induce bleeding if tissues are maintained.

Hemorrhagic episodes may also manifest in persons who have vascular defects, too few or too many platelets in their blood, liver disease, renal disease, leukemia, and severe hypertension. Hemorrhage may also be caused by a reaction to anticoagulant therapy, female endocrine imbalances, pregnancy, infection, hematoma, tumor, or medications such as salicylates, hormones, and iron preparations.

**Laboratory tests** used to screen patients for bleeding disorders include platelet count, platelet function analyzer 100 (PFA-100), prothrombin time (PT), partial prothrombin time (PTT), and thrombin time (TT). Tests most often needed for patients seeking dental treatment are PFA-100, PT, and PTT. The PFA-100 measures ability of an adequate number and quality of platelets to form a platelet plug in the test instrument expressed as the closure time. The normal closure time for the PFA-100 is less than 175 seconds. PT evaluates
the phase of coagulation (extrinsic and common pathways) that does not include Factors VIII and IX. The range for normal PT is 11 to 15 seconds. PT will be prolonged in patients receiving coumarin therapy or with liver disease. The INR is used to express the level of anticoagulation in patients taking coumarin. According to the American Medical Association and the American Drug Association, these patients should be at a level of coagulation no greater than an INR of 3.5 before dental procedures that involve bleeding are provided. PTT (measures the intrinsic and common pathways) is an appropriate measure of coagulation for patients with hemophilia or Christmas disease, since it requires Factors VIII and IX, which are not evaluated by PT. The range for normal PTT is 25 to 35 seconds.

**Topical hemostatic agents used to control bleeding** include: gauze, gelfoam, HemCon Dental Dressing, Cellulose (Surgicel, Oxycel), Collagen (Instat, Avitene, Helistat, CollaCote, Tape, Plug), Thrombin (Thrombostat, Thrombinar, Thrombogen), Tranexamic acid (Lyteda tablets, IV Cyklokapron), Amicar (tablets, syrup, IV) and Histocryl.

**Conditions Indicating Medical Consultation:**
1. Hemophilia A
2. Hemophilia B
3. Other bleeding disorders such as thrombocytopenia and von Willebrand's disease
4. Patients with bleeding problems as suggested by medical history or clinical examination

**Dental Treatment Modifications:**
Hemophilia and other blood disorders:
1. Perform no dental procedures unless the patient had been prepared based on consultation with a hematologist. Hospitalization for dental procedures may be recommended.
2. If the patient's gingival tissues are markedly inflamed, the severe hemophiliac may require factor replacement therapy for the first prophylaxis appointment.
3. Periodontal treatment planning should consider the severity of the patient's disease. Attempt conservative treatment before employing more radical procedures. If periodontal surgery or deep scaling is employed, factor replacement may be required.
4. Frequent recall appointments with emphasis on disease prevention may be necessary.
5. Use of local measures to assist in the control of excessive bleeding such as splints, microfibrillar collagen, and gelfoam with thrombin may be needed.
6. Endodontic procedures rather than extractions should be performed whenever possible.
7. Avoid the use of block injections unless, in the case of hemophilia, the patient has a plasma Factor VIII level of 50% or greater.

**Patients with bleeding problems:**
Perform no dental procedures until appropriate screening tests have been conducted and appropriate values achieved by replacement therapy.
1. Aspirin therapy (20 gr or more for 1 week or more): PFA- 100 (if available) and PTT tests
2. Coumarin therapy: INR test if greater than 3.5, request the patient’s physician to reduce the coumarin dosage. The effects of the reduction will take 3 to 5 days. On the day of the appointment, INR must be rechecked prior to procedures to assure a level less than 3.5.
3. Liver disease: platelet count and PT tests
4. Chronic leukemia: complete blood count (WBC count and differential, Hb, platelet count)

**Conditions Indicating Premedication:**
Patients with hemophilia or other bleeding disorders: Prophylactic antibiotics are not indicated. Prophylaxis can be considered however if dental treatment is performed in areas of acute infection.

**Drugs To Avoid:**
1. Aspirin and aspirin-containing compounds
2. NSAIDS

**Potential Emergency Situations:**
Non-cardiac: Hemorrhage
Shock

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7. *Have you ever had a blood transfusion? If so, during what year?*

Patients with a history of blood transfusion may have a potentially significant underlying problem that necessitates blood transfusion. The dental health care professional should question the patient to determine why the blood transfusion occurred and if further medical consultation is needed. Transfusion recipients prior to 1994 have a high rate of infection with the hepatitis C virus. In addition, patients who received blood transfusions during the period 1978 to 1985 may have been inadvertently infected with the human immunodeficiency virus (HIV). The donated blood supply now is very safe but not completely free of risk for Hepatitis B, Hepatitis C and HIV transmission and on rare occasions infection with one of these agents may occur.

**Conditions Indicating Medical Consultation:**
Advise patients at risk for having contracted the Hepatitis C virus or HIV and have not been previously screened for the presence of these viruses to see their physician.

**Dental Treatment Modifications:**
None

**Conditions Indicating Premedication:**
None
Drugs To Avoid:
None

Potential Emergency Situations:
None
I. Immune System and Neoplasia

1, 2. Do you have allergies? Do you have or have you had a skin rash or hives?

Patients with a history of allergies may have had a reaction to some of the drugs or materials that are used in dentistry. Antibiotics and analgesics are common drug allergens reported by patients. Local anesthetics are rare allergens. Some patients may report allergies to items such as latex gloves, rubber dams, fluoride, or impression materials. The dental healthcare professional should question the patient to determine how he or she reacted in the past. Some follow-up is needed to establish a definite history of allergy. Patients may state that they have an allergy to a particular substance; however, upon further questioning, their symptoms more accurately describe an intolerance, adverse side effect, or, with local anesthetics, a psychomotor reaction.

True allergic symptoms include itching, hives, rash, swelling, wheezing, edema, runny nose, and tearing eyes. The most severe allergic reaction is anaphylaxis, which can occur within seconds following the administration of the antigen. Death can result if immediate steps (injection of 1:1,000 epinephrine) are not taken. Avoidance of any drugs or materials causing allergic reaction is recommended. Symptoms such as nausea, vomiting, palpitations, and fainting are generally not considered to be related to an allergic response but may be related to substance intolerance.

Conditions Indicating Medical Consultation:
1. Patients with allergic symptoms of unknown origin
2. Allergic responses to previously unidentified drugs or materials

Dental Treatment Modifications:
1. Avoid drugs and/or materials that cause allergic reaction.
2. When prescribing drugs, inform patients of the signs and symptoms of allergic reactions; advise patients to call if such a reaction occurs or to report to a hospital emergency room.

Conditions Indicating Premedication:
None

Drugs To Avoid:
Drugs that cause an allergic reaction

Potential Emergency Situations:
Cardiac: Anaphylactic shock
Angioneurotic Edema—Larynx/Pharynx
3-8. Are you HIV infected? Do you have AIDS? Do you have sores in your mouth? Do you have white lesions in your mouth? Have you had night sweats? Have you had unusual weight loss?

Acquired immune deficiency syndrome (AIDS), first reported in the United States in 1981, is an infectious disease characterized by a partial or complete loss of immune system function. AIDS differs from other immune system disorders in that it is not genetic and is not caused by an immunosuppressive medication or underlying disease. AIDS is caused by the human immunodeficiency virus (HIV). HIV infection occurs when the virus invades the T-helper lymphocytes. AIDS is transmitted predominantly through intimate sexual contact and parenteral means by HIV. Infection with HIV is identified by isolation of the virus or presence of antibodies to the virus. Two serological tests are used to determine antibody presence: enzyme-linked immunosorbent assay (ELISA) and immunofluorescence assay (Western Blot). The DNA polymerase chain reaction (PCR) can be used too for direct detection of HIV. It is much more expensive than the ELISA and Western Blot tests. The viral load (degree of viremia in blood plasma) can be determined by the use of a PCR-based test.

During the first 2 to 6 weeks after initial infection with HIV more than 50% of patients develop flu-like symptoms that last from 10 to 14 days. It takes 6 weeks to 6 months for infected patients to seroconvert (become antibody positive for HIV), however, during this period they are infectious (virus is present). Once exposure to HIV and seroconversion has occurred, three groups of patients may be identified. The first group consists of patients that are antibody positive to HIV but are asymptomatic (asymptomatic carrier stage). During this period a patient may be infectious without exhibiting symptoms. Laboratory evidence of infection may not appear for months after exposure to the virus. The second group of patients are antibody positive and demonstrate various laboratory changes (lymphopenia, T-helper/T-suppressor ratio usually less than 1) These patients may show clinical signs or symptoms, such as enlarged lymph nodes, night sweats, weight loss, oral candidiasis, fever, malaise and diarrhea (symptomatic stage). Other oral findings that may be found in patients in the symptomatic stage include hairy leukoplakia, herpes simplex, and xerostomia. Some patients may have acute gingival infections resembling acute necrotizing ulcerative gingivitis (ANUG) or accelerated periodontal disease. The third group of patients is those with AIDS. This represents the final stage of HIV infection. These patients have opportunistic infections, certain cancers, wasting syndrome, and/or a CD4 count less than 200 and an altered T-helper/T-suppressor ratio of 0.5 or less. AIDS patients may exhibit the same symptoms and oral findings as symptomatic patients. However, they develop multiple opportunistic infections such as Pneumocystis carinii pneumonia, tuberculosis, toxoplasmosis or certain cancers. One of the most frequent malignant manifestations of AIDS is Kaposi’s sarcoma, a skin cancer. Kaposi’s sarcoma lesions appear as single (or multiple), painless, reddish blue, flat (or elevated) areas which are highly vascular. They are commonly seen in the mouth especially on the hard palate. Other cancers found in patients with AIDS include NonHodgkin’s lymphoma and carcinoma of the cervix.

Early in the AIDS epidemic most AIDS cases involved homosexual and bisexual males and
IV drug abusers. Some cases were reported in children and heterosexuals. Hemophiliacs with AIDS represented about 1% of all cases and transfusion patients about 2%. The estimated incidence of HIV has remained stable overall in recent years at about 50,000 new HIV infections per year. Within the overall estimates however, some groups are affected more than others. Men who have sex with men continue to bear the greatest burden of HIV infection and among races/ethnicities. Among races and ethnicities, African Americans continue to be disproportionately affected. AIDS has now become more common in children and older adults. It has become much more common due to heterosexual contact with increasing numbers of women becoming infected. New HIV infections among women are primarily attributed to heterosexual contact (84% in 2010) or injection drug use (16% in 2010). Women accounted for 20% of estimated new HIV infections in 2010 and 23% of those living with HIV infection in 2011. The 9,500 new infections among women in 2010 reflect a significant 21% decrease from the 12,000 new infections that occurred among this group in 2008. The number of cases occurring in hemophiliacs and transfusion recipients has been greatly reduced since screening of blood donors for HIV and production of ultra pure factor-VIII replacements. All segments of our society are now affected by AIDS.

It is estimated that all individuals infected with HIV will eventually develop AIDS. It takes, on average, about 10 years from the initial HIV infection to the development of AIDS. In the past, from the time of diagnosis, AIDS patients lived approximately 2 years. There was no effective treatment or cure. However, a few drugs, specifically zidovudine (AZT), had been successful in slowing the progress of the disease. Now therapy consists of a combination of antiretroviral regimens. These include protease inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside transcriptase inhibitors, nucleotides, and fusion inhibitors. Treatment with these agents is referred to as highly active antiretroviral therapy (HAART). HAART slows the progression of infection but is not a cure. Now about 30% of patients with AIDS will live approximately 2 to 3 years with about 70% of the patients with AIDS expected to live 10 years or longer. At the present time there is no effective vaccine to prevent HIV infection. A number of investigators are working on finding an effective vaccine. An effective vaccine offers the best hope for containing the HIV epidemic.

Most HIV infected patients can receive needed dental treatment without any special precautions. Once the infection has progressed to AIDS special precautions may be indicated for patients with thrombocytopenia, leukopenia, and severe depression of the CD4 count. Patients with a platelet count of 50,000 per mm$^3$ of blood or less may need special preparation prior to periodontal or surgical procedures. Antibiotic prophylaxis can be considered for AIDS patients with a neutrophil count of 500 or less per mm$^3$ of blood and a CD4 count of 200 or less per mm$^3$ of blood. The need for prophylaxis should be established by consultation with the patient’s physician. Standard precautions for infectious disease transmission must be practiced when treating these patients.

HIV is principally transmitted by intimate sexual contact, use of contaminated needles, or contact with blood. While sexual contact and use of contaminated needles are the most prevalent routes of transmission in the general population, contact with infected blood poses
the greatest risk for health care workers. Saliva has not been shown to transmit the virus, even though small quantities of HIV have been isolated in saliva.

While risk of transmission of HIV from a patient to a dental health care professional is extremely low, the risk does exist. Strict infectious disease control protocol for all patients is an essential component of protection since detection of HIV status and other diseases through medical history taking alone may be unreliable. For legal purposes, periodic serologic testing for evidence of HIV infection may be desirable for dental health care professionals to establish a record of HIV status should exposure occur in the workplace.

If a dental health care professional is exposed to the blood or body fluids of a patient, both patient and dental health care professional should be serologically tested for HIV infection. While patients can be requested to undergo such testing, it is not mandatory. Follow-up evaluations should be done at 6 weeks and at 3, 6, and 12 months after exposure to determine if transmission has occurred. No further testing is necessary if seroconversion has not occurred after 1 year.

**Conditions Indicating Medical Consultation:**
1. Unexplained signs or symptoms that may be related to HIV infection
2. Patients with HIV infection who are not under the care of a physician
3. If extensive dental treatment is needed
4. Prior to surgical or complex restorative procedures

**Dental Treatment Modifications:**
1. Because most patients infected with HIV are undetectable by taking a medical history, all patients should be treated using standard precautions.
2. Avoid tissue trauma.
4. Schedule frequent recall appointments with emphasis on disease prevention.
5. Complications of HIV, such as candidiasis and herpes simplex, may require treatment modification and should be diagnosed by appropriate laboratory tests. Candidiasis may be treated effectively with anti-fungal agents such as nystatin or clotrimazole; herpes may be treated with acyclovir. Chlorhexidine may be effective in eliminating or controlling other oral mucosal infections.

**Conditions Indicating Premedication:**
Prophylactic antibiotics may be recommended to prevent post-operative infection in patients with AIDS if the neutrophil and CD4 counts are very low.

**Drugs To Avoid:**
None unless specified by physician

**Potential Emergency Situations:**
9, 10. **Do you have lumps or tumors in your mouth or neck? Have you been treated for cancer with surgery, radiation, or chemotherapy?**

The presence of lumps or tumors may indicate the need for consultation by the patient’s physician or an oral pathologist. In addition, a history of lumps or tumors may indicate an increased risk for the development of other growths in the head and neck region. Treatment may include surgery, radiation, and/or chemotherapy.

Patients who have had surgery may have missing oral structures, limitations in jaw opening, and difficulty performing oral hygiene techniques. Oral manifestations and complications related to radiation and/or chemotherapy will vary depending on the treatment protocol, dosage, and the patient’s tolerance level. These reactions result from both direct and indirect effects of cancer therapy.

Patients receiving chemotherapy may be at increased risk for mucositis, ulcerations, xerostomia, bacterial and fungal infections, hemorrhage, and anemia. The effects of radiation to the head and neck may result in taste loss, hypersensitivity, xerostomia, mucositis, bacterial and fungal infections, nutritional deficiency, radiation caries, trismus, and osteonecrosis (bone marrow that has been subjected to radiation and is no longer viable). To minimize these side effects, dental intervention prior to therapy is essential.

**Conditions Indicating Medical Consultation:**

Consultation with the patient’s oncologist:

1. Prior, during, and after radiation therapy
2. Prior and during chemotherapy: prophylactic antibiotics may be recommended for emergency dental treatment if severe neutropenia (less than 500 per mm$^3$ of blood) is present.

**Dental Treatment Modifications:**

Prior to starting chemotherapy:

1. Complete a thorough examination, including full-mouth radiographs.
2. Eliminate areas of infection or irritation such as broken restorations, periodontal inflammation, and ill-fitting prostheses.
3. Treat all non-vital teeth endodontically if possible, otherwise extract them.
4. Remove orthodontic bands and gingival operculum.
5. For pediatric patients, mobile primary teeth should be extracted as well as those expected to be lost during chemotherapy.
6. Implement an aggressive disease prevention plan for caries and periodontal disease. Patients with such a plan who follow through with home care instruction will have fewer complications.
a. Maintain excellent oral hygiene of natural teeth by using a soft toothbrush and flossing daily. If gums bleed easily, brush teeth, gums, and tongue gently with an extra-soft toothbrush and a baking soda/water paste.

b. Use a 1% to 2% acidulated fluoride gel or 0.5% neutral sodium fluoride gel once daily in custom trays or brush-on application of 1.1 % NaF 5 000 ppm fluoride such as PreviDent (Colgate) or Clinpro 5000 (3M Espe).

c. Use baking soda-salt rinses (1 tsp of each in 1 pint of water) to soothe tissues. Avoid commercial mouthwashes that contain alcohol.

d. Maintain cleanliness of removable appliances by brushing and soaking in an antimicrobial cleaner or mild detergent. Remove prostheses at night, and keep out of the mouth if sores develop.

e. Provide dental dietary counseling to assess current habits related to caries; include instructions for minimizing decay. If xerostomia develops, place special emphasis on calcium phosphate products (MI Paste with Recaldent), xylitol products, sugarless choices of gum, lozenges, and moisture-rich foods. Provide dietary instructions for maintaining adequate food intake and minimizing trauma related to food. Recommend thinning foods with liquid to aid in swallowing, use of straws to drink liquids, and avoidance of irritating foods such as citrus fruits, citrus juices, and hot and spicy foods and liquids.

f. Discuss habits that may be detrimental to oral health, for example, use of tobacco or excessive use of alcohol. If the patient lives with smokers, suggest the use of air filtering appliances.

During chemotherapy:

1. Culture and prescribe treatment for oral infections in cooperation with the patient’s oncologist.
   a. Candidiasis may be treated effectively with anti-fungal agents such as nystatin or clotrimazole.
   b. Herpes may be treated with acyclovir.
   c. Chlorhexidine may be effective in eliminating other bacterial infections.

2. Provide pain control.
   a. Use analgesics such as ibuprofen; if ineffective, progress to prescription medication as needed.
   b. Mix equal parts of benylin syrup and kaopectate as a mouth coating and rinse.
   c. Use 2% xylocaine 30 minutes or more before meals.

3. Reinforce home care instructions and provide additional instructions to minimize disease as needed. If xerostomia develops during treatment, restrict caffeine intake, humidify the air, use nonpetroleum-based lip balms, sip on water regularly, and allow ice to melt in the mouth. Use salivary substitutes such as Xero-tube (Scherer Labs), Saliv-aid (Copley Labs), Moi-Stir (Kingsport Labs), or Salivart (Westport Pharmaceutical). Use salivary aids such as Biotene toothpaste, gum, mouthwash, and oral balance gel (all Laclede Professional Products) or Oasis (GlaxoSmithKline) as needed. Consider salivary stimulants available by prescription such as pilocarpine hydrochloride or cemiveline hydrochloride. Products containing amorphous calcium phosphate such as Trident with Recaldent or Minimal Intervention (MI)
paste will assist in promoting remineralization.

4. Provide emergency care only during treatment. If invasive procedures must be performed, consult with the patient’s oncologist.

**Following chemotherapy:**
Resume normal disease prevention and maintenance schedule after all side effects of therapy have resolved.

**Prior to head and neck radiation therapy:**
The goal of treatment prior to radiation therapy is to establish a dentition that will be maintained the rest of the patient’s life.

1. Provide a complete oral examination.
2. Assess the patient’s motivation and determine the number of restorable teeth. Lack of motivation or capability to maintain adequate oral hygiene may require total odontectomy.
3. For patients who will have all or partial dentition remaining, follow the modifications in dental treatment listed previously for care prior to starting chemotherapy.

**During head and neck radiation therapy:**
1. Follow the modifications in dental treatment listed previously for care during chemotherapy.
2. Include instructions for jaw muscle exercises to minimize the development of trismus.
   a. Instruct the patient to open and close the mouth, as far as possible, 20 times, 3 times daily.
   b. If restriction develops, instruct the patient to insert 2 tongue blades banded together into the mouth 3 times daily. Gradually increase jaw opening by inserting as many tongue blades as possible between the banded blades. Continue until no restriction exists.

**Following head and neck radiation therapy:**
1. Prevent disease through frequent recall intervals (3-4 months). Treatment should include prophylaxis, examination, topical fluoride treatment, and patient education regarding disease prevention.
2. Patients must continue daily fluoride applications (tray or brush-on or varnish) for the remainder of their lives.
3. Construct new prosthetic appliances 3-6 months following therapy. Attend to prosthetic appliance irritation immediately to minimize the risk of alveolar process involvement.
4. Provide restorative care for carious lesions as soon as possible.
5. Consult the patient’s oncologist prior to performing dental care such as tooth extractions or periodontal surgery. Risk of osteonecrosis is lifelong. Therefore patients needing these procedures require special precautions.

**Conditions Indicating Premedication:**
None unless specified by the patient’s oncologist
11. Do you use tobacco? If so, what kind, how much, and how long have you used it?

The use of tobacco products is a risk factor associated with malignancies, cardiovascular disease, and pulmonary disease. Such conditions may present the need for dental treatment modifications as described in previous sections of this manual. Increased risk of periodontal disease has also been associated with tobacco use. While all forms of tobacco are potentially detrimental to oral health, cigarette smoking has been specifically identified as a risk indicator for periodontal disease. Studies have revealed that cigarette smokers are 5 times more likely to have periodontal disease than non-smokers. Cigarette smoking impairs the healing processes of the periodontal tissues and consequently, decreases the likelihood of successful periodontal therapy. Use of smokeless or spit tobacco may result in localized periodontal problems such as recession and loss of attachment. Initiation of a smoking cessation program in the dental office should be pursued for interested and willing patients.

Conditions Indicating Medical Consultation:
1. Signs or symptoms related to undiagnosed systemic conditions
2. Abnormal findings from the head and neck examination

Dental Treatment Modifications:
1. Perform thorough head and neck examinations at each recall interval.
2. Discuss the effects of tobacco use on general health and on oral health. Provide the opportunity for smoking cessation through an office program or other source.
3. Emphasize oral hygiene to promote healthy tissues.

Conditions Indicating Premedication:
None

Drugs To Avoid:
None

Potential Emergency Situations:
None
1. Do you have an eye disorder such as glaucoma, macula degeneration, cataracts, or blindness?

Glaucoma is an obstruction of the circulation of the eye. Macula degeneration is associated with loss of the central vision of the eye. A cataract is a clouding of the lens. Blindness may be congenital or acquired. An individual is considered to be legally blind if, with corrective lenses, he or she can see at 20 feet what a person with normal vision can see at 200 feet. Therefore, most legally blind individuals have some vision. While surgery can provide improvement for some of these conditions, limitations in vision may remain. Through further questioning, the dental professional should ascertain the degree of visual impairment, the age of onset, and the degree of independence.

Conditions Indicating Medical Consultation:
Signs or symptoms of previously undiagnosed limitations in vision

Dental Treatment Modifications:
1. Provide assistance to and from the reception area as needed.
2. Provide verbal explanations for all dental procedures, including a description of surroundings and various sounds.
3. Provide disease prevention education based on feel rather than look.
4. Be careful when using certain expressions in conversation that may be potentially offensive. For example, “When was the last time you saw your dentist” may be more appropriately expressed “When was your last dental check-up?”

Conditions Indicating Premedication:
None

Drugs To Avoid:
For patients with closed-angle glaucoma, avoid anticholinergic drugs that block the parasympathetic nervous system since an increase in intraocular pressure may occur.

Potential Emergency Situations:
None

2. Do you wear a hearing aid or are you hard of hearing?

Knowledge of a hearing impairment can prevent socially and professionally embarrassing circumstances. A hearing impairment may be congenital or acquired as a result of infection, injury, aging, or prolonged exposure to noise. The dental professional should question the
patient regarding the type and severity of hearing loss, age at onset, etiology, how the person generally communicates, and previous dental experiences.

**Conditions Indicating Medical Consultation:**
Signs and symptoms of previously undiagnosed hearing impairments

**Dental Treatment Modifications:**
1. If necessary, establish alternative methods of effective communication such as sign language, lip reading, pictures, models, or drawings. When possible, include tactile and visual senses in demonstrations.
2. If the patient is a lip reader, face the patient so your face and lip movements are observable. Pronounce words carefully and distinctly in a normal tone. You may need to talk louder than usual but do not talk more slowly than usual.
3. Avoid startling the patient by maintaining physical or visual contact.
4. When using equipment and procedures that create vibrations (for example, high speed handpiece, low speed handpiece, and ultrasonic and sonic scalers), determine the patient’s preference for volume settings on his or her hearing aid. Hearing aids may be turned down or removed for maximum comfort.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
None
K. Behavioral System

1. Are you depressed or being treated for depression?

In 2014, American Psychiatric Association published the updated “Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM5).” It replaces the DSM-4 manual that had been their key reference for over 10 years. The diagnostic features, prevalence, clinical course, risk and prognosis including suicide risk are covered for depression, anxiety including post-traumatic stress disorder, and phobias that are described below. Depression is also a significant feature in patients with bipolar I and bipolar II disorders.

**Depression** may indicate a normal, temporary change in an individual’s emotional state or a more serious condition requiring professional psychiatric evaluation. Approximately 20% to 25% of the adult female population and 7% to 12% of the adult male population will experience a major depressive episode. A major depression can immobilize an individual. Difficulty getting up in the morning, restlessness, and loss of interest in life are signs of depression. Self-esteem is often low, and little attention may be paid to personal hygiene. Weight loss or gain and insomnia may also occur. Inability to think or concentrate or indecisiveness are common problems in depressed individuals. Depressed individuals may have recurrent thoughts of death, or suicidal ideation (thinking) without a specific plan, or with a plan, or attempted. If untreated, major depression will usually last 8 or 9 months. Treatment may involve a combination of psychotherapy and antidepressant medication.

A common side effect of antidepressant medication is xerostomia. Patients may also experience facial pain and glossodynia. In addition to life circumstances, medical illnesses, medications, or substance abuse (such as alcohol or cocaine) can produce symptoms of depression.

**Conditions Indicating Medical Consultation:**

1. History of unexplained signs and/or symptoms related to depression
2. If patient information regarding current status or medications is lacking
3. If xerostomia exists, consultation with the patient’s physician regarding type and dosage of medication may be necessary.
4. Patient who has expressed thoughts of suicide.

**Dental Treatment Modifications:**

1. Establish a trusting relationship with good communication.
2. Establish an interest in oral health; emphasize the importance of maintaining plaque control for disease prevention.
3. Provide preventive education regarding xerostomia. Recommend salivary aids as needed. For specific guidelines, refer to the section in this manual on the immune system and neoplasia.
4. Encourage good nutrition. Provide dental dietary counseling as needed.
5. Avoid excessive use of epinephrine as it may interact with antidepressant medications causing severe hypotension. Two cartidges of 2% lidocaine with 1:100,000 epinephrine can safely be used.

**Conditions Indicating Premeditation:**
None

**Drugs To Avoid:**
Vasoconstrictors in large doses

**Potential Emergency Situations:**
None

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2. **Do you have an anxiety disorder or phobia related to dental care?**

*Anxiety* is a feeling of foreboding that something awful is about to happen. The reason for anxiety is not always apparent to an individual experiencing it. Mild levels of anxiety related to dental care are experienced by most individuals. In some instances, however, the level of anxiety may be strong enough to cause a marked increase in heart rate, dilation of pupils, sweating, muscle tension, and diarrhea. *Post-traumatic stress disorder* is a common anxiety disorder that occurs after severe psychological stress such as that produced by military combat, violence, and natural disasters. In general, anxious patients will appear tense, apprehensive, and/or overalert.

Specific *phobias* include a fear or anxiety about an object or situation such as flying, heights, animals, receiving an injection or seeing blood. The fear is persistent and usually lasts for 6 months or longer. The 12-month community prevalence for specific phobias is 7-9%. Prevalence rates are higher in children (5%) and 13-17 year olds (16%) and are lower in older individuals (3-5%). They are more common in females than males (rate of 2:1). An example of a specific phobia is a *dental phobia* characterized by anxiety and/or fear related to certain aspects of dentistry or dentistry as a whole. A dental phobia may result from an unpleasant dental experience. Examples include phobias of the dental chair, handpiece, or injection syringe. In most cases, the person is aware of the problem and why he or she is fearful. Such fear can lead to an aversion of dental care for years or even a lifetime. Symptoms related to dental phobias include shortness of breath, dizziness, trembling, sweating, choking, numbness, tingling sensations, or chest pain.

**Conditions Indicating Medical Consultation:**
History of unexplained signs and/or symptoms related to dental phobia

**Dental Treatment Modifications:**
1. Establish a trusting relationship with good communication to minimize the potential for an unpleasant dental experience.
2. If dental anxiety is suspected, discuss your perceptions with the patient. Encourage dialogue regarding the patient’s attitude toward dental professionals and dental procedures. Allow sufficient time for patients to discuss their feelings without conveying an urgency to proceed with the appointment.
3. Assure the patient that dental procedures can stop at any time; identify a signal the patient can use to indicate he or she would like the procedure to stop.
4. Use oral sedation or nitrous oxide to manage dental treatment if necessary.
5. Encourage an interest in oral health; stress the importance of maintaining plaque control for disease prevention.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
Non-cardiac:  
- Syncope
- Hyperventilation

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3. **Do you have dementia or Alzheimer's disease?**

*Dementia* is a condition characterized by a gradual loss of intellectual abilities. Dementia may be caused by infection, nutritional disorders, intracranial lesions, metabolic diseases, or intoxication. While some cases of dementia are reversible, most are not. *Alzheimer's disease* is primarily a disease of the elderly, occurring most often in persons over the age of 65. Alzheimer’s disease is the seventh leading cause of death in the United States. Recent memory loss or subtle personality or behavioral changes may be the first signs of the disease. Depression, anxiety, or apathy is common in the early stages. The disease may go undetected until an event creates an unusual level of confusion for the individual. Deterioration of memory, judgment, language, and ability to perform basic tasks such as personal grooming eventually leave individuals incapable of caring for themselves. Although research advancements continue to be made with this disease, treatment is limited. The onset of symptoms can be slowed by cholinesterase inhibitors such as Ancept, Reminyl, and Exelon and a beta-amyloid inhibitor Nemed. Individuals may take antidepressants, sedative-hypnotics, and anti-seizure medications that may have implications for dental treatment. In addition, once individuals are unable to care for themselves, a personal attendant or family member will need to assist with maintaining oral health. Clinical findings may include poor oral hygiene, increased incidence of oral disease, and injury.
Conditions Indicating Medical Consultation:
1. History of unexplained signs or symptoms that may be related to dementia or Alzheimer’s disease
2. If patient information regarding current status or medications is lacking.
3. If xerostomia exists, consultation with the patient’s physician regarding type and dosage of medication may be necessary.

Dental Treatment Modifications:
1. Communication should be empathetic and positive; use short words and phrases; be repetitive. Use positive nonverbal communication such as direct eye contact, smiling, and touching the patient on the arm.
2. Establish a treatment plan that is realistic and flexible.
3. Apply the tell-show-do principle. Explain the procedure and demonstrate techniques, if possible, before providing treatment.
4. Schedule shorter appointments.
5. Use mouth props.
6. Emphasize oral hygiene and disease prevention in controlling and eliminating oral infection.
   a. 3-month maintenance intervals
   b. Personal attendant may need instruction in providing proper oral hygiene care.
   c. Encourage good nutrition. Provide dental dietary counseling with care providers as needed.
   d. Antimicrobial mouth rinses such as chlorhexidine may be beneficial. However if severe xerostomia exists, avoid mouth rinses with alcohol.
   e. Provide preventive education regarding xerostomia; recommend salivary aids and amorphous calcium phosphates as needed. For specific guidelines, refer to the section on the immune system and neoplasia.
7. Use local anesthetic with a small amount of a vasoconstrictor is recommended.
8. Do not use topical epinephrine to control bleeding or in retraction cords if the patient is being treated with antidepressant or antipsychotic medications.
9. Consider sedation with chloral hydrate or a benzodiazepine if the patient is difficult to manage.

Conditions Indicating Premedication:
None

Drugs To Avoid:
1. Atropine
2. Reduce the dosage of sedatives, hypnotics, and narcotics.

Potential Emergency Situations:
Non-cardiac: Seizure
Cardiac: Arrhythmia, Tachycardia
4. **Do you have a psychiatric condition such as schizophrenia?**

A current or past history of psychiatric illness and associated behavioral patterns need to be identified by the dental health professional. Individuals with psychiatric conditions may be aggressive, uncooperative, and have difficulty communicating. The patient’s medications may produce side effects or interactions with other drugs administered in the dental office. Depending on the psychiatric disorder, individuals may have poor oral hygiene or may be overaggressive in their oral care creating abrasion and other injury to soft tissue.

**Schizophrenia** is a chronic mental disorder characterized by thoughts and feelings that do not accurately interpret reality. Behavior may be hyperactive or flat, that is, no emotions or monotonous speech. Key features that define a psychotic disorder such as schizophrenia include delusions, hallucinations, disorganized thinking and speech, grossly disorganized or catatonic behavior and negative symptoms (diminished emotional expression or avolition). Treatment with antipsychotic medication can be effective for many individuals; however, these medications may have implications for dental treatment. The dental health professional needs to assess the individual’s level of communication and functioning and ability to maintain oral health.

**Conditions Indicating Medical Consultation:**
1. History of unexplained signs or symptoms that may be related to a psychotic condition or schizophrenia
2. If patient information regarding current status or medications is lacking
3. If xerostomia exists, consultation with the patient’s physician regarding type and dosage of medication may be necessary.

**Dental Treatment Modifications:**
1. Establish a treatment plan that is realistic and flexible.
2. Avoid confrontational or authoritative attitudes.
3. Schedule shorter appointments if necessary.
4. Emphasize oral hygiene and disease prevention in controlling and eliminating oral infection.
   a. Encourage good nutrition. Provide dental dietary counseling as needed.
   b. Antimicrobial mouthrinses such as chlorhexidine may be beneficial. However, if severe xerostomia exists, avoid mouthrinses with alcohol.
   c. Provide preventive education regarding xerostomia. Recommend salivary aids and amorphous calcium phosphates as needed. For specific guidelines, refer to the section on the immune system and neoplasia.
5. Limit use of local anesthetic with vasoconstrictor: 2 cartridges of 2% lidocaine with 1:100,000 epinephrine is safe.
6. Do not use more concentrated forms of epinephrine such as topical epinephrine to
control bleeding or in retraction cords as severe hypotension may occur.
7. Consider sedation if the patient is difficult to manage.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
1. Atropine
2. Reduce the dosage of sedatives, hypnotics, and narcotics.

**Potential Emergency Situations:**
Non-cardiac: Seizure
Cardiac: Arrhythmia, Tachycardia

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5. **Are you chemically dependent?**

Chemical dependence occurs when an individual takes a substance in larger amounts or over a longer period of time than was intended. Substances commonly associated with chemical dependence include cocaine, alcohol, amphetamines, methamphetamine, cannabis, sedatives, hypnotics, and nicotine. Individuals may spend a great deal of time obtaining the substance, taking the substance, and recovering from its effects. A tolerance to the substance develops over time, creating the need for greater and greater quantities to achieve the same effects. Examination of the patient may reveal cutaneous lesions associated with parenteral abuse of drugs: subcutaneous abscesses, cellulitis, thrombophlebitis, and skin tracks (linear or bifurcated erythematous lesions which become indurated and hyperpigmented. Chemical dependence may increase an individual’s risk for liver disease (hepatitis, cirrhosis), HIV, and/or cancer.

**Conditions Indicating Medical Consultation:**
1. History of unexplained signs or symptoms that may be related to chemical dependence
2. If patient information regarding current status or medications is lacking

**Dental Treatment Modifications:**
1. 1. Select pain medication with care.
   a. aUse non-narcotic analgesics such as NSAIDs.
   b. bFor control of anxiety in these patients propranolol can be considered.
2. Avoid recommending over-the-counter or prescription products that contain alcohol.
3. Never administer a drug, or another of its class, that has been abused by the patient in the past.

**Conditions Indicating Premedication:**
Drugs To Avoid:
Eliminate or reduce dosage of sedatives, hypnotics, and narcotics. (See dental treatment modifications.)

Potential Emergency Situations:
None

6. Do you use cocaine recreationally? Do you use methamphetamine?
Individuals who use cocaine recreationally are at increased risk for cardiac arrhythmias and myocardial ischemia and, therefore, should not receive any dental treatment for at least 6 hours following the last use of cocaine. Local anesthetics with vasoconstrictors should not be used during this 6 hour waiting period since drug interactions could result in hypertensive crisis, stroke, or myocardial infarction.

Patients who are “high” on methamphetamine should not receive dental treatment for at least 8 hours after the last administration of the drug. To be safe, dental treatment should not occur until at least 24 hours after the administration of the drug. Myocardial ischemia and cardiac arrhythmia are the primary concerns. Chronic methamphetamine use causes xerostomia and rampant caries, bad taste, bruxism and muscle trismus (jaw clenching). The combination of these effects in methamphetamine users is referred to as “meth mouth”.

Conditions Indicating Medical Consultation:
If emergency treatment is necessary within 6 hours of cocaine use anesthetic without a vasoconstrictor. The same is true for methamphetamine use that has occurred within 24 hours.

Dental Treatment Modifications:
1. No dental treatment should be provided for a patient who is high on cocaine. At least 6 hours need to elapse since last use of the drug. For patients who have just taken methamphetamine, at least 24 hours should elapse until dental treatment is performed.
2. Infectious disease control precautions are of particular concern, since recreational drug use may indicate an increased risk of HIV infection and Hepatitis B or C.

Conditions Indicating Premedication:
None

Drugs To Avoid:
Local anesthetic with vasoconstrictor during the 6 hour period following cocaine use or the
first 24 hours following methamphetamine use.

**Potential Emergency Situations:**
Cardiac:  Hypertensive crisis  
Cerebrovascular Accident  
Myocardial Infarction

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**7. Do you have an eating disorder such as anorexia nervosa or bulimia?**

The 5th Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) published by the American Psychiatric Association in 2014 describes three types of eating disorders: anorexia nervosa, bulimia nervosa, and binge-eating disorder. Eating disorders may first be suspected or diagnosed in the dental office. In general, patients with eating disorders are teenage or young adult women who often do not perceive their behavior as hazardous to their health.

**Anorexia nervosa** is an eating disorder characterized by self-starvation or an avoidance of eating. Anorexics may have thin hair, brittle nails, constipation, amenorrhea, extreme weight loss (self starvation), depression, hypotension, and/or low pulse rate. If untreated, suicide or death from ventricular tachyarrhythmia may result.

Patients with **bulimia** alternate between binge eating and self-induced vomiting or purging. The repeated vomiting of acidic gastric contents results in a pattern of decalcification of the lingual, palatal, and posterior occlusal surfaces of the teeth. Caries and dentinal hypersensitivity may also occur as a result of enamel loss. Use of laxatives, diuretics, and cathartics are common to assist with weight loss. Chronic use of these substances, in addition to the cycle of bingeing and purging, creates many irreversible systemic problems for these individuals. The systemic complications associated with bulimia include: aspiration of vomitus, esophageal or gastric rupture, cardiac arrhythmias, pancreatitis, and death. Chronic ipecac users may develop extensive cardiac myopathy or skeletal myopathy. When confronted, most patients will deny such behavior; however, a direct yet empathetic confrontational approach, without criticism, is necessary. The dental health professional should provide information, encouragement, and referral to a mental health professional or eating disorders clinic when these signs or symptoms are recognized. Once the patient has been able to eliminate the need for repeated vomiting associated with their bulimia, crowns and bridges (if needed) can be provided. As long as the repeated vomiting continues, temporary restorations are indicated.

Patients with **binge-eating disorder** have recurrent episodes of binge-eating consisting of eating an amount of food that is definitely larger than most people would eat during a similar time period. They sense a lack of control during the eating episode. The bingeeating episodes are associated with eating much more rapidly than normal, eating until feeling uncomfortably full, eating large amounts of food when not feeling physically hungry, eating
alone because of feeling embarrassed by how much they are eating, and feeling disgusted with themselves, depressed or very guilty after eating. The impact of binge-eating is not as serious as with anorexia nervosa or bulimia nervosa but can lead to weight gain, obesity and increased medical morbidity and mortality.

**Conditions Indicating Medical Consultation:**
History of unexplained signs or symptoms that may be related to an eating disorder

**Dental Treatment Modifications:**
Bulimia:
1. Do not perform extensive permanent restorative treatment until the binge/purge cycle is controlled.
2. Discourage brushing immediately following vomiting, since doing so may accelerate the erosion process. Instead, instruct the patient to rinse with sodium bicarbonate or magnesium hydroxide after vomiting to neutralize the effects of gastric acid.
3. Recommend use of a daily fluoride mouth rinse or a prescription concentration gel until caries risk has been minimized.

**Conditions Indicating Premedication:**
None

**Drugs To Avoid:**
None

**Potential Emergency Situations:**
None
**L. Medications and Drugs**

To supplement this section of the medical history, a current reference book providing information on drugs and medications should be available to the dental professional. The Physician’s Desk Reference and the Dental Drug Reference are two examples. These references are valuable to the dental professional in identifying indications, contraindications, adverse reactions, and precautions for specific drugs and medications that a patient may be currently using. The patient’s medications may need to be confirmed by medical consultation.

1. Are you presently taking medications or drugs?
   a. Antibiotics (e.g., penicillin G, penicillin V, amoxicillin, cephalexin, streptomycin, gentamicin, vancomycin, achromycin, decloymycin, erythromycin, neomycin, tetracycline)
      1. If the patient is taking antibiotics to treat an infection, determine the type of infection.
      2. Using broad-spectrum antibiotics (such as tetracycline) for an extended period of time can lead to excessive bleeding following invasive dental procedures. The antibiotics block the formation of vitamin K by inhibiting intestinal bacteria.
      3. If an antibiotic is required for prophylactic therapy prior to dental treatment, select a different antibiotic to avoid the problem of resistant oral organisms. For example a patient being treated for acute infection with penicillin can be given clindamycin for prophylaxis.
   b. Anticoagulants (prevent and treat venothromboembolism-VTE)
      1. Warfarin, Coumarin, Coumadin
         - Usually used in cases of heart disease, pulmonary embolism, thrombophlebitis, and arterial embolism (atrial fibrillation) -Affects the clotting mechanisms and PT; can result in prolonged bleeding if invasive dental procedures are performed -Monitored by INR; antidote is Vitamin K
         - Consult the physician before any drugs are prescribed or before performing invasive dental procedures to determine if the dosage of the anticoagulant needs to be reduced.
      2. Heparin
         - Usually used in the hospital setting to prevent or treat thromboembolism
         - Monitored by PTT; antidote: protamine sulfate
         - When used for dialysis, the patient should be seen the next day for dental treatment as the heparin effect is gone and dialysis has cleaned the blood.
      3. Low-molecular weight heparins [Dalteparin, Fragmin; Enoxaparin, Lovenox)
         - Used to prevent thrombosis in hospitalized patients and those with joint replacement, cancer and other conditions.
         - Does not require monitoring; antidote: protamine sulfate is only a partial antidote
- Most dental treatment can be provided without stopping the drug.
- For extensive surgical procedures, the drug may have to be stopped.

4. Synthetic inhibitors of Factor Xa [Fondaparinux (Arixtra)]
- Does not require monitoring; antidote: none
- Most dental treatment can be provided without stopping the drug.
- For more extensive surgical procedures, the drug may have to be stopped.

5. Direct Factor Xa Inhibitors [Rivaroxaban (Xarelto), Apixaban (Eliquis), Edoxaban (Liniana)]
- Used to prevent thromboembolism in patients with joint replacements, atrial fibrillation and other conditions.
- Does not require monitoring; antidote: none
- Most dental treatment can be provided without stopping the drug.
- For more extensive surgical procedures, the drug may have to be stopped.

6. Direct Thrombin Inhibitors [Dabigatran (Pradaxa); Argatroban (Acoa)]
- Used to prevent thromboembolism in patients with joint replacements, atrial fibrillation and other conditions.
- Does not require monitoring; antidote: none
- Most dental treatment can be provided without stopping the drug.
- For more extensive surgical procedures, the drug may have to be stopped.

c. Antithrombotic Agents (Antiplatelet Drugs)

1. Used to treat and prevent arterial thrombi resulting in myocardial infarction, recurrent myocardial infarction, transient ischemic attacks, strokes, coronary thrombosis and other arterial thrombotic conditions.

2. Aspirin, oral; aspirin plus dipyridamole (Aggrenox), oral; adenosine diphosphate inhibitors [Clopidogrel (Plavix), oral; Ticlopidine (Ticlid), IV]

3. The most commonly used agents are aspirin and clopidogrel either alone or in combination. Most dental procedures can be done without altering the dosage of the drugs. However, for more extensive surgical procedures the drugs may have to be stopped for 3-5 days prior to the surgical procedure. Medical consultation is recommended.

d. Antihistamines (e.g., Actifed, Benadryl, ChlorTrimeton, Coricidin, Phenergan)

1. If used to treat an allergy, determine what the allergen is. If the allergen is an agent used in dentistry it must be avoided.

2. Xerostomia-like condition of mouth may exist. This can lead to increased risk for dental caries and periodontal disease.

e. Antihypertensives (blood pressure medications such as hydrochlorothiazide, Dyazide, Diuril, Lasix, Inderal, Lopressor, Coreg, Capoten, Atacand, Cardizem, Minipress, Aldomet, Apresoline)

1. Avoid use of vasoconstrictors (epinephrine) except for small amounts in local anesthetics. Confirm use by medical consultation.
2. Oral lesions may develop in some patients.
3. Xerostomia is a common side effect of most hypertension medications. Other side effects include depression, drowsiness, dizziness, nausea, and fainting. Orthostatic hypotension is a side effect that requires changing the patient’s chair position slowly and offering physical support when he or she arises from the chair.

f. Aspirin (or other pain medication)
   1. Chronic use may cause hemorrhage.
   2. Interaction may be unfavorable with other drugs.
   3. Avoid giving aspirin to patients with peptic ulcers.

g. Cortisone or steroids (e.g., Aristocort, Acthar, ACTH, Cortone, Dexadron, Cortef, Meticorten)
   1. If used to treat chronic inflammatory conditions, determine the type of condition present.
   2. Inhibits healing process and may increase risk for infection. Therefore, the need for prophylactic antibiotic coverage prior to invasive dental treatment should be determined by medical consultation.
   3. Avoid unnecessary trauma.
   4. Stressful dental procedures or pain may require supplemental steroids. This should be determined by medical consultation.

h. Digitalis or medications for the heart (e.g., quinidine, digoxin)
   1. Be aware of early symptoms of drug toxicity which include headache, visual disturbances, nausea, vomiting, drowsiness, disorientation, confusion, and hallucinations. Contact the physician if any of these symptoms occur.
   2. May increase response of gag reflex and induce vomiting

i. Dilantin or medications to control seizures (e.g., Tegretol, Luminal, Depakene, Klonopin)
   1. Use of dilantin may result in gingival hyperplasia if plaque control is inadequate.
   2. Other potential side effects include increased risk of microbial infection, delaying healing, and gingival bleeding.
   3. Xerostomia may occur in some patients.

j. Insulin, oral hypoglycemic drugs and other medication to control diabetes (e.g., Glipizide, Glyburide, Metformin, Acarbose, Pioglitazibe, Repaglinide, Exenatide, Pramlintide, Sitagliptin)
   1. Use indicates diabetic condition
   2. Prophylactic antibiotic coverage may be considered in some cases of type I diabetes (IDDM) that are poorly controlled with insulin.
   3. Insulin shock or diabetic coma may occur.
   4. Acute infection makes control of diabetes difficult and requires an increased dosage of insulin or the need for insulin in type II diabetic patients treated with oral hypoglycemic agents. Medical consultation is essential.

k. Nitroglycerin (e.g., Nitroglyn, Nitro-bid, Nitrostat, Isordil)
1. Use indicates presence of angina pectoris
2. The patient may take 1 tablet prior to local anesthetic injection if suggested by the physician.
3. Have drug available for emergency use during treatment
   I. Tranquilizers or sedatives (e.g., Valium, Librium, Equanil, Embutal, Seconal, Valmid) and agents used for pain control
      1. Identify the patient’s reason for taking this medication.
      2. Prescribe no additional sedatives.
      3. These must be used with caution in patients with chronic obstructive lung disease to avoid respiratory depression.
      4. Avoid use in pregnant women.
   m. Hallucinogens (e.g., LSD, cocaine, methamphetamine)
      1. Cocaine or methamphetamine may react with vasoconstrictors (epinephrine) used in local anesthetic agents to produce significant cardiac arrhythmias or increased blood pressure.
      2. Instruct the patient to avoid use of cocaine and methamphetamine 1 week prior to dental treatment and until convalescent period is over.
      3. May indicate history of other drug abuse
      4. The patient may be a hepatitis carrier and have chronic liver disease or HIV.

2. Are you allergic to or have you ever reacted adversely to:
   a. Aspirin?
      1. If the patient is allergic to aspirin, substitute another mild analgesic which does not contain salicylates.
      2. Two out of 1000 persons are allergic to aspirin.
      3. Asthmatic patients who are allergic to aspirin will also react to the nonsteroidal anti-inflammatory agents. With these patients, use Tylenol for pain relief.
   b. Barbiturates, sedatives, or sleeping pills?
      1. Allergies are common.
      2. Avoid use if the patient is diagnosed with an allergy to these drugs.
   c. Iodine?
      1. May be a component of some dental products, e.g., disclosing solutions
      2. Avoid use if the patient is diagnosed with an allergy to iodine.
   d. Local anesthetics (e.g. Novocaine, Xylocaine, Marcaine, Carbocaine, Articaine, Local)?
      1. Avoid use if the patient is diagnosed with an allergy to these drugs. This is rare with local anesthetics other than Novocaine (procaine).
      2. In many cases, previous reactions are psychogenic in origin, involving mild syncope in response to anxiety. Reactions can also be toxic; however, good technique in administration of local anesthetics can prevent future reactions.
3. Any questions as to the origin of a reported reaction should be clarified with the dentist and the patient’s physician.

e. Penicillin or other antibiotics?
   1. Avoid use if the patient is diagnosed with an allergy to these drugs.
   2. Of all patients, 5-10% are allergic to penicillin. This is most common for patients with asthma, other allergies, or a family history of allergy to penicillin.
   3. All forms of penicillin must be avoided in patients reporting an allergy to a particular penicillin preparation.

f. Sulfa drugs?
   1. Avoid use if the patient is diagnosed with an allergy to these drugs.
   2. Use of sulfa drugs is rare in dentistry.
   3. If a patient is allergic to only one of the sulfa drugs, anaphylactic shock is very rare.