Management of Patients with Chronic Diseases

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Conflict of Interest Disclosure Statement

- The author report no conflicts of interest associated with this course. She has no relevant financial relationships to disclose.

Introduction – Chronic Diseases

Management of Patients with Chronic Diseases is a free dental continuing education course that covers a wide range of topics relevant to the oral healthcare professional community.

Course Contents

Overview

This course will provide an overview of the ten common chronic diseases and present ways for oral health professionals to manage the provision of oral health care to meet each patient's unique needs. Chronic Diseases are the leading cause of death and disability in the United States. To facilitate evidence-based care for individuals diagnosed with chronic diseases, oral health professionals must have the knowledge and tools to conduct a thorough assessment and be aware of chronic disease clinical signs and symptoms, epidemiology and etiology, and appropriate oral health considerations.

Learning Objectives

Upon completion of this course, the oral health professional should be able to:

- Describe the prevalence and contributing factors of chronic disease.
- List patient assessment considerations.
- Recognize clinical signs and symptoms of ten chronic diseases.
- Explain the epidemiology and etiology of ten chronic diseases.
- Recognize oral health conditions associated with ten chronic diseases.
- Describe patient management considerations for ten chronic diseases.

Chronic Diseases

Chronic Diseases include a broad list of conditions, such as diabetes and heart disease, which last for at least 1 year and require ongoing medical attention. They are the leading cause of death and disability in the United States. The National Center for Chronic Disease Prevention and Health Promotion report 60% of adults have at least one chronic disease and 40% of adults have two or more.[1] Patients diagnosed with a chronic disease should be carefully examined for secondary disease. Tobacco use, exposure to secondhand smoke, poor nutrition, lack of physical activity, and excessive alcohol use contribute to developing chronic diseases. Poor oral health has also been cited as a contributing factor, symptom, and consequence of chronic diseases.[2] The relationship between oral health and chronic disease has been well documented in a growing body of evidence.[3-9]

Patient Assessment Considerations

Understanding a patient's medical history is a critical element of the patient assessment when providing dental care to *any* patient, but, is especially important when a patient has been diagnosed with a chronic disease. The medical history should include vital signs and detailed discussions about the patient's medications, medical condition, disease prognosis, comorbidities, patient's perception of their oral status, physical limitations, and cognitive status (level of cooperation and mental state).[10,11] Tools are available to help oral health providers understand a patients unique needs such as how they like to communicate, what they liked and didn't like during past dental visits, and what parts of a dental appointment may be hard for them. Oral Health Kansas developed My Dental Care Passport to help improve the dental team-patient relationship (Figure 1).[12] This tool provides a structured way to modify the dental office environment and appointment plan to meet an individual's unique needs.[12]

Oral health providers should collaborate with the patient's interprofessional health care team (family, caregivers, physician, nurses, occupational therapists, psychiatrists, and other health professionals) to gain a

My Dental Care Passport

For users: This passport is unique to you. Please fill out all information that you think is important.

For my dentist or healthcare provider: This is key reading for all staff working with me. It gives important information about how I can be supported when visiting your clinic. This passport should be kept visible and used when you talk to me or have a question about me.

Please check the box that applies:
☐ I completed this form myself ☐ I completed this form with help from someone else

This form was completed with help from:
Name:
Phone:
E-mail:

ABOUT ME

My name is:
I like to be called:
Nickname if you have one.

I am: ☐ Male ☐ Female ☐ Transgender Male ☐ Transgender Female
☐ Variant/Non-conforming ☐ Not listed_____

My preferred pronoun is:
☐ He ☐ She ☐ They ☐ Ze ☐ Not listed_____ ☐ No preference

Where I live right now:
For example: supported living; in my own home; in my family home.

Figure 1. My Dental Care Passport.
Adapted with permission from Oral Health Kansas, 2024. *Click to Download*

better understanding and confirm medical history findings. Communication with these individuals should be ongoing and documented throughout each phase of dental treatment.[10] An interdisciplinary approach is critical for success. The following sections in this course provides specific information about Alzheimer's disease, arthritis, COPD, depression, diabetes, heart disease, high blood pressure, multiple sclerosis, Parkinson's disease, and stroke.

Alzheimer's Disease

A progressive, degenerative brain disease beginning with mild memory loss and over time possibly leading to loss of the ability to carry on a conversation and respond to the environment.[13-15] A brain with Alzheimer's disease typically has an accumulation of beta-amyloid plaques outside the neuron and tau tangles inside the neuron.[14] As the number of damaged neurons increase, signals will no longer be able to carry information through the synapses. Clinical signs and symptoms are summarized in Figure 2.

Epidemiology and Etiology

Alzheimer's disease is the most common cause of dementia.[13,17] In 2024, 6.9 million Americans were diagnosed with this disease. The number of diagnoses are projected to increase to 11.2 million in 2040 and 13.8 million people by 2060.[13] Signs and symptoms typically of Alzheimer's disease typically develop after age 60 and risk increases with age.[13] Although dementia is caused by damage to brain cells, the actual cause of the damage in Alzheimer's disease is not yet fully known.[16] Age, family history, and genetics appear to increase the likelihood of developing the disease.[13,16] There is strong evidence that periodontal disease, traumatic brain injury, mid-life obesity, and current smoking also increases the risk of developing AD.[18,19] Figure 3 provides additional statistics about this disease.

Patient Management and Oral Health Considerations for Alzheimer's Disease

Understanding the oral health status of a patient diagnosed with Alzheimer's disease can be complicated. Individuals in advanced stages may be unable to verbalize oral pain or discomfort. This may lead to refusal to eat, pulling at the face or mouth, refusal to wear dentures, increased restlessness or shouting, disturbed sleep, refusal to participate in activities, and aggressive behavior.[20] Care providers must be aware of behavioral changes that may indicate a patient is experiencing dental problems. It is helpful to have a baseline understanding of each patient's typical behavior in order to identify when these behaviors are atypical.[10]

Patients diagnosed with Alzheimer's disease routinely experience problems in the oral

Figure 2. Clinical Signs and Symptoms of Alzheimer's Disease.[13,16]

- Memory loss disruptive to daily life
- Changes in planning or solving problems
- Difficulty handling money or paying bills and completing other familiar tasks
- Confusion with time or place
- Decreased or poor judgment
- Misplacing things and inability to retrace steps to find them
- Changes in mood, personality, or behaviors[13]
- Withdrawal from work or social activities
- Problems with words when speaking or writing

Figure 3. Alzheimer's Disease Statistics and Risk Factors.

- 6th leading cause of death among US adults; 5th among those 65 years or older[13,16]
- Nearly 2/3rds of Americans with Alzheimer's disease are women[16]
- Older African-Americans are about twice as likely to have Alzheimer's or other dementias as older whites[16]
- Hispanics are about one and one-half times as likely to have Alzheimer's or other dementias as older whites[16]
- Risk factors for heart disease and stroke (like high blood pressure/high cholesterol) may also increase risk of Alzheimer's disease[16]

cavity such as periodontal disease, caries, tooth loss, tooth mobility, orofacial pain, impaired swallowing, articular abnormalities in temporomandibular joints, difficulty wearing dentures, sores in mouth, cracked lips, coated tongue, and halitosis.[11,14,21-26] Patients may forget how to brush their teeth[17] or be unable to remember the need for oral hygiene, which may contribute to oral cavity problems.[20] Additionally, patients may be taking medications, such as antidepressants, antipsychotics, and sedatives, which have oral side effects such as dry mouth, glossitis, mucositis, glossodynia, dysphagia, candidiasis, and involuntary repetitive tongue and jaw movements.[31,32] These oral problems can have a negative impact on eating, smiling, laughing, self-esteem, and quality of life.[27-29] Oral health providers should recommend rigorous preventive measures such as 3-month hygiene recall appointments, to also include fluoride varnish applications.

Patients diagnosed with Alzheimer's disease will have diminishing decision-making capacity as the disease progresses. This can create problems with obtaining valid informed consent. When given the opportunity, oral health providers should discuss informed consent alternatives with the patient prior to the patient reaching this stage.[11,15] Unfortunately, this is not always an option. If a patient is unable to provide valid informed consent, and a surrogate has not been identified, treatment procedures should not be initiated. In emergency situations oral health providers may legally act in the best interest of the patient without having informed consent.[30]

Arthritis

The inflammation or swelling of one or more joints. The term encompasses more than 100 diseases and conditions that affect the joints, tissues surrounding the joints, and other connective tissues.[31] Some of the most common types of arthritis include osteoarthritis, rheumatoid arthritis, fibromyalgia, gout, and juvenile idiopathic arthritis. Some forms of arthritis, such as rheumatoid arthritis and juvenile idiopathic arthritis, have inflammation present that affects the entire body including the skin, muscles, gastrointestinal tract, lungs, heart, and eyes.[31,32] Clinical signs and symptoms of arthritis are summarized in Figure 4. These symptoms will vary depending on the type of arthritis present.

Epidemiology and Etiology

Arthritis is one of the most common chronic diseases in the United States.[31] The Centers for Disease Control reports 58 million adults and 300,000 children have been diagnosed with this disease.[31,33] The etiology of arthritis varies depending on the type of arthritis present. Common risk factors for arthritis include joint injury and overuse, occupations involving repetitive movements, infection of joints, obesity, autoimmune disorders, and genetic factors.[31] Osteoarthritis is a type of arthritis caused by the joint cartilage between bones breaking down.[45,46] Common risks factors for rheumatoid arthritis (an autoimmune disorder) are inherited genotypes, smoking and early life exposure to secondhand smoke.[45,46] Fibromyalgia can be triggered by stressful events.[45,46] Gout is a type of arthritis resulting from too much uric acid in the blood.[45,46] Juvenile idiopathic arthritis appears to be genetic.[32] Chronic heart failure, hypertension, insulin resistance, metabolic syndrome or diabetes increases the risks for developing gout.[45,46] Figure 5 provides additional statistics about this disease.

Figure 4. Clinical Signs and Symptoms of Arthritis.[31,32]

- Pain and stiffness in and around one or more joints is the most common symptom
- Decreased range of motion
- Swelling and erythema
- Unsteadiness
- Deformity
- Weight loss
- Fever
- Fatigue
- Weakness
- Depression/anxiety
- Sleep problems
- Headaches
- Memory and concentration problems
- Tingling/numbness
- Pain in the face/jaw, including temporomandibular joint dysfunction
- Digestive problems

Figure 5. Arthritis Statistics and Risk Factors.[31,32]

- Arthritis is the leading cause of disability in the United States
- Risk for developing arthritis increases with age
- Most types of arthritis are more common in women
- Gout is more common in men
- Some Asian populations have a lower risk of osteoarthritis
- Women who have given birth have a lower risk of developing rheumatoid arthritis

Patient Management and Oral Health Considerations for Arthritis

Patients diagnosed with arthritis routinely experience problems in the oral cavity such as periodontitis, temporal joint dysfunction (TMD), oral ulcers, xerostomia, and Sjogren's syndrome.[31,32,34] There are a number of factors that contribute to this. Arthritis medications frequently suppress the immune system which inhibits the mouth's ability to fight harmful bacteria.[31] Methotrexate is known to induce oral ulcers.[34] And, stiff, painful hands can make oral self-care difficult.[35] Oral health providers should keep these items in mind when developing treatment plans for patients diagnosed with arthritis.

Oral health providers must also be aware of the considerable amount of evidence that a relationship exists between rheumatoid arthritis and periodontal disease. Historically oral health providers assumed that rheumatoid arthritis led to periodontal disease because of the strong epidemiological serological and clinical associations.[36] However, we now know the relationship is much more complicated. Joint tissue and oral tissue have similar inflammatory processes.[36] In fact, periodontal problems can precede the diagnosis of rheumatoid arthritis. Research has revealed multiple intersecting pathobiologic pathways.[34,36] Nonsurgical treatment for periodontal disease has been shown to improve rheumatoid arthritis symptoms.[34,35,37]

Chronic Obstructive Pulmonary Disease (COPD) / Asthma

A group of diseases that cause airflow blockage and breathing-related problems, including emphysema, chronic bronchitis, and asthma.[38] These diseases have different etiologies; however, the signs and symptoms often overlap. Clinical signs and symptoms are summarized in Figure 6.

Epidemiology and Etiology

At the present time 14 million Americans have been diagnosed with COPD[40] and 22 million Americans have been diagnosed with asthma.[40] Many people are unaware they have decreased lower pulmonary function so these numbers are likely an underestimate.[38] COPD is typically caused by long-term exposure to lung irritants such as air pollution, chemical fumes and dust from the workplace, and secondhand smoke.[40] It is estimated that 75% of people who have COHP smoke or used to smoke.[40] Additional risk factors include genetic factors,[38] alpha-1 antitrypsin deficiency,[40] smoking (particularly in the US),[38,40] air pollutants,[38] chemical fumes, dusts,[40] and respiratory infections.[38,39] The social determinants of health are also a COPD risk factor. Individuals who are unemployed, retired, unable to work, divorced, widowed, or separated, and people who had less than a high school education are more likely to report COPD.[38] Figure 7 provides additional statistics about this disease.

Figure 6. Clinical Signs and Symptoms of COPD.

- Coughing that produces large amounts of mucus - COPD
- Night or early morning cough – asthma[39]
- Wheezing
- Chest tightness[38,40]
- Shortness of breath,[38] particularly with physical activity[40]
- Frequent respiratory infections
- Severe COPD can cause lower extremity edema, weight loss, decreased muscle endurance, blue lips or fingernails, tachycardia, and decreased alertness[40]

Figure 7. COPD Statistics and Risk Factors.

- Cigarette smoking is the #1 cause of COPD[40]
- COPD (not including asthma) is the 6th leading cause of death in the United States[40]
- COPD is more common in people greater than 40 years old[40]
- COPD is more common in American Indian/Alaska Native and multiracial non-Hispanic[38]
- COPD is twice as common in rural communities as compared to cities
- COPD is more common in women[38]
- COPD is more common in people who have a history of asthma[38]
- 1 in 13 Americans have asthma[41]
- Allergies are a risk factor for triggering asthma.[39,42]

Patient Management and Oral Health Considerations for COPD

The majority of patients diagnosed with COPD or asthma can be safely treated in the dental office with few modifications to how care is delivered. Oral health providers should assess the severity of disease when patients have these diagnoses. Patients with severe disease may need to have dental care provided while sitting in an upright position in the dental chair. COPD and asthma medications reduce the quantity and quality of saliva (xerostomia) and increase the risk of mouth breathing, dental caries, dental erosion, periodontal disease and oral candidiasis.[43] Gastroesophageal acid reflex is more common in patients diagnosed with asthma and can cause enamel erosion. It is important to provide oral hygiene instructions which include preventive interventions and ways to reduce modifiable and non-modifiable risk factors. Patients that are chronic cigarette smokers may present with leukoplakia, erythroplakia or frank carcinoma.[42] Oral health providers should make sure patients are aware that cigarette smoking is a risk factor for COPD and asthma, advise patients to quit smoking, and offer patients information about tobacco cessation. COPD has been known to increase the risk of arthritis and depression.[38] The oral conditions associated with these diseases could also affect people diagnosed with COPD.

Figure 8. Signs and Symptoms of Depression.

- Persistent sad, anxious, or "empty" mood
- Feelings of hopelessness, or pessimism
- Irritability
- Feelings of guilt, worthlessness, or helplessness
- Loss of interest or pleasure in hobbies and activities
- Decreased energy or fatigue
- Moving or talking more slowly
- Feeling restless or having trouble sitting still
- Difficulty concentrating, remembering, or making decisions
- Difficulty sleeping, early-morning awakening, or oversleeping
- Appetite and/or unplanned weight changes
- Thoughts of death or suicide, or suicide attempts
- Aches or pains, headaches, cramps, or digestive problems without a clear physical cause and/or that do not ease even with treatment[44]

Depression

A mood disorder which affects how a person feels, thinks, and handles daily activities.[44] Clinical signs and symptoms are summarized in Figure 8. These signs and symptoms must be present most of the day, nearly every day, for at least 2 weeks to signal the presence of depression (also called major depressive disorder or clinical depression). People who are depressed may experience a wide-ranging number of symptoms. A key consideration is that the symptoms interfere with daily functions and cause significant distress for the person experiencing them.

Epidemiology and Etiology

Depression is one of the most common mood disorders in the United States.44,45Major depression affects 21 million adults and 5 million adolescents ages 12-17.45 For both ages groups it's prevalence is higher in females and those reporting two or more races.45 It is thought to be caused by a combination of genetic, biological, environmental, and psychological factors.[44] It may present itself at

Figure 9. Oral Side Effects from Medications Prescribed to Treat Depression.[42,46]

- Aphthous stomatitis
- Bruxism
- Burning mouth syndrome
- Candidiasis or candida albicans
- Cheilitis
- Dental caries
- Distortion with the sense of taste
- Dysphagia
- Facial, tongue or oral edema
- Gingival hyperplasia
- Glossitis
- Halitosis
- Mucositis and stomatitis
- Oral ulcers
- Periodontitis
- Periodontal abscesses
- Sialadenitis
- Sinusitis
- Temporomandibular joint disorder (TMD)
- Toothache
- Ulcerative gingivitis
- Xerostomia

any age, but often it begins in adulthood. Risk factors include high levels of anxiety as a child, a personal or family history of depression, being diagnosed with a serious medical condition or medications, and major life changes, trauma, or stress.[44] In children, depression often presents as irritability.[44] Serious mental illness decreases life expectancy by 25 years.[45] Depression can co-occur with other chronic diseases such as diabetes, cancer, heart disease, chronic pain, and Parkinson's disease. When people have depression and a chronic disease, the symptoms tend to be more severe for both illnesses.[44]

Patient Management and Oral Health Considerations for Depression

If you have a patient experiencing depression who is suicidal or in emotional distress, consider using the 988 Suicide and Crisis Lifeline.

Patients experiencing depression may not recognize their oral hygiene needs or they may not care about their oral health. This can lead to poor oral self-care, fewer dental appointments, and ultimately oral health problems.[46] Medications used to treat depression can also contribute to oral health problems (Figure 9).[20,47] Antidepressants have been associated with bruxism and TMD.[46]

Antidepressants, antihistamines, anticholinergics, antihypertensives, and antipsychotics are known to alter salivary gland function resulting in xerostomia.[20,47] A high percentage of patients taking these medications experience dry mouth. This leads to many of the other problems listed in Figure 9 such as dental caries, taste distortion, chewing, swallowing, and oral infection.

Diabetes

A chronic metabolic disease affecting how the body turns food into energy resulting in too much sugar in the blood (high blood glucose).[48] There are several types of diabetes. Type 1 is an autoimmune disease where the pancreas does not make enough insulin. Type 2 is a condition where the body cannot use the insulin which it makes (insulin resistance).[48] Sometimes women develop type 2 diabetes during pregnancy. This condition is called gestational diabetes. Uncontrolled diabetes can result in hyperglycemia (high blood sugar) or hypoglycemia (low blood sugar). Hypoglycemia can result in unconsciousness, coma, or death. Clinical signs and symptoms of diabetes are summarized in Figure 10.

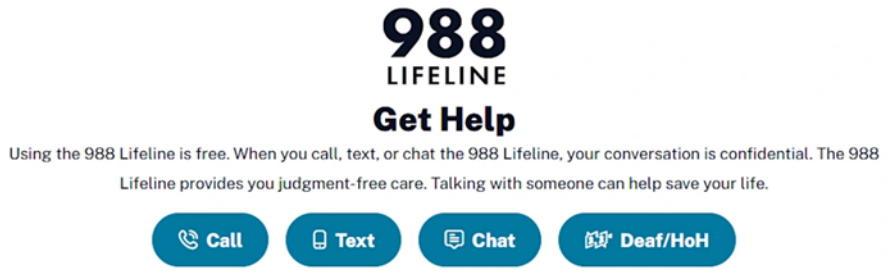


Figure 10. Clinical Signs and Symptoms of Diabetes.[48]

- Urinate a lot, often at night
- Are very thirsty
- Smell of acetone (sweet, fruity odor) on breath
- Lose weight without trying
- Are very hungry
- Have blurry vision
- Have numb or tingling hands or feet
- Feel very tired
- Have very dry skin
- Have sores that heal slowly
- Have more infections than usual
- Elevated blood sugar
- Type 1 diabetes may also cause nausea, vomiting, and stomach pain
- Gestational diabetes typically has no symptoms

Figure 11. Diabetes Statistics and Risk Factors.

Type 1 diabetes
- Family history
- Can develop at any age but it's more likely to develop in children, teens, and young adults

Type 2 diabetes
- Family history
- Prediabetes (symptomless slightly elevated blood sugar levels)
- Overweight
- Age 45 years or older
- Physical activity less than 3 times a week
- History of gestational diabetes or given birth to a baby who weighed more than 9 pounds
- African American, Hispanic/Latino American, American Indian, Alaska Native, and some Pacific Islanders and Asian Americans

Gestational diabetes
- Family history of type 2 diabetes
- History of gestational diabetes or given birth to a baby who weighed more than 9 pounds
- Overweight
- Age 25 years or older
- History of polycystic ovary syndrome (a hormone disorder)
- African American, Hispanic/Latino American, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander

Epidemiology and Etiology

More than 136 million Americans are living with diabetes (38 million) or prediabetes (98 million).[48,100] A large percentage of people living with diabetes (20%) and prediabetes (80%) are unaware that they have this disease. Diabetes is the most common endocrine disease, the No. 1 cause of kidney failure, lower-limb amputations, and adult blindness, and the eighth leading cause of death.[48] The risk factors for developing this condition differ depending on the type of diabetes that is present. However, having a family history of diabetes (a parent or sibling) is a common risk factor among all types of diabetes. Figure 11 provides additional statistics and risk factors about this disease.

Patient Management and Oral Health Considerations for Diabetes

When providing care to patients diagnosed with diabetes, oral health providers must be mindful of the patient's blood glucose levels. Dental procedures can cause physiological and psychological stress, which increases the risk for developing hyperglycemia. Epinephrine 1:100,000 is typically well tolerated; however, the pharmacologic effect can increase blood glucose levels.[49] Generally morning appointments are most suitable because there is a lower risk for hypoglycemia.[50] Long-term control of blood glucose levels is evaluated by measuring the extent of glycosylation of hemoglobin A in red blood cells which forms HbA1c. HbA1c levels are normally 6-8%. Measurements below 7% indicate the patient's diabetes is well controlled.[49] It is advisable for oral health providers to keep a glucose meter in the office to check a patient's blood glucose level when needed. If a glucose meter is not available, oral health providers should ask the patient to bring their glucose meter to appointments. Oral

health providers should ask the patient when their last meal was and compare that to the patient's typical meal times. They should also confirm that the patient has taken all regularly scheduled medications including insulin. It is advisable to have a 15-20 grams of an oral fast acting carbohydrate readily available to administer when blood glucose levels fall below 70 milligrams per deciliter (mg/dL).[51,52]

Patients diagnosed with diabetes may experience accelerated periodontal disease, gingival proliferations, periodontal abscesses, xerostomia, poor healing, infection, oral ulcerations, candidiasis, numbness, burning mouth syndrome, and pain in the oral cavity.[42,53] These conditions may be more severe in patients who do not have good glycemic control. Patients who have not yet been diagnosed may present with oral problems that can be one of the first signs of disease. Oral health providers that observe conditions, such as poor healing after having a tooth removed or periodontal therapy, should talk with their patient about diabetes and see if any of the clinical signs and symptoms are present.[54]

Heart Disease

Conditions that affect the heart and how it functions including coronary artery disease, myocardial infarction (heart attack), congestive heart failure, and atrial fibrillation.[55] Coronary artery disease (the buildup of plaque inside the coronary arteries[56]) is the most common form of heart disease.[55] Clinical signs and symptoms of heart disease are summarized in Figure 12.

One of the signs and symptoms of heart disease that oral health professionals need to be mindful of is orofacial (jaw) pain that mimics a toothache. This is an early cardiac warning sign that is especially prevalent in women. When a patient presents with unexplained orofacial pain oral health providers may want to see if the pain subsides when the patient takes the vasodilator called nitroglycerin. There are several signs that may suggest orofacial pain is due to heart issues. These include pain that is: burning or pulsing, oppressive, spontaneous in multiple teeth, does not stop after administering local anesthesia block, or does not respond to dental treatment.[101]

Epidemiology and Etiology

Heart disease is the leading cause of death for both men and women in the United States.[55] In the United States it accounts for 2% of deaths.[55] Figure 13 lists disease risk factors.

Patient Management and Oral Health Considerations for Heart Disease

When providing care to patients diagnosed with some form of heart disease, oral health providers should assess the patient's risk for complications before providing any dental care. Items to consider include severity of the disease, type and magnitude of dental procedure, and patient stability.[49] Patients who have experienced a myocardial infarction within the last 30 days are at major risk for complications. Elective care should be postponed.[49] A consultation with the patient's

Figure 12. Signs and Symptoms of Heart Disease.[55,56]

- Chest pain, particularly pain that worsens with activity
- Pain in the jaw, neck, or back
- Feeling weak, lightheaded, or faint
- Pain in arms or shoulder
- Shortness of breath
- Unusual tiredness
- Nausea/vomiting
- Heart failure – shortness of breath, fatigue, and swelling of lower extremities, stomach, and veins in the neck

Figure 13. Risk Factors for Heart Disease.[55,56]

- High blood pressure, high cholesterol, and diabetes
- Physical inactivity, diet high in saturated fats/trans fats/cholesterol, obesity, excessive alcohol, tobacco use
- Genetics and family history
- Increasing age
- Metabolic syndrome
- Elevated C-reactive protein, sleep apnea, stress, preeclampsia

physician is recommended. Short stress-free appointments scheduled in the morning reduce the risk for complications. It is important to make sure the chair position is comfortable. Oral health providers may need to provide care with the patient seated semi supine or upright. Patients who are taking Warfarin should report their international normalized ratio (INR). A therapeutic range is 3.5 or less. It is not necessary to discontinue or alter the dosage for most dental procedures (including minor surgery)[49] Avoid placing a retraction cord impregnated with epinephrine and prescribing anticholinergics.[49] Prescribing NSAIDs should be avoided in patients who have a history of myocardial infarction because NSAIDs increase the risk for subsequent myocardial infarctions.[49] If using NSAIDs is unavoidable, the drug of choice is naproxen administered for less than 7 days.[49]

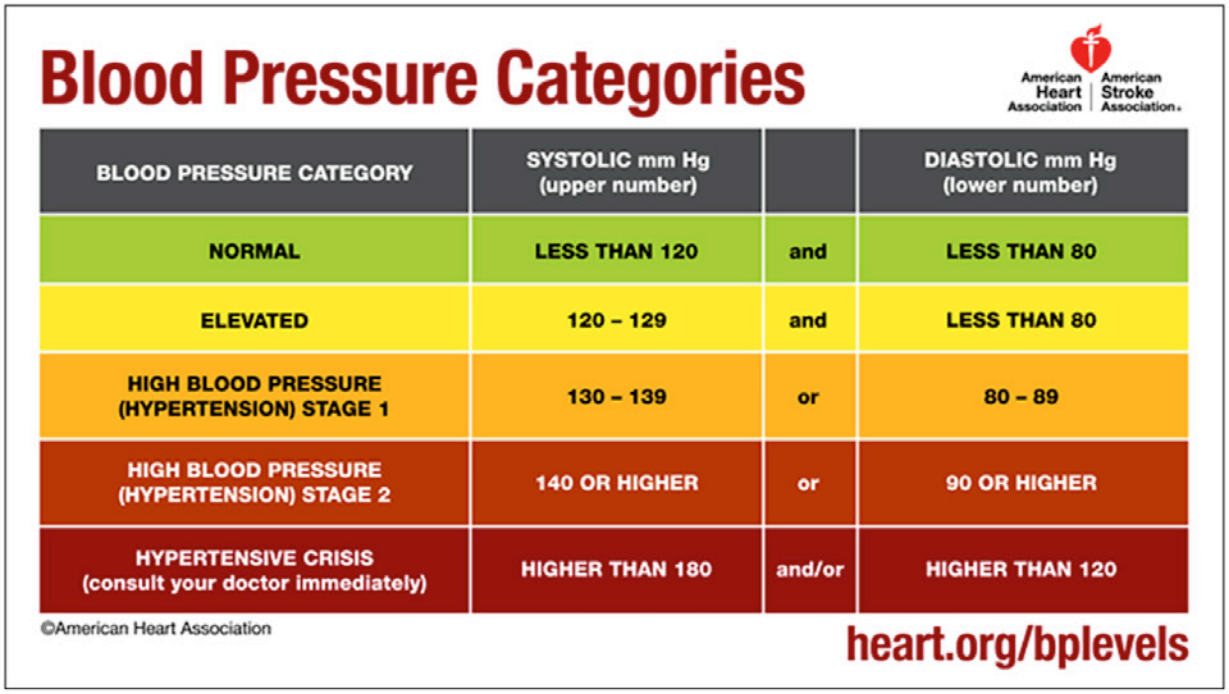
Effective pain control during and following the procedure will reduce stress and the risk for complications. Local anesthesia should have a limited amount of vasoconstrictor (epinephrine). If a vasoconstrictor is necessary, patients can be safely given 2 cartridges of anesthesia with epinephrine 1:100,000 (0.036 mg) or 2 cartridges of levonordefrin 1:20,000 (0.20 mg). Intravascular injections should be avoided. It is very important to effectively aspirate before depositing any anesthesia. Oral health providers should observe the patient for signs of digitalis toxicity, such as hypersalivation, if a patient is taking digitalis glycoside (digoxin).[49]

There are no oral manifestations that are the direct result of heart disease. Medications used to treat heart disease may produce taste changes, stomatitis, gingival bleeding, petechiae, xerostomia or lichenoid mucosal lesions.[49] Calcium channel blockers may produce gingival overgrowth.[49]

Hypertension

Elevated arterial blood pressure (high blood pressure) that over time can damage organs such as the heart and kidneys.[49] The disease is referred to as the "silent killer" because often there are no warning signs and people are unaware they have the condition.[57] The only way to identify hypertension is by measuring blood pressure. The American Heart and Stroke Association blood pressure guidelines are in Figure 14.[58]

Figure 14. Blood Pressure Guidelines.[58]



Epidemiology and Etiology

Hypertension affects 1 out of 3 adults living in the United States.[57] It is a primary or contributing cause in many deaths.[59] A large percentage of people living with hypertension (20%) are unaware that they have this disease. Health conditions such as diabetes and kidney disease, an unhealthy diet, lack of physical activity, obesity, too much alcohol, tobacco use, and family history increase a person's risk for developing this condition. Figure 15 lists additional hypertension statistics.

Figure 15. Hypertension Statistics.[57,59]

- Hypertension is a primary or contributing cause of more than a half a million deaths yearly
- Hypertension is present in 7 out of 10 people who have their first heart attack
- Hypertension is present in 8 out of 10 people who have their first stroke
- Hypertension is more common in men (50%) than women (44%)
- High blood pressure is more common in non-Hispanic black adults (56%) than in non-Hispanic white adults (48%), non-Hispanic Asian adults (46%), or Hispanic adults (39%)
- Hypertension is a major risk factor for cardiovascular disease and stroke

Patient Management and Oral Health Considerations for Hypertension

When providing care to patients diagnosed with hypertension, oral health providers should assess the patient's risk for complications before providing any dental care. The risk for most patients who are having routine treatment is very low. Items to consider include severity of the disease, type and magnitude of dental procedure, and patient stability.[49] Patients who have uncontrolled high blood pressure (≥ 180/110 mm Hg) are at high risk for complications. Elective care should be postponed.[49] A consultation with the patient's physician is recommended. Short stress-free appointments scheduled in the morning reduce the risk for complications. Oral health providers may administer nitrous oxide with oxygen and oral premedication with a short-acting benzodiazepine to reduce stress. Orthostatic hypertension may be caused by antihypertensive agents. Oral health providers need to avoid sudden changes with the patient chair and when treatment is finished return the chair slowly to an upright position.[49] They should also avoid placing a retraction cord impregnated with epinephrine.

Effective pain control during the procedure and post-operative will reduce stress and the risk for complications. Topical vasoconstrictors are not recommended. Local anesthesia should have a limited amount of vasoconstrictor (epinephrine). If a vasoconstrictor is necessary, patients can be safely given 2 cartridges of anesthesia with epinephrine 1:100,000 (0.036 mg). Intravascular injections should be avoided. It is very important to effectively aspirate before depositing any anesthesia.[49]

There are no oral manifestations that are the direct result of hypertension. Medications used to treat hypertension may produce xerostomia, lichenoid mucosal lesions, burning mouth, delayed healing, and gingival bleeding. Gingival hyperplasia may be present in patients who are taking a calcium channel blocker. Oral lesions may be present in patients who have an allergic reaction to mercurial diuretics.[49]

Multiple Sclerosis

A chronic, inflammatory, *immune-mediated disease* of the central nervous system for which there is currently no cure. Multiple Sclerosis is a disease that results from individuals' immune system attacking their central nervous system (brain, spinal cord, and optic nerves). The immune system damages myelin sheath (fatty substance surrounding the nerve fibers), Schwann cells, and the nerve fiber itself, disrupting the transmission of nerve impulses.[60] This results in the damaged myelin forming scar tissue, commonly referred to as demyelination. Demyelination episodes are commonly referred to as relapses, exacerbations, attacks, or flare-ups. This leads to fatigue, weakness, numbness, incoordination, imbalance, vision loss, bladder dysfunction, bowel dysfunction, difficulty speaking, and cognitive impairment.[61] Clinical signs and symptoms are summarized in Figure 16.

Figure 16. Clinical Signs and Symptoms of Multiple Sclerosis.[62]

- Bladder dysfunction
- Cognition
- Constipation
- Depression
- Dizziness (vertigo)
- Dysesthesias
- Dysphagia
- Emotional changes[63]
- Fatigue and weakness
- Numbness, tingling, and weakness
- Pain syndromes[64]
- Problems with gait
- Sexual problems
- Spasticity[65]
- Trigeminal neuralgia[66]
- Vision problems (optic neuritis)
- Walking (gait) difficulties

Figure 17. Multiple Sclerosis Statistics.[60]

- 2-3 times more common in women
- More common when there is a family history of MS
- Frequency of disease is higher in the northern United States, southern Canada, Europe, New Zealand, and southeast Australia (farther from the equator)
- Most common in Non-Hispanic white people of northern European ancestry

Epidemiology and Etiology

Multiple sclerosis affects approximately 490,000 individuals in the U.S. and 2.3 million individuals worldwide.[67] Diagnosis generally occurs between the ages of 20 and 30; however it can also occur in children.[67] The average age of multiple sclerosis disease onset is 30 years; though, this can vary widely depending on the type of multiple sclerosis and one's gender. The etiology of multiple sclerosis is thought to be multifactorial; the interaction of a genetically susceptible individual with one of more environmental factors. The environmental factors include exposure to Epstein-Barr virus, sun exposure, Vitamin D, smoking, and environmental smoke.[61,68-72] It is important for the oral health professional to understand that smoking has been shown to exacerbate symptoms of multiple sclerosis and increase risk of disease progression.[73,74] Figure 17 provides additional statistics about this disease.

Patient Management and Oral Health Considerations for Multiple Sclerosis

Many multiple sclerosis symptoms can make it difficult to adequately care for the teeth (hand numbness, pain, spasticity, etc.) leading to dental caries, periodontal disease, and other conditions due to neglect.[75] Oral self-care instructions should be based on the patient's functional ability and values. It is also not uncommon for patients diagnosed with multiple sclerosis to experience oral cavity problems such as drug-induced xerostomia, bruxism, and malocclusion.[75] Dysarthria, dysphonia, stuttering and dysphagia are also commonly associated with the disease.[62] Depression is one of the more common symptoms of multiple sclerosis.[62] The same oral conditions described in the depression section of this course are also seen in individuals diagnosed with multiple sclerosis. Extra-oral facial nerve pain, such as trigeminal neuralgia,[66] is also common in individuals diagnosed with multiple sclerosis and may be an early symptom before a patient has the diagnosis of multiple sclerosis. Always note extra-oral findings of facial nerve pain in a patient's dental record and immediately make physician referrals when patients report facial pain that cannot be explained.

Parkinson's Disease

A neurodegenerative disorder that affects predominately dopamine-producing ("dopaminergic") neurons in the substantia nigra, a specific area of the midbrain.[76] Damaged neurons in the substantia nigra display a primary diagnostic marker of Parkinson's disease called Lewy body.[77-79] This decreases the availability of dopamine, a chemical that is partially responsible for transmitting messages which control movement and coordination in the midbrain and emotions in the forebrain.[78-80] Parkinson's disease clinical signs and symptoms are

diverse. In most cases, they begin subtly and progress gradually over time. Providers may initially notice a patient's body is stiff and unsteady or their face lacks expression and animation.[79] As the disease progresses, providers may observe individuals with Parkinson's disease begin to exhibit the clinical signs and symptoms summarized in Figure 18.

Figure 18. Clinical Signs and Symptoms of Parkinson's Disease.[76,79,81]

- Resting tremors which often begins in a hand, foot, or jaw
- Muscular rigidity which causes resistance to movement or short, jerky movements
- Loss of spontaneous and automatic movement
- Autonomic signs and symptoms- problems with gait, balance, and coordination
- Mood/cognitive signs and symptoms- apathy, depression, constipation, sleep behavior disorders, loss of sense of smell and cognitive impairment

Epidemiology and Etiology

Parkinson's disease is the second most common adult-onset neurodegenerative disease lagging only behind Alzheimer's disease.[82] Worldwide, it is estimated that ten million individuals have this disorder.[77] In the United States it is estimated that nearly one million individuals have Parkinson's disease.[76] The cause remains largely unknown.[76] There is ongoing debate about the etiology of Parkinson's disease and whether the disease is from genetic factors, environment toxins or injury, an illness, or some other event. Many experts think it is combination of factors. Scientific advances point towards genetic mutations as the most likely etiology of the disease.[83-85] Environmental factors such as long-term pesticide exposure, have also been shown to play a causative role in developing Parkinson's disease. However, there is no evidence to substantiate that environmental factors can singlehandedly cause the disease. Other factors that contribute to developing Parkinson's disease include head trauma involving loss of consciousness, gender, and increasing age.[76,82,86] Protective factors have also been identified. They include caffeine, uric acid, anti-inflammatory drugs, smoking, vitamin D, exercise, and low cholesterol levels.[76] Figure 19 provides additional statistics about this disease.

Figure 19. Parkinson's Disease Statistics.[76]

- The primary risk factor for Parkinson's disease is age
- Only 4% of those diagnosed have symptoms before 50
- 1.5x more common in men
- 10-15% of all cases are thought to be solely genetic
- 85-90% genetics determines the effects of an environmental factor
- In large population studies, individuals with an affected first-degree relative (parent or sibling) have a 4-9% higher chance of developing Parkinson's disease, as compared to the general population.[87]

Patient Management and Oral Health Considerations for Parkinson's Disease

Patients diagnosed with Parkinson's disease have altered face and tongue muscle function.[88] Apathy, depression, forgetfulness, and the physical effects of rigidly and tremors can make oral self-care challenging for them. Patients experience oral motor and sensorimotor impairment, salivary dysfunction, dysphagia, burning mouth pain, loss of taste, olfactory dysfunction, increased pain in the orofacial area, and dysfunction of the masticatory system.[89-91] Factors such as medications, dry mouth, nutritional deficiencies, and functional deficiencies contribute to developing these problems.[89,92] Oral health providers must be attentive to these impairments because they may lead to inadequate oral self-care, poor oral health, decreased quality of life, and increased risk for developing oral infections such as caries, periodontal involvement, tooth mobility, and tooth loss.[89,93-98] Oral

health providers must also be attentive to salivary dysfunction (conditions of sialorrhea in conjunction with xerostomia) because this can increase problems with dysphagia and result in choking, sudden coughing, and "silent aspiration" pneumonia.[89] Another important consideration for oral health providers is how long the patient has been diagnosed with Parkinson's disease and whether the patient is taking levodopa. Patients who have been taking levodopa for an extended period of time may have shortened period of time when the drug is effective. This is called wearing-off phenomenon. When this occurs, motor function is severely impaired, making it impossible for the patient to keep their mouth open.[92] It is important for oral health providers to be aware of when the patient took levodopa and make sure dental procedures are complete before the medication wears off.[92] Patients who have been taking levodopa for several years may begin to develop dyskinesia which can affect the jaw and create difficulty in safely accessing the patient's mouth.[90] Patients diagnosed with Parkinson's disease may be unable to verbalize dental pain.[27]

Stroke

A cerebrovascular accident due to a lack of blood flow to the brain. This causes a lack of oxygen and brain cells begin to die. This can result in death or disability. Clinical signs and symptoms of a stroke are listed in Figure 20. If the oral health provider observes any of these signs and symptoms, it is critical to act fast. Treatment must be started within 3 hours of having a stroke to be effective.

Figure 20. Clinical Signs and Symptoms of a Stroke.[99]

- A severe headache with unknown cause
- Sudden numbness of the face, arm, or leg on one side of the body
- Sudden confusion, trouble speaking, or difficulty understanding speech
- Sudden trouble with vision in one or both eyes
- Sudden trouble walking, dizziness, loss of balance, or loss of coordination

Epidemiology and Etiology

Stroke affects 795,000 people living in the United States.[99] It is a primary or contributing cause in 1 out of 20 deaths.[99] High blood pressure is the leading cause of strokes. Other risk factors include previous stroke or Transient Ischemic Attack (TIA), high cholesterol, heart disease, diabetes, and sickle cell disease. An unhealthy diet, lack of physical activity, obesity, too much alcohol, tobacco use, family history, age, gender, and race also increase a person's risk for developing this condition. Figure 21 lists additional stroke statistics.

Figure 21. Stroke Statistics.[59,99]

- After age 55 the chance of developing a stroke doubles every 10 years
- Nearly 1 in every 4 strokes occur in people who have had a previous stroke
- Pregnancy and birth control increase the risk of stroke in women
- Blacks, Hispanics, American Indians, and Alaska Natives are at higher risk for having a stroke than non-Hispanic whites and Asians

Patient Management and Oral Health Considerations for Stroke

- After age 55 the chance of developing a stroke doubles every 10 years
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- Blacks, Hispanics, American Indians, and Alaska Natives are at higher risk for having a stroke than non-Hispanic whites and Asians

Note the time when any symptoms first appear. This information helps health care providers determine the best treatment.

When providing care to patients who have had a stroke, oral health providers should assess

the patient's risk for complications before providing any dental care. Items to consider include the timing of the stroke and type and magnitude of dental procedure.[49] Patients who are have experienced a TIA or stroke within the last 6 months are unstable. Elective care should be postponed.[49] A consultation with the patient's physician is recommended. Patients who are taking Warfarin should report their international normalized ratio (INR). A therapeutic range is 3.5 or less. Metronidazole and tetracycline interact with warfarin which can increase the INR. Oral health providers should avoid concurrent use of these drugs. Short stress-free appointments scheduled in the morning reduce the risk for complications. Oral health providers should avoid placing a retraction cord impregnated with epinephrine.

Effective pain control during the procedure and post-operative will reduce stress and the risk for complications. Oral health providers may administer nitrous oxide with oxygen. Local anesthesia should have a limited amount of vasoconstrictor (epinephrine). Patients can be safely given local anesthesia with epinephrine 1:100,000 or 1:200,000. The amount of vasoconstrictor should be ≤ 0.04 mg.

Oral manifestations associated with a stroke include unilateral paralysis of the face, loss of sensory stimuli or oral tissues, a flaccid tongue with multiple folds, and dysphagia. You may also notice that patients neglect oral self-care on one side of their mouth. This is associated with the brain damage that has occurred.[49] Increased caries, periodontal disease, and halitosis is also common due to challenges with oral self-care. Oral health providers should recommend rigorous preventive measures such as 3-month recall appointments and application of fluoride varnish.

Conclusion

As part of an integrated health care team, oral health professionals provide daily care to more patients who have an underlying chronic disease. In fact, many chronic diseases can alter a person's oral health status and/or present with various oral manifestations. Oral health providers must maintain an up-to-date knowledge base of medical conditions that may require the dental professional to modify oral health treatment approaches and make the appropriate medical referral/consultation. The oral and overall health of the person is intertwined, e.g., diabetes and periodontal disease. As new medications are brought to market, the negative oral side effects from the medications to manage diseases and associated oral conditions are also common. When oral health providers are prepared to provide safe, patient-centered, evidence-based oral health care to those with chronic diseases, the patient-provider relationship will be rewarded with increased trust and treatment outcomes that continually improve the quality of life of those we serve.

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: *www.dentalcare.com/en-us/ce-courses/ce567/start-test*

1. Which of the following factors does NOT contribute to developing chronic diseases?
A. Exposure to secondhand smoke
B. Fluoride in drinking water
C. Lack of physical activity
D. Excessive alcohol use

2. When assessing the patient, the medical history should include all of the following EXCEPT for one. Which is the exception?
A. Financial limitations
B. Vital signs
C. Physical limitations
D. Cognitive status

3. The risk of developing Alzheimer's disease is increased in _____.
A. people who eat a lot of chocolate
B. people who have more years of formal education
C. people who are currently smoking
D. None of the above.

4. Informed consent is NOT legally necessary _____.
A. when a spouse is present at the dental appointment
B. if a patient is not submitting an insurance claim
C. in emergency situations when the oral health provider is acting in the best interest of the patient
D. when a procedure is reversible

5. Rheumatoid arthritis only affects joints, tissues surrounding the joints, and connective tissue.
A. True
B. False

6. Which of the chronic diseases listed below increases the risk for developing gout?
A. Chronic heart failure
B. Depression
C. Parkinson's disease
D. Multiple sclerosis

7. Asthma medications do not increase the risk of _____.
A. mouth breathing
B. dental caries
C. oral cancer
D. oral candidiasis
E. dental erosion

8. _____ have been associated with bruxism and TMD.
A. Antihistamines
B. Anticholinergics
C. Antidepressants
D. Antihypertensives

9. _____ is an autoimmune disease where the pancreas does not make enough insulin.

A. Type 1 diabetes
B. Type 2 diabetes
C. Gestational diabetes

10. Urinating often at night, smell of acetone on breath, and weight loss without trying are signs and symptoms of _____.

A. Arthritis
B. COPD
C. Depression
D. Diabetes

11. HbA1c levels below ____ indicate the patient's diabetes in well controlled.

A. 7%
B. 8%
C. 9%
D. 10%

12. Shortness of breath, fatigue, and swelling of the lower extremities, stomach, and veins in the neck are signs and symptoms of _____.

A. COPD
B. Heart failure
C. Multiple sclerosis
D. Stroke

13. Patients who are taking Warfarin should discontinue or alter their dose for most dental procedures.

A. True
B. False

14. According to the American Heart Association guidelines, a blood pressure range of 145/100 is considered _____.

A. Normal
B. Elevated
C. High blood pressure–stage 1
D. High blood pressure–stage 2
E. Hypertensive crisis

15. Elective dental treatment should be postponed for patients who have uncontrolled high blood pressure (≥ 180/110 mm Hg).

A. True
B. False

16. Multiple sclerosis is _____.

A. an auto-immune disease of the central nervous system
B. an immune-mediated disease of the central nervous system
C. an auto-immune disease of the circulatory system
D. an immune-mediated disease of the circulatory system

17. Which of the following is NOT a typical motor or sensory abnormality that individuals diagnosed with MS may experience?

A. Hearing loss
B. Numbness
C. Fatigue
D. Bladder dysfunction

18. Which of the following is NOT a symptom of multiple sclerosis?

A. Trigeminal neuralgia
B. Depression
C. Hearing problems
D. Dysphagia

19. The etiology of Parkinson's disease is most likely _____.

A. genetic factors
B. environmental toxins or injury
C. an illness
D. All of the above.

20. Oral impairments from Parkinson's disease may lead to all of the following EXCEPT _____.

A. poor oral health
B. decreased quality of life
C. increased risk for oral cancer
D. increased risk for developing oral infections

21. Sudden numbness of the face, arm, or leg on one side of the body is a classic sign and symptom of _____.

A. Stroke
B. Chronic heart failure
C. Multiple sclerosis
D. Asthma

22. Patients who have experienced a stroke _____.

A. should never be given a vasoconstrictor
B. should never be given nitrous oxide with oxygen
C. can be safely given local anesthesia with epinephrine 1:100,000 or 1:200,000

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Additional Resources

- No Additional Resources Available

About the Author

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