

# Quality Resource Guide

## Guidelines for Consultation with and/or Referral to a Physician

### Author Acknowledgements

#### RAJESH V. LALLA, DDS PhD

Professor and Associate Dean for Research  
University of Connecticut  
School of Dental Medicine  
Farmington, Connecticut

Dr. Lalla has no relevant financial relationships to disclose.

MetLife designates this activity for **1.0 continuing education credit** for the review of this Quality Resource Guide and successful completion of the post test.

### Educational Objectives

Following this unit of instruction, the practitioner should be able to:

1. Understand the general importance of consulting with physicians on some patients presenting for dental care.
2. Understand the general importance of referring some patients presenting for dental care to a physician for medical care.
3. Recognize the elements of a well-written consultation or referral request.
4. Understand methods of communicating consultation and referral requests to physicians; and methods of record-keeping to track consultation and referral requests sent out, received back, and their review.
5. Recognize specific indications for generating a consultation or referral request and the relevant information that should be requested for each indication.
6. Understand how to apply the information received from the physician in the dental management of the patient.

The following commentary highlights fundamental and commonly accepted practices on the subject matter. The information is intended as a general overview and is for educational purposes only. This information does not constitute legal advice, which can only be provided by an attorney.

© 2022 MetLife Services and Solutions, LLG. All materials subject to this copyright may be photocopied for the noncommercial purpose of scientific or educational advancement.

Originally published July 2019. Updated and revised May 2022. Expiration date: May 2025.

The content of this Guide is subject to change as new scientific information becomes available.



Accepted Program Provider FAGD/MAGD Credit **05/01/21 - 06/31/25**.

MetLife is an ADA CERP Recognized Provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP does not approve or endorse individual courses or instructors, nor does it imply acceptance of credit hours by boards of dentistry. Concerns or complaints about a CE provider may be directed to the provider or to ADA CERP at <https://ccepr.ada.org/en/ada-cerp-recognition>.

Address comments or questions to:

DentalQuality@metlife.com - or -  
MetLife Dental Continuing Education  
501 US Hwy 22  
Bridgewater, NJ 08807

**Cancellation/Refund Policy:**

Any participant who is not 100% satisfied with this course can request a full refund by contacting us.

## Background

Patients presenting for dental care often have medical conditions that can:

1. Impact the appropriate and safe delivery of dental care
2. Have oral manifestations that the dentist is called upon to diagnose and manage

For example, in a patient with poorly controlled diabetes mellitus, the appropriate and safe delivery of dental care is impacted by the risk for a hypoglycemic episode during dental treatment and increased risk for infections and poor wound healing. Such patients may also have oral manifestations due to poor systemic disease control including increased severity of periodontal disease and oral candidiasis.

More recent data is also suggesting, in some cases, a bidirectional relationship (the severity of oral disease can also impact on systemic disease control). Data from several randomized controlled trials and meta-analyses indicate that aggressive treatment of periodontal disease in patients with diabetes mellitus can result in a small but consistent reduction in blood glucose values (measured as Hemoglobin A1C- HbA1c).

Due to these relationships between systemic/ medical and oral/dental health, it is important for the dental practitioner to work closely with the patient's medical and other healthcare providers when warranted. Such interactions are helpful to obtain information on a patient's systemic conditions that impact on the delivery of dental care, as well as to alert the medical team to findings that may suggest undiagnosed or poorly managed systemic disease. For example, the dental team may be the first to suspect undiagnosed diabetes mellitus based on symptoms reported by the patient (such as frequent urination and dry mouth) and findings on examination (such as increased severity of periodontal disease and oral candidiasis).

Our patients will be best served when the dental providers are a part of the patients' inter-professional health care team, working together to promote not only oral but also systemic health.

## Format/Template for Consultations and Referrals to a Physician

### Consultations

In cases where a consultation request is being written due to potential impact of a patient's medical condition on the safe and appropriate delivery of dental care, the following points should be kept in mind:

- The dentist is a healthcare professional responsible for making decisions related to the delivery of dental care.
- Our medical colleagues should not be expected to know the level of complexity or invasiveness of various dental procedures.
- Therefore, a consultation request should NOT request "clearance" to perform a specific dental procedure. It should request information, that is used by the dentist to decide on the safety and appropriateness of performing a specific dental procedure.
- In some cases, after receiving the requested medical information, further discussion with the medical provider may be indicated.

The key elements of such a consultation request are:

- Description of dental procedures planned
- Description of medical condition that is of concern
- Information requested from the medical provider

### Referrals

Referrals to physicians are typically made because the dental team suspects an undiagnosed medical condition or because a known medical condition appears to be poorly controlled. A referral request does not necessarily need to be justified based on planned dental procedures. We have an obligation to the general health and well-being of our patients, even when the relevant condition may not impact on their dental care.

The key elements of such a referral request are:

- Description of dental procedures planned, if applicable
- Description of signs/symptoms that suggest an undiagnosed or poorly controlled medical condition
- Request to the medical provider to assess and provide information as to findings

#### Example - Consultation Request

Dear Dr. Smith,

Our patient, Mr. John Doe, presents for dental care which may include dental implants and periodontal surgery. He gives a history of insulin therapy for poorly controlled diabetes mellitus type 2 including recent hypoglycemic episodes and non-healing foot ulcers, and of insulin therapy. Please advise as to:

- 1) Control of diabetes mellitus including recent fasting blood glucose and HbA1c levels;
- 2) medications for diabetes mellitus, including insulin type and dosages; and
- 3) any other relevant information, including wound healing and infection risk.

Thank-you,  
Sally Jones, DDS

*(Note: while this consultation request asks the physician for any additional information that he/she feels would be relevant, it does not shift the decision-making for whether or not to proceed with the dental procedures to the physician).*

#### Example - Referral Request

Dear Dr. Smith,

Mr. John Doe presents for dental care which may include dental implants and periodontal surgery. He gives a history of recent fainting episodes, frequent urination, non-healing foot ulcers, and presents with severe periodontal disease. Please assess Mr. Doe for possible diagnosis of diabetes mellitus and advise us as to your findings and management.

Thank you,  
Sally Jones, DDS

## Communication & Record Keeping

### Methods for communicating consultation requests or referrals

The traditional method for sending consultation requests and referrals is through a written document that is sent to the medical office, often via fax. Newer systems allow for the fax to be directly delivered into an email inbox. With the increasing adoption of electronic medical and dental records, some systems may support the electronic delivery of consultation requests, especially when the dental and medical providers are part of the same healthcare system. A barrier in this regard is that many of the commonly used medical and dental electronic health record systems do not “talk” to each other. On occasion, urgent requests for information may be made by phone. In this case, it is critical to document the details of the conversation in the dental record, including the parties to the conversation, date and time of the conversation, and the specific issues discussed and information received.

### Methods for keeping track of requests sent out and received back

Once a consultation or referral request is sent out, it is incumbent on the dental office to monitor the request until the required information has been received back and/or the issue is resolved. For practices still using paper charts, this may take the form of a separate document/binder where consultation requests are recorded as they are sent out and returned and a member of the staff is charged with checking the list on a regular basis and following up as needed. The increasing use of electronic records provides the opportunity for creating alerts for outstanding consultations and automated regular searches for all outstanding consultation requests that may require follow-up.

### Methods for documenting and reviewing information received and its review

Once a consultation request is received back, it is important to document that the information has been reviewed in a timely manner by the dentist and applied to the decision-making process for the patient. This usually takes the form of a note in the patient record documenting the date the consultation was received back and reviewed, the pertinent information received, and the application of that information to the patient’s dental care. For example: “Response from Dr. Smith received on X date and reviewed by Dr. Jones today. On X date, Mr. Doe had FBG of 240 and HbA1c of 10. He was diagnosed with diabetes mellitus and started on metformin and pioglitazone. Based on this information, we will defer on periodontal surgery and dental implants until diabetes is under better control, due to concerns about wound healing and infection risk”.

## Conditions Warranting Consultation or Referral to a Physician

The tables on the following pages list some of the common systemic conditions for which a dental practitioner may need to generate a consultation or referral request to a physician. It also describes, in brief, the main implications for dental care, when to consult/refer, what to ask for and how to use the information received. This table does not include every situation in which a medical consultation or referral may be warranted, nor every medical or dental implication of the listed conditions. There are many excellent textbooks that provide a comprehensive description of these issues.<sup>1,2</sup> This succinct information in table format should serve as a useful chairside resource for the dental practitioner and the office staff members.

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<p><b>ADRENAL CORTEX DISORDERS AND CORTICOSTEROID THERAPY</b></p> <p>Low cortisol, aldosterone in <b>Primary Adrenal Insufficiency (Addison Disease)</b></p> <p>Low cortisol in <b>Secondary Adrenal Insufficiency</b>, often due to long-term steroid therapy.</p> <p>High cortisol in <b>Cushing Syndrome</b>.</p>	<ul style="list-style-type: none"> <li>- Patients with adrenal insufficiency at risk of adrenal crisis, especially if primary insufficiency<sup>3</sup></li> <li>- Oral and/or skin pigmentation in Addison Disease</li> <li>- Patients on high doses of steroids at risk for infection (including oral candidiasis) and delayed wound healing</li> </ul>	<ul style="list-style-type: none"> <li>- History of Addison Disease or Cushing Syndrome</li> <li>- History of long-term use of systemic steroids at higher than maintenance doses (e.g. &gt; 10 mg prednisone/day)</li> <li>- Symptoms of undiagnosed or uncontrolled adrenal disease including: pigmentation, hypotension in Addison Disease; weight gain, fat deposition on face and back, hypertension in Cushing syndrome</li> </ul>	<ul style="list-style-type: none"> <li>- Level of control, medications including dose and duration of systemic steroids.</li> <li>- Presence of adrenal suppression and potential for adrenal crisis- assessed by corticotropin (ACTH) stimulation test.</li> <li>- Patients with adrenal suppression may need steroid supplementation prior to surgical procedures, especially if primary insufficiency.<sup>4</sup> Monitor blood pressure during and after the procedure.</li> <li>- Defer elective surgery for patients on temporarily high doses of steroids (e.g. ≥ 20 mg prednisone/day).</li> </ul>
<b>ANTIBIOTIC PROPHYLAXIS</b>			
<p>For <b>prevention of Infective Endocarditis (IE)</b></p>	<ul style="list-style-type: none"> <li>- Patients with a specific list of cardiac conditions should receive antibiotic prophylaxis prior to dental procedures that involve manipulation of gingival tissue, manipulation of the periapical region of teeth, or perforation of the oral mucosa.</li> </ul>	<p>History or suspected history of one of the indications for IE prophylaxis:<sup>5,6</sup></p> <ul style="list-style-type: none"> <li>- History of IE</li> <li>- Prosthetic cardiac material: Presence of prosthetic cardiac valves, prosthetic devices used for valve repair, left ventricular assist devices, or implantable heart.</li> <li>- Congenital heart disease (CHD): Unrepaired cyanotic CHD, CHD repaired with prosthetic material within first 6 months after procedure, repaired CHD with prosthetic material and residual defects.</li> <li>- Cardiac transplant recipients with cardiac valvulopathy</li> </ul>	<ul style="list-style-type: none"> <li>- Confirm or rule out a history of indication for IE prophylaxis.</li> <li>- Patients with a listed indication should receive IE prophylaxis, only prior to dental procedures that involve manipulation of gingival tissue, manipulation of the periapical region of teeth, or perforation of the oral mucosa. Prophylaxis is not needed for routine anesthetic injections through noninfected tissue, taking dental radiographs, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of deciduous teeth, and bleeding from trauma to the lips or oral mucosa.</li> <li>- First line regimen for adults (without penicillin allergy) is 2g amoxicillin taken orally 30-60 minutes before the procedure.</li> <li>- For a patient with penicillin allergy, clindamycin is no longer recommended due to risk of adverse reactions. Instead, one of the following single-dose regimens is recommended for adults, taken orally 30-60 minutes before the procedure:                         <ul style="list-style-type: none"> <li>• Cephalexin 2g</li> <li>• Azithromycin or Clarithromycin 500 mg</li> <li>• Doxycycline 100 mg</li> </ul> </li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>ANTIBIOTIC PROPHYLAXIS (continued)</b>			
<p><b>For prevention of prosthetic joint infection</b></p>	<ul style="list-style-type: none"> <li>- In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection<sup>7</sup></li> <li>- For patients who may be at higher risk of prosthetic joint infection, consult with the orthopedic surgeon</li> </ul>	<p>History of a condition that may place the patient at a higher risk of prosthetic joint infection. For example:</p> <ul style="list-style-type: none"> <li>- History of prosthetic joint infection that required an operation</li> <li>- Severely immunocompromised status, due to disease or immunosuppressive therapy</li> <li>- Poorly controlled diabetes mellitus with HbA1C <math>\geq</math> 8%</li> </ul>	<ul style="list-style-type: none"> <li>- In patients who may be at higher risk, discuss risks and benefits of antibiotic prophylaxis with the orthopedic surgeon and patient.</li> <li>- If antibiotic prophylaxis is used, the orthopedic surgeon should recommend the appropriate antibiotic regimen and, when reasonable, write the prescription.</li> <li>- If antibiotic prophylaxis is used, it is indicated only for dental procedures that involve manipulation of gingival tissue, manipulation of the periapical region of teeth, or perforation of the oral mucosa.</li> </ul>
<p><b>Arrhythmias:</b> Abnormal rate or rhythm of the heartbeat</p>	<ul style="list-style-type: none"> <li>- Patients may present with fast or slow pulse or irregular rhythm</li> <li>- Patients with some arrhythmias (e.g. atrial fibrillation) are often taking anticoagulants, due to increased risk for thromboembolic events<sup>8</sup></li> <li>- Patients may have a pacemaker or implanted cardioverter-defibrillator</li> </ul>	<ul style="list-style-type: none"> <li>- Signs or Symptoms of undiagnosed or uncontrolled arrhythmia such as abnormal pulse rate or rhythm, palpitations, syncope, orthopnea</li> <li>- Unclear history related to type of arrhythmia or its management</li> </ul>	<ul style="list-style-type: none"> <li>- Specific type and control of arrhythmia: in case of symptomatic poorly controlled arrhythmia, may be appropriate to avoid elective dental care.</li> <li>- Use of vasoconstrictors: Limited use of epinephrine-containing local anesthetic in patients with arrhythmia and those taking digoxin or non-selective beta blockers (e.g. propranolol) - Avoid epinephrine retraction cord.</li> <li>- Presence of pacemaker or cardioverter-defibrillator: Potential for interference from electrosurgery units.</li> <li>- Anticoagulant therapy: Potential for increased bleeding (see Bleeding Disorders).</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>BLEEDING DISORDERS</b>			
<p><b><u>Congenital Bleeding Disorders:</u></b> Inherited conditions affecting coagulation. For example: von Willebrand disease, Hemophilia.</p>	<ul style="list-style-type: none"> <li>- Increased risk for bleeding</li> <li>- Patient may present with signs of submucosal bleeding such as petechiae, ecchymoses or hematomas</li> </ul>	<ul style="list-style-type: none"> <li>- Patient with a diagnosis of a congenital bleeding disorder</li> <li>- Possible undiagnosed bleeding disorder, suggested by a history of excessive bleeding or the presence of petechiae, ecchymoses or hematomas</li> </ul>	<ul style="list-style-type: none"> <li>- Specific diagnosis.</li> <li>- Laboratory tests: Indicate severity of disease - may include activated partial thromboplastin time (aPTT), prothrombin time (PT), thrombin time (TT) and platelet count.</li> <li>- How managed: for example, patients with type 1 von Willebrand disease or hemophilia may be receiving desmopressin therapy.</li> <li>- Precautions needed for procedures involving bleeding: for example, factor VIII replacement in severe hemophilia; desmopressin, aminocaproic acid, or factor VIII with von Willebrand factor in von Willebrand disease. Avoid aspirin and other NSAIDs. Block anesthetic injections can lead to hematoma and respiratory compromise.</li> </ul>
<p><b><u>Anticoagulant therapy:</u></b> Patients taking anticoagulants to reduce the risk of a thromboembolic event (e.g. stroke, myocardial infarction).</p>	<ul style="list-style-type: none"> <li>- Increased risk for bleeding</li> <li>- Patient may present with signs of submucosal bleeding such as petechiae, ecchymoses or hematomas</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of taking anticoagulants</li> <li>- Patients taking warfarin/coumadin</li> <li>- If planning major surgery with significant bleeding expected</li> </ul>	<ul style="list-style-type: none"> <li>- Specific anticoagulant being taken, dose, and indication.</li> <li>- Antiplatelet therapy (aspirin, clopidogrel): Usually no changes to antiplatelet therapy indicated<sup>9</sup>.</li> <li>- Warfarin: Obtain recent prothrombin time/INR. Most dental procedures, including most extractions, can be performed with INR <math>\leq 3.5^{10}</math> - If over 3.5, consult with the physician to reduce warfarin dose.</li> <li>- Heparin: Typically used for a limited time only. Defer elective procedures where significant bleeding expected.</li> <li>- Direct factor XA inhibitors (rivaroxaban, apixaban, edoxaban) and direct thrombin inhibitors (dabigatran): Evidence to date suggests that most dental procedures, including most extractions, can be performed without modifying these medications<sup>11</sup>.</li> <li>- For all of the above: Expect and be prepared to locally manage some increase in bleeding - If planning major surgery, discuss benefits and risks (thromboembolic event) of dose reduction with physician and patient, and follow-up with the patient after surgical procedures.</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>CANCER THERAPY</b> Patients receiving radiation therapy (RT) for head and neck (H&N) cancer or patients receiving chemotherapy for any cancer.			
<u>Prior to cancer therapy</u>	Patients may present for dental evaluation and management prior to H&N RT or prior to high-dose chemotherapy or prior to initiation of intravenous (IV) bisphosphonates or denosumab.	Patients who are to receive H&N RT Patients who are to receive high-dose chemotherapy Patients who are to receive IV bisphosphonates or denosumab (used to manage cancer metastases to bone or cancer developing in bone).	H&N RT: Total planned RT dose and areas of jaws expected to receive over 5000 cGy. In these areas, teeth with poor long-term prognosis should be extracted at least 2 weeks prior to the start of RT, to reduce future risk for osteoradionecrosis. Prescribe high strength topical fluoride due to expected dry mouth and increased caries risk <sup>12</sup> . Chemotherapy: Active oral infection should be managed before the start of chemotherapy, to reduce risk for flare-up during immunosuppression. IV bisphosphonates or denosumab: Teeth with poor long-term prognosis should be extracted at least 2 weeks prior to the start of therapy, to reduce future risk for medication-related osteonecrosis of the jaw (MRONJ).
<u>During cancer therapy</u>	Bone marrow suppression due to high dose chemotherapy, resulting in increased risk for infection and bleeding Patients may experience several oral complications of cancer therapy including oral mucositis, dry mouth, oral candidiasis, recurrent herpes simplex virus (HSV) lesions, taste changes. Patients receiving targeted anticancer agents (such as mTOR inhibitors) may present with aphthous-like oral ulcers.	Patients presenting for urgent dental care Patients presenting due to oral complications of cancer therapy	Details of cancer therapy including agents, start and end dates, recent lab values including neutrophil and platelet counts. In patients receiving immunosuppressive chemotherapy, any invasive oral care should be timed to occur with neutrophil count $\geq 1000$ cells/mm <sup>3</sup> and platelet count $\geq 75,000$ cells/mm <sup>3</sup> - Adequate healing time should be allowed before next period of immunosuppression. For management of oral mucositis due to conventional chemotherapy or RT <sup>13</sup> - see <a href="https://www.mascc.org/mascc-guidelines">https://www.mascc.org/mascc-guidelines</a> . For stomatitis secondary to mTOR inhibitors or other targeted anticancer agents, a dexamethasone mouthrinse can be helpful <sup>14,15</sup> . In immunosuppressed patients, topical agents may not be effective for oral candidiasis or recurrent HSV lesions.

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>CANCER THERAPY (continued)</b> Patients receiving radiation therapy (RT) for head and neck (H&N) cancer or patients receiving chemotherapy for any cancer.			
<u>After cancer therapy</u>	<p>Patients who have received high dose RT to the jaws are at life-long risk for several oral complications including osteoradionecrosis, dry mouth, dental caries, oral candidiasis, and reduced mouth opening due to fibrosis<sup>16</sup></p> <p>Patients who have recently received chemotherapy may still have some bone marrow suppression, resulting in increased risk for infection and bleeding</p>	<p>Patients who have received high dose RT to the jaws</p> <p>Patients who received chemotherapy within the last 30 days</p>	<p>H&amp;N RT: Total dose and specific dose to areas in which invasive dental procedures are planned. Invasive procedures in bone should ideally be avoided in areas that have received over 5000 cGy, due to risk for osteoradionecrosis. If necessary, consider referral to an oral surgeon. Management of dry mouth and increased caries risk including high strength topical fluoride and saliva substitutes.</p> <p>Recent chemotherapy: Defer elective care until neutrophil and platelet counts have returned to normal ranges. For urgent invasive care, neutrophil count <math>\geq 1000</math> cells/mm<sup>3</sup> and platelet count <math>\geq 75,000</math> cells/mm<sup>3</sup> are desirable.</p>
<u>Congestive Heart Failure (CHF)</u>	<p>CHF is usually due to an underlying cardiovascular condition, such as ischemic heart disease, hypertension, cardiomyopathy, or valvular heart disease.</p> <p>Patients with uncontrolled CHF are at increased risk for adverse cardiovascular events such as heart attack and stroke<sup>17</sup></p>	<p>Unclear history of CHF</p> <p>Signs or symptoms suggestive of poorly controlled or undiagnosed CHF, such as swelling of feet/ankles, fingers or abdomen; shortness of breath at rest/exercise or in a recumbent position</p>	<p>Diagnosis of CHF and causative cardiovascular condition: Underlying condition may have its own implications for dental management.</p> <p>Level of control: Ejection fraction (<math>\geq 55\%</math> = normal; <math>&lt; 50\%</math> = CHF; 20-35% = moderate CHF; <math>&lt; 20\%</math> = severe CHF). Poorly controlled or highly symptomatic patients (Class III or IV CHF) may need care in a hospital setting.</p> <p>How medically managed: Medications used for CHF or underlying cardiovascular condition may have oral side-effects (for e.g. diuretics can cause dry mouth; anticoagulants increase bleeding risk).</p> <p>NSAIDS can increase CHF symptoms.</p>



Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<p><b><u>Diabetes Mellitus</u></b></p>	<p>Poorly controlled diabetics have a greater risk for:<sup>18</sup></p> <ul style="list-style-type: none"> <li>- Hypoglycemic episodes</li> <li>- Infections including periodontal disease and oral candidiasis</li> <li>- Impaired wound healing</li> <li>- Oral lichen planus, dry mouth, burning mouth.</li> </ul>	<ul style="list-style-type: none"> <li>- History of poorly controlled diabetes including hypoglycemic episodes, diabetic complications such as eye, kidney, blood vessel or nerve damage, fasting blood glucose (FBG) &gt;200 mg/dL.</li> <li>- Symptoms of undiagnosed or poorly controlled diabetes including frequent thirst, urination, and hunger.</li> </ul>	<p>Level of control: Hemoglobin A1c (HbA1c) &gt; 9% or FBG &gt; 200 mg/dL indicates poor control – defer elective care, especially surgery. May need more frequent or aggressive periodontal therapy.</p> <p>Medications: Patients on insulin or sulphonylureas are at greater risk for hypoglycemic episodes during peak action time. Metformin may cause a metallic taste.</p>
<p><b><u>Inflammatory Bowel Disease (IBD)</u></b></p> <p><b><u>Ulcerative Colitis (UC):</u></b> Ulcerations of the large intestine and rectum</p> <p><b><u>Crohn Disease (CD):</u></b> Ulcerations anywhere along the alimentary tract, commonly the ileum (last part of the small intestine) and proximal colon (first half of the large intestine)</p>	<p>Patients may be on steroids or immunosuppressive drugs (such as azathioprine or methotrexate)</p> <p>Patients may have oral manifestations of IBD</p> <p>Patient may need frequent bathroom breaks</p>	<p>Unclear history of IBD</p> <p>Symptoms of poorly controlled or undiagnosed IBD such as frequent diarrhea and abdominal pain</p> <p>Oral manifestations: Aphthous-like ulcerations or pustular raised lesions (pyostomatitis vegetans) in UC. Linear ulcers with hyperplastic margins or cobblestone appearance of mucosa in CD<sup>19</sup></p>	<p>Diagnosis and level of control: Defer elective dental care during a flare-up .</p> <p>How managed: Patient may be on higher doses of steroids and/or immunosuppressants during flare-ups, with increased risk for infection and delayed healing (see Adrenal Cortex Disorders and Corticosteroid Therapy).</p> <p>Oral manifestations resolve with medical control of the GI condition. Topical steroids may be helpful.</p> <p>Methotrexate can cause oral ulcerations.</p>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<p><b>HIV Disease:</b> Infection with the human immunodeficiency virus</p> <p><b>AIDS (acquired immunodeficiency syndrome):</b> Advanced stage of HIV infection, characterized by a severely immunocompromised state.</p>	<ul style="list-style-type: none"> <li>- Increased risk for infections</li> <li>- Potential for oral manifestations including oral candidiasis, viral disease including HSV, VZV, HPV, and hairy leukoplakia (EBV), severe periodontal disease, Kaposi sarcoma, aphthous ulcers, salivary gland swelling<sup>20</sup></li> <li>- Risk of transmission</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of HIV/AIDS</li> <li>- Signs or symptoms suggestive of poorly controlled or undiagnosed disease or disease progression such as recurrent oral candidiasis or other oral manifestations.</li> <li>- Unknown level of control or recent CD4 count less than 200 cells/<math>\mu</math>L.</li> </ul>	<p>Diagnosis and level of control as indicated by CD4 count (over 500 cells/<math>\mu</math>L = well-controlled; less than 200 = AIDS/poorly controlled) and viral load (undetectable = well-controlled, over 100,000 copies/mL = poorly controlled):</p> <ul style="list-style-type: none"> <li>- For poorly controlled patients, defer elective dental care due to high risk for systemic infections and potential for increased bleeding. For urgent care, discuss the use of antibiotic prophylaxis with physician based on neutrophil and CD4 counts.</li> <li>- How managed: HIV medications can cause oral pigmentation, taste changes, paresthesia, and Stevens-Johnson syndrome.</li> </ul>
<p><b>Hypertension</b></p>	<ul style="list-style-type: none"> <li>- Epinephrine and stress can exacerbate hypertension</li> <li>- Increased risk for acute cardiovascular events such as stroke and myocardial infarction</li> <li>- Side-effects of medications used for hypertension</li> </ul>	<ul style="list-style-type: none"> <li>- Undiagnosed or poorly controlled hypertension (systolic <math>\geq</math> 140 mm Hg or diastolic <math>\geq</math> 90 mm Hg)</li> <li>- Unless an emergency, take readings at two separate visits and at beginning and end of the visit.</li> <li>- If blood pressure is greater than 180/110, defer elective dental care and refer urgently. If symptomatic (e.g. headache, chest pain), call 911 or refer to the ER/urgent care center immediately.</li> </ul>	<ul style="list-style-type: none"> <li>- Confirm diagnosis, stage and level of control: 2017 guidelines classify systolic <math>\geq</math> 140 or diastolic <math>\geq</math> 90 as Stage 2.</li> <li>- How managed: Some antihypertensive drugs can lead to orthostatic hypotension and oral lichenoid lesions.<sup>21</sup> Diuretics can cause dry mouth. Calcium channel blockers can cause gingival hyperplasia.</li> <li>- Use of epinephrine: Avoid retraction cord soaked in epinephrine. 1-2 carpules of local anesthetic containing 1:100,000 epinephrine can usually be used safely unless blood pressure is greater than 180/110</li> <li>- Ask the patient about compliance with medications.</li> <li>- If hypertension is poorly controlled, consider stress reduction measures such as sedation.</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<p><b><u>Atherosclerotic Heart Disease</u></b></p>	<ul style="list-style-type: none"> <li>- Increased risk for angina, myocardial infarction (MI) and stroke</li> <li>- May lead to other cardiac pathology such as congestive heart failure</li> <li>- Side-effects of medications used for atherosclerotic heart disease</li> </ul>	<ul style="list-style-type: none"> <li>- Symptoms of undiagnosed or poorly controlled atherosclerotic heart disease such as angina/chest pain</li> </ul>	<ul style="list-style-type: none"> <li>- Confirm diagnosis of atherosclerotic heart disease and how managed. Patients may be on aspirin or other medications that increase bleeding risk.</li> <li>- If there is a history of recent angina, confirm if stable or unstable and how managed (e.g. nitroglycerin). If unstable angina or history of MI or cardiac surgery within last 30 days, defer elective care.</li> <li>- Use of epinephrine: Avoid retraction cord soaked in epinephrine. 1-2 carpules of local anesthetic containing 1:100,000 epinephrine can usually be used safely unless unstable angina is present.</li> <li>- If there is a history of recent angina, consider stress reduction measures such as sedation and use of nitroglycerin prophylactically. Nitroglycerin should be available at the appointment.</li> <li>- Patients with cardiac stents or history of coronary artery bypass surgery (CABG) do not need antibiotic prophylaxis before dental procedures (unless a valve was replaced)<sup>5,6,20</sup>.</li> </ul>
<p><b><u>Chronic Kidney Disease (CKD)</u></b></p>	<ul style="list-style-type: none"> <li>- Drug metabolism may be impaired</li> <li>- Increased bleeding and infection risk in end-stage renal disease (ESRD)</li> <li>- Patients on hemodialysis:                         <ul style="list-style-type: none"> <li>• Typically have an arteriovenous shunt in one arm - avoid this arm for blood pressure measurements</li> <li>• Receive heparin to prevent blood clotting during hemodialysis- schedule dental care on days not receiving hemodialysis</li> <li>• Antibiotic prophylaxis is not generally needed for hemodialysis patients with arteriovenous shunts</li> </ul> </li> <li>- Potential for oral manifestations in ESRD, including oral ulcerations, white uric acid precipitates (uremic frost), uremic odor, taste disturbances, bony changes, including radiolucent lesions in jaws (due to secondary hyperparathyroidism)<sup>22</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of CKD or incomplete information on its severity and kidney function status</li> </ul>	<ul style="list-style-type: none"> <li>- Cause of CKD: Most common causes are diabetes mellitus and hypertension, each of which have their own dental management implications.</li> <li>- Stage of CKD and Glomerular Filtration Rate (GFR): Ranges from Stage 1 (mild, GFR over 90 ml/min) to Stage 5 (ESRD, GFR less than 15 ml/min or on dialysis): Dosage adjustments for drugs such as antibiotics and analgesics is likely to be needed when GFR is below 50 ml/min; and nephrotoxic drugs should be avoided.</li> <li>- Other lab values: serum creatinine and blood urea nitrogen (BUN) provide additional measures of kidney function. In ESRD, CBC is helpful to assess anemia and thrombocytopenia/bleeding risk.</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<p><b><u>Liver Disease</u></b></p>	<ul style="list-style-type: none"> <li>- Drug metabolism may be impaired</li> <li>- Potential for increased bleeding (liver produces some clotting factors)</li> <li>- Potential for oral manifestations including yellowish coloration of oral mucosa (jaundice), signs of bleeding (petechiae), increased risk of oral lichen planus in patients with Hepatitis C<sup>23</sup></li> </ul>	<ul style="list-style-type: none"> <li>- History of liver disease or presence of signs suggestive of undiagnosed liver disease</li> </ul>	<ul style="list-style-type: none"> <li>- Cause of liver disease: Most common causes of chronic liver disease are alcohol abuse and Hepatitis B, C, D virus infection, which have their own implications for dental management.</li> <li>- Laboratory measures:                         <ul style="list-style-type: none"> <li>• AST/ALT: increased levels indicate active hepatocyte damage (normal &lt; 40 IU/L; 80-400 = chronic hepatitis; over 400 = acute hepatitis).</li> <li>• Bilirubin (bile pigment): normal &lt; 1.2 mg/dL, &gt; 2 = advanced liver disease; &gt; 3 = leads to jaundice.</li> <li>• Serum albumin (protein made in liver): normal = &gt; 3.5 gm/dL, decrease indicates reduced liver function.</li> <li>• PT/INR: In patients with liver disease and not on warfarin, INR over 1.5 is indicative of increased bleeding risk.</li> <li>• Platelet count: May be reduced in advanced liver disease, increasing bleeding risk.</li> </ul> </li> <li>- Current status of Hepatitis, how treated, presence of antibodies and viral load:                         <ul style="list-style-type: none"> <li>• Hepatitis B: In 90% cases, antibody against Hep B surface antigen develops, indicating resolution and immunity.</li> <li>• Hepatitis C: Without treatment, 85% cases become chronic; presence of antibody against Hep C virus does not indicate resolution/immunity. Treatment with modern antivirals has a high success rate in inducing a long-lasting remission with undetectable viral load.</li> </ul> </li> <li>- In acute or advanced chronic liver disease (ALT &gt; 160 IU/L or serum bilirubin &gt; 2 mg/dL or serum albumin &lt; 3.5 gm/dL), consult with physician on selection/dosage of systemic medications.</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>NEUROLOGIC DISORDERS</b>			
<p><b>Epilepsy:</b> Characterized by seizures, due to excessive neuronal activity</p>	<ul style="list-style-type: none"> <li>- Risk of a seizure in the dental chair</li> <li>- Gingival overgrowth due to epilepsy medications</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of seizures, history of seizures that are recent or poorly managed</li> </ul>	<ul style="list-style-type: none"> <li>- Diagnosis, type of seizures, cause if known, and any known precipitating factors: Seizures can be partial or generalized, with the latter being more severe. Epilepsy is often idiopathic but can be secondary to other conditions such as cancer and head trauma. In some patients, light and sound stimuli can lead to seizures.</li> <li>- Level of control: Poorly controlled patients may require special precautions for seizure prevention, including sedation or other stress reduction measures. The dental team should be prepared to manage a seizure if it occurs. Dental treatment planning should take seizures into account (e.g. fixed prostheses may be preferable).</li> <li>- How treated: Gingival overgrowth is a side-effect of phenytoin (Dilantin). Risk is increased with local irritants (such as calculus) and concomitant use of other medications that can cause gingival overgrowth (calcium channel blockers, cyclosporine)<sup>24</sup>.</li> </ul>
<p><b>Parkinson Disease:</b> Characterized by degeneration of neurons that produce dopamine, leading to tremors and possibly mood disorders and dementia</p>	<ul style="list-style-type: none"> <li>- Tremors can impede professional dental care and home oral hygiene measures</li> <li>- Side effects of medications</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of Parkinson Disease or its management, tremors without a known diagnosis</li> </ul>	<ul style="list-style-type: none"> <li>- Diagnosis and level of control: Poorly controlled patients may have significant involuntary movements and stress and may need a modified toothbrush and frequent recall visits.</li> <li>- How managed: Dopamine precursors/agonists and COMT inhibitors can cause orthostatic hypotension and dry mouth.</li> </ul>
<p><b>Alzheimer Disease:</b> Characterized by deposition of amyloid plaques and inflammation in the brain, leading to reduced levels of neurotransmitters, manifesting as cognitive deficits and memory loss</p>	<ul style="list-style-type: none"> <li>- Patients may have difficulty understanding questions or remembering instructions</li> <li>- Patients with severe dementia may have a legal guardian for healthcare issues.</li> <li>- Side effects of medications</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of Alzheimer Disease or its management, or late-stage of dementia.</li> </ul>	<ul style="list-style-type: none"> <li>- Diagnosis and stage of dementia: Middle and late-stage patients may be uncooperative and need treatment planning modifications, (e.g. sedation, written instructions, frequent recall).</li> <li>- How managed: Patients on antipsychotics and antidepressants may have dry mouth.</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<p><b><u>Organ Transplantation</u></b></p>	<ul style="list-style-type: none"> <li>- Patients may be referred for dental management prior to organ transplantation, to reduce the risk for infection after transplant.</li> <li>- Patients who have received an organ transplantation are often on immunosuppressive drugs, that increase risk for infection. Chronic immunosuppressive therapy increases cancer risk.</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear history of organ transplantation or of therapy with immunosuppressive drugs</li> </ul>	<ul style="list-style-type: none"> <li>- Confirm history of organ transplantation and status/function, including lab values related to relevant organ function: For example, a patient with a history of a successful kidney transplant may still have reduced renal function, which has its own implications for dental care.</li> <li>- Medications to prevent transplant rejection: These immunosuppressive medications increase the risk for infections, including recurrent HSV, oral candidiasis and systemic spread of a dental infection. Cyclosporine can cause gingival overgrowth.<sup>25</sup></li> <li>- Infection risk, including CBC with differential: High doses of some immunosuppressive drugs can lead to neutropenia, with increased infection risk. Antibiotic prophylaxis may be advisable before invasive dental procedures if neutrophil count is below 1000 cells/mm<sup>3</sup>.</li> </ul>
<p><b><u>Osteoporosis (and Bisphosphonate therapy)</u></b></p> <p>Reduced bone mineral density (BMD), leading to risk for fractures.</p> <p>Often treated with bisphosphonate (BP) medications, which increase BMD by inhibiting bone resorption. These drugs may persist in bone for years after discontinued.</p>	<ul style="list-style-type: none"> <li>- A reduced width of the mandibular cortex on panoramic radiograph has good predictive value for reduced BMD/osteoporosis in other bones<sup>26</sup></li> <li>- Patients currently taking or with a history of taking BP medication are at risk for medication-related osteonecrosis of the jaw (MRONJ)<sup>27</sup></li> <li>- Potential impact on bone healing and risk for MRONJ after extractions, implant placement and other surgical procedures involving bone</li> </ul>	<ul style="list-style-type: none"> <li>- A reduced width of the mandibular cortex on panoramic radiograph in a patient not yet tested for osteopenia/osteoporosis</li> <li>- Unclear history of osteopenia/osteoporosis or of medications used for its management</li> <li>- Planned dental surgical procedures involving significant bone manipulation in a patient with a history of BP use</li> </ul>	<ul style="list-style-type: none"> <li>- Diagnosis of osteopenia/osteoporosis and severity: Osteoporosis is defined as a T-score &lt; 2.5, which indicates BMD that is 2.5 standard deviations less than young healthy women.</li> <li>- Medications used for management, doses and duration of use: May include oral BPs taken daily or weekly or IV BP used once a year. Overall risk of MRONJ in patients taking BPs for osteoporosis is low (about 0.1%); risk increases with dose/duration of BP therapy. Greater risk in the mandible.</li> <li>- Concomitant conditions that increase the risk for MRONJ: IV BPs or anti-angiogenic agents for cancer therapy, systemic steroid therapy, diabetes mellitus, smoking.</li> <li>- Feasibility of interrupting BP therapy: No data to support the effectiveness of a drug holiday in reducing risk of MRONJ; some groups suggest consideration of a 2-month drug holiday prior to oral surgery involving bone in patients with an extended history of BP exposure (&gt; 4 years).</li> <li>- Dental implants are not necessarily contraindicated in osteoporotic patients, including those with a history of BP therapy for osteoporosis. However, a longer healing time may be needed before implant loading and patient should be cautioned about a small risk of MRONJ<sup>28</sup>.</li> </ul>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b><u>Pregnancy</u></b>	<ul style="list-style-type: none"> <li>- Patients may have a physiologic systolic murmur due to increased blood volume and cardiac output</li> <li>- Patients may have hypertension as part of preeclampsia</li> <li>- Patients may have gestational diabetes mellitus</li> <li>- Fetus susceptible to drugs</li> <li>- Fetus susceptible to radiation</li> <li>- Patients may have pregnancy gingivitis, pyogenic granuloma<sup>29</sup></li> <li>- Patients may be prone to nausea and vomiting, leading to enamel erosion</li> <li>- Patient at risk for supine hypotensive syndrome if she is in a supine position in late pregnancy</li> <li>- Patients may be short of breath, needing the dental chair to be kept semi-upright</li> </ul>	<ul style="list-style-type: none"> <li>- If heart murmur heard</li> <li>- If the patient has undiagnosed hypertension</li> <li>- Signs or symptoms of undiagnosed diabetes mellitus</li> <li>- If need to prescribe medication</li> </ul>	<ul style="list-style-type: none"> <li>- Type/cause of murmur: A physiologic/functional murmur does not indicate cardiac pathology and antibiotic prophylaxis is not needed.</li> <li>- If preeclampsia present: See section on hypertension.</li> <li>- If the patient has gestational diabetes: See section on diabetes.</li> <li>- Recommended medication: Acetaminophen and penicillins are usually safe during pregnancy and nursing.</li> </ul> <p>Avoid aspirin, codeine, tetracyclines, and sedatives such as benzodiazepines.</p>

Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>PSYCHIATRIC DISORDERS</b>			
<p><b>Depression:</b> Characterized by a depressed mood.</p> <p><b>Bipolar Disorder:</b> Characterized by manic episodes, often alternating with depressive episodes.</p> <p><b>Schizophrenia:</b> Characterized by hallucinations and delusions.</p>	<ul style="list-style-type: none"> <li>- Patients may neglect oral hygiene</li> <li>- Antidepressant and mood-stabilizing drugs have many side-effects including dry mouth, postural hypotension, and involuntary movements<sup>30</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Signs or symptoms of undiagnosed or poorly controlled psychiatric disease</li> <li>- Unclear history of psychiatric disease, level of control, or medications (e.g. antipsychotics, lithium) that do not correspond to stated history</li> </ul>	<ul style="list-style-type: none"> <li>- Confirm diagnosis and level of control: Some poorly controlled patients may not be good candidates for elective dental care.</li> <li>- Medication list: Consider drug interactions when prescribing medications including NSAIDs, metronidazole, narcotics and sedatives. Avoid large amounts of epinephrine in patients on antidepressants or antipsychotics.</li> </ul>
<b>RHEUMATOLOGIC DISORDERS</b>			
<p><b>Osteoarthritis:</b> Characterized by joint degeneration due to wear and tear.</p> <p><b>Rheumatoid Arthritis:</b> Characterized by joint damage due to inflammation.</p> <p><b>Systemic Lupus Erythematosus (SLE):</b> Characterized by involvement of multiple organs due to an autoimmune process.</p> <p><b>Sjogren syndrome (SS):</b> An autoimmune condition characterized by dry mouth and dry eyes.</p>	<ul style="list-style-type: none"> <li>- Patients may have a history of joint replacement</li> <li>- Patients may be on aspirin, NSAIDs, steroids, or immunosuppressive agents</li> <li>- Patients with SLE may have ulcerative or lichenoid oral lesions, and joint, skin, heart, kidney, or lung involvement</li> <li>- Patients with SS may have severe dry mouth<sup>31</sup></li> </ul>	<ul style="list-style-type: none"> <li>- Signs or symptoms of undiagnosed or poorly controlled rheumatologic disease</li> <li>- Unclear history of rheumatologic disease, level of control, or medications</li> <li>- History suggesting an increased risk of artificial joint infection (see section on antibiotic prophylaxis)</li> </ul>	<ul style="list-style-type: none"> <li>- Confirm diagnosis and level of control: Some poorly controlled patients may not be good candidates for elective dental care.</li> <li>- Confirm medication list: Aspirin or NSAIDs may be associated with increased bleeding. For patients taking steroids, see section on Adrenal Cortex Disorders and Corticosteroid Therapy.</li> <li>- Immunosuppressive agents can cause bone marrow suppression, a CBC may be needed prior to surgery.</li> </ul>



Medical Condition	Implications for Dental Care	When to Consult/Refer	What to ask for and how to use information received
<b>THYROID DISEASE</b>			
<p><b><u>Hyperthyroidism</u></b></p>	<p>Poorly controlled hyperthyroid patients have a greater risk for:<sup>32</sup></p> <ul style="list-style-type: none"> <li>- thyroid gland swelling</li> <li>- osteoporosis of alveolar bone</li> <li>- early eruption of teeth (in children)</li> </ul>	<ul style="list-style-type: none"> <li>- History of poorly controlled hyperthyroidism including hospitalization, thyrotoxic crisis</li> <li>- Symptoms of undiagnosed or poorly controlled hyperthyroidism including heat intolerance, weight loss, palpitations</li> </ul>	<p>Level of control: Low levels of Thyroid Stimulating Hormone (TSH) indicate Hyperthyroidism. Free Thyroid hormone levels (T3 and T4) may be high or normal (if subclinical hyperthyroidism).</p> <p>Medications: Once hyperthyroidism is treated (usually with surgery or radioactive iodine), dental care can be safely performed. Most patients will become hypothyroid at some point after such treatment. Radioactive iodine treatment can lead to salivary gland damage and dry mouth. If poorly controlled hyperthyroidism, avoid vasoconstrictors in local anesthetics or on gingival retraction cords.</p>
<p><b><u>Hypothyroidism</u></b></p>	<p>Poorly controlled hypothyroid patients have a greater risk for:<sup>32</sup></p> <ul style="list-style-type: none"> <li>- enlarged tongue, lips, gingiva, due to the accumulation of submucosal mucopolysaccharides</li> <li>- delayed eruption of teeth/malocclusion (in children)</li> </ul>	<ul style="list-style-type: none"> <li>- History of poorly controlled hyperthyroidism including hospitalization, myxedema coma</li> <li>- Symptoms of undiagnosed or poorly controlled hypothyroidism including cold intolerance and weight gain</li> </ul>	<p>Level of control: High levels of Thyroid Stimulating Hormone (TSH) indicate Hypothyroidism. Free Thyroid hormone levels (T3 and T4) may be low or normal (if subclinical hypothyroidism).</p> <p>Medications: Once stabilized on levothyroxine (T4) and asymptomatic, dental care can be safely performed. If poorly controlled hypothyroidism, avoid CNS depressants including narcotics and sedatives due to the risk of myxedema coma.</p>

## References

- Little, J.W., Miller, C.S., and Rhodus, N.L., Little and Falace's Dental Management of the Medically Compromised Patient. Ninth ed. 2018, St. Louis, MO: Elsevier, Inc.
- Glick, M., Greenberg M, Lockhart P, Challacombe S. Burket's Oral Medicine. Thirteenth ed. 2021, USA: John Wiley and Sons, Inc.
- Khalaf, M.W., Khader, R., Cobetto, G., et al. Risk of adrenal crisis in dental patients: results of a systematic search of the literature. *J Am Dent Assoc*, 2013. 144(2): 152-60.
- Miller, C.S., Little, J.W., and Falace, D.A. Supplemental corticosteroids for dental patients with adrenal insufficiency: reconsideration of the problem. *J Am Dent Assoc*, 2001. 132(11): 1570-9; quiz 1596-7.
- Wilson, W., Gewitz, M., Lockhart P. et al. Adapted From: Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement from the American Heart Association.. *J Am Dent Assoc*, 2021. 152(11):886-902.e2.
- Wilson, W., , Gewitz, M., Lockhart P. et al. Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement from the American Heart Association. *Circulation*, 2021. 143(20):e963-e978.
- Sollecito, T.P., Abt, E., Lockhart, P.B., et al. The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints: Evidence-based clinical practice guideline for dental practitioners--a report of the American Dental Association Council on Scientific Affairs. *J Am Dent Assoc*, 2015. 146(1): 11-16 e8.
- Friedlander, A.H., Yoshikawa, T.T., Chang, D.S., Feliciano, Z., and Scully, C. Atrial fibrillation: pathogenesis, medical-surgical management and dental implications. *J Am Dent Assoc*, 2009. 140(2): 167-77; quiz 248.
- Aframian, D.J., Lalla, R.V., and Peterson, D.E. Management of dental patients taking common hemostasis-altering medications. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 2007. 103 Suppl: S45 e1-11.
- Wahl, M.J., Pinto, A., Kilham, J., and Lalla, R.V. Dental surgery in anticoagulated patients--stop the interruption. *Oral Surg Oral Med Oral Pathol Oral Radiol*, 2015. 119(2): 136-57.
- Patel, J.P., Woolcombe, S.A., Patel, R.K., et al. Managing direct oral anticoagulants in patients undergoing dentoalveolar surgery. *Br Dent J*, 2017. 222(4): 245-249.
- Levi, L.E. and Lalla, R.V. Dental Treatment Planning for the Patient with Oral Cancer. *Dent Clin North Am*, 2018. 62(1): 121-130.
- Lalla, R.V., Bowen, J., Barasch, A., et al. MASCC/ISOO clinical practice guidelines for the management of mucositis secondary to cancer therapy. *Cancer*, 2014. 120(10): 1453-61.
- Rugo, H.S., Seneviratne, L., Beck, J.T., et al. Prevention of everolimus-related stomatitis in women with hormone receptor-positive, HER2-negative metastatic breast cancer using dexamethasone mouthwash (SWISH): a single-arm, phase 2 trial. *Lancet Oncol*, 2017. 18(5): 654-662.
- Edwards, R.L., Andan, C., Lalla, R.V., et al. Afatinib Therapy: Practical Management of Adverse Events With an Oral Agent for Non-Small Cell Lung Cancer Treatment. *Clin J Oncol Nurs*, 2018. 22(5): 542-548.
- Sroussi, H.Y., Epstein, J.B., Bensadoun, R.J., et al. Common oral complications of head and neck cancer radiation therapy: mucositis, infections, saliva change, fibrosis, sensory dysfunctions, dental caries, periodontal disease, and osteoradionecrosis. *Cancer Med*, 2017. 6(12): 2918-2931.
- Herman, W.W. and Ferguson, H.W. Dental care for patients with heart failure: an update. *J Am Dent Assoc*, 2010. 141(7): 845-53.
- Lalla, R.V. and D'Ambrosio, J.A. Dental management considerations for the patient with diabetes mellitus. *J Am Dent Assoc*, 2001. 132(10): 1425-32.
- Lankarani, K.B., Sivandzadeh, G.R., and Hassanpour, S. Oral manifestation in inflammatory bowel disease: a review. *World J Gastroenterol*, 2013. 19(46): 8571-9.
- El Howati, A. and Tappuni, A. Systematic review of the changing pattern of the oral manifestations of HIV. *J Investig Clin Dent*, 2018: e12351.
- Rice, P.J. and Hamburger, J. Oral lichenoid drug eruptions: their recognition and management. *Dent Update*, 2002. 29(9): 442-7.
- Pontes, F.S.C., Lopes, M.A., de Souza, L.L., et al. Oral and maxillofacial manifestations of chronic kidney disease-mineral and bone disorder: a multicenter retrospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol*, 2018. 125(1): 31-43.
- Lodi, G., Pellicano, R., and Carrozzo, M. Hepatitis C virus infection and lichen planus: a systematic review with meta-analysis. *Oral Dis*, 2010. 16(7): 601-12.
- Trackman, P.C. and Kantarci, A. Molecular and clinical aspects of drug-induced gingival overgrowth. *J Dent Res*, 2015. 94(4): 540-6.
- King, G.N., Healy, C.M., Glover, M.T., et al. Prevalence and risk factors associated with leukoplakia, hairy leukoplakia, erythematous candidiasis, and gingival hyperplasia in renal transplant recipients. *Oral Surg Oral Med Oral Pathol*, 1994. 78(6): 718-26.
- Calciolari, E., Donos, N., Park, J.C., Petrie, A., and Mardas, N. Panoramic measures for oral bone mass in detecting osteoporosis: a systematic review and meta-analysis. *J Dent Res*, 2015. 94(3 Suppl): 17S-27S.
- Ruggiero, S.L., Dodson, T.B., Fantasia, J., et al. American Association of Oral and Maxillofacial Surgeons position paper on medication-related osteonecrosis of the jaw--2014 update. *J Oral Maxillofac Surg*, 2014. 72(10): 1938-56.
- Tsolaki, I.N., Madianos, P.N., and Vrotsos, J.A. Outcomes of dental implants in osteoporotic patients. A literature review. *J Prosthodont*, 2009. 18(4): 309-23.
- Steinberg, B.J., Hilton, I.V., Iida, H., and Samelson, R. Oral health and dental care during pregnancy. *Dent Clin North Am*, 2013. 57(2): 195-210.
- Tan, E.C.K., Lexomboon, D., Sandborgh-Englund, G., Haasum, Y., and Johnell, K. Medications That Cause Dry Mouth As an Adverse Effect in Older People: A Systematic Review and Metaanalysis. *J Am Geriatr Soc*, 2018. 66(1): 76-84.
- Mays, J.W., Sarmadi, M., and Moutsopoulos, N.M. Oral manifestations of systemic autoimmune and inflammatory diseases: diagnosis and clinical management. *J Evid Based Dent Pract*, 2012. 12(3 Suppl): 265-82.
- Pinto, A. and Glick, M. Management of patients with thyroid disease: oral health considerations. *J Am Dent Assoc*, 2002. 133(7): 849-58.

## POST-TEST

Internet Users: This page is intended to assist you in fast and accurate testing when completing the “Online Exam.” We suggest reviewing the questions and then circling your answers on this page prior to completing the online exam.

(1.0 CE Credit Contact Hour) Please circle the correct answer. 70% equals passing grade.

1. Which of the following is **not** a typical dental management consideration of liver disease?
  - a. Impact on the metabolism of drugs
  - b. Potential for oral manifestations
  - c. Effect on oxygen saturation
  - d. Risk of bleeding
2. Which of the following is **not** a typical risk associated with dental surgery in a patient taking high doses of systemic steroids for a prolonged period?
  - a. Delayed healing
  - b. Adrenal crisis due to adrenal insufficiency
  - c. Increased risk for infections
  - d. Increased risk for bleeding
3. Which of the following is **not** an oral manifestation typically associated with poorly controlled diabetes mellitus?
  - a. Oral pigmentation
  - b. Periodontal disease
  - c. Oral candidiasis
  - d. Xerostomia
4. Which of the following should be avoided in a **hyperthyroid** patient with poorly controlled disease?
  - a. Antibiotics
  - b. Sedatives
  - c. Vasoconstrictors in dental local anesthetics
  - d. Analgesics
5. Which of the following should be avoided in a **hypothyroid** patient with poorly controlled disease?
  - a. Antibiotics
  - b. Sedatives
  - c. Vasoconstrictors in dental local anesthetics
  - d. Analgesics
6. Which of the following lab tests would be **least** relevant to assessing the medical status of a patient with AIDS prior to extracting a tooth?
  - a. CD4 count
  - b. Viral load
  - c. Serum troponin
  - d. Neutrophil count
7. Patients who have received high doses of radiation therapy for treatment of head and neck cancer are usually at increased risk for all of the following **except**:
  - a. Dry mouth and dental caries
  - b. Oral candidiasis
  - c. Osteoradionecrosis
  - d. Oral lichen planus
8. Which of the following is **not** a typical dental management consideration for a patient with end-stage renal disease receiving hemodialysis?
  - a. Drug metabolism may be impaired and dosage adjustments may be needed
  - b. Patient may be receiving heparin on days of hemodialysis
  - c. Potential for oral manifestations
  - d. Risk for an adrenal crisis
9. Which of the following conditions is **not** typically associated with hyposalivation and xerostomia?
  - a. History of radiation therapy for head and neck cancer
  - b. Current use of antidepressant or mood stabilizing drugs
  - c. Von Willebrand disease
  - d. Sjogren Syndrome
10. Which of the following medications has **not** been typically associated with gingival hyperplasia?
  - a. Dilantin (phenytoin)
  - b. Aspirin
  - c. Calcium channel blockers (e.g. nifedipine)
  - d. Cyclosporine

## Registration/Certification Information (Necessary for proper certification)

Name (Last, First, Middle Initial): \_\_\_\_\_  
PLEASE PRINT CLEARLY  
 Street Address: \_\_\_\_\_ Suite/Apt. Number \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Date of Birth: \_\_\_\_\_ Email: \_\_\_\_\_  
 State(s) of Licensure: \_\_\_\_\_ License Number(s): \_\_\_\_\_  
 Preferred Dentist Program ID Number: \_\_\_\_\_  Check Box If Not A PDP Member  
 AGD Mastership:  Yes  No  
 AGD Fellowship:  Yes  No Date: \_\_\_\_\_  
 Please Check One:  General Practitioner  Specialist  Dental Hygienist  Other

FOR  
OFFICE  
USE  
ONLY

## Evaluation - Guidelines for Consultation with and/or Referral to a Physician 2nd Ed.

Providing dentists with the opportunity for continuing dental education is an essential part of MetLife's commitment to helping dentists improve the oral health of their patients through education. You can help in this effort by providing feedback regarding the continuing education offering you have just completed.

Please respond to the statements below by checking the appropriate box, using the scale on the right.

**1 = POOR**

**5 = Excellent**

- |   | 1                        | 2                        | 3                        | 4                        | 5                        |                              |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------------------------|
| 1. How well did this course meet its stated educational objectives?         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 2. How would you rate the quality of the content?                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 3. Please rate the effectiveness of the author.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 4. Please rate the written materials and visual aids used.                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 5. The use of evidence-based dentistry on the topic when applicable.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> N/A |
| 6. How relevant was the course material to your practice?                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 7. The extent to which the course enhanced your current knowledge or skill? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 8. The level to which your personal objectives were satisfied.              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| 9. Please rate the administrative arrangements for this course.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |

10. How likely are you to recommend MetLife's CE program to a friend or colleague? *(please circle one number below:)*

<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
extremely likely					neutral					not likely at all

What is the primary reason for your 0-10 recommendation rating above?

11. Please identify future topics that you would like to see:

Thank you for your time and feedback.

