Dental Management: A Summary

This table presents the more important factors to be considered in the dental management of medically compromised patients. Each medical problem is outlined according to potential problems related to dental treatment, oral manifestations, prevention of these problems, and effects of complications on dental treatment planning.

This table has been designed for use by dentists, dental students, graduate students, dental hygienists, and dental assistants as a convenient reference work for the dental management of patients who have medical diseases discussed in this book.
# Dental Management: A Summary

## Infective Endocarditis

**Chapter 2**

1. Dental procedures that involve the manipulation of gingival tissues or the periapical region of teeth or perforation of the oral mucosa can produce a bacteremia. Bacteremias can also be produced on a daily basis as the result of toothbrushing, flossing, chewing, or the use of toothpicks or irrigating devices. Although it is unlikely that a single dental procedure–induced bacteremia will result in infective endocarditis (IE), it is remotely possible that it can occur.

2. Patients with mechanical prosthetic heart valves may have excessive bleeding following invasive dental procedures as the result of anticoagulant therapy.

- Oral petechiae may be found in patients with IE.

## Hypertension

**Chapter 3**

1. Routine delivery of dental care to a patient with severe uncontrolled hypertension could result in a serious outcome such as angina, myocardial infarction, or stroke.

2. Stress and anxiety related to the dental visit may cause an increase in blood pressure, leading to angina, myocardial infarction, or stroke.

3. In patients taking nonselective beta blockers, excessive use of vasoconstrictors can potentially cause an acute elevation in blood pressure.

4. Some antihypertensive drugs can cause oral lesions or oral dryness and can predispose patients to orthostatic hypotension.

- No oral complications are due to hypertension itself; however, adverse effects such as dry mouth, taste changes, and oral lesions may be drug related.

---

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
Prevention of Problems

• Identify patients at greatest risk for adverse outcomes of IE, including patients with:
  • Prosthetic cardiac valves
  • A history of previous IE
  • Certain types of congenital heart disease (i.e., unrepaired cyanotic congenital heart disease, including patients with palliative shunts and conduits, completely repaired congenital heart disease for the first 6 months after a procedure, or repaired congenital heart disease with residual defect)
  • Cardiac transplantation recipients who develop cardiac valvulopathy
  • Prescribe antibiotic prophylaxis for only those patients above who undergo dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.

• If prophylaxis is required for an adult, take a single dose 30 minutes to 1 hour before the procedure:
  • Standard (oral amoxicillin, 2 g)
  • Allergic to penicillin (oral *cephalexin 2 g, oral clindamycin 600 mg, or azithromycin or clarithromycin 500 mg) *NOTE: Cephalexin should not be used in individuals with a history of anaphylaxis, angioedema, or urticaria with penicillins.
  • Unable to take oral medications (intravenous [IV] or intramuscular [IM] ampicillin, cefazolin, or ceftriaxone)
  • Allergic to penicillin and unable to take oral medications (IV or IM clindamycin phosphate, cefazolin, or ceftriaxone)
  • See Chapter 25 for management of potential bleeding problems associated with anticoagulant therapy.

• Detection of patients with hypertension and referral to a physician if poorly controlled or uncontrolled. Defer elective dental treatment if blood pressure (BP) is ≥180/110.

• For patients who are being treated for hypertension, consider the following:
  • Take measures to reduce stress and anxiety.
  • Provide oral sedative premedication and/or inhalation sedation.
  • Provide local anesthesia of excellent quality.
  • For patients who are taking a nonselective beta blocker, limit epinephrine to ≤2 cartridges of 1:100,000 epinephrine.
  • Avoid epinephrine-containing gingival retraction cord.
  • For patients with upper level stage 2 hypertension, consider intraoperative monitoring of BP, and terminate appointment if BP reaches 180/110.
  • Make slow changes in chair position to avoid orthostatic hypotension.

• Encourage the maintenance of optimal oral hygiene in all patients at increased risk for IE.

• Provide antibiotic prophylaxis for only those patients with the highest risk for adverse outcomes of IE.

• Provide antibiotic prophylaxis for all dental procedures, except
  • Routine anesthetic injections
  • Taking of radiographs
  • Placement of removable prosthetic or orthodontic appliances
  • Adjustment of orthodontic appliances
  • Shedding of deciduous teeth or bleeding from trauma to the lips or oral mucosa.

• For patients selected for prophylaxis, perform as much dental treatment as possible during each coverage period.

• A second antibiotic dose may be indicated if the appointment lasts longer than 4 to 6 hours, or if multiple appointments occur on the same day.

• For multiple appointments, allow at least 9 days between treatment sessions so that penicillin-resistant organisms can clear from the oral flora. If treatment becomes necessary before 9 days have passed, select one of the alternative antibiotics for prophylaxis.

• For patients with prosthetic heart valves who are taking anticoagulants, the dosage may have to be reduced on the basis of international normalized ratio (INR) level and the degree of invasiveness of the planned procedure (see Chapter 25).

• For patients with BP <180/110, and no evidence of target organ involvement, any treatment may be provided

• For patients with BP ≥180/110, defer elective dental care

• For patients with target organ involvement, refer to appropriate chapter for management recommendations
Dental Management: A Summary—cont’d

Potential Problems Related to Dental Care | Oral Manifestations

**ANGINA PECTORIS**

*Chapter 4*

1. The stress and anxiety of a dental visit could precipitate an anginal attack, myocardial infarction, or sudden death.
2. For patients who are taking a nonselective beta blocker, the use of excessive amounts of epinephrine could precipitate a dangerous elevation in blood pressure.
3. Patients who are taking aspirin or other platelet aggregation inhibitor may experience excessive bleeding.
4. Questions may arise as to the necessity of antibiotic prophylaxis for patients with a history of coronary artery bypass graft, balloon angioplasty, or stent.

- No oral complications are due to angina; however, adverse effects such as dry mouth, taste changes, and oral lesions may be drug related.
- Excessive bleeding may occur as the result of the use of aspirin or other platelet aggregation inhibitors.

**PREVIOUS MYOCARDIAL INFARCTION**

*Chapter 4*

1. The stress and anxiety of a dental visit could precipitate an anginal attack, myocardial infarction, or sudden death in the office.
2. Patients may have some degree of heart failure.
3. If the patient has a pacemaker, some dental equipment may potentially cause electromagnetic interference.
4. In patients who are taking a nonselective beta blocker, excessive amounts of epinephrine may cause a dangerous elevation in blood pressure.
5. Patients who are taking aspirin or another platelet aggregation inhibitor or Coumadin may experience excessive postoperative bleeding.
6. Questions may arise as to the necessity of antibiotic prophylaxis for patients with a history of CABG, balloon angioplasty, or stent.

- No oral complications are due to myocardial infarction; however, adverse effects such as dry mouth, taste changes, and oral lesions may be drug related. Also, bleeding may be excessive because of the use of aspirin, other platelet aggregation inhibitors, or Coumadin.
Dental Management: A Summary

**Prevention of Problems**

**Unstable Angina (major risk)**
- Elective dental care should be deferred; if care becomes necessary, it should be provided in consultation with the physician. Management may include establishment of an IV line; sedation; monitoring of electrocardiogram, pulse oximeter, and blood pressure; oxygen; cautious use of vasoconstrictors; and prophylactic nitroglycerin.

**Stable Angina (intermediate risk)**
- Elective dental care may be provided with the following management considerations:
  - For stress/anxiety reduction: Provide oral sedative premedication and/or inhalation sedation if indicated, assess pretreatment vital signs and availability of nitroglycerin, and limit the quantity of vasoconstrictor used.
  - For patients who are taking a nonselective beta blocker: Limit epinephrine to ≤2 cartridges of 1:100,000 epinephrine.
  - Avoid the use of epinephrine-impregnated gingival retraction cord.
  - Avoid anticholinergics
  - Provide local anesthesia of excellent quality and postoperative pain control.
  - If the patient is taking aspirin or another platelet aggregation inhibitor: Excess bleeding is usually manageable through local measures only; discontinuation of medication is not recommended.
  - Antibiotic prophylaxis is not recommended for patients with a history of coronary artery bypass graft (CABG), angioplasty, or stent.

**Recent Myocardial Infarction (<1 month) (major risk)**
- Elective dental care should be deferred; if care becomes necessary, it should be provided in consultation with the physician.
- Management may include establishment of an IV line; sedation; monitoring of electrocardiogram, pulse oximeter, and blood pressure; oxygen; cautious use of vasoconstrictors; and prophylactic nitroglycerin.

**Past Myocardial Infarction (>1 month without symptoms) (intermediate risk)**
- Elective dental care may be provided with the following management considerations:
  - For stress/anxiety reduction: Provide oral sedative premedication and/or inhalation sedation if indicated, assess pretreatment vital signs and availability of nitroglycerin, and limit the quantity of vasoconstrictor used.
  - For patients who are taking a nonselective beta blocker: Limit epinephrine to ≤2 cartridges of 1:100,000 epinephrine.
  - Avoid the use of epinephrine-impregnated gingival retraction cord.
  - Avoid anticholinergics
  - Provide local anesthesia of excellent quality and postoperative pain control.

**Recent Myocardial Infarction**
- Dental treatment should be limited to urgent care only such as treatment of acute infection, bleeding, or pain.

**Past Myocardial Infarction**
- Any indicated dental treatment may be provided taking into consideration appropriate management considerations.
ARRHYTHMIAS
Chapter 5
1. The stress and anxiety of dental treatment or excessive amounts of epinephrine may induce life-threatening arrhythmias in susceptible patients.
2. Patients with existing arrhythmia are at increased risk for serious complications such as angina, myocardial infarction, stroke, heart failure, or cardiac arrest.
3. Patients with a pacemaker or a defibrillator are at risk for possible malfunction caused by electromagnetic interference from some dental equipment; some question about the need for prophylactic antibiotics may arise.
4. In patients who are taking a nonselective beta blocker, excessive amounts of epinephrine may cause a dangerous elevation in blood pressure.
5. Patients with atrial fibrillation who are taking Coumadin are at risk for excessive postoperative bleeding.
6. Patients who are taking digoxin are at risk for arrhythmia if epinephrine is used; digoxin toxicity is also a potential problem.

- No oral complications are due to arrhythmia; however, adverse effects such as dry mouth, taste changes, and oral lesions may be drug related.
- Excessive bleeding may occur as the result of use of Coumadin.

HEART FAILURE
Chapter 6
1. Providing dental treatment to a patient with symptomatic or uncontrolled heart failure may result in worsening of symptoms, acute failure, arrhythmia, myocardial infarction, or stroke.

- No oral complications are caused by heart failure; however, adverse effects such as dry mouth, taste changes, and oral lesions may be drug related.
- Digoxin can cause an enhanced gag reflex.
### Prevention of Problems

<table>
<thead>
<tr>
<th>Treatment Planning Modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• If the patient is taking aspirin or another platelet aggregation inhibitor, excessive bleeding is usually manageable by local measures only; discontinuation of medication is not recommended.</td>
</tr>
<tr>
<td>• If the patient has a pacemaker or implanted defibrillator, avoid the use of electrosurgery and ultrasonic scalers; antibiotic prophylaxis is not recommended for these patients.</td>
</tr>
<tr>
<td>• If the patient is taking Coumadin, the INR should be 3.5 or less prior to performance of invasive procedures.</td>
</tr>
<tr>
<td>• Antibiotic prophylaxis is <em>not</em> recommended for patients with a history of CABG, angioplasty, or stent.</td>
</tr>
</tbody>
</table>

- Determine the nature, severity, and appropriate treatment of arrhythmia through history and clinical findings; if unclear, obtain medical consultation to confirm the following:
  - For high-risk arrhythmia (high-grade atrioventricular [AV] block, symptomatic ventricular arrhythmia, supraventricular arrhythmia with uncontrolled ventricular rate):
    1. Elective dental care should be deferred; if care becomes necessary, it should be provided in consultation with the physician.
    2. Management may include establishment of an IV line; sedation; monitoring of electrocardiogram, pulse oximeter, and blood pressure; oxygen; and cautious use of vasoconstrictors.
  - For intermediate- and low-risk arrhythmia (essentially all others):
    1. Elective dental care may be provided with the following management considerations for stress/anxiety reduction: Provide oral sedative premedication and/or inhalation sedation if indicated; assess pretreatment vital signs; avoid excessive use of epinephrine (for patients who are taking a nonselective beta blocker, limit epinephrine to ≤2 cartridges of 1:100,000 epinephrine, avoid the use of epinephrine-impregnated gingival retraction cord, and provide local anesthesia of excellent quality and postoperative pain control)
    2. For patients who are taking Coumadin, the INR should be 3.5 or less prior to any invasive dental procedure; provide local measures for hemostasis.
    3. For patients with a pacemaker or an implanted defibrillator, avoid the use of electrosurgery and ultrasonic scalers; antibiotic prophylaxis is *not* recommended for these patients.
    4. For patients who are taking digoxin, avoid the use of epinephrine because of the increased risk of inducing arrhythmia; be observant for signs of digoxin toxicity (e.g., hypersalivation).

### High-Risk Arrhythmias

- Dental treatment should be limited to urgent care only such treatment of acute infection, bleeding, or pain.

### All Other Arrhythmias

- Any indicated dental treatment may be provided as long as appropriate management issues are considered.

### Symptomatic Heart Failure (NYHA Class III or IV)

- Elective dental care should be deferred and medical consultation obtained; if care becomes necessary, it should be provided in consultation with the physician.

### Symptomatic Heart Failure (NYHA Class III or IV)

- Dental treatment should be limited to urgent care only such as treatment of acute infection, bleeding, or pain.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEART FAILURE (cont'd)</strong></td>
</tr>
<tr>
<td>2. Patients with heart failure may have difficulty breathing and may not tolerate a supine chair position.</td>
</tr>
<tr>
<td>3. Heart failure is due to an underlying condition such as coronary artery disease or hypertension that may require management considerations.</td>
</tr>
<tr>
<td>4. In patients who are taking a nonselective beta blocker, excessive amounts of epinephrine may cause a dangerous elevation in blood pressure.</td>
</tr>
<tr>
<td>5. The use of epinephrine in patients who are taking digoxin may cause arrhythmia.</td>
</tr>
</tbody>
</table>

**CHRONIC OBSTRUCTIVE PULMONARY DISEASE**  
*Chapter 7*
1. Aggravation or worsening of compromised respiratory function
   - Leukoplakia, erythroplakia, or squamous cell carcinoma in chronic smokers of tobacco

**ASTHMA**  
*Chapter 7*
1. Precipitation of an acute asthma attack
   - Oral candidiasis is reported with the use of an inhaler without a “spacer,” but it occurs rarely.
   - Maxillofacial growth is altered when asthma is severe during childhood.
Prevention of Problems | Treatment Planning Modifications

Management may include establishment of an IV line; sedation; monitoring of electrocardiogram, pulse oximeter, and blood pressure; oxygen; cautious use of vasoconstrictors; and possibly, prophylactic nitroglycerin.

Asymptomatic/Mild Heart Failure (NYHA Class I and II and possibly III)
• Elective dental care may be provided with the following management considerations:
  • For stress/anxiety reduction: Provide oral sedative premedication and/or inhalation sedation if indicated, and assess pretreatment vital signs.
  • For patients who are taking a nonselective beta blocker, limit epinephrine to ≤ 2 cartridges of 1:100,000 epinephrine, avoid the use of epinephrine-impregnated gingival retraction cord, and provide local anesthesia of excellent quality and postoperative pain control.
  • Ensure a comfortable chair position; supine position may not be tolerated.
  • If patient is taking digoxin, avoid the use of epinephrine.
  • Avoid the use of nonsteroidal anti-inflammatory drugs (NSAIDs).

• Avoid treating if upper respiratory infection is present.
• Use an upright chair position.
• Use of local anesthesia is okay; minimize the use of bilateral mandibular or palatal blocks.
• Do not use a rubber dam in severe disease.
• Use pulse oximetry to monitor oxygen saturation.
• Use of low-flow oxygen is helpful.
• Do not use nitrous oxide–oxygen sedation in cases of severe emphysema.
• Low-dose oral diazepam is acceptable.
• Avoid barbiturates, narcotics, antihistamines, and anticholinergics.
• An additional steroid dose may be needed in patients who are taking systemic steroids for surgical procedures.
• Avoid macrolide antibiotics (erythromycin, clarithromycin) and ciprofloxacin for patients who are taking theophylline.
• Outpatient general anesthesia is contraindicated.

• Identify asthmatic patient by history.
• Determine character of asthma:
  • Type (allergic or nonallergic)
  • Precipitating factors
  • Age at onset
  • Level of control (frequency, severity of attacks [mild, moderate, severe])
  • How usually managed

• None required
**TUBERCULOSIS**

*Chapter 9*

1. Tuberculosis may be contracted by the dental health care worker from an actively infectious patient.
2. Patients and staff may be infected by a dentist who is actively infectious.

<table>
<thead>
<tr>
<th>Potential Problems Related to Dental Care</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTHMA (cont’d)</td>
<td>• Oral ulceration (rare); tongue most common</td>
</tr>
<tr>
<td></td>
<td>• Tuberculous involvement of cervical and submandibular lymph nodes (scrofula)</td>
</tr>
<tr>
<td>Prevention of Problems</td>
<td>Treatment Planning Modifications</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>- Medications being taken</td>
<td></td>
</tr>
<tr>
<td>- Necessity for past emergency care</td>
<td></td>
</tr>
<tr>
<td>- Baseline forced expiratory volume at 1 second (FEV₁) stable (not decreasing)</td>
<td></td>
</tr>
<tr>
<td>- Avoid known precipitating factors.</td>
<td></td>
</tr>
<tr>
<td>- Consult with physician for severe persistent asthma.</td>
<td></td>
</tr>
<tr>
<td>- Reduce the risk of an attack: Have the patient bring medication inhaler to each appointment, and prophylax with an inhaler prior to each appointment for persons with moderate to severe persistent asthma.</td>
<td></td>
</tr>
<tr>
<td>- Drugs to avoid:</td>
<td></td>
</tr>
<tr>
<td>- Aspirin-containing medications</td>
<td></td>
</tr>
<tr>
<td>- NSAIDs</td>
<td></td>
</tr>
<tr>
<td>- Narcotics and barbiturates</td>
<td></td>
</tr>
<tr>
<td>- Macrolide antibiotics (e.g., erythromycin), if the patient is taking theophylline</td>
<td></td>
</tr>
<tr>
<td>- Discontinue cimetidine 24 hours before IV sedation in patients who are taking theophylline.</td>
<td></td>
</tr>
<tr>
<td>- Sulfite-containing local anesthetic solutions may need to be avoided.</td>
<td></td>
</tr>
<tr>
<td>- An additional steroid dose may be needed for surgical procedures in patients who are taking systemic steroids.</td>
<td></td>
</tr>
<tr>
<td>- Premedication (nitrous oxide or diazepam) may be needed for anxious patients.</td>
<td></td>
</tr>
<tr>
<td>- Provide a stress-free environment.</td>
<td></td>
</tr>
<tr>
<td>- Use a pulse oximeter.</td>
<td></td>
</tr>
<tr>
<td>- Recognize signs and symptoms of a severe or worsening asthma attack (e.g., difficulty breathing, tachypnea).</td>
<td></td>
</tr>
</tbody>
</table>

**CAVEAT:** Many patients with infectious disease cannot be identified by history or examination; therefore, all patients should be approached with the use of standard precautions (see Appendix B).

- **Patient with active sputum-positive tuberculosis:**
  - Consult with physician before treatment.
  - Treatment is limited to emergency care (older than 6 years of age)
  - Treatment is provided in the hospital setting with proper isolation, sterilization, mask, gloves, gown, and ventilation.
  - For patients younger than 6 years of age, treat as a normal (noninfectious) patient after consulting with the physician.
  - For patients producing consistently negative sputum after undergoing at least 2 to 3 weeks of chemotherapy, treat as a normal patient.

- **Patients with a past history of tuberculosis:**
  - Patients should be approached with caution; obtain good history of disease and its treatment, and conduct appropriate review of systems.
  - Obtain history of adequate treatment, periodic chest radiographs, and examination findings to rule out reactivation.
  - Dental treatment should be postponed if:
    1. Questionable history of adequate treatment
    2. Lack of appropriate medical supervision since recovery
    3. Signs or symptoms of relapse

- None required
Potential Problems Related to Dental Care

TUBERCULOSIS (cont’d)

**OBSTRUCTIVE SLEEP APNEA**

*Chapter 10*

1. Patients with untreated obstructive sleep apnea are at increased risk for hypertension, stroke, arrhythmia, myocardial infarction, and diabetes.

- Large tongue, long soft palate, long uvula, redundant parapharyngeal tissues, large tonsils, retrusive mandible

**VIRAL HEPATITIS, TYPES B, C, D, AND E**

*Chapter 11*

1. Hepatitis may be contracted by the dentist from an infectious patient.

2. Patients or staff may be infected by the dentist with active hepatitis or who is a carrier.

3. With chronic active hepatitis, the patient may have chronic liver dysfunction, which may be associated with a bleeding tendency or altered drug metabolism.

- Bleeding
- Lichenoid eruptions
**Prevention of Problems**

- If present status is free of clinical disease, patient should be treated as a normal patient.
- Patients with recent conversion to a positive tuberculin skin test (purified protein derivative [PPD]):
  - Should have been evaluated by the physician to rule out clinical disease
  - May be receiving isoniazid (INH) prophylactically for 6 months to 1 year
  - Should be treated as a normal patient when the physician approves health status
- Patients with signs or symptoms of tuberculosis:
  - Should be referred to the physician and should have treatment postponed
  - If treatment is necessary, provide treatment as for patient with active sputum-positive tuberculosis (above).

- Patients should be identified by history and clinical examination and referred to a sleep medicine specialist for diagnosis and treatment planning.
- Signs and symptoms suggestive of obstructive sleep apnea include heavy snoring, witnessed apnea episodes during sleep, excessive daytime sleepiness, obesity, and large neck circumference.
- Depending upon the diagnosis and severity of the disease, treatment may include positive airway pressure, oral appliances, or various forms of upper airway surgery.

- Patients with obstructive sleep apnea may undergo any necessary dental treatment.

**CAVEAT:** Because most carriers are undetectable by history, all patients should be treated with the use of standard precautions (see Appendix B); risk may be decreased by the use of hepatitis B vaccine.

- For patient with active hepatitis, use the following procedures:
  - Consult with the physician (to determine status).
  - Treat on an emergency basis only.
- For patients with a history of hepatitis, use the following procedures:
  - Consult with the physician (to determine status).
  - Probable type determination:
    1. Age at time of infection (type B uncommon at younger than 15 years of age)
    2. Source of infection (if food or water, usually type A or E)
    3. If blood transfusion related, probably type C
    4. If type is indeterminate, assay for hepatitis B surface antigen (HBsAg) may be considered.
- With patients in high-risk categories, consider screening for HBsAg or anti–hepatitis C virus.
- If HBsAg or hepatitis C virus positive (carrier):
  - Consult with the physician to determine the status of liver dysfunction and/or recommendations for early treatment.
  - Minimize the use of drugs metabolized by the liver.
  - Monitor preoperative prothrombin time and bleeding time in chronic active hepatitis.

- None required
ALCOHOLIC LIVER DISEASE (CIRRHOSIS)
Chapter 11
1. Bleeding tendencies; unpredictable drug metabolism
   - Neglect
   - Bleeding
   - Ecchymoses
   - Petechiae
   - Glossitis
   - Angular cheilosis
   - Impaired healing
   - Parotid enlargement
   - Candidiasis
   - Oral cancer
   - Alcohol breath odor
   - Bruxism
   - Dental attrition
   - Xerostomia

PEPTIC ULCER DISEASE
Chapter 12
1. Further injury to the intestinal mucosa caused by aspirin and NSAIDs
2. Fungal overgrowth during or after systemic antibiotic use
   - Rare—Enamel dissolution associated with persistent regurgitation
   - Fungal overgrowth
   - Rare—Vitamin B deficiency (glossopyrosis) with omeprazole use

INFLAMMATORY BOWEL DISEASE
Chapter 12
1. In patients who are being treated with steroids, stress may lead to serious medical problems.
   - Cobblestoned—Aphthous lesions
   - Pyostomatitis vegetans

PSEUDOMEMBRANOUS COLITIS
Chapter 12
1. Fungal overgrowth during or after course of antibiotics
   - Rare—Fungal overgrowth

END-STAGE RENAL DISEASE
Chapter 13
1. Bleeding tendency
2. Hypertension
3. Anemia
4. Intolerance to nephrotoxic drugs metabolized by the kidney
5. Enhanced susceptibility to infection
   - Mucosal pallor
   - Xerostomia
   - Metallic taste
   - Ammonia breath odor
   - Stomatitis
   - Loss of lamina dura
   - Bone radiolucentities
   - Bleeding tendency
### Prevention of Problems

- Needle stick:
  - Consult the physician.
  - Consider hepatitis B immunoglobulin.

- Identify alcoholic patients through the following methods:
  - History
  - Clinical examination
  - Detection of odor on breath
  - Information from friends or relatives

- Consult with the physician to determine the status of liver dysfunction.

- Perform clinical screening with the CAGE questionnaire, and attempt to guide patients during treatment.

- Laboratory screening should include the following:
  - Complete blood count with differential
  - Aspartate aminotransferase, alanine aminotransferase
  - Platelet count
  - Thrombin time
  - Prothrombin time

- Minimize the use of drugs metabolized by the liver.

- If screening tests are abnormal for surgery, consider antifibrinolytic agents, fresh frozen plasma, vitamin K, and platelets.

- Defer routine care if ascites (encephalopathy), if present.

- Avoid aspirin and NSAIDs.

- Avoid corticosteroids.

- Examine oral cavity for signs of fungal overgrowth.

- Additional steroids may be needed for surgical procedures.

- Complete blood count is needed to monitor toxic hematologic effects of drugs.

- Select appropriate antibiotic, dosage, and duration.

- Take precautions with prolonged antibiotic use in the elderly and those previously affected.

- Consult with physician (to determine status).

- Provide pretreatment screening (i.e., PFA-100, prothrombin time, partial thromboplastin time, hematocrit, hemoglobin) for hematologic disorder.

- Closely monitor blood pressure before and during treatment.

- Avoid drugs excreted by the kidney and nephrotoxic drugs.

- Meticulous attention should be paid to good surgical technique to minimize the risk of abnormal bleeding or infection.

- Provide aggressive management of infection.

<table>
<thead>
<tr>
<th>Prevention of Problems</th>
<th>Treatment Planning Modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Needle stick:</td>
<td>• Because oral neglect is commonly seen in alcoholic individuals, patients should be required to demonstrate interest in and ability to care for dentition before any significant treatment is rendered.</td>
</tr>
<tr>
<td>• Identify alcoholic patients through the following methods:</td>
<td></td>
</tr>
<tr>
<td>• History</td>
<td></td>
</tr>
<tr>
<td>• Clinical examination</td>
<td></td>
</tr>
<tr>
<td>• Detection of odor on breath</td>
<td></td>
</tr>
<tr>
<td>• Information from friends or relatives</td>
<td></td>
</tr>
<tr>
<td>• Consult with the physician to determine the status of liver dysfunction.</td>
<td></td>
</tr>
<tr>
<td>• Perform clinical screening with the CAGE questionnaire, and attempt to guide patients during treatment.</td>
<td></td>
</tr>
<tr>
<td>• Laboratory screening should include the following:</td>
<td></td>
</tr>
<tr>
<td>• Complete blood count with differential</td>
<td></td>
</tr>
<tr>
<td>• Aspartate aminotransferase, alanine aminotransferase</td>
<td></td>
</tr>
<tr>
<td>• Platelet count</td>
<td></td>
</tr>
<tr>
<td>• Thrombin time</td>
<td></td>
</tr>
<tr>
<td>• Prothrombin time</td>
<td></td>
</tr>
<tr>
<td>• Minimize the use of drugs metabolized by the liver.</td>
<td></td>
</tr>
<tr>
<td>• If screening tests are abnormal for surgery, consider antifibrinolytic agents, fresh frozen plasma, vitamin K, and platelets.</td>
<td></td>
</tr>
<tr>
<td>• Defer routine care if ascites (encephalopathy), if present.</td>
<td></td>
</tr>
<tr>
<td>• Avoid aspirin and NSAIDs.</td>
<td></td>
</tr>
<tr>
<td>• Avoid corticosteroids.</td>
<td></td>
</tr>
<tr>
<td>• Examine oral cavity for signs of fungal overgrowth.</td>
<td></td>
</tr>
<tr>
<td>• Additional steroids may be needed for surgical procedures.</td>
<td></td>
</tr>
<tr>
<td>• Complete blood count is needed to monitor toxic hematologic effects of drugs.</td>
<td></td>
</tr>
<tr>
<td>• Select appropriate antibiotic, dosage, and duration.</td>
<td></td>
</tr>
<tr>
<td>• Take precautions with prolonged antibiotic use in the elderly and those previously affected.</td>
<td></td>
</tr>
<tr>
<td>• Consult with physician (to determine status).</td>
<td></td>
</tr>
<tr>
<td>• Provide pretreatment screening (i.e., PFA-100, prothrombin time, partial thromboplastin time, hematocrit, hemoglobin) for hematologic disorder.</td>
<td></td>
</tr>
<tr>
<td>• Closely monitor blood pressure before and during treatment.</td>
<td></td>
</tr>
<tr>
<td>• Avoid drugs excreted by the kidney and nephrotoxic drugs.</td>
<td></td>
</tr>
<tr>
<td>• Meticulous attention should be paid to good surgical technique to minimize the risk of abnormal bleeding or infection.</td>
<td></td>
</tr>
<tr>
<td>• Provide aggressive management of infection.</td>
<td></td>
</tr>
<tr>
<td>• Provide as stress free an environment as possible.</td>
<td></td>
</tr>
<tr>
<td>• Schedule appointments during remissions.</td>
<td></td>
</tr>
<tr>
<td>• Schedule appointments when the patient is free of disease.</td>
<td></td>
</tr>
<tr>
<td>• Major emphasis on oral hygiene and optimal maintenance care to eliminate possible sources of infection</td>
<td></td>
</tr>
<tr>
<td>• No contraindications for routine dental care, but extensive reconstructive crown and bridge procedures not recommended</td>
<td></td>
</tr>
</tbody>
</table>
Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
</tr>
<tr>
<td>Lichenoid eruptions</td>
</tr>
<tr>
<td>Chancre</td>
</tr>
<tr>
<td>Mucous patch</td>
</tr>
<tr>
<td>Gumma</td>
</tr>
<tr>
<td>Interstitial glossitis</td>
</tr>
<tr>
<td>Congenital syphilis</td>
</tr>
</tbody>
</table>

HEMODIALYSIS

Chapter 13

1. Bleeding tendency
2. Hypertension
3. Anemia
4. Intolerance to nephrotoxic drugs metabolized by the kidney
5. Bacterial endarteritis of arteriovenous fistula secondary to bacteremia
6. Hepatitis (active or carrier)
7. Bacterial endocarditis
8. Collapse of shunt

GONORRHEA

Chapter 14

1. Remote possibility of transmission from oral or pharyngeal lesions of an infected patient

SYPHILIS

Chapter 14

1. Syphilis may be contracted by the dentist from an actively infectious patient.
2. Patients or staff may be infected by the dentist who has syphilis.
1. Consultation with physician.
2. Delay dental treatment for at least 4 hours following dialysis to avoid heparin effects (potential for excessive bleeding); best to perform dental treatment on the day following dialysis.
3. Avoid drugs metabolized by kidney or nephrotoxic drugs.
4. AHA does not recommend antibiotic prophylaxis for invasive dental procedures.
5. Avoid placing blood pressure cuff on the arm containing the shunt used for dialysis.

CAVEAT: Many patients with sexually transmitted disease cannot be identified by history or examination; therefore, all patients must be approached with the use of standard precautions (see Appendix B).
- For patients currently receiving treatment for gonorrhea, provide necessary care.
- For patients with past history of gonorrhea, perform the following:
  - Obtain a good history of disease and its treatment.
  - Provide necessary care.
- For patients with signs or symptoms suggestive of gonorrhea, perform the following:
  - Refer to physician for evaluation.
  - Provide necessary care after disease treatment has been initiated.

- For patients receiving treatment for syphilis:
  - Consult with physician before treatment.
  - Provide necessary care.
  - Be aware that oral lesions of primary and secondary syphilis are infectious prior to initiation of antibiotic therapy.

- None required
## Dental Management: A Summary—cont’d

<table>
<thead>
<tr>
<th>Potential Problems Related to Dental Care</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYPHILIS (cont’d)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**GENITAL HERPES**

*Chapter 14*

1. Inoculation of oral cavity and potential transmission to dentist (fingers, eyes)

- Autoinoculation of type 2 herpes to oral cavity

**HUMAN PAPILLOMAVIRUS (HPV) INFECTION**

*Chapter 14*

1. Inoculation of oral cavity and potential transmission to fingers

- Autoinoculation of HPV to oral cavity
- Specific genotypes associated with risk for development of carcinoma

**DIABETES MELLITUS**

*Chapter 15*

1. In uncontrolled diabetic patients:
   a. Infection
   b. Poor wound healing
2. Insulin reaction in patients treated with insulin
3. In diabetic patients, early onset of complications relating to cardiovascular system, eyes, kidneys, and nervous system (angina, myocardial infarction, cerebrovascular accident, renal failure, peripheral neuropathy blindness, hypertension, congestive heart failure)

- Accelerated periodontal disease
- Gingival proliferations
- Periodontal abscesses
- Xerostomia
- Poor healing
- Infection
- Oral ulcerations
- Candidiasis
- Mucormycosis
- Numbness, burning, or pain in oral tissues
Prevention of Problems

Treatment Planning Modifications

- For patients with a past history of syphilis:
  - Approach with caution; obtain good history of disease, its treatment, and negative serologic tests for syphilis test following completion of therapy.
  - Treat as normal patient if free of disease.
- For patients showing signs or symptoms suggestive of syphilis:
  - Refer to physician, and postpone treatment.
  - The dentist may elect to order serologic tests for syphilis before referral.
  - Defer treatment until diagnosis established and medical treatment provided.

CAVEAT: Many patients with sexually transmitted disease cannot be identified by history or examination; therefore, all patients must be approached with the use of standard precautions (see Appendix B).
- Localized genital infection poses no problem; however, be aware of the possibility of autoinoculation to dermal sites and the oral cavity by the patient.
- For oral infection with HSV-1 or HSV-2 postpone elective dental care until lesion is healing (in scab phase or when it disappears).

None is usually required; patients prone to recurrence after dental treatment should be provided a short-term systemic antiviral drug for prophylactic use.

CAVEAT: Many patients with sexually transmitted disease cannot be identified by history or examination; therefore, all patients must be approached with the use of standard precautions (see Appendix B).
- Localized genital infection poses no problem; however, be aware of the possibility of autoinoculation to the oral cavity by the patient.
- Oral lesions should be excised and submitted for histologic examination.

Discuss risks of transmission and the potential for development of carcinoma with high-risk types (HPV 16, 18, 31, 33, 35). Appropriate treatment and follow-up care should be provided.

- Detection by the following methods:
  - History
  - Clinical findings
  - Screening for blood glucose
  - Referral for diagnosis and treatment
  - Monitoring and control of hyperglycemia by assessment of blood glucose
  - Monitoring of hemoglobin A1c (HbA1c) status
- For patients receiving insulin, an insulin reaction is prevented by the following methods:
  - Eating of normal meals before appointments
  - Scheduling of appointments in morning or midmorning
  - Informing the dentist of any symptoms of insulin reaction when they first occur
  - Having sugar available in some form in cases of insulin reaction

In well-controlled diabetic patients, no alteration of treatment plan is indicated unless complications of diabetes present, such as:
- Hypertension
- Congestive heart failure
- Myocardial infarction
- Angina
- Renal failure
- Defer prosthodontic care until periodontal disease is well controlled.
Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Primary pigmentation of oral mucous membranes</td>
</tr>
<tr>
<td>• Delayed healing</td>
</tr>
<tr>
<td>• Possible oral infection</td>
</tr>
</tbody>
</table>

ADRENAL INSUFFICIENCY

Chapter 16

1. Inability to tolerate stress
2. Delayed healing
3. Susceptibility to infection
4. Hypertension (with steroid use)

HYPERTHYROIDISM (THYROTOXICOSIS)

Chapter 17

1. Thyrotoxic crisis (thyroid storm) may be precipitated in untreated or incompletely treated patients with thyrotoxicosis by:
   a. Infection
   b. Trauma
   c. Surgical procedures
   d. Stress
2. Patients with untreated or incompletely treated thyrotoxicosis may be very sensitive to actions of epinephrine and other pressor amines; thus, these agents must not be used; once the patient is well managed from a medical standpoint, these agents may be administered.
3. Thyrotoxicosis increases the risk for hypertension, angina, MI, congestive heart failure, and severe arrhythmias.

• Osteoporosis may occur.
• Periodontal disease may be more progressive.
• Dental caries may be more extensive.
• Premature loss of deciduous teeth and early eruption of permanent teeth may occur.
• Early jaw development may be noted.
• Tumors found at the midline of the posterior dorsum of the tongue must not be surgically removed until the possibility of functional thyroid tissue has been ruled out by 131I uptake tests.
### Prevention of Problems

- Treatment with insulin of diabetic patients who develop oral infection may require increased insulin dosage and consultation with the physician, in addition to aggressive local and systemic management of infection (including antibiotic sensitivity testing).
- Drug considerations include the following:
  - **Insulin**—Insulin reaction
  - **Hypoglycemic agents**—On rare occasions, aplastic anemia, etc.
  - Avoidance of general anesthesia in patients with severe diabetes

- For routine dental procedures (excluding extractions):
  - Patients currently taking corticosteroids—no additional supplementation generally required; be sure to obtain good local anesthesia and good postoperative pain control
  - Patients with past history of regular corticosteroid usage; none generally required
  - Patients using topical or inhalational steroids—generally no supplementation required

- For extractions or other surgery, extensive procedures, or extreme patient anxiety, with local anesthetic include the following:
  - Discontinue drugs that decrease cortisol levels (e.g., ketoconazole) at least 24 hours before surgery with the consent of the patient’s physician.
  - Target dose of 25 mg hydrocortisone per day for minor oral and periodontal surgery, administered prior to procedure.
  - Target dose of 50 to 100 mg hydrocortisone within first hour of major oral surgery or procedures involving general anesthesia. Give 25 mg hydrocortisone every 8 hours for 24 to 48 hours postoperatively.
  - Monitor blood pressure throughout procedure and initial postoperative phase.
  - Provide good pain control.

### Treatment Planning Modifications

- None required

- Detection of patients with thyrotoxicosis by history and examination findings
- Referral for medical evaluation and treatment
- Avoidance of any dental treatment for patient with thyrotoxicosis until good medical control is attained; however, any acute oral infection will have to be dealt with by antibiotic therapy and other conservative measures to prevent development of thyrotoxic crisis; suggest consultation with patient’s physician during management of acute oral infection
- Avoidance of epinephrine and other pressor amines in untreated or incompletely treated patient
- Recognition of early stages of thyrotoxic crisis:
  - Severe symptoms of thyrotoxicosis
  - Fever
  - Abdominal pain
  - Delirious, obtunded, or psychotic

- Once under good medical management, the patient may receive any indicated dental treatment.
- If acute infection occurs, the physician should be consulted regarding management.
### Potential Problems Related to Dental Care

#### Oral Manifestations

<table>
<thead>
<tr>
<th>Hypothyroidism (Thyrotoxicosis) (cont’d)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYPOTHYROIDISM</strong></td>
</tr>
<tr>
<td><em>Chapter 17</em></td>
</tr>
<tr>
<td>1. Untreated patients with severe hypothyroidism exposed to stressful situations such as trauma, surgical procedures, or infection may develop hypothyroid (myxedema) coma.</td>
</tr>
<tr>
<td>2. Untreated hypothyroid patients may be highly sensitive to actions of narcotics, barbiturates, and tranquilizers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thyroiditis</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Chapter 17</em></td>
<td></td>
</tr>
<tr>
<td>1. Acute suppurative—Patient has acute infection, antibiotics</td>
<td></td>
</tr>
<tr>
<td>2. Subacute painful—Period of hyperthyroidism</td>
<td></td>
</tr>
<tr>
<td>3. Subacute painless—Up to 6-month period of hyperthyroidism</td>
<td></td>
</tr>
<tr>
<td>4. Hashimoto’s—Leads to severe hypothyroidism</td>
<td></td>
</tr>
<tr>
<td>5. Chronic fibrosing (Riedel’s)—Usually euthyroid</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thyroid Cancer</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Chapter 17</em></td>
<td></td>
</tr>
<tr>
<td>1. Usually none</td>
<td></td>
</tr>
<tr>
<td>2. Levothyroxine suppression following surgery and radioiodine ablation is usual treatment for follicular carcinomas. Patient may have mild hyperthyroidism. May be sensitive to actions of pressor amines.</td>
<td></td>
</tr>
<tr>
<td>3. Patients with multiple endocrine neoplasia-2 (MEN-2) may have symptoms of hypertension and/or hypercalcemia.</td>
<td></td>
</tr>
<tr>
<td>4. Anaplastic carcinomas may be treated by external radiation and/or chemotherapy. See problems listed in summary for Chapter 26</td>
<td></td>
</tr>
</tbody>
</table>
Prevention of Problems | Treatment Planning Modifications
--- | ---
• Initiation of immediate emergency treatment procedures:  
  • Seek immediate medical aid.  
  • Cool with cold towels, ice packs.  
  • Hydrocortisone (100 to 300 mg)  
  • Monitor vital signs  
  • Start CPR if needed
• Detection and referral of patients suspected of being hypothyroid for medical evaluation and treatment
• Avoidance of narcotics, barbiturates, and tranquilizers in untreated hypothyroid patients
• Recognition of initial stage of hypothyroid (myxedema) coma
  • Hypothermia  
  • Bradycardia  
  • Hypotension  
  • Epileptic seizures
• Initiation of immediate treatment for myxedema coma
  • Seek immediate medical aid.  
  • Administer hydrocortisone (100 to 300 mg).  
  • Provide cardiopulmonary resuscitation (CPR) as indicated
• In hypothyroid patients under good medical management, indicated dental treatment may be performed.
• In patients with a congenital form of disease and severe mental retardation, assistance with hygienic procedures may be needed.

• None
• Include in differential diagnosis of jaw pain, see above under hyperthyroidism
• See above under hyperthyroidism
• See above under hypothyroidism
• None
• Postpone elective dental care until infection has been treated.
• Avoid elective dental care if possible until symptoms of hyperthyroidism have cleared.
• Avoid elective dental care if possible until symptoms of hyperthyroidism have cleared.
• In hypothyroid patients under good medical management, any indicated dental treatment can be performed. See above for uncontrolled disease.
• None

• Examine for signs and symptoms of thyroid cancer:
  a. Hard, painless lump in thyroid  
  b. Dominant nodule in multinodular goiter
  c. Hoarseness, dysphagia, dyspnea
  d. Cervical lymphadenopathy
  e. Nodule that is fixed to underlying tissues
  f. Patient is usually euthyroid
• Patients found to have thyroid nodule(s) should be referred for fine-needle aspiration biopsy.
• Consult with patient’s physician regarding degree of hyperthyroidism for patients treated with thyroid hormone.
• Manage complications of radiation and chemotherapy as described in summary of Chapter 26.
• For most patients the dental treatment plan is not affected unless patient has been treated by external radiation or chemotherapy. See summary of Chapter 26. Patients with anaplastic carcinoma have a poor prognosis and complex dental procedures are usually not indicated.
• May have to take care in the use of epinephrine in patients treated with thyroid hormone.
• Prognosis is poor with anaplastic carcinoma.
Potential Problems Related to Dental Care

PREGNANCY AND LACTATION

Chapter 18

1. Dental procedures could harm the developing fetus via:
   a. Radiation
   b. Drugs
   c. Stress
2. Supine hypotension in late pregnancy
3. Poor nutrition and diet can affect oral health.
4. Transmission of drugs to infant via breast milk
5. Lack of proper oral health care during pregnancy could harm the development of the fetus and time of delivery

   - Exaggeration of periodontal disease, “pregnancy gingivitis”
   - “Pregnancy tumor”
   - Tooth mobility

ANTIBODY POSITIVE FOR HIV (AIDS) BUT ASYMPTOMATIC

Chapter 19

1. Transmission of infectious agents to dental personnel and patients includes:
   a. Acquired immunodeficiency syndrome (AIDS) virus (human immunodeficiency virus [HIV])
   b. Hepatitis B virus (HBV)
   c. Hepatitis C virus (HCV)
   d. Epstein-Barr virus (EBV)
   e. Cytomegalovirus (CMV)
2. To date, no dental health care workers have been infected with HIV through occupational exposure; six patients may have been infected by an HIV-infected dentist; thus, risk of HIV transmission in the dental setting is very low, but the potential exists.
3. Individuals who are hepatitis carriers may transmit HBV or HCV infection.

   - None in the early stage; however, increased incidence of certain oral lesions associated with AIDS is found when compared with noninfected individuals (i.e., candidiasis).
Prevention of Problems | Treatment Planning Modifications
--- | ---
- Women of childbearing age:
  - Always use contemporary radiographic techniques, including lead apron, when performing radiographic examination.
  - Do not prescribe drugs that are known to be harmful to the fetus, or whose effects are as yet unknown (see Table 18-3).
  - Encourage patients to maintain a balanced, nutritious diet.
- For pregnant women:
  - Contact the patient’s physician to verify physical status and present management plan; ask for suggestions regarding patient’s treatment, especially as it relates to drug administration.
  - Maintain optimal oral hygiene, including prophylaxis, throughout pregnancy.
  - Minimize oral microbial load (consider chlorhexidine and/or fluoride).
  - Avoid elective dental care during the first trimester. The second trimester and most of the third trimester are the best times for elective treatment.
  - Do not schedule radiographs during the first trimester; thereafter, take only those necessary for treatment, always with the use of a lead apron.
  - Avoid drugs known to be harmful to the fetus, or whose effects are unknown (see Table 18-3).
  - In advanced stages of pregnancy (late third trimester), do not place the patient in the supine position for prolonged periods; avoid aspirin, NSAIDs.
- For lactating mothers:
  - Most drugs are of little pharmacologic significance to lactation.
  - Do not prescribe drugs known to be harmful (see Table 18-3).
  - Administer drugs just after breast feeding.

- Identification of HIV-infected patient is difficult; interview questions should address promiscuous sexual behavior; infectious disease control procedures must be used for all patients.
- Extreme care must be taken to avoid needle stick and instrument wounding.
- All dental personnel should be vaccinated to be protected from HBV infection.
- All asymptomatic antibody-positive (HIV) individuals may go on to develop AIDS; however, it may take as long as 15 years before a diagnosis of AIDS is made.
- The HIV-infected patient’s CD4 count and HIV titer must be monitored.
- Patients’ immune status, medications, and potential for opportunistic infections must be determined and monitored.

- None, except that major reconstructive procedures, crown and bridge fabrication, and significant operations are best delayed until after delivery.

- None indicated
DM-26  DENTAL MANAGEMENT OF THE MEDICALLY COMPROMISED PATIENT

Dental Management: A Summary—cont’d

Potential Problems Related to Dental Care

HIV-INFECTED, ASYMPTOMATIC PATIENT (CD4 LYMPHOCYTE COUNT LESS THAN 500, MORE THAN 200)

Chapter 19

1. Transmission of infectious agents to dental personnel and patients includes the following:
   a. HIV
   b. Hepatitis B virus
   c. Hepatitis C virus
   d. Epstein-Barr virus
   e. Cytomegalovirus
2. To date, with the exception of possible transmission by a Florida dentist:
   a. HIV has not been found to be transmitted to patients in the dental setting.
   b. No dental health care workers have been HIV infected through occupational exposure.
   c. However, transmission of HBV and HCV has been well documented on numerous occasions.
3. Patients with decreasing CD4 lymphocytes may have significant immune suppression and be at increased risk for infection.
4. Patients with decreasing CD4 lymphocytes may be thrombocytopenic and hence potential bleeders.

AIDS (CD4 LYMPHOCYTE COUNT LESS THAN 200)

Chapter 19

1. Transmission of infectious agents to dental personnel and patients:
   a. HIV
   b. Hepatitis B virus
   c. Hepatitis C virus
   d. Epstein-Barr virus
   e. Cytomegalovirus
2. To date, HIV has not been found to be transmitted to patients in the dental setting (possible exception of six patients who may have been infected by a Florida dentist); no dental health care workers have been HIV infected through occupational exposure; however, HBV and HCV have been transmitted to patients or dental health care workers on a number of occasions in the dental setting.
3. Patients with advanced disease have significant suppression of their immune system and may be at risk for infection resulting from invasive dental procedures.
4. Patients may be bleeders because of thrombocytopenia.

ANAPHYLAXIS

Chapter 20

1. Severe reaction following administration of agent to patient who is allergic to agents such as:
   a. Drugs
   b. Local anesthetic
   c. Latex gloves or other rubber products (rubber dam, gutta percha)

Oral Manifestations

- Oral candidiasis
- Hairy leukoplakia
- Persistent lymphadenopathy
- With the exception of Kaposi’s sarcoma and non-Hodgkin’s lymphoma, other lesions listed under AIDS may be found with increased frequency.

- Kaposi’s sarcoma
- Non-Hodgkin’s lymphoma
- Oral candidiasis
- Lymphadenopathy
- Hairy leukoplakia
- Xerostomia
- Salivary gland enlargement
- Venereal warts
- Linear gingivitis erythema
- Necrotizing ulcerative periodontitis
- Necrotizing stomatitis
- Herpes zoster
- Primary or recurrent herpes simplex lesions
- Major aphthous lesions
- Herpetiform aphthous lesions
- Petechiae, ecchymoses
- Others (see Table 19-8)

- Usually none
Prevention of Problems  Treatment Planning Modifications

- Use infectious disease control procedures for all patients.
- Vaccinate dental personnel for protection from HBV infection.
- Identify patients by the presence of signs and symptoms associated with decreasing CD4 lymphocytes; refer for medical evaluation, counseling, and management.
- Establish platelet status and immune status of patients with decreasing CD4 lymphocytes before performing invasive dental procedures (see AIDS, next page).
- Inform patients of various support groups available to help in terms of education and emotional, financial, legal, and other issues.

- None indicated

- None for cases in “remission”; however, complex restorative procedures usually are not indicated because of poor prognosis (death occurs most often within 2 years after diagnosis).
- Patients in advanced stages of disease should receive emergency and preventive dental care; elective dental treatment usually is not indicated at this stage.

- Take careful history and identify patients who are allergic to agents used in dentistry, and who have a history of atopic reactions (e.g., asthma, hay fever, urticaria, angioneurotic edema).
- Do not use agents to which the patient is allergic, as identified in the medical history.
- For patients with a history of atopic reactions, use care when giving drugs and materials with a high incidence of allergy such as penicillin; be prepared to deal with severe allergic reaction in the following ways:
  - Identify anaphylactic reaction.
  - Call for medical help.
### URTICARIA (ANGIONEUROTIC EDEMA)

**Chapter 20**

1. Nonemergency; edematous swelling of lips, cheek, etc., after contact with antigen
2. Emergency; edematous swelling of tongue, pharynx, and larynx with obstruction of airway

<table>
<thead>
<tr>
<th>Potential Problems Related to Dental Care</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANAPHYLAXIS (cont’d)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Soft tissue swelling</td>
</tr>
</tbody>
</table>
Prevention of Problems

- Place patient in the supine position.
- Check for open airway.
- Administer oxygen.
- Check vital signs—Respiration, blood pressure, pulse rate, and rhythm.
- If vital signs depressed or absent, inject 0.3 to 0.5 mL of epinephrine 1:1000 IM into the tongue.
- Provide CPR as indicated.
- Repeat injection of epinephrine, if no response.
- When prescribing drugs, inform the patient regarding signs and symptoms of allergic reactions; advise the patient to call the dentist if such a reaction occurs, or to report to the nearest hospital emergency room.

- Identify patients who have had allergic reactions through the history and what drug or materials caused the reaction.
- Avoid the use of antigen in allergic persons.
- If patients develop allergic reaction to drug or material to which they gave no indication of being allergic, consider the following:
  - Nonemergency reaction, no further contact with agent—Administer diphenhydramine 50 mg up to 4 times a day, orally or IM.
  - Emergency reaction—Put patient in the supine position; with patent airway and oxygen, inject 0.3 to 0.5 mL epinephrine 1:1000 IM; support respiration if necessary; check pulse; obtain medical assistance.
- Before administering local anesthetics, consider the following:
  - Obtain from the patient information about being allergic to a local anesthetic. (Most patients who say they are allergic will describe a fainting episode or a toxic reaction.) If an allergic reaction has occurred, identify the type of anesthetic used, and select one from various chemical groups.
    1. Inject 1 drop (aspirate first) of alternate anesthetic, and wait 5 minutes; if no reaction occurs, proceed with injection of remaining anesthetic.
    2. If anesthetic that patient has reacted to cannot be identified, consider the following procedures:
      a. Refer to allergist for provocative dose testing, or
      b. Use diphenhydramine (Benadryl) with epinephrine 1:100,000 as local anesthetic (1% solution, 1 to 4 mL).
- Allergy to penicillin
  - Administer erythromycin or another macrolide antibiotic.
  - In nonallergic person, administer by the oral route whenever possible—Lowest incidence of sensitization.
  - Do not use in topical form.

Treatment Planning Modifications

- Do not use agents to which the patient is allergic, as identified in the medical history.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRAVASCULAR ACCESS DEVICES (ULDALL CATHETER, CENTRAL IV LINE, BROVIAC-HICKMAN DEVICE)</strong></td>
</tr>
</tbody>
</table>

1. High rate of infection, but the role of transient dental bacteremias that cause these infections has not been established.

2. **SOLID ORGAN TRANSPLANTATION**

   **Chapter 21**
   1. Infection from suppression of immune response by the following:
      - Cyclosporine
      - Azathioprine
      - Prednisone
      - Antithymocyte globulin
      - Antilymphocyte globulin
      - Orthoclone (monoclonal antibody)
   2. Acute rejection, reversible
   3. Chronic rejection, nonreversible, includes the following:
      - Graft failure—End-stage organ failure
      - Bleeding—Liver, kidney
      - Drug overdose—Liver, kidney
      - Death or need for transplantation of heart, liver
      - Osteoporosis
      - Psychoses
      - Anemia
      - Leukopenia
      - Thrombocytopenia
      - Gingival hyperplasia
      - Adrenocortical suppression
      - Tumors (listed above)
      - Poor healing
      - Bleeding
      - Infection

   **Chapter 22**
   1. Infection from suppression of immune response by the following:
      - Cyclosporine
      - Azathioprine
      - Prednisone
      - Antithymocyte globulin
      - Antilymphocyte globulin
      - Orthoclone (monoclonal antibody)
   2. Acute rejection, reversible
   3. Chronic rejection, nonreversible, includes the following:
      - Graft failure—End-stage organ failure
      - Bleeding—Liver, kidney
      - Drug overdose—Liver, kidney
      - Death or need for transplantation of heart, liver
      - Osteoporosis
      - Psychoses
      - Anemia
      - Leukopenia
      - Thrombocytopenia
      - Gingival hyperplasia
      - Adrenocortical suppression
      - Tumors (listed above)
      - Poor healing
      - Bleeding
      - Infection

   - Usually none
   - Excessive immune suppression includes the following:
   - Candidiasis
   - Herpes simplex
   - Herpes zoster
   - Hairy leukoplakia
   - Lymphoma
   - Kaposi's sarcoma
   - Aphthous stomatitis
   - Squamous cell carcinoma of lip
   - Adverse effects of immunosuppressant drugs include the following:
   - Bleeding (spontaneous)
   - Infection
   - Ulceration
   - Petechiae
   - Ecchymoses
   - Gingival hyperplasia
   - Salivary gland dysfunction
   - Graft failure includes the following:
   - Uremic stomatitis (kidney)
   - Bleeding (liver)
   - Petechiae (liver, kidney)
   - Ecchymoses (liver)
Prevention of Problems

- The CDC does not recommend antibiotic prophylaxis for invasive dental procedures.

- Dental evaluation and treatment before transplantation includes the following:
  1. Establish stable oral and dental status free of active dental disease.
  2. Initiate aggressive oral hygiene program to maintain oral health.
  3. Arrange medical consultation for patients with organ failure before performing needed dental treatment to establish the following:
     1. Degree of failure
     2. Current status of patient
     3. Need for antibiotic prophylaxis
     4. Need to modify drug selection or dosage
     5. Need to take special precautions to avoid bleeding
     6. If surgery is indicated, access to recent prothrombin time, partial thromboplastin time, bleeding time, and white cell count or differential may be needed.

- Dental treatment after transplantation includes the following:
  1. Immediate posttransplant period (6 months):
     1. Provide emergency dental care only.
     2. Continue oral hygiene procedures.
  2. Stable graft period:
     1. Maintain oral hygiene.
     2. Recall every 3 months.
     3. Use universal precautions.
     4. Vaccinate dental staff against HBV infection.
     5. Schedule medical consultation on the following topics:
        a. Need for antibiotic prophylaxis
        b. Need for precautions to avoid excessive bleeding
        c. Need for supplemental steroids
        d. Selection of drugs and dosage
       6. Examine for clinical evidence of the following:
        a. Organ failure or rejection
        b. Overimmunosuppression (tumors, infection, etc.)
    7. Monitor blood pressure at every appointment.
    8. If evidence of drug adverse effects, graft rejection, or overimmunosuppression is found, refer patient to physician.

- Chronic rejection period
  1. Perform immediate or emergency dental care only.
  2. Follow guidelines for stable graft when treatment is performed.

Treatment Planning Modifications

- Depends on the reason for the intravascular device

- Before transplantation, consider the following:
  1. For patients with poor dental status, consider extractions and full dentures.
  2. For patients with good dental status, perform the following:
     1. Maintain dentition.
     2. Establish aggressive oral hygiene program in the following areas:
        a. Toothbrushing, flossing
        b. Diet modification, if indicated
        c. Topical fluorides
        d. Plaque control, calculus removal
        e. Chlorhexidine or Listerine mouth rinse
  3. Treat all active dental disease in the following areas:
     a. Extraction—Nonrestorable teeth
     b. Endodontics—Nonvital teeth
     c. Restoration of carious teeth
     d. Complex dental prostheses, etc., deferred until after transplantation

- For patients with dental status between the above extremes:
  1. Decision to maintain natural dentition must be made on an individual patient basis.
  2. Factors to be considered:
     a. Extent and severity of dental disease
     b. Importance of teeth to patient
     c. Cost of maintaining natural dentition
     d. Systemic status of patient and prognosis
     e. Physical ability to maintain good oral hygiene

- Following transplantation:
  1. Immediate posttransplantation period—Limit dental care to emergency needs.
  2. Stable graft period—Base treatment plan on needs and desires of the patient; recall every 3 to 6 months.
  3. Chronic rejection period—Limit dental care to immediate or emergency needs.
  4. Maintain aggressive oral hygiene program throughout all periods.
  5. Consult with physician to confirm patient’s current status and the need for special precautions.
Potential Problems Related to Dental Care—cont’d

HEART TRANSPLANTATION, SPECIAL CONSIDERATIONS
Chapter 22
1. Patient may be on long-term anticoagulation therapy; excessive bleeding may occur with surgical procedures.
2. Graft atherosclerosis may occur, increasing the risk for myocardial infarction.
3. No nerve supply exists to the transplanted heart; thus, pain will not be symptomatic of myocardial infarction.
4. Some patients require cardiac pacing; electrical equipment may interfere with the pacemaker.
5. Cardiac valvular disease may develop.

LIVER TRANSPLANTATION, SPECIAL CONSIDERATIONS
Chapter 22
1. Drugs that may be toxic to the liver must not be prescribed.
2. Some patients may be on anticoagulation medication.
3. Excessive bleeding may occur with surgical procedures.

KIDNEY TRANSPLANTATION, SPECIAL CONSIDERATIONS
Chapter 22
1. Drugs that may be toxic to the kidney must not be prescribed.

PANCREAS TRANSPLANTATION
Chapter 22
1. No special considerations

BONE MARROW TRANSPLANTATION
Chapter 22
1. Immune suppression and pancytopenia resulting from conditioning therapy, including:
   a. Total body irradiation
   b. Cyclophosphamide
   c. Busulfan
2. Problems during conditioning phase and critical phase (until transplanted marrow becomes functional) include:
   a. Infection
   b. Bleeding
   c. Poor healing
3. Immune suppression resulting from maintenance medications used to prevent graft-versus-host disease and
   a. Cyclosporine
   b. Prednisone
   c. Methotrexate
4. Problems during maintenance phase include:
   a. Infection
   b. Others listed above under solid organ transplantation related to medication(s) being used
5. Graft-versus-host disease and chronic rejection:
   a. Infection
   b. Bleeding
### Prevention of Problems
- Have physician modify degree of anticoagulation to 2.5 normal prothrombin time or less (INR, 3.5 or less), if surgical procedures are planned.
- Consult with physician to establish status of coronary vessels of transplanted heart; if advanced graft atherosclerosis is present, manage as described under section on coronary atherosclerotic heart disease.
- Be aware of signs and symptoms of myocardial infarction, other than pain; if these occur, obtain immediate medical assistance for patient.
- Do not use Cavitron or electrosurgery in patients with a pacemaker.

### Treatment Planning Modifications
- The American Heart Association has stated that evidence regarding the need for antibiotic prophylaxis for prevention of endocarditis in patients with heart transplantation is inconclusive.
- The American Heart Association recommends that prophylaxis be considered for cardiac transplant patients who develop cardiac valvular disease.
- If prophylaxis is planned, the standard amoxicillin regimen of the American Heart Association would be appropriate.

### Prevention of Problems
- Avoid drugs that are toxic to the liver.
- Have the physician modify the degree of anticoagulant to an INR of 3.5 or less.

### Treatment Planning Modifications
- The need for prophylactic antibiotics for invasive dental procedures in patients with stable liver transplants should be determined on an individual patient basis through medical consultation.

### Prevention of Problems
- Avoid drugs that are toxic to the kidney.

### Treatment Planning Modifications
- The need for prophylactic antibiotics for invasive dental procedures in patients with stable kidney transplants should be determined on an individual patient basis through medical consultation.

### Prevention of Problems
- Avoid dental treatment during conditioning and critical phases of bone marrow transplantation.
- Treat all active dental disease prior to bone marrow transplantation.
- Observe requirements for antibiotic prophylaxis for invasive dental procedures:
  - Prophylaxis is indicated if procedures must be performed on an emergency basis during conditioning or critical phases of bone marrow transplantation.
  - Need should be determined through medical consultation. (See Solid Organ Transplantation [previous pages] for details of hygiene program and dental management.)

### Treatment Planning Modifications
- If possible, treat active dental disease before transplantation.
- Prognosis varies according to reason for transplantation, source of marrow to be transplanted, and techniques used to condition and maintain the patient; other factors that may affect prognosis include age and general health status; complex dental prostheses may not be indicated for many patients.
- (See Solid Organ Transplantation [previous pages] for other suggested treatment planning considerations.) (For management of soft tissue complications, see Appendix C.)
<table>
<thead>
<tr>
<th>Potential Problems Related to Dental Care</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IRON DEFICIENCY ANEMIA</strong></td>
<td></td>
</tr>
<tr>
<td><em>Chapter 23</em></td>
<td></td>
</tr>
<tr>
<td>1. Usually none</td>
<td>• Paresthesias</td>
</tr>
<tr>
<td>2. In rare cases, severe leukopenia and</td>
<td>• Loss of papillae</td>
</tr>
<tr>
<td>thrombocytopenia may result in</td>
<td>on dorsum of tongue</td>
</tr>
<tr>
<td>problems with infection and</td>
<td>• In rare cases,</td>
</tr>
<tr>
<td>excessive loss of blood.</td>
<td>infection and</td>
</tr>
<tr>
<td></td>
<td>bleeding</td>
</tr>
<tr>
<td></td>
<td>In patients with</td>
</tr>
<tr>
<td></td>
<td>dysphagia, increased</td>
</tr>
<tr>
<td></td>
<td>incidence of</td>
</tr>
<tr>
<td></td>
<td>carcinoma of oral</td>
</tr>
<tr>
<td></td>
<td>and pharyngeal areas</td>
</tr>
<tr>
<td></td>
<td>(Plummer-Vinson</td>
</tr>
<tr>
<td></td>
<td>syndrome)</td>
</tr>
<tr>
<td><strong>G-6-PD DEFICIENCY</strong></td>
<td>• Usually none</td>
</tr>
<tr>
<td><em>Chapter 23</em></td>
<td></td>
</tr>
<tr>
<td>1. Accelerated hemolysis of red blood</td>
<td></td>
</tr>
<tr>
<td>cells</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Paresthesias</td>
</tr>
<tr>
<td></td>
<td>• Usually none</td>
</tr>
<tr>
<td><strong>PERNICIOUS ANEMIA</strong></td>
<td>• Delayed healing</td>
</tr>
<tr>
<td><em>Chapter 23</em></td>
<td>(severe cases),</td>
</tr>
<tr>
<td>1. Infection</td>
<td>infection, bald red</td>
</tr>
<tr>
<td>2. Bleeding</td>
<td>tongue, angular</td>
</tr>
<tr>
<td>3. Delayed healing</td>
<td>cheilosis</td>
</tr>
<tr>
<td></td>
<td>• Petechial</td>
</tr>
<tr>
<td></td>
<td>hemorrhages</td>
</tr>
<tr>
<td><strong>SICKLE CELL ANEMIA</strong></td>
<td>• Loss of</td>
</tr>
<tr>
<td><em>Chapter 23</em></td>
<td>trabecular pattern</td>
</tr>
<tr>
<td>1. Sickle cell crisis</td>
<td>• Delayed eruption</td>
</tr>
<tr>
<td></td>
<td>of teeth, growth</td>
</tr>
<tr>
<td></td>
<td>abnormalities</td>
</tr>
<tr>
<td></td>
<td>• Hypoplasia of</td>
</tr>
<tr>
<td></td>
<td>teeth</td>
</tr>
<tr>
<td></td>
<td>• Pallor of oral</td>
</tr>
<tr>
<td></td>
<td>mucosa</td>
</tr>
<tr>
<td></td>
<td>• Jaundice of oral</td>
</tr>
<tr>
<td></td>
<td>mucosa</td>
</tr>
<tr>
<td></td>
<td>• Bone pain</td>
</tr>
<tr>
<td></td>
<td>• Osteoporosis</td>
</tr>
<tr>
<td>Prevention of Problems</td>
<td>Treatment Planning Modifications</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Detection and referral for diagnosis and treatment</td>
<td>Usually none</td>
</tr>
<tr>
<td>Recognition that in women most cases are caused by physiologic process—Menstruation or pregnancy</td>
<td></td>
</tr>
<tr>
<td>Recognition that in men most cases are the result of underlying disease—Peptic ulcer, carcinoma of colon, etc.—requiring referral to the patient’s physician</td>
<td></td>
</tr>
<tr>
<td>Control infection.</td>
<td>Usually none unless anemia is severe; then, perform only urgent dental needs</td>
</tr>
<tr>
<td>Avoid drugs that contain certain antibiotics, aspirin, or acetaminophen, which may increase risk for hemolytic anemia.</td>
<td></td>
</tr>
<tr>
<td>Be aware that these patients also often have increased sensitivity to sulfa drugs and chloramphenicol.</td>
<td></td>
</tr>
<tr>
<td>Detection and medical treatment (early detection and treatment can prevent permanent neurologic damage)</td>
<td>None, once the patient is under medical care</td>
</tr>
<tr>
<td>Consult with patient’s physician to ensure that condition is stable.</td>
<td></td>
</tr>
<tr>
<td>Institute aggressive preventive dental care.</td>
<td></td>
</tr>
<tr>
<td>Avoid any procedure that may produce acidosis or hypoxia (avoid long, complicated procedures).</td>
<td></td>
</tr>
<tr>
<td>Consideration of the following drug situations:</td>
<td></td>
</tr>
<tr>
<td>Avoid excessive use of barbiturates and narcotics because suppression of the respiratory center may occur, leading to acidosis, which can precipitate acute crisis. Use benzodiazepine instead.</td>
<td></td>
</tr>
<tr>
<td>Avoid excessive use of salicylates because “acidosis” may result, again leading to possible acute crisis; codeine and acetaminophen in moderate dosage can be used for pain control.</td>
<td></td>
</tr>
<tr>
<td>Avoid the use of general anesthesia because hypoxia can lead to precipitation of acute crisis.</td>
<td></td>
</tr>
<tr>
<td>Nitrous oxide may be used, provided that 50% oxygen is supplied at all times; it is critical to avoid diffusion hypoxia at the termination of nitrous oxide administration. For nonsurgical procedures, use local without vasoconstrictor; for surgical procedures, use 1:100,000 epinephrine in anesthetic solution.</td>
<td></td>
</tr>
<tr>
<td>1. Aspirate before injecting.</td>
<td></td>
</tr>
<tr>
<td>2. Inject slowly.</td>
<td></td>
</tr>
<tr>
<td>3. Use no more than two cartridges.</td>
<td></td>
</tr>
<tr>
<td>4. It is necessary to prevent infection. Use prophylactic antibiotics for major surgical procedures.</td>
<td></td>
</tr>
<tr>
<td>5. If infection occurs, manage aggressively, with the use of:</td>
<td></td>
</tr>
<tr>
<td>a. Heat</td>
<td></td>
</tr>
<tr>
<td>b. Incision and drainage</td>
<td></td>
</tr>
<tr>
<td>c. Antibiotics</td>
<td></td>
</tr>
<tr>
<td>d. Corrective treatment—Extraction, pulpectomy, etc.</td>
<td></td>
</tr>
<tr>
<td>6. Avoid dehydration in patients with infection and in patients who are receiving surgical treatment.</td>
<td></td>
</tr>
</tbody>
</table>

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Condition</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGRANULOCYTOSIS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chapter 24</strong></td>
<td></td>
</tr>
<tr>
<td>1. Infection</td>
<td>• Oral ulcerations</td>
</tr>
<tr>
<td></td>
<td>• Periodontitis</td>
</tr>
<tr>
<td></td>
<td>• Necrotic tissue</td>
</tr>
<tr>
<td><strong>CYCLIC NEUTROPENIA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chapter 24</strong></td>
<td></td>
</tr>
<tr>
<td>1. Infection</td>
<td>• Periodontal disease</td>
</tr>
<tr>
<td></td>
<td>• Oral infection</td>
</tr>
<tr>
<td></td>
<td>• Oral ulceration similar to aphthous stomatitis</td>
</tr>
<tr>
<td><strong>LEUKEMIA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chapter 24</strong></td>
<td></td>
</tr>
<tr>
<td>1. Infection</td>
<td>• Gingival swelling/enlargement</td>
</tr>
<tr>
<td>2. Bleeding</td>
<td>• Mucosal or gingival bleeding</td>
</tr>
<tr>
<td>3. Delayed healing</td>
<td>• Oral infection</td>
</tr>
<tr>
<td>4. Mucositis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gingival swelling/enlargement</td>
</tr>
<tr>
<td></td>
<td>• Mucosal or gingival bleeding</td>
</tr>
<tr>
<td></td>
<td>• Oral infection</td>
</tr>
<tr>
<td></td>
<td>• Gingival swelling/enlargement</td>
</tr>
<tr>
<td></td>
<td>• Mucosal or gingival bleeding</td>
</tr>
<tr>
<td><strong>MULTIPLE MYELOMA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chapter 24</strong></td>
<td></td>
</tr>
<tr>
<td>1. Excessive bleeding after invasive dental procedures</td>
<td>• Soft tissue tumors</td>
</tr>
<tr>
<td>2. Risk of infection because of decrease in normal immunoglobulins</td>
<td>• Osteolytic lesions</td>
</tr>
<tr>
<td>3. Risks of infection and bleeding in patients who are being treated by radiation or chemotherapy</td>
<td>• Amyloid deposits in soft tissues</td>
</tr>
<tr>
<td>4. Risk of osteonecrosis in patients who are taking bisphosphonates (especially intravenously).</td>
<td>• Unexplained mobility of teeth</td>
</tr>
<tr>
<td></td>
<td>• Exposed bone</td>
</tr>
<tr>
<td><strong>LYMPHOMAS: HODGKIN'S DISEASE, NON-HODGKIN'S LYMPHOMA, BURKITT'S LYMPHOMA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chapter 24</strong></td>
<td></td>
</tr>
<tr>
<td>1. Increased risk for infection</td>
<td>• Extranodal oral tumors in Waldeyer’s ring or osseous soft tissues</td>
</tr>
<tr>
<td>2. Risks of infection and excessive bleeding in patients receiving chemotherapy</td>
<td>• Xerostomia in patients treated by radiation; some of these patients prone to osteonecrosis</td>
</tr>
<tr>
<td>3. Minor risk of osteonecrosis in patients treated by radiation to the head and neck region (this usually does not occur because radiation dosage seldom exceeds 50 Gy)</td>
<td>• Burning mouth or tongue symptoms</td>
</tr>
<tr>
<td></td>
<td>• Petechiae or ecchymoses if thrombocytopenia present because of tumor invasion of bone marrow</td>
</tr>
<tr>
<td></td>
<td>• Cervical lymphadenopathy</td>
</tr>
</tbody>
</table>

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
Prevention of Problems | Treatment Planning Modifications
---|---
- Referral for medical diagnosis and treatment | - During periods of low blood count, provide emergency care only. Treatment should include the use of antimicrobial agents and supportive therapy for oral lesions (see Appendix C for specific treatment regimens).
- Drug considerations—Some antibiotics (macrolides, penicillins, and cephalosporins) used for oral infections have a higher incidence of agranulocytosis. Avoid these antibiotics if possible.
- Antibiotics should be given to prevent infection. | - Modifications not required when the WBC is normal.
- Serial white blood cell count (WBC) should be performed to identify the safest period for dental treatment (i.e., when the WBC is closest to normal level). | - If the WBC is depressed severely, antibiotics should be provided to prevent postoperative infection.
- Referral for medical diagnosis, treatment, and consultation | - Inspect head, neck, and radiographs for undiagnosed or latent disease (e.g., retained root tips, impacted teeth) and infections that require acute attention prior to chemotherapy.
- Complete blood count to determine risk for anemia, bleeding, and infection | - Eliminate infections prior to chemotherapy.
- Antibiotics, antivirals, and antifungals provided during chemotherapy to prevent opportunistic oral infection | - Extractions should be performed at least 10 days before initiation of chemotherapy.
- Chlorhexidine rinse/bland rinses to manage mucositis | - Implement plaque control measures and chlorhexidine during chemotherapy.
- Use prophylactic antibiotics if WBC count is less than 2000, or neutrophil count is less than 500 (or 1000 at some institutions).
- Platelet replacement may be required (if platelet count is <50,000) when invasive dental procedures are performed.
- Patients with oral soft tissue lesions and/or osseous lesions should have them biopsied by the dentist or should be referred for diagnosis and treatment as indicated. | - Provide supportive dental care only for patients in terminal stage.
- Medical history should identify patients with diagnosed disease; medical consultation is needed to establish current status. (See sections on chemotherapy and radiation therapy on prevention and management of medical complications.) | - Long-term prognosis is poor, so complex dental procedures may not be indicated.
- Be aware of and take precautions for bisphosphonate-induced osteonecrosis. | - If thrombocytopenia or leukopenia is present, special precautions (platelet replacement, antibiotic therapy) are needed to prevent bleeding and infection when invasive dental procedures are performed.
- Patients may be bleeders because of the presence of abnormal immunoglobulin M macroglobulins, which form complexes with clotting factors, thus inactivating the clotting factors. (See sections on chemotherapy and radiation therapy for treatment plan modifications.)
- Patients with generalized lymphadenopathy, extranodal tumors, and osseous lesions must be identified and referred for medical evaluation and treatment. | - Patients in terminal phase should receive only supportive dental treatment.
- The dentist can biopsy extranodal or osseous lesions to establish a diagnosis; patients with lesions involving the lymph nodes should be referred for excisional biopsy. | - Patients under “control” may receive any indicated treatment; however, complex restorative treatment may not be indicated in cases with a poor prognosis.
- Platelet replacement may be needed for patients with thrombocytopenia. (See sections on radiation therapy and chemotherapy for treatment plan modifications.)
**Potential Problems Related to Dental Care**

<table>
<thead>
<tr>
<th>LYMPHOMAS: HODGKIN’S DISEASE, NON-HODGKIN’S LYMPHOMA, BURKITT’S LYMPHOMA (cont’d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Xerostomia may occur in patients treated by radiation to the head and neck region.</td>
</tr>
<tr>
<td>5. Non-Hodgkin’s lymphoma may be found in patients with AIDS; hence, transmission of infections agents may be a problem.</td>
</tr>
</tbody>
</table>

**Oral Manifestations**

- Mucositis in patients treated by radiation therapy or chemotherapy

---

**BLEEDING PROBLEM SUGGESTED BY EXAMINATION AND HISTORY FINDINGS BUT NO CLUES AS TO UNDERLYING CAUSE**

**Chapter 25**

1. Excessive blood loss following surgical procedures, scaling, etc.

- Excessive bleeding after dental procedures

---

**THROMBOCYTOPENIA (PRIMARY OR SECONDARY) CAUSED BY CHEMICALS, RADIATION, OR LEUKEMIA**

**Chapter 25**

1. Prolonged bleeding
2. Infection in patients with bone marrow replacement or destruction
3. In patients being treated with steroids, a serious medical emergency resulting from stress

- Spontaneous bleeding
- Prolonged bleeding following certain dental procedures
- Petechiae
- Ecchymoses
- Hematomas

---

**VASCULAR WALL ALTERATIONS (SCURVY, INFECTION, CHEMICAL, ALLERGIC, AUTOIMMUNE, OTHER)**

**Chapter 25**

1. Prolonged bleeding after surgical procedures or any insult to integrity of oral mucosa

- Excessive bleeding after scaling and surgical procedures
- Petechiae
- Ecchymoses
- Hematomas

---

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
Prevention of Problems

- Medical history should identify patients with diagnosed disease; medical consultation will be needed to establish current status. (See sections on chemotherapy and radiation therapy on management and prevention of medical complications.)
- Prior to invasive procedures, a complete blood count should be obtained to determine risks for bleeding and infection.
- Screen patients with the following (if one or more are abnormal, refer for diagnosis and medical treatment):
  - Prothrombin time
  - Activated partial thromboplastin time
  - Thrombin time
  - Platelet count
  - PFA-100
  - Avoid use of aspirin and related drugs.

- Identification of patients to include the following:
  - History
  - Examination findings
  - Screening tests—PFA-100, platelet count
  - Referral and consultation with hematologist
  - Correction of underlying problem or replacement therapy before surgery
  - Local measures to control blood loss—Splint, gelfoam, thrombin, etc.
  - Prophylactic antibiotics may be considered in surgical cases to prevent postoperative infection.
  - Additional steroids should be used for patients being treated with steroids, if indicated (see section on adrenal insufficiency).
  - Aspirin, aspirin-containing compounds, and NSAIDs are not to be used; acetaminophen (Tylenol) with or without codeine may be used.

- Identification of patients should include the following:
  - History
  - Clinical findings
  - Screening test, bleeding time (not reliable)
  - Consultation with the hematologist should be obtained.
  - Local measures should be used to control blood loss. Splints, gelfoam, Oxycel, and surgical thrombin (see Table 25-5).
  - Prevention of allergy is causative, and the antigen is identified.

- Use prophylactic antibiotics if the WBC count is less than 2000, or the neutrophil count is less than 500 (or 1000 at some institutions).

- None, unless test(s) abnormal; then, manage on the basis of the nature of the underlying problem once diagnosis has been established by the physician.

- In general dental procedures can be performed if the platelet count is 30,000/mm³ or higher.
- Extractions and minor surgery can be performed if the platelet count is 50,000/mm³ or higher.
- Major oral surgery can be performed if the platelet count is 80,000/mm³ to 100,000/mm³ or higher.
- Platelet transfusion will be needed for patients with platelet counts below the above values.
- Patients with severe neutropenia (500/mm³ or less) may require antibiotics for certain surgical procedures.
- In children with primary thrombocytopenia, many will respond to steroids with platelet levels increasing to levels allowing dental procedures to be performed.

Surgical procedures must be avoided in these patients unless the underlying problem has been corrected, or the patient has been prepared for surgery by the hematologist, and the dentist is prepared to control excessive loss of blood through local measures; splints, thrombin, microfibrillar collagen, gelfoam, Oxycel, Amicar (see Table 25-5).
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>CONGENITAL DISORDERS OF COAGULATION (HEMOPHILIA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 25</td>
</tr>
<tr>
<td>1. Excessive bleeding following dental procedures</td>
</tr>
<tr>
<td>2. HIV-, HBV-, and HCV—infected patients are potentially infectious (see Appendix B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Spontaneous bleeding</td>
</tr>
<tr>
<td>• Prolonged bleeding after dental procedures that injure soft tissue or bone</td>
</tr>
<tr>
<td>• Hematomas</td>
</tr>
<tr>
<td>• Oral lesions associated with HIV infection in patients who receive infected replacement products (most occurred before 1986)</td>
</tr>
</tbody>
</table>
**Prevention of Problems**

- Identification of patients includes the following:
  - History—Bleeding problems in relatives, excessive bleeding following trauma or surgery
- Examination findings:
  1. Ecchymoses
  2. Hemarthrosis
  3. Dissecting hematomas
- Screening tests—Prothrombin time (normal), activated partial thromboplastin time (prolonged), thrombin time (normal), platelet count (normal), PFA-100 (normal)
- Consultation and referral should be provided for diagnosis and treatment and for preparation before dental procedures are performed.
- Replacement options include the following:
  - Cryoprecipitate (used rarely)
  - Fresh frozen plasma (used rarely)
  - Factor VIII concentrates, including:
    1. Heat-treated concentrate
    2. Purified factor VIII
    3. Recombinant factor VIII
    4. Porcine factor VIII
- Mild and moderate factor VIII deficiency, consider using:
  1. 1-desamino-8-D-arginine vasopressin (oral or nasal)
  2. Epsilon-aminocaproic acid (Amicar) rinse or orally
  3. Tranexamic acid (Cyklokapron); not available in the United States
  4. Factor VIII replacement for some cases
  5. Often treated on an outpatient basis.
- For severe factor VIII deficiency, alleviate by such measures as:
  - Agents used above for mild to moderate deficiency
  - Higher dose(s) of factor VIII
- Patients who are low responders:
  - Agents used for mild to moderate deficiency
  - Very high dose(s) of factor VIII
- Patients who are high responders:
  - No elective surgery
  - Agents used for mild to moderate deficiency
  - High doses of porcine factor VIII concentrate
  - Nonactivated prothrombin/complex concentrate
  - Activated prothrombin/complex concentrate
  - Plasmapheresis
  - Factor VIIA
  - Steroids
  - In rare cases plasmapheresis
- Treatment is provided on an outpatient basis in accordance with results of the consultation (mild to moderate deficiency, no inhibitors).
- Local measures (splints, thrombin, microfibrillar collagen, etc.) are used for control of bleeding (see Table 25-5).
- Aspirin, aspirin-containing compounds, and NSAIDs should be avoided.

**Treatment Planning Modifications**

- No dental procedures unless the patient has been prepared on the basis of consultation with the hematologist
- Avoid aspirin, aspirin-containing compounds, and NSAIDs—Use acetaminophen (Tylenol) with or without codeine.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Von Willebrand’s Disease</th>
<th>Oral Manifestations</th>
</tr>
</thead>
</table>
| 1. Excessive bleeding after invasive dental procedures | • Spontaneous bleeding  
• Prolonged bleeding following dental procedures that injure soft tissue or bone  
• Petechiae  
• Hematomas |

### Acquired Disorders of Coagulation (Liver Disease, Broad-Spectrum Antibiotics, Malabsorption Syndrome, Biliary Tract Obstruction, Heparin, and Others)

| Chapter 25 | 1. Excessive bleeding following dental procedures that result in soft tissue or osseous injury | • Excessive bleeding  
• Spontaneous bleeding  
• Petechiae  
• Hematomas |
Prevention of Problems                      Treatment Planning Modifications

- Identification of patients should include:
  - History of bleeding problems in relatives and of excessive bleeding after surgery or trauma, etc.
  - Examination findings to include:
    1. Petechiae
    2. Hematomas
  - Screening laboratory tests—Prolonged platelet function analyzer (PFA)-100; possible prolonged partial thromboplastin time, platelet count may be low
  - Consultation and referral should be provided for diagnosis and treatment and preparation before dental procedures.
  - Type I and many type II cases require the following:
    - 1-desamino-8-D-arginine vasopressin
    - Local measures (see Table 25-5)
    - May be treated on an outpatient basis
  - Type III and some type II patients require the following:
    - Fresh frozen plasma
    - Cryoprecipitate
    - Special factor VIII concentrates (retain vWF)
      1. Humate-P
      2. Koate HS
    - Local measures (see Table 25-5)
    - Outpatient treatment is possible on the basis of results of consultation.
    - Local measures for control of bleeding include:
      - Splints
      - Gelfoam with thrombin
      - Oxycel, Surgicel
    - Avoid aspirin, aspirin-containing compounds, and NSAIDs.

- Identification of patients with disorder should include:
  - History
  - Examination findings
  - Screening laboratory tests—Prothrombin time (prolonged), PFA-100 (in liver disease prolonged if hypersplenism present)
  - Consultation and referral should be provided.
  - Preparation before the dental procedure may include vitamin K injection by the physician and platelet replacement if indicated.
  - Local measures are used to control blood loss (see Table 25-5)
  - For patients with liver disease, avoid or reduce dosage of drugs metabolized by the liver.
  - Do not use aspirin, aspirin-containing compounds, and NSAIDs.

- No invasive dental procedures unless the patient has been prepared on the basis of consultation with the hematologist.
- Most dental procedures including complex restorations can be offered to these patients.
- Emphasis on maintaining good oral hygiene, topical fluorides, and diet.
- Acetaminophen with or without codeine may be used for postoperative pain control.

- No dental procedures unless the patient is prepared on the basis of a consultation with the hematologist.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive bleeding</td>
</tr>
<tr>
<td>Hematomas</td>
</tr>
<tr>
<td>Petechiae</td>
</tr>
<tr>
<td>In rare cases, spontaneous bleeding</td>
</tr>
</tbody>
</table>

#### ANTICOAGULATION WITH COUMARIN DRUGS

**Chapter 25**

1. Excessive bleeding after dental procedures that result in soft tissue or osseous injury

#### DISSEMINATED INTRAVASCULAR COAGULATION (DIC)

**Chapter 25**

1. Excessive bleeding after invasive dental procedures; in chronic form of disease, widespread thrombosis may occur

- Spontaneous gingival bleeding
- Petechiae
- Ecchymoses
- Prolonged bleeding following invasive dental procedures
Prevention of Problems

• Identify patients who are taking anticoagulants/Coumarin in the following ways:
  • History
  • Screening laboratory test—International normalized ratio (INR), prothrombin time (PT) (prolonged), PFA-100 (may be prolonged)
  • Consultation should be obtained regarding level of anticoagulation:
    • If international normalized ratio (INR) is 3.5 or less, most surgical procedures can be performed.
    • Dosage of anticoagulant should be reduced if INR is greater than 3.5 (it takes several days for the INR to fall to the desired level; confirmation should be attained by new tests before surgery is completed).
    • Patients having major oral surgery should be managed on an individual basis; in most cases the INR should be below 3.0 at the time of surgery.
    • Amicar rinses, just before surgery and every hour for 6-8 hours, will aid in control of bleeding. Local measures should be instituted to control blood loss after surgery (see Table 25-5).

Identifi cation of patients includes the following:
  • History—Excessive bleeding after minor trauma; spontaneous bleeding from the nose, gingiva, gastrointestinal tract, or urinary tract; recent infection, burns, shock and acidosis, or autoimmune disease; history of cancer most often associated with chronic form of DIC, in which thrombosis rather than bleeding is usually the major clinical problem
  • Examination fi ndings include the following:
    1. Petechiae
    2. Ecchymoses
    3. Spontaneous gingival bleeding; bleeding from nose, ears, etc.
  • Screening laboratory fi ndings include the following:
    1. Acute DIC—Prothrombin time (prolonged), partial thromboplastin time (prolonged), thrombin time (prolonged), PFA-100 (prolonged), platelet count (decreased)
    2. Chronic DIC—Most tests may be normal, but fibrin-split products are present (positive D-Dimer test).
  • Obtain referral and consultation with physician if invasive dental procedures must be performed, and include information on:
    • Acute DIC—Cryoprecipitate, fresh frozen plasma, and platelets
    • Chronic DIC—Anticoagulants such as heparin or vitamin K antagonists
    • Aspirin or aspirin-containing products are prohibited.
    • Local measures are used to control bleeding (see Table 25-5).
    • Antibiotic therapy may be considered to prevent postoperative infection.

Treatment Planning Modifications

• No dental procedures should be performed unless medical consult has been obtained and level of anticoagulation is at an acceptable range; the procedure may have to be delayed by 2 to 3 days if the dosage of anticoagulant has to be reduced.
• Avoid aspirin or aspirin-containing compounds. Use Tylenol for postoperative pain control.
• Depending on the cause of DIC, the treatment plan should be altered in the following ways:
  • Cases of acute DIC—No routine dental care until medical evaluation and correction of cause
  • Cases of chronic DIC—No routine dental care until medical evaluation and correction of cause when possible; if prognosis is poor on the basis of underlying cause (advanced cancer), limited dental care is indicated
  • Avoid aspirin, aspirin-containing compounds, NSAIDS
  • Acetaminophen with or without codeine can be used for postoperative pain
Dental Management: A Summary—cont’d

<table>
<thead>
<tr>
<th>Potential Problems Related to Dental Care</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISORDERS OF PLATELET RELEASE</td>
<td></td>
</tr>
<tr>
<td>Chapter 25</td>
<td></td>
</tr>
</tbody>
</table>
| 1. Excessive bleeding after invasive dental procedures | • Excessive bleeding may occur following surgery.  
  • Petechiae, ecchymoses, and hematomas may be found when other platelet or coagulation disorders are present. |

| PRIMARY FIBRINOGENOLYSIS                   |                     |
| Chapter 25                                |                     |
| 1. Excessive bleeding after invasive dental procedures | • Prolonged bleeding following invasive dental procedures  
  • Jaundice of mucosa  
  • Ecchymoses |

| LOW MOLECULAR WEIGHT HEPARIN THERAPY: ENOXAPARIN (LOVENOX), ARDEPARIN (NORMIFLO), DALTEPARIN (FRAGMIN), NADROPARIN (FRAXIPARINE), REVIPARIN (CLIVARIN), TINZAPARIN (INNOHEP) |                     |
| Chapter 25                                |                     |
| 1. Used in patients who have received prosthetic knee or hip replacement; patient takes medication for approximately 2 weeks after getting out of the hospital | • Gingival bleeding  
  • Petechiae  
  • Ecchymoses  
  • In rare cases, excessive bleeding after dental procedures |
| 2. Complications include the following:   |                     |
|   a. Excessive bleeding                 |                     |
|   b. Anemia                            |                     |
|   c. Fever                             |                     |
|   d. Thrombocytopenia                   |                     |
|   e. Peripheral edema                   |                     |
Prevention of Problems

- Identification of patient should include the following:
  - History—Recent use of aspirin, indomethacin, phenylbutazone, ibuprofen, or sulfinpyrazone; presence of other platelet or coagulation disorders
  - Examination—Often negative unless signs related to other platelet or coagulation disorders are present
  - Screening laboratory tests—PFA-100 (prolonged), partial thromboplastin time (prolonged)
- Most patients on drugs noted above without an additional platelet or coagulation problem will not bleed excessively following surgery.
- Patients with prolonged PFA-100 and/or partial thromboplastin time should be referred for evaluation prior to performance of any surgical procedures.
- Elective surgery can be performed after withdrawal of drug for at least 3 days and management of other platelet or coagulation disorders by appropriate means.

Treatment Planning Modifications

- Usually, no modifications are indicated for patients who have no other platelet or coagulation disorders.

Identification of patients should include the following:
- History—Liver disease, cancer of lung, cancer of prostate, and heatstroke may cause this condition.
- Examination findings to consider:
  1. Jaundice
  2. Spider angiomas
  3. Ecchymoses
  4. Hematomas
- Screening laboratory tests
  1. Platelet count (often normal)
  2. Prothrombin time (prolonged)
  3. PFA-100 (usually normal)
  4. Partial thromboplastin time (prolonged)
  5. Thrombin time (prolonged)
- Consultation and referral prior to any invasive dental procedure; epsilon-aminocaproic acid therapy will inhibit plasmin and plasmin activators.

Patients with advanced cancer should have treatment limited to emergency dental procedures and preventive measures; complex dental restorations in general are not indicated; in other patients, once preparation to avoid excessive bleeding has occurred (epsilon-aminocaproic acid), most dental treatment can be rendered.

Delay procedure until patient is off the medication.
- Have physician stop medication and perform surgery the next day; once hemostasis is obtained, have the physician resume medication.
- Perform surgery, and manage any excessive bleeding through local means (preferred if excessive bleeding is not anticipated).

Usually none needed.
### Potential Problems Related to Dental Care

**Oral Manifestations**

<table>
<thead>
<tr>
<th>Chapter 25</th>
<th><strong>ANTIPLATELET DRUG THERAPY: ASPIRIN, ASPIRIN PLUS DIPYRIDAMOLE (AGGRENOX), IBUPROFEN (ADVIL, MOTRIN)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Used for prevention of initial or recurrent myocardial infarction and stroke prevention</td>
<td></td>
</tr>
<tr>
<td>2. Complications include:</td>
<td></td>
</tr>
<tr>
<td>a. Excessive bleeding</td>
<td></td>
</tr>
<tr>
<td>b. Gastrointestinal bleeding</td>
<td></td>
</tr>
<tr>
<td>c. Tinnitus</td>
<td></td>
</tr>
<tr>
<td>d. Bronchospasm</td>
<td></td>
</tr>
<tr>
<td>• Gingival bleeding</td>
<td></td>
</tr>
<tr>
<td>• Petechiae</td>
<td></td>
</tr>
<tr>
<td>• Ecchymoses</td>
<td></td>
</tr>
<tr>
<td>• In rare cases, excessive bleeding following dental procedures</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 25</th>
<th><strong>FIBRINOGEN RECEPTOR THERAPY (GLYCOPROTEIN [GP] IIB/IIIA INHIBITORS: CLOPIDOGREL [PLAVIX], TICLOPIDINE [TICLID])</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Used for prevention of recurrent myocardial infarction and stroke</td>
<td></td>
</tr>
<tr>
<td>2. Complications include:</td>
<td></td>
</tr>
<tr>
<td>a. Excessive bleeding</td>
<td></td>
</tr>
<tr>
<td>b. Gastrointestinal bleeding</td>
<td></td>
</tr>
<tr>
<td>c. Neutropenia</td>
<td></td>
</tr>
<tr>
<td>d. Thrombocytopenia</td>
<td></td>
</tr>
<tr>
<td>• Gingival bleeding</td>
<td></td>
</tr>
<tr>
<td>• Petechiae</td>
<td></td>
</tr>
<tr>
<td>• Ecchymoses</td>
<td></td>
</tr>
<tr>
<td>• In rare cases, excessive bleeding following dental procedures</td>
<td></td>
</tr>
<tr>
<td>• Adverse reactions increase risk for infection (neutropenia) and bleeding (thrombocytopenia).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 26</th>
<th><strong>RADIATION-TREATED PATIENTS (RADIATION TO HEAD AND NECK)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patients treated by radiation tend to develop the following problems during and just after completion of therapy:</td>
<td></td>
</tr>
<tr>
<td>a. Mucositis</td>
<td></td>
</tr>
<tr>
<td>b. Xerostomia</td>
<td></td>
</tr>
<tr>
<td>c. Loss of taste</td>
<td></td>
</tr>
<tr>
<td>d. Constrictures of muscles (trismus)</td>
<td></td>
</tr>
<tr>
<td>e. Secondary infections—Viral, bacterial, fungal (candidiasis)</td>
<td></td>
</tr>
<tr>
<td>f. Tooth sensitivity</td>
<td></td>
</tr>
<tr>
<td>2. Chronic problems caused by radiation therapy include the following:</td>
<td></td>
</tr>
<tr>
<td>a. Xerostomia</td>
<td></td>
</tr>
<tr>
<td>b. Cervical caries</td>
<td></td>
</tr>
<tr>
<td>c. Osteonecrosis</td>
<td></td>
</tr>
<tr>
<td>d. Muscle trismus</td>
<td></td>
</tr>
<tr>
<td>e. Tooth sensitivity</td>
<td></td>
</tr>
<tr>
<td>f. Loss of taste</td>
<td></td>
</tr>
<tr>
<td>• Mucositis</td>
<td></td>
</tr>
<tr>
<td>• Candidiasis</td>
<td></td>
</tr>
<tr>
<td>• Xerostomia</td>
<td></td>
</tr>
<tr>
<td>• Loss of taste</td>
<td></td>
</tr>
<tr>
<td>• Trismus</td>
<td></td>
</tr>
<tr>
<td>• Sensitivity of teeth</td>
<td></td>
</tr>
<tr>
<td>• Cervical caries</td>
<td></td>
</tr>
<tr>
<td>• Osteonecrosis</td>
<td></td>
</tr>
</tbody>
</table>
**Prevention of Problems**

- If no other complications occur, dental procedures and surgery can usually be performed.
- Screening with PFA-100 can be done, and, if less than 175 seconds, most surgeries can be performed.

**Treatment Planning Modifications**

- Usually none needed unless these are other medical problems, such as recent MI or stroke.
- If no other complications occur, dental procedures and surgery may be performed.
- Usually none needed unless these are other medical problems such as recent MI or stroke.

**Before radiation therapy is started, the dentist should be involved; after a complete examination, the following procedures should be done:**
- Extract teeth that cannot be repaired.
- Extract teeth with advanced periodontal disease.
- Perform preprosthetic surgery.
- Restore large carious lesions.
- Perform surgeries with adequate time for healing, or consider hyperbaric oxygen therapy.
- Establish good oral hygiene.
- Start daily fluoride treatment with the use of a flexible tray and gel.
- Start sialogogue (pilocarpine HCl) therapy.
- Treat endodontically, or extract nonvital teeth.
- Treat chronic infection in jaw bones.

**During radiation treatment, the dentist can be involved with the following:**
- Symptomatic treatment of mucositis (see Appendix C)
- Management of xerostomia (see Appendix C)
- Prevention of trismus by having the patient use (several) tongue blades in the mouth as daily exercise
- Chlorhexidine rinses for plaque and candidiasis control (see Appendix C)
- Diagnosis and treatment of secondary infection—Candidiasis, etc. (see Appendix C)
- Continue daily fluoride treatment.

**Following radiation treatment, the dentist should ensure the following:**
- Have patient back for frequent recall appointments (every 3 to 4 months).
- Continue emphasis on good oral hygiene.
- Treat carious lesions when first detected.
- Make every effort to avoid oral infection.
- Manage xerostomia (see Appendix C).
- Manage chronic loss of taste (see Appendix C).

**Once radiation treatment has been completed and more than 6000 cGy used, every effort must be made to avoid osteonecrosis:**
- Teeth should not be extracted.
- Diseased teeth should be endodontically treated, if indicated.
- Aggressive preventive measures are needed to prevent periodontal disease and cervical caries.
- Most dental procedures other than extractions and surgical procedures can be done if performed atraumatically and without vascular compromise.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>PATIENTS RECEIVING CHEMOTHERAPY FOR CANCER</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 26</td>
<td></td>
</tr>
<tr>
<td>1. Excessive bleeding because of bone marrow suppression (thrombocytopenia)</td>
<td>Mucositis</td>
</tr>
<tr>
<td>2. Prone to infection because of bone marrow suppression (leukopenia)</td>
<td>Excessive bleeding following minor trauma</td>
</tr>
<tr>
<td>3. Severe anemia from bone marrow suppression</td>
<td>Spontaneous gingival bleeding</td>
</tr>
<tr>
<td>4. Thrombocytopenia, leukopenia, and anemia are possible complications of underlying cancer.</td>
<td>Xerostomia</td>
</tr>
<tr>
<td></td>
<td>Infection</td>
</tr>
<tr>
<td></td>
<td>Poor healing</td>
</tr>
</tbody>
</table>
Prevention of Problems | Treatment Planning Modifications

• Before starting chemotherapy, the dentist should:
  • Eliminate gross infection in the following areas:
    • Periapical
    • Periodontal
    • Soft tissue
  • Treat advanced carious lesions.
  • Tooth edges are smooth and not sharp.
  • Remove appliances.
  • Provide oral hygiene instructions.
  • Ensure that in children and young adults, the following occur:
    • Mobile primary teeth are removed.
    • Gingival operculum is removed.
    • Adequate time is allowed for healing before induction.

• During chemotherapy, the dentist should:
  • Consult with oncologist prior to any invasive dental procedures.
  • Perform the following if invasive procedures are required:
    1. Consider antibiotic prophylaxis if granulocyte count is less than 2000/mm³ or absolute neutrophil count is less than 500/mm³.
    2. Consider platelet replacement if platelet count is less than 50,000/mm³.
  • Perform culture and antibiotic sensitivity testing of exudate from areas of infection.
  • Control spontaneous bleeding with gauze, periodontal packing, and soft mouth guard.
  • Use topical fluoride for caries control.
  • Apply chlorhexidine rinses for plaque and candidiasis control (see Appendix C).
  • Provide symptomatic relief of mucositis and xerostomia (see Appendix C).
  • Be aware of and take precautions for bisphosphonate-induced osteonecrosis.
  • If severe anemia is present, avoid general anesthesia.
  • Consider modifying home care instructions on the basis of oral status, reduce or stop flossing and brushing if excessive bleeding or tissue irritation results; damp gauze can be used to wipe the gingiva and teeth; solution of water and baking soda can be used to rinse the mouth to clean ulcerated tissues.
  • Minimize food aversion during chemotherapy—Fast before treatment (4 hours), eat novel nonimportant food just before treatment, and avoid nutritionally important foods during posttreatment nausea.
  • Following completion of chemotherapy:
    • Monitor patient until all adverse effects of therapy have cleared.
    • Place patient on dental recall program.
    • Antibiotic prophylaxis is not indicated for these patients on the basis of available evidence; however, need should be decided on an individual patient basis following medical consultation.
    • Be aware of and take precautions for bisphosphonate-induced osteonecrosis.

• Perform only emergency dental treatment during chemotherapy.
• On the basis of the prognosis of underlying disease, consider limiting dental treatment to only immediate care needs for patients who are being treated in a palliative sense; however, children and adults who are being treated for leukemia may have a very good prognosis, and any indicated dental treatment may be performed; also, many patients with lymphoma may have a good prognosis.
### Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>SEIZURE DISORDER (Epilepsy)</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 27</td>
<td></td>
</tr>
<tr>
<td>1. Occurrence of generalized tonic-clonic seizure in dental office</td>
<td>• Gingival overgrowth caused by phenytoin (Dilantin)</td>
</tr>
<tr>
<td>2. Drug-induced leukopenia and thrombocytopenia (phenytoin, carbamazepine, valproic acid)</td>
<td>• Traumatic oral injuries</td>
</tr>
<tr>
<td>3. Drug-induced gingival overgrowth that affects periodontal health.</td>
<td>• Drug-induced erythema multiforme</td>
</tr>
</tbody>
</table>

**STROKE**

*Chapter 27*

1. Dental treatment could precipitate or coincide with a stroke.
2. Bleeding is caused by drug therapy used to prevent clots.
   * May have unilateral atrophy and one-sided neglect

**PARKINSON'S DISEASE**

*Chapter 27*

1. Patient may be unable to perform oral hygiene procedures.
2. Patient may have a tremor or may be unable to cooperate during dental treatment.
   * Excess salivation and drooling
   * Muscle rigidity and repetitive muscle movements contribute to poor oral hygiene
   * Antiparkinsonian drugs may cause xerostomia, nausea, and tardive dyskinesia
### Prevention of Problems

- Identify epileptic patient by history, including:
  - Type of seizure
  - Age at time of onset
  - Cause of seizures
  - Medications
  - Regularity of physician visits
  - Degree of control
  - Frequency of seizures, last seizure
  - Precipitating factors
  - History of seizure-related injuries

- Well controlled—Normal care provided
- Poorly controlled—Consultation with physician; medication change may be required
- Awareness of adverse effects of anticonvulsants
- Patients taking valproic acid—perform PFA-100 test; avoid aspirin and NSAIDs
- Avoid propoxyphene and erythromycin in patients taking carbamazepine
- Seizure managed with the use of a ligated mouth prop at beginning of the appointment

### Treatment Planning Modifications

- Maintenance of optimal oral hygiene
- Surgical reduction of gingival hyperplasia, if indicated
- Replacement of missing teeth with fixed prosthesis as opposed to removable
- Metal prosthodontic devices used instead of porcelain when possible
- Protect patient during a seizure, manage airway, and discontinue treatment afterward.

- Identify stroke-prone patient from history (hypertension, congestive heart failure, diabetes, transient ischemic attacks, age >75 years, etc.).
- Reduce patient’s risk factors for stroke (smoking, elevated cholesterol, hypertension).
- For past history of stroke:
  - For current transient ischemic attacks—No elective care
  - Delay elective care for 6 months.
- Drug considerations include the following:
  1. Aspirin and dipyridamole—Order pretreatment PFA-100; if grossly abnormal, consult with physician.
  2. Warfarin (Coumadin)—Order INR; should be 3.5 or less before invasive procedures are performed.
- Consider periodic panoramic film to assess carotid patency.
- Plan is dependent on physical impairment.
- All restorations should be made easily cleansable—Porcelain occlusals should be prevented.
- Modified oral hygiene aids may be needed.

- Sedation may be required to overcome muscle rigidity.

- Provide frequent dental recall and specialized toothbrushes (e.g., Collis curve toothbrush, mechanical brushes) to maintain adequate oral hygiene.
- Salivary substitutes and topical fluoride are beneficial.
- Personal care providers should be educated about their role in assisting and maintaining the oral hygiene of these patients (also applies to stroke victims).

---

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
Potential Problems Related to Dental Care | Oral Manifestations
--- | ---
**ANXIETY**
Chapter 28
1. Extreme apprehension
2. Avoidance of dental care
3. Elevation of blood pressure
4. Precipitation of arrhythmia
5. Adverse effects and drug interactions with agents used in dentistry
• Usually none
• Oral lesions associated with adverse effects of medications

EATING DISORDER: ANOREXIA NERVOSA AND BULIMIA NERVOSA
Chapter 28
1. Patients with anorexia are in a state of self-starvation (severe weight loss) and may be subject to hypotension, bradycardia, severe arrhythmia, and death.
2. Bulimic patients are at risk for serum electrolyte disturbances, esophageal or gastric rupture, cardiac arrhythmia, and death.
3. Patients with bulimia may induce vomiting through the use of physical means (finger in throat) or the use of ipecac (may cause myopathy or cardiomyopathy); laxatives and diuretics also are used by bulimics to purge.
4. Some patients may show signs and symptoms of both anorexia and bulimia.
• In bulimia, the following may be noted:
  • Dental erosion of the lingual surfaces of teeth (usually maxillary teeth)
  • Patients with poor oral hygiene may have increased risk for caries and periodontal disease.
  • Extensive dental caries (associated with diet—Lots of carbohydrates)
  • Tooth sensitivity to thermal changes
• In anorexia, the following may be noted:
  • Usually, no oral findings
  • Patients with poor oral hygiene may have increased risk for caries and periodontal disease.

DELIRIUM
Chapter 28
1. Consists of an acute disorder of attention and cognitive function
2. Inability of patient to interact and follow directions
3. A number of problems associated with underlying cause(s):
   a. Cardiovascular—Heart failure, myocardial infarction, embolism
   b. Endocrine—Diabetes, hypothyroidism, hyperthyroidism
   c. Gastrointestinal disorders—Hepatic failure, pancreatitis
   d. Intoxications—Alcohol, prescribed drugs, illicit drugs
   e. Neurologic disorders—Tumors, meningitis, encephalitis
4. Refer to specific disorder in summary table for details.
• No specific oral manifestations
• Oral manifestations may be found on the basis of cause(s) of delirium in specific patient.
• Refer to specific disorder in summary table for listing of oral changes.
Prevention of Problems

- Behavioral aspects—The dentist should do the following:
  - Provide effective communication (be open and honest).
  - Explain what is going to happen.
  - Make procedures as “pain free” as possible.
  - Encourage patient to ask questions at any time.
  - Use relaxation techniques such as hypnosis, music, etc.
- Pharmacologic aspects—The dentist should provide the following as indicated:
  - Oral sedation—Alprazolam, diazepam, triazolam
  - Inhalation sedation—Nitrous oxide
  - Intramuscular sedation—Midazolam, meperidine
  - Intravenous sedation—Diazepam, midazolam, fentanyl
  - Analgesics for pain control—Salicylates, NSAIDs, acetaminophen, codeine, oxycodone, fentanyl
  - Adjunctive medications—Antidepressants, muscle relaxants, steroids, anticonvulsants, antibiotics

- Avoid elective dental procedures until the patient is stable from a cardiac standpoint.
- In general, for both anorexic and bulimic patients, the emphasis should be on oral hygiene maintenance and noncomplex repair, until significant improvement of their condition has occurred from a medical standpoint.
- Complex restorative procedures should be avoided in bulimic patients until the purging has been corrected. However, crowns may have to be placed to stabilize a tooth or to protect it from thermal symptoms in patients who are still actively purging.

- Postpone complex dental procedures until patient is more comfortable in the dental environment.
- It is important to develop trust and establish communication with patients with posttraumatic stress disorder.
- May need to refer for diagnosis and treatment patients with panic attack or phobic symptoms related to dentistry.

- Intravenous sedation—Diazepam, midazolam, fentanyl
- Analgesics for pain control—Salicylates, NSAIDs, acetaminophen, codeine, oxycodone, fentanyl
- Adjunctive medications—Antidepressants, muscle relaxants, steroids, anticonvulsants, antibiotics

- Postpone complex dental procedures until patient is more comfortable in the dental environment.
- It is important to develop trust and establish communication with patients with posttraumatic stress disorder.
- May need to refer for diagnosis and treatment patients with panic attack or phobic symptoms related to dentistry.

- Elective dental treatment is usually not indicated for patients with delirium.
- Once the cause(s) of delirium has been identified and managed, the patient can receive routine dental treatment.
- Management will have to involve underlying causes such as heart failure, myocardial infarction, diabetes, etc.
- Emergency dental treatment during the acute phase of delirium
- Once the acute phase has been managed, the treatment plan may be influenced by the underlying disorder(s).
Potential Problems Related to Dental Care

**ANXIOLYTIC DRUGS** (anxiety control): Benzodiazepines, Librium (chlordiazepoxide), Valium (diazepam), Ativan (Lorazepam), Serax (oxazepam), Xanax (alprazolam)

Chapter 28

1. Drug adverse effects include the following:
   a. Daytime sedation
   b. Aggressive behavior
   c. Amnesia (older adults)

2. Drug interactions (central nervous system [CNS] depression):
   a. Antipsychotic agents
   b. Antidepressants
   c. Narcotics
   d. Sedative agents
   e. Antihistamines
   f. H2 histamine receptor blockers

**DEPRESSION AND BIPOLAR DISORDERS**

Chapter 29

1. Little or no interest in oral health
2. Factors increasing risk of suicide:
   a. Age—Adolescent and elderly at greatest risk
   b. Chronic illness, alcoholism, drug abuse, and depression
   c. Recent diagnosis of serious condition such as AIDS and cancer
   d. Previous suicide attempts
   e. Recent psychiatric hospitalization
   f. Loss of a loved one
   g. Living alone or little social contact
3. Taking medications that have significant adverse effects and that may interact with agents used by the dentist

**SCHIZOPHRENIA**

Chapter 29

1. Patient may be difficult to communicate with and uncooperative during dental care.
2. Significant drug adverse effects are common, and agents used by the dentist may interact with medications the patient is taking [see section below regarding antipsychotic (neuroleptic) drugs].

**ANTIDEPRESSANT DRUGS**

Chapter 29

1. Drug adverse effects include the following:
   a. Xerostomia
   b. Hypotension
   c. Orthostatic hypotension
   d. Arrhythmia
   e. Nausea and vomiting
   f. Leukopenia, anemia, thrombocytopenia, agranulocytosis
   g. Mania, seizures
   h. Hypertension (venlafaxine)
   i. Loss of libido
2. Drug interactions (CAVEAT: Do not mix the different classes of antidepressant drugs.) include the following:
   a. Epinephrine
      - Hypertensive crisis
      - Myocardial infarction

**Oral Manifestations**

- Usually no significant oral findings
- Depression—Poor oral hygiene and xerostomia associated with agents used to treat depression increase risks for caries and periodontal disease; facial pain syndromes and glossodynia
- Manic disorder—Injury to soft tissue and abrasion of teeth from overflossing and overbrushing
- Oral lesions associated with the adverse effects of medications used to treat depression and mania
- Usually none
- Oral lesions may be self-inflicted or may develop as adverse effects of medications used to treat the patient (see section below on antipsychotic drugs).
- Usually, no significant oral findings associated with medications, unless the following drug adverse effects are present:
  - Xerostomia—Increases risk for caries, periodontal disease, and mucositis
  - Leukopenia—Infection
  - Thrombocytopenia—Bleeding
• Advise patient not to drive when using these medications.
• Use reduced dosage in older adults.
• Do not dispense or reduce dosage for patients on other CNS depressant drugs.
• Use in reduced dosage in patients taking:
  • Cimetidine
  • Ranitidine
  • Erythromycin
• Do not dispense to patients with narrow angle glaucoma.

• If patients appear very depressed:
  • Ask if they have thoughts of suicide:
    1. Do they have a plan?
    2. Do they have the means to carry out their plan?
  • Immediately refer patient who is suicidal for medical intervention.
  • If possible, involve family member or relative.
  • Obtain good history, including medications (prescription, herbal, over-the-counter), and avoid using agents that may have significant interactions (see Table 29-6).
  • If history and examination findings suggest presence of significant drug adverse effects, refer patients to their physician.

• Have family member or attendant accompany the patient.
• Schedule morning appointments.
• Avoid confrontational and authoritative attitudes.
• Perform elective dental care only if patient is under good medical management.
• Consider sedation with diazepam or oxazepam.

• When using sedative agents, narcotics or antihistamines, reduce dosage or do not use these agents.
• All dental procedures can be provided to patients on these medications.
• Use anxiolytic drugs in dentistry for short durations to avoid tolerance and dependency.

• Patients often have little interest in dental health or home care procedures, and poor dental repair is common.
• Emphasis should be on maintaining the best possible oral health during depressive episodes.
• Dental treatment should be directed toward immediate needs with elective and complex procedures put off until effective medical management of depression and mania is obtained.

• Emphasis is on maintaining oral health and comfort by preventing and controlling dental disease.
• Family member or attendant may have to assist patient with home care procedures.
• Complex dental procedures are usually not indicated.

• Avoid elective dental procedures until depression has been managed by medication or behavioral means.
• Local anesthetic:
  • Use without vasoconstrictor for most dental procedures.
  • For surgical or complex restorative procedures:
    1. Epinephrine is the vasoconstrictor of choice.
    2. Use 1:100,000 concentration of epinephrine.
    3. Aspirate before injecting.
    4. In general, do not use more than two cartridges.
  • Do not use topical epinephrine to control bleeding or in retraction cord.
  • Provide treatment to deal with xerostomia (see Appendix C).

• Identify by medical and drug history patients who are taking any of these medications.
• Identify patients with significant drug adverse effects:
  • History
  • Examination—Blood pressure, pulse rate, bleeding, soft tissue lesions, infection
• Refer patients with significant drug adverse effects.
• Consult with patient’s physician to confirm current status and medications.
• Minimize effects of orthostatic hypotension:
  • Change chair position slowly.
  • Support patients as they get out of the dental chair.
  • Avoid atropine in patients with glaucoma.
  • Use epinephrine with caution and only in small concentrations.

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
Potential Problems Related to Dental Care

Oral Manifestations

<table>
<thead>
<tr>
<th>ANTIDEPRESSANT DRUGS (cont’d)</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Sedative, hypnotics, narcotics, and barbiturates may cause respiratory depression.</td>
<td>Lithium (metallic taste)</td>
</tr>
<tr>
<td>c. Atropine: Increase intraocular pressure.</td>
<td>Valproic acid and carbamazepine</td>
</tr>
<tr>
<td>d. Warfarin metabolism may be inhibited, thus causing bleeding.</td>
<td>Oral ulcerations</td>
</tr>
<tr>
<td>3. Patients taking monoamine oxidase inhibitors (MOIs) must avoid foods that contain tyramine (may cause severe hypertension).</td>
<td>Bleeding</td>
</tr>
<tr>
<td></td>
<td>Infection</td>
</tr>
<tr>
<td></td>
<td>Tremor of the tongue</td>
</tr>
</tbody>
</table>

ANTIMANIC DRUGS

Chapter 29

1. Lithium
   a. Adverse effects include the following:
      • Nausea, vomiting, diarrhea
      • Metallic taste
      • Hypothyroidism
      • Diabetes insipidus
      • Arrhythmia
      • Sedation
      • Seizures
   b. Drug interactions (toxicity) include the following:
      • NSAIDs
      • Diuretics
      • Erythromycin

2. Valproic acid and carbamazepine
   a. Adverse effects include the following:
      • Nausea, ataxia, blurred vision
      • Tremor
      • Agranulocytosis (infection)
      • Platelet dysfunction (bleeding)
      • Seizures, if abruptly stopped
   b. Drug interactions (toxicity) include the following:
      • Erythromycin
      • Isoniazid
      • Cimetidine

ANTIPSYCHOTIC (Neuroleptic) DRUGS

Chapter 29

1. Drug adverse effects include the following:
   a. Hypotension
   b. Acute dystonia, akathisia
   c. Parkinsonism
   d. Tardive dyskinesia
   e. Xerostomia, dry eyes
   f. Dizziness, postural hypotension
   g. Sexual dysfunction
   h. Seizures
   i. Neuroleptic malignant syndrome
   j. Agranulocytosis
2. Drug interactions include the following:
   a. Prolong or intensify the actions of the following:
      • Alcohol
      • Sedatives, hypnotics, opioids, antihistamines
      • Anesthetics (general)
   b. Antiarrhythmics—Increase risk of arrhythmia
   c. Anticonvulsants—Reduce effects of neuroleptic drugs
   d. Antihypertensives—Increase risk of hypotension
   e. Erythromycin—Increase serum level of neuroleptic drugs
   f. Sympathomimetics (epinephrine)—Risk for hypotension

No significant oral findings are associated with these medications, unless the following drug adverse effects are present:

- Agranulocytosis—Ulceration, infection
- Xerostomia—Mucositis, caries, periodontal disease
- Leukopenia—Infection
- Thrombocytopenia—Bleeding
- Tardive dyskinesia—Uncontrolled movement of the lips and tongue
### Prevention of Problems

- Look up specific medication the patient is taking to explore significant adverse effects associated with the drug and possible drug interactions with agents used in dentistry.

- Identify by medical and drug histories that patients are taking these medications.
- Refer to physician when significant drug adverse effects occur.
- Avoid the use of NSAIDs and erythromycin, or use in reduced dosage in patients on lithium.
- Avoid the use of erythromycin, or use in reduced dosage in patients who are taking valproic acid or carbamazepine.
- No special modifications are needed in the treatment plan of patients whose condition is well controlled with lithium or anticonvulsant drugs.
- Patients with signs or symptoms of lithium toxicity should be referred to their physician for evaluation.
- NSAIDs should be avoided or used in reduced dosage for pain control in patients who are taking lithium, to prevent lithium toxicity.
- Erythromycin should not be used for infection because lithium toxicity may result.
- Patients on the anticonvulsant drugs (valproic acid or carbamazepine) who develop oral ulcerations, infection, or bleeding should be referred for medical evaluation.
- Erythromycin should be avoided in patients who are taking valproic acid or carbamazepine.

### Treatment Planning Modifications

- Patients with tardive dyskinesia may be difficult to manage; if this adverse effect has just started, refer patients to their physician for evaluation and possible change in medication.
DM-60  DENTAL MANAGEMENT OF THE MEDICALLY COMPROMISED PATIENT

Dental Management: A Summary—cont’d

Potential Problems Related to Dental Care

<table>
<thead>
<tr>
<th>SOMATOFORM DISORDERS—CONVERSION DISORDER, PAIN DISORDER, FACTITIOUS DISORDER AND OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 29</td>
</tr>
</tbody>
</table>

1. Somatoform disorders:
   a. Isolated symptoms with no physical cause that do not conform to known anatomic pathways
   b. Psychological factors involved in the origin
   c. May serve as a defense to reduce anxiety (primary gain)
   d. Secondary gain reason for not working, attention from family
   e. When these patients are followed over time, in 10% to 50%, a physical disease process will become apparent.

2. Factitious disorders:
   a. Intentional production of physical or psychological signs
   b. Voluntary production of symptoms without external incentive
   c. More often seen in men and health care workers

SUBSTANCE ABUSE

Chapter 29

1. Dilated pupils, elevated blood pressure, and cardiac arrhythmias may indicate recent use.
2. Extreme anxiety and aggressive behavior may also be related to recent use.
3. Stroke is a risk during the “high” with these drugs.
4. Myocardial ischemia may occur, and myocardial infarction is a risk.
5. Cardiac arrhythmias may be severe and life threatening.
6. Vasopressors such as epinephrine and levonordefrin can precipitate hypertensive crisis, myocardial infarction, arrhythmia, or stroke.
7. Patients with rash caused by cocaine use may react to ester-type local anesthetics.
8. If the drugs are abused by injecting the agents, a risk of infection with hepatitis B virus, hepatitis C virus, and HIV is present (examine for needle tracks on the arm, if exposed).
9. Xerostomia, particularly with methamphetamine
10. Gastrointestinal regurgitation, bulimia, or vomiting in methamphetamine abusers
11. High intake of refined carbohydrates and sucrose

OLDER ADULTS: FALLS

Chapter 30

1. Falling in dental reception area or in operatory
2. Patient who is taking multiple medications may be at increased risk for falls.
3. Patient with dementia, musculoskeletal disorders, proprioceptive dysfunction, or peripheral neuropathy also may be at increased risk for falls.
Prevention of Problems | Treatment Planning Modifications
---|---
- Refer patients found to have psychological disorders for diagnosis and management, but stay involved from a dental standpoint.
- Discuss with patient the possible causes of symptoms, and rule out underlying systemic conditions that could account for the symptoms.
- Continue to examine for signs and symptoms that may be related to an underlying systemic or local condition.
- Do not perform dental treatment on the basis of the patient’s symptoms, unless a dental cause can be established.
- Maintain good oral hygiene and dental repair for the patient, but avoid complex dental procedures until somatoform symptoms have been managed.
- Patients may insist that the dentist do something to “cure” the symptom such as extraction or endodontic therapy; the dentist must avoid this.
- A diagnosis of an oral somatoform disorder should not be made until after a thorough search over time has failed to uncover pathologic findings that could explain the symptoms.
- Antidepressants and pain medication may be used to comport the patient.
- Do not treat patients who are “high” on these drugs or who show evidence of recent use.
- Wait at least 6 hours after administration of these drugs before providing any dental treatment. (Cocaine and methamphetamine effects take several hours to wear off.)
- Avoid ester-type local anesthetics in patients who have skin rash associated with cocaine use.
- Use standard infection control procedures for all patients.
- Avoid additive drugs for pain control.
- Monitor blood pressure and pulse rate in these patients during dental procedures when possible.
- Patients found to be abusing these drugs should be encouraged to seek professional help in dealing with their addiction; the dentist can attempt to make an appointment for this purpose.
- If the patient presents with evidence of being “high” on these drugs, the dental appointment must be rescheduled for another day.
- Emphasis should be placed on attempting to improve the patient’s oral hygiene, which in the case of many methamphetamine abusers will be difficult at best until they deal with their addiction.
- Cocaine and methamphetamine abusers may be using other drugs and may try to get prescriptions for strong pain medications or may steal prescription pads or drugs.
- Care must be taken in selection of medications used for sedation and pain control.
- Tolerance may be present for sedative drugs and local anesthetics, requiring increased dosage; this increases the risk for toxic adverse effects.
- The dentist should not prescribe addictive substances for these patients.
- Anxiety control can be provided with the use of propranolol, if needed.
- Pain control can be attained with the use of acetaminophen or NSAIDs.
- Move chair position slowly, aid patient in getting out of the chair, and support patient for the first few steps.
- For patients taking multiple medications whose balance is impaired, the dentist may consult with the physician to see whether the number of medications can be reduced, or if the dosage of any of the drugs can be reduced.
- Plan for short appointments in late morning or early afternoon.
- May have to transfer patient from wheelchair to the dental chair, and then back to the wheelchair.
- Usually none
Potential Problems Related to Dental Care

OLDER ADULTS: POOR EYESIGHT, LOSS OF HEARING, DEMENTIA, OR ADVANCED ILLNESS

Chapter 30

1. Difficult to fill out health and dental history questionnaire
2. Unable to hear questions or directions
3. Difficult to follow directions during dental treatment
4. Unable to sit still during appointments
5. Difficult or impossible to render effective oral hygiene procedures

- Usually none
- Periodontal disease, recurrent caries, mucositis, xerostomia, fractured restorations, infections, and others, depending on the medical illness and medications used to treat it

OLDER ADULTS: ORGAN SYSTEM CHANGES WITH AGING

Chapter 30

1. General—Increase in fat, decrease in body water:
   a. Less initial and more prolonged effects of fat-soluble drugs
   b. Increased effects of water-soluble drugs
2. Immune system—Decrease in numbers of lymphocytes and their response to antigens with increased risk for infection and cancer
3. Musculoskeletal—Decrease in muscle mass and bone density with increased risk for fracture of bones and functional impairment
4. Cardiovascular—Increased risk for syncope, heart failure, and heart block
5. Respiratory—Decreased lung elasticity and increased chest wall stiffness, decreasing ventilation and perfusion and causing a decrease in pO2. May lead to breathing difficulty during some dental procedures
6. Endocrine—Blood glucose increase in response to illness, decreased vitamin D absorption and activation, and decreased T4 clearance. These changes can complicate diabetes, increase risk for osteomalacia and fracture, or cause thyroid dysfunction. Decrease in testosterone levels in males leads to impotency.
7. Nervous system—Brain atrophy, decrease in catechol synthesis, dopaminergic synthesis, and righting reflexes. These changes may result in benign forgetfulness, stiffer gait, and increased body sway (increasing the risk for falls). Impaired thermal regulation, leading to hypothermia
8. Gastrointestinal—Loss of liver mass, which can affect drugs metabolized in the liver; decreased gastric acidity, which can cause decreased absorption of calcium; decreased colonic motility, which can cause constipation

- Usually none, but in severe cases, increased risk of fracture of mandible and loss of masticatory muscle function. Increased incidence of periodontal disease
- Oral complications associated with diabetes, hypothyroidism, liver failure, dementia, and major depression—See respective topics in summary table.

Copyright © 2008 Mosby, Inc., an affiliate of Elsevier Inc. All rights reserved.
### Prevention of Problems

- Have spouse of relative help fill out questionnaire, or take history orally.
- Speak slowly and directly to the patient while increasing the volume of your voice.
- Use nonverbal communication to show what you want the patient to do (pressure on side of head—turn head).
- Schedule short appointments, usually in the late morning.
- Instruct spouse, relative, or care provider on how to provide basic oral hygiene procedures for the patient.

### Treatment Planning Modifications

- None for patients with loss of hearing and poor eyesight who are in good general health.
- Patients with significant dementia or advanced illness are usually not candidates for complex dental procedures; emphasis should be placed on maintaining oral and dental health as well as possible.

- Use lowest effective dosage for fat-soluble drugs and decreased dosage for water-soluble drugs—“Start low and go slow.”
- Avoid oral infection; if it occurs, treat by local and systemic means, and search for early signs of oral cancer.
- Avoid falls in the dental office by escorting older adults to the operatory, changing dental chair position slowly, supporting patients when they are getting out of the dental chair, and escorting patients back to the reception area.
- Do not treat patients with symptomatic congestive heart failure (refer for medical treatment); avoid epinephrine in patients with severe arrhythmia, unstable angina, or recent myocardial infarction.
- Do not use rubber dam or give bilateral mandibular blocks in patients with breathing difficulties. Avoid drugs that will suppress the respiratory center, such as barbiturates and narcotics. Treat patient in upright chair position if breathing difficulty is severe.
- Refer patients with signs and symptoms of diabetes mellitus and hypothyroidism or history of fracture. Patients should ask their physician about possible vitamin D and calcium supplementation.
- Refer to rule out dementia, depression, and Parkinson’s disease; take actions listed above to avoid falls in the dental office.
- Avoid or use lowest effective dose of drugs metabolized by the liver.

- Minimize the use of medications, and use in the lowest possible dosage.
- Changes in body composition seen with advancing age do not affect the selection of treatment options for the older adult, except in cases with extreme loss of muscle mass and bone density. In these cases, certain complex oral surgical procedures or periodontal surgery may not be indicated.
- Complex or elective dental procedures are not indicated for patients with heart failure that is nonresponsive to medical treatment.
- Avoid complex dental procedures for patients with severe pulmonary dysfunction.
- Changes seen in the endocrine system in general will not affect the selection of dental treatment procedures, unless complicated by diabetes, hypothyroidism, or renal failure.
- Changes seen in the nervous system in general will not affect the selection of dental procedures, unless complicated by dementia, major depression, Parkinson’s disease, or severe peripheral neuropathy.
- Changes seen in the gastrointestinal tract usually will not affect the selection of dental procedures, unless complicated by severe liver disease, cancer, or complications of cancer therapy.