

*Operational Guide for School
Oral Health Program*

**Dental Management
of Medically
Compromised Patients**

Dental Management of Medically Compromised Patients 46-54

Definition:

It is the management of patients in whom the dental treatment may need modification according to their medical condition.

Preoperative Management:

1. Good detailed medical history of the patient should be taken and updated during each visit.
2. The medical condition should be mentioned in the consent form.
3. Any problem in previous dental treatment should be reported precisely.
4. Report any previous hospitalization of the patient and the reason for it.
5. Early morning appointments are preferred except in cardiac patients which are preferred to be in late morning.
6. In school oral health program, severe medically compromised patients are treated at the program centers.

In the next few pages we have highlighted the most common medical conditions that may be encountered by the dental staff and their possible management.

Deficiency Anemia

- Anemia is a decrease in the level of circulating hemoglobin below the normal reference range for a patient's age and sex (Appendix J, page 148).
- Deficiency anemia can be caused by lack of iron, vitamin B12 or folate.
- The different deficiencies produce different effects on the erythrocyte. Iron deficiency produces small cells and lack of vitamin B12 or folate results in large erythrocytes.
- Deficiency states are corrected by replacement therapy. Iron deficiency may be due to
 - dietary factors or due to loss of blood. Vitamin B12 deficiency, known as pernicious anemia, is not due to dietary problems but is caused by poor absorption of the vitamin. This is a result of defective intrinsic factor function caused by autoantibody attack. Pernicious anemia is of interest to dentists as it is one of the complications of nitrous oxide abuse.
- The dentist should be aware of the cause and the extent of the patient's anemia.
- Local Anesthesia (LA) is satisfactory for pain control.
- Oral Manifestations: Angular stomatitis, atrophic glossitis, soreness of the tongue.
- Candidosis can be aggravated by anemia and may be the presenting feature.
- Paterson-Kelly (Plummer-Vinson) syndrome of glossitis and dysphagia is uncommon.

Hemolytic Anemia

- Hemolytic anemia can be the result of extrinsic factors (e.g. malaria) or problems with hemoglobin. Included among the conditions that produce defects in hemoglobin are sickle cell disease, the thalassaemias and glucose 6-phosphate dehydrogenase deficiency.
- LA is the safest method for pain control. It is preferred to avoid prilocain which (in over dose) may precipitate methemoglobinemia.
- Drugs that can potentially cause hemolysis such as Aspirin and non steroidal anti- inflammatory drugs (NSAIDs) should be stopped.
- Prophylactic antibiotics (Penicillin V or Clindamycin) should be given for surgical procedures, and infections must be treated vigorously, since the patient may be immunocompromised if the spleen is non-functional

or removed.

- Hepatitis B or C or HIV carriage may be a complication in repeatedly transfused patients.
- Oral manifestations: In sickle cell disease (painful infarcts in the jaws, pulpal symptoms are common in the absence of any obvious dental disease, and hair-on-end appearance on lateral skull x-ray). Thalassaemia major (enlargement of the maxilla caused by bone marrow expansion).

Bleeding Disorders

- Take a family history to determine whether the bleeding disorder is the result of an inherited or an acquired problem.
- Medical report and consultation with the hematologist required (for example patients on anti-coagulant treatment).
- Avoid aspirin and NSAIDs in patient with bleeding tendency (e.g. hemophilia). Avoid erythromycin and ketoconazol in patients taking warfarin. (Inhibit warfarin metabolism).
- Some bleeding parameters can change frequently, therefore laboratory tests are needed within a week or closer to the time of dental treatment.
- Dental procedures should be limited according to the medical condition.
- No surgical procedure, no matter how minor, should be performed on a patient with a bleeding disorder without prior consultation with the patient's hematologist or physician.
- Patients with congenital bleeding disorders should be treated in specialist centers where cooperation between surgeon and hematologist is established.

Cardiac Problems

- Patients should be instructed always to maintain good oral hygiene.
- Effective painless LA is essential, and an aspirating syringe should be used.
- Epinephrine-containing LA should not be given in excessive doses to patient taking beta blockers, which may induce hypertension and cardiovascular complications.
- Citanest is not recommended to be used for cardiac or hypertensive patients.
- Assure the patient. Stress free short, late- morning appointments are recommended.

- Antibiotic prophylaxis is recommended for cardiac patients to prevent infective endocarditis.
- It is given according to the recommendation of the cardiologist in the situations mentioned, from the latest updates given in tables No 20-22 (page No 125-126).
- Flu- like symptoms within 2-4 weeks following procedure may be a sign of bacterial endocarditis, even if prophylaxis was taken.

Diabetes Mellitus(DM)

DM is a complex syndrome characterized by abnormalities in carbohydrate, lipid and protein metabolism that result either from profound or an absolute deficiency of insulin, related to autoimmune destruction of the insulin-producing pancreatic beta cells(Type 1), or from target-tissue resistance to its cellular metabolic effects, related commonly to obesity(Type2)

- A carefully constructed questionnaire can give some indications that a patient could be at risk of being diabetic or be an undiagnosed diabetic, especially type 2.
- The classical symptoms of DM include : polydipsia, polyuria and polyphagia.
- The following findings are also indicative of possible diabetes: recent weight loss, irritability, dry mouth, frequent infections, history of poor wound healing.
- It is recommended that a patient suspected by the dentist to be diabetic, should be referred to a physician for proper evaluation and diagnosis.
- Properly controlled type 1 and type 2 diabetic patients usually can undergo all dental treatments without special precautions.
- The dentist must know the type and dose of insulin as well as any other medications that the patient is taking.
- Consultation with the patient's physician is a must when:
 1. The patient has systemic complications of diabetes such as heart or renal disease.
 2. The patient has difficult to control diabetes or is under high insulin dosage (Check appendix K, page:149).
 3. The patient has an acute oral infection such as periapical or periodontal abscess.
- The main hazard during dental care is hypoglycemia, as dental treatment may disrupt the normal pattern of food intake.

- Blood sugar level (Glucometer) should be checked and controlled.
- Early morning appointments are preferred which will minimize the risk of stress-induced hypoglycemia.
- LA can usually be safely used. The epinephrine level in LA has no significant effect on blood sugar.
- Drugs that can disturb diabetic control (aspirin and steroids) must be avoided.
- Routine dental treatment or short minor surgery under LA can be carried out with no special precautions apart from ensuring that it does not interfere with eating.
- Oral manifestations: have slightly more periodontal diseases, dry mouth, glossitis.
- Orofacial infections should be treated immediately by antibiotics and appropriate incision and drainage if needed.

Epilepsy

- Epilepsy is a term that describes a group of disorders characterized by chronic, recurrent, paroxysmal changes in neurologic function (seizures) that are caused by abnormal electrical activity in the brain. Seizures may either be accompanied by motor manifestations or manifested by sensory, cognitive or emotional changes in neurologic function.
- The first step in the management is identification, which is best accomplished by the medical history (Seizure history: Type, age at onset, cause and medications).
- Make sure patient has taken his medication.
- Schedule patient early morning.
- Epileptics can have good and bad phases and dental treatment should be carried out in a good phase, when attacks are infrequent.
- Poorly controlled patients may require additional anticonvulsant or sedative medications, for these patients a consultation with the physician is advised before dental treatment.
- Mouth prop is to be used during dental treatment.
- Keep equipments as much as possible away from the area of the patient.
- Be alert for any feature that may indicate the start of seizure.
- Aspirin and NSAIDs should not be administered to patients taking valporic acid (medicine used in treatment of epilepsy).

- Propoxyphene (analgesic drug) and erythromycin should not be administered to patients taking carbamazepine.
- Oral Complications: the most significant oral complication is gingival overgrowth associated with phenytoin. The anterior labial surfaces of the maxillary and mandibular gingivae are most commonly and severely affected.

Renal Disease

- Renal disease in children mainly comprises the so-called nephritic syndromes which may
- progress to chronic renal failure (CRF).
- Progression to CRF leads to the need for dialysis and possibly transplantation.
- CRF patients may be taking corticosteroid and other immunosuppression drugs. This can make medical management difficult for these patients.

Potential problems include:

- Impaired drug excretion.
 - Anemia.
 - Bleeding tendencies.
 - Associated anticoagulant therapy.
 - Hypertension.
 - Infections e.g. hepatitis B.
 - Renal osteodystrophy.
- The main concern is the bleeding tendency. Careful hemostasis should be ensured if surgery is necessary.
 - Local anesthesia is safe unless there is severe bleeding tendency.
 - Prophylactic antibiotics are to be prescribed due to immunosuppression.
 - Dental treatment is best carried out on the day after dialysis.
 - Tetracycline should be avoided in chronic renal failure.
 - Aspirin and NSAIDs should be avoided as they affect renal function.
 - Codeine and dyhydrocodeine are favored as analgesics and diazepam may be used.
 - Retarded teeth eruption can be demonstrated in children with renal failure.

- Dry mouth and decreased salivary flow result in calculus accumulation.
- Alter the dosage of drugs eliminated by kidney i.e. penicillin.

Bronchial Asthma

- Bronchial asthma is a generalized airway obstruction which in the early stages is paroxysmal and reversible.
- The obstruction, leading to wheezing, is due to bronchial muscle contraction, mucosa swelling and increased mucus production.
- Exposure to allergens and/or stress can induce an attack. It is now accepted fact that inflammation is an important etiological factor in asthma and this has resulted in the use of anti-inflammatory medication in the management of the condition.
- Infrequent attacks of asthma can be managed by salbutamol (ventolin) inhalers or can be used prophylactically if an attack is predicted. e.g. before exercise or prior to a stressful event such as dental treatment.
- If the attacks are more frequent, the salbutamol should be used regularly.
- If this is insufficient, inhaled steroids (or cromoglycate in the young) should be used.
- In severe cases systemic steroids may be prescribed.

Dental Management for Patients with Bronchial Asthma

- Avoid anxiety which may precipitate an asthmatic attack.
- Patients are advised to bring their regular medication with them.
- Elective dental care should be deferred in severe asthmatics until they are in a better phase.
- Patient should not be treated during sickness e.g. flu-like symptoms.
- Allergy to penicillin may be more frequent.
- Epinephrine, erythromycin, clindamycin and azithromycin are contraindicated for patients on theophylline.
- Avoid the use of LA containing vasoconstrictor because some asthmatic patients may react to sulphites present as preservatives in it.
- Aspirin and NSAIDs should be avoided as they are considered asthma precipitating drugs.
- Patients on steroid inhalers are prone to oral and pharyngeal thrush and those on ipratroium bromide may have dry mouth.
- Avoid antihistamines such as promethazine and diphenhydramine

because of their drying effect that can exacerbate the formation of tenacious mucus in acute attack.

Liver Disorders

- Liver disorders are important to the dentist due to a potential bleeding tendency, intolerance to drugs (e.g. general anesthetics, benzodiazepines) and the possibility of underlying infective causes for the liver dysfunction.
- Signs of liver disease include jaundice, spider naevi, leuconychia, finger clubbing, palmar erythema, dupuytren's contracture, sialosis and gynaeconomastia.
- Patients with parenchymal liver disease have impaired hemostasis and can present serious bleeding problems.
- Disorders associated with an early rise in serum levels of conjugated bilirubin can cause dental hypoplasia and greenish discoloration of the teeth.
- LA is safe given in normal doses, but prilocain or articain are preferred to lidocain.
- Severe bleeding can occur after dental extractions in patients with chronic liver disease and hence the clotting status must be tested. The commonest liver function test (LFT) involves the measurement of aspartate transaminase (AST) and alanine transaminase (ALT). ALT may also be raised in cardiac or skeletal muscle damage and is therefore not specific for liver disease.
- The use of any drug in a patient with severe liver disease should be discussed with the patient's physician. Hepatic impairment will lead to failure of metabolism of many drugs that can result in toxicity. In some cases dose reduction is required; other drugs should be avoided completely. The anti-fungal drug miconazole is contra-indicated if there is hepatic impairment and fluconazole requires dose reduction. Erythromycin, metronidazole and tetracyclines should be avoided.
- Antimicrobials such as pencillins, cephalixin and cefazolin can be safely given in normal doses.
- Acetaminophen can be used for analgesia in lower than normal doses.
- Aspirin and NSAIDs should be avoided because of the risk of gastric hemorrhage.

Hepatitis B

- The main problems are: highly infective disease, bleeding tendency and drug sensitivity.
- Pure saliva does not contain HBsAg, but serum via gingival exudates does.
- Blood, plasma or serum can be infectious as little as 0.0000001 ml of HBsAg.
- Dentist should treat the patient within the current regulations for cross infection control.
- Patients with active acute hepatitis B should have dental treatment after complete recovery only, which take about three months after symptomatic recovery.
- Needle stick injury can transmit the virus. An injection of hepatitis B immuno- globulin (HBIG) within 24h of contact may protect from developing hepatitis.
- **Patients who are hepatitis carriers.** If a patient is found to be a hepatitis B carrier, recommendations from the Center for Disease Control for avoiding transmission of infection should be closely followed. In addition, some hepatitis carriers may have chronic active hepatitis, leading to compromised liver function and interfering with hemostasis and drug metabolism. Physician consultation or laboratory screening for liver function is advised.
- **Patients with signs or symptoms of hepatitis.** Any patient having signs or symptoms suggesting hepatitis should be referred to a physician, and should not be treated. If emergency care becomes necessary, it should be provided as for the patient with acute disease.

Oral complications associated with hepatitis:

The only oral complication associated with hepatitis is the potential for abnormal bleeding in cases of significant liver damage.

If surgery is required, it is advisable to:

- Check the prothrombin time. If it is greater than 35, an injection of vitamin K will usually correct the problem. This should be discussed with the patient's physician.
- Monitor the bleeding time to check platelet function. If it is not less than 20 minutes, the patient may require platelet replacement before surgery. This should also be discussed with the patient's physician.

Guideline on Prevention of Infective Endocarditis in Pediatric Dental Patients at Risk₂₄

(Table 20)

Cardiac conditions associated with the highest risk of adverse outcome from endocarditis for which prophylaxis with dental procedures is recommended

1. Prosthetic cardiac valve.
2. Previous infective endocarditis.
3. Congenital heart disease (CHD)*
 - Unrepaired cyanotic CHD, including palliative shunts and conduits
 - Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first six months after the procedure.
 - Repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialization)**
4. Cardiac transplantation recipients who develop cardiac valvulopathy.

*Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of CHD.

** Prophylaxis is recommended because endothelialization of prosthetic material occurs within six months after the procedure.

(Table 21)

Dental Procedures for which Endocarditis Prophylaxis is Recommended

All dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.

The following procedures and events do not need prophylaxis:

- Routine anesthetic injections through non-infected tissue.
- Taking dental radiographs.
- Placement of removable prosthodontic or orthodontic appliances.
- Adjustment of orthodontic appliances, placement of orthodontic brackets.
- Shedding of primary teeth.
- Bleeding from trauma to the lips or oral mucosa.

Antibiotics Prophylaxis Regimens for a Dental Procedure (Table 22)

Situation	Agent	Regimen : Single Dose 30 – 60 Minutes Before Procedure	
		Adults	Children*
Oral	Amoxicillin	2 grams	50 mg/kg
Unable to take oral medication	Ampicillin or	2g: IM or IV	50 mg/kg IM or IV
	Cefazolin or Ceftriaxone	1g: IM or IV	50mg/kg IM or IV
Allergic to penicillins or ampicillin Oral	Cephalexin*# or	2g	50 mg/kg
	Clindamycin or	600 mg	20 mg/kg
	Azithromycin or Clarithromycin	500 mg	15 mg/kg
Allergic to penicillins or ampicillin and unable to take oral medication	Cefazolin or Ceftriaxone#	1g IM or IV	50 mg/kg IM or IV
	or Clindamycin	600 mg IM or IV	20mg/kg IM or IV

IM : Intramuscular

IV : Intravenous

* Or other first or second generation oral cephalosporin in equivalent adult or pediatric dosage.

Cephalosporins should not be used in person with a history of anaphylaxis, angioedema or urticaria with penicillins or ampicillin.