POLICY GUIDE FOR CONSULTATION AND MANAGEMENT OF MEDICALLY COMPLEX PATIENTS

ORAL MEDICINE AND DIAGNOSTIC SCIENCES
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ANTICOAGULANT THERAPY

Patient management and medical consultation should be based on:

1. The disorder for which the anticoagulant is being prescribed
2. The level of anticoagulation (INR level)
3. Anticipated dental procedure and the risk of inducing bleeding

BLEEDING DISORDERS ARE MULTIFACTORIAL AND MAY BE DRUG INDUCED, GENETIC OR ACQUIRED. MEDICAL CONSULTATION IS FREQUENTLY NECESSARY, ESPECIALLY IF THE INR IS GREATER THAN 2.5-3.0.

The INR should be the basis for determining the patient's anticoagulation status. The INR is a standardized prothrombin time (PT) that adjusts for varying sensitivities of the thromboplastins and makes it possible to target the same therapeutic ranges while using different laboratory reagents.

Routine dental and simple surgical procedures may proceed if the INR is 2.5-3.0 or below. No alteration of the patient's anticoagulant medication is necessary.

Medical consultation and adjustment of the patient's anticoagulant therapy is necessary if the INR is greater than 2.5-3.0.

Liver Disease may increase the INR because of the vitamin K dependant coagulation factors

Medications that increase INR;	Medications that do not increase INR but may prolong bleeding:
1. Alcohol	1. Aspirin
2. Nonsteroidal anti-inflammatory drugs	2. Coumadin (Warfarin)
3. Ticlid (ticlopidine)	3. Dipyridimole (Persantine)
4. Plavix (clopidogrel)	

IF THE INR IS GREATER THAN 2.5 OR IF THE PATIENT REPORTS EASILY BRUISING, NOSE BLEEDS OR PROLONGED BLEEDING AFTER MINOR INJURY, CONSULTATION WITH THE PATIENT'S PHYSICIAN IS MANDATORY FOR ANY DENTAL PROCEDURE LIKELY TO INDUCE BLEEDING:

RECENT LITERATURE CLEARLY STATES THAT PLAVIX SHOULD NEVER BE DISCONTINUED ESPECIALLY IF THE PATIENT IS TAKING PLAVIX AND ASPIRIN FOR CORONARY ARTERY STENTS. IT MUST BE UNDERSTOOD THAT ANY TIME AN ANTICOAGULANT MEDICATION IS DISCONTINUED, THE PATIENT BECOMES AT RISK FOR THROMBOEMBOLIC DISEASE SUCH AT STROKE OR MYOCARDIAL INFARCTION. IF AT ALL POSSIBLE, DISCONTINUANCE OF ANTICOAGULANT MEDICATIONS SHOULD BE AVOIDED.

ANTICOAGULANT MEDICATIONS SHOULD NEVER BE DISCONTINUED WITHOUT THE TREATING PHYSICIANS EXPRESS CONSENT

1. The physician will likely discontinue an anticoagulant medication such as coumadin or aspirin three days (72 hours) prior to the dental procedure.
2. The dental or surgical procedure can then be performed taking great care to control bleeding by local means
3. Aspirin and NSAID's should be avoided post-operatively
4. The physician will usually advise the patient to return to their previous anticoagulant dose immediately following the dental procedure.

References:

1. Aframian DJ, Lalla RV, Peterson DE. Management of dental patients taking common hemostasis-altering medications. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008; 103(Suppl):45-49.
2. Brennan MT, Wynn RL, Miller CS. Aspirin and bleeding in dentistry: an update and recommendations. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008; 104(3):316-23.
3. Grines CL, Bonow RO, Casey DE, Gardner TJ, Lockhart PB, Moliterno DJ, O'Gara P, Whitlow P. Prevention of premature discontinuation of dual antiplatelet therapy in patients with coronary artery stents. J Am Dent Assoc 2007; 138(5):652-5.
4. Yepes JF, Sullivan JA, Castellanos AL, Sollecito TP. Hypercoagulability syndromes: what the dentist needs to know. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008; 104(1):3-11.

BISPHOSPHONATE THERAPY AND MANAGEMENT OF BISPHOSPHONATE-ASSOCIATED OSTEONECROSIS (BON)

BON IS DEFINED AS THE PRESENCE OF EXPOSED NECROTIC BONE IN THE ORAL CAVITY IN A PATIENT TAKING A BISPHOSPHONATE AND WITH NO HISTORY OF RADIATION THERAPY OF THE HEAD & NECK.

Patients taking any of the bisphosphonate medications can be at risk for BON.

The most frequently used medications are:

Intravenous: Pamidronate (Aredia), Zoledronate (Zometa, Reclast), Ibandronate (Boniva).

Oral: Alendronate (Fosamax), Risedronate (Actonel), Ibandronate (Boniva).

Patients who usually take bisphosphonates have the following medical conditions:

- Cancer: breast, lung, prostate, multiple myeloma.
- Osteoporosis
- Osteopenia

Medical consultation

1. Is necessary only for patients taking the intravenous medications (cancer patients). These individuals may be receiving other cancer therapies that may alter immunity and resistance against infection and bleeding. Therefore, the consultation is not necessary only due to the fact the patient is on bisphosphonate therapy.

2. Patients on oral bisphosphonates (osteopenia, osteoporosis) may be routinely treated without the need for medical consultation.

Oral Medicine Consultation:

1. Any patient taking a bisphosphonate medication should have a consultation with an oral medicine faculty.
2. Patient will be advised about the risk of BON based on dental care needs
3. The risk for BON is higher for patients taking intravenous medication (up to 11%) than for patients taking oral medication (less than 1%). This risk is more evident when patients have invasive procedures, including:

    - Dental extractions
    - Any type of dental surgery
    - Dental implant placement
    - Patients who wear ill-fitting dentures

Discontinuation of bisphosphonate therapy

1. There is **NO STRONG SCIENTIFIC EVIDENCE** that the discontinuation of bisphosphonate therapy will decrease the risk for BON or improve the healing in patients who have developed BON. This fact is more evident in cancer patients receiving intravenous bisphosphonates.
2. The discontinuation of bisphosphonate therapy may lead to skeletal complications in cancer patients (severe pain and fractures) and in patients with osteoporosis (increased risk of fractures).

THE DISCONTINUATION OF BISPHOSPHONATE THERAPY IS A MEDICAL DECISION AND SHOULD BE DECIDED BY THE PATIENT'S PHYSICIAN ONLY.

THE MANAGEMENT OF PATIENTS WITH BON WILL BE DONE BY ORAL MEDICINE AND ORAL SURGERY FACULTY MEMBERS.

ROUTINE DENTAL CARE CAN BE PROVIDED WITHOUT MAJOR RISKS FOR BON

IN GENERAL, ANY TYPE OF SURGICAL PROCEDURES INCREASES THE RISK IN PATIENTS TAKING INTRAVENOUS MEDICATION LONGER THAN 6 MONTHS AND IN PATIENTS WHO HAVE BEEN ON ORAL BISPHOSPHONATE THERAPY LONGER THAN 3 YEARS

ENDONDONTIC AND PERIODONTAL THERAPY (PROBING, SCALING AND ROOT PLANNING), RESTORATIVE DENTISTRY, AND PROSTHODONTICS CAN BE DONE ROUTINELY

PATIENTS WHO NEED SURGERY OF ANY TYPE WILL RECEIVE COUNSELING FROM ORAL MEDICINE AND/OR ORAL SURGERY FACULTIES AND WILL BE ASKED TO SIGN AN INFORMED CONSENT PRIOR TO THE PROCEDURE

ORAL CTX TESTING PRIOR TO SURGERY IS NOT SUPPORTED BY SCIENTIFIC EVIDENCE AND AT THIS TIME, IT SHOULD NOT BE USED TO JUSTIFY OR DECLINE ANY FORM OF SURGERY

References

1. Migliorati CA, Casiglia J, Epstein J, Jacobson P, Siegel M, Woo S-B. Managing the care of patients with bisphosphonate-associated osteonecrosis: An American Academy of Oral Medicine position paper. JADA 2005; 136:1658-1668, December 2005.
2. American Dental Association Council on Scientific Affairs: Dental management of patients receiving oral bisphosphonate therapy. J American Dental Association 2006;137(8):1144-50. Updated on: J Am Dent Assoc 2008;139;1674-1677
3. Badros A, Terpos E, Katodritou E, et al. Natural history of osteonecrosis of the jaw in patients with multiple myeloma. Journal of Clinical Oncology 2009; 26:5904-5909.

DIABETES MELLITUS

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia that results from defects in insulin secretion, insulin action, or both.

Type 1:

1. 5-10% of cases
2. Usually results from autoimmune destruction of pancreatic ß-cells, but the cause may also be idiopathic
3. ABSOLUTE INSULIN DEFICIENCY
4. Peak incidence during puberty, but can occur at any age
5. Ketoacidosis (breath smells like alcohol)

Type 2:

1. 90-95% of cases
2. RELATIVE INSULIN DEFICIENCY
3. Risk factors increase over the age of 45 years and include genetic predisposition, obesity and sedentary lifestyle
4. High risk ethnic groups include Black Americans, Latinos and Native Americans

DIABETES, BY DEFINITION IS A FASTING PLASMA GLUCOSE GREATER THAN 126 mg/dl (mg%) ON AT LEAST TWO OCCASIONS. FASTING IS DEFINED AS NO CALORIC INTAKE FOR 8 HOURS.

THE PURPOSE OF MEDICAL MANAGEMENT IS TO MAINTAIN TIGHT GLYCEMIC CONTROL. THIS IS THE BASIS OF THE MEDICAL CONSULTATION.

DIABETIC PATIENTS SHOULD BE ASKED WHETHER THEY ATE A MEAL PRIOR TO COMING TO THE DENTAL CLINIC TO PREVENT AGAINST A HYPOGLYCEMIC EPISODE.

THE COMBINATION OF DIABETES AND HYPERTENSION GREATLY INCREASES THE RISK FOR STROKE (CVA)

Medical Consultation:

1. Level of patient control and compliance
2. Medication regimen
3. Target blood glucose maintenance level
4. If a patient is difficult to control or there are oral signs suggestive of poor control, you may request a glycated hemoglobin assessment (HbA1c) that reflects the mean blood glucose levels over the previous 2-3 month period and is used to assess whether a patient's metabolic control has remained within the target range (normal range is less than 7%). The HbA1c is also a predictor for the development of chronic complications in diabetes.

References:

1. Bergman SA. Perioperative management of the diabetic patient. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008; 103(6):731-7.
2. Friedlander AH, Chaudhuri G, Altman L. A past medical history of gestational diabetes: its medical significance and its dental implications. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007;103(2):157-63.
3. Lalla RV, D'Ambrosio JA. Dental management considerations for the patient with diabetes mellitus. J Am Dent Assoc 2001;132(10):1425-32.

EPINEPHRINE

Clinical studies on local anesthetics containing epinephrine have consistently shown negligible influences on blood pressure in hypertensive patients.

Numerous studies in young healthy patients with no known history of cardiovascular disease show that injection of local anesthetic with epinephrine is associated with an increased plasma epinephrine level but no corresponding significant hemodynamic effect.

Epinephrine is included in the anesthetic solution to delay systemic absorption that increases the duration and profoundness of the local anesthesia. The preponderance of data in regard to epinephrine-containing local anesthetics shows that blood pressure and heart rate are minimally affected by the typically low doses and short-term use of the drug in dentistry.

Furthermore, the exogenous epinephrine contained in anesthetic solution may actually help prevent the release of excessive endogenous epinephrine. Less-than-profound anesthesia has been associated with increased release of endogenous epinephrine.

THE BENEFITS OF THE SMALL DOSES OF EPINEPHRINE USED IN DENTISTRY (UP TO 3 CARPULES CONTAINING 0.054 MG OF EPI), WHEN ADMINISTERED PROPERLY, FAR OUTWEIGH THE CARDIOVASCULAR DISADVANTAGES.

PATIENTS WITH STAGE 1, WELL-CONTROLLED HYPERTENSION WHO USE ANTIHYPERTENSIVE MEDICATION TOLERATE REGULAR DOSES OF LOCAL ANESTHETIC CONTAINING EPINEPHRINE.

EPINEPHRINE SHOULD BE USED JUDICIOUSLY [2 CARPULES OR LESS OF ANESTHETIC CONTAINING 1:100,000 EPINEPHRINE 90.036 MG0] IN PATIENTS WITH STAGE 2 HYPERTENSION (BP GREATER THAN 180/1100, IN THOSE PATIENTS WHOSE HYPERTENSION IS UNCONTROLLED, AND IN THOSE PATIENTS WITH SUPRAVENTRICULAR ARRHYTHMIAS (See Hypertension). GINGIVAL RETRACTION CORDS CONTAINING EPINEPHRINE ARE ABSOLUTELY CONTRAINDICATED

EPINEPHRINE IS ABSOLUTELY CONTRAINDICATED IN PATIENTS WITH UNCONTROLLED GRAVES DISEASE (THYROTOXICOSIS), PHEOCHROMOCYTOMA AND IN PATIENTS USING COCAINE

EPINEPHRINE SHOULD BE USED JUDICIOUSLY WITH TRICYCLIC ANTIDEPRESSANTS (AMITRIPTYLINE, IMIPRAMINE, DOXEPIN)

EPINEPHRINE SHOULD BE USED JUDICIOUSLY WITH MONOMAINE OXIDASE INHIBITORS (PARNATE, MARPLAN)

References:

1. Brand HS, Gortzak RA, Palmer-Bouva CC, Abraham RE, Abraham-Inpijn L. Cardiovascular and neuroendocrine responses during acute stress induced by different types of dental treatment. Int Dent J 1995;45:45-8.
2. Davenport RE, Porcelli RJ, Iacono VJ, Bonura CF, Mallis GI, Baur PN. Effects of anesthetics containing epinephrine on catecholamine levels during periodontal surgery. J Periodontol 1990;61:553-8.
3. Montebugnoli L, Servidio D, Miaton RA, Prati C. Heart rate variability: a sensitive parameter for detecting abnormal cardiocirculatory changes during a stressful dental procedure. J Am Dent Assoc 2004;135(12):1718-23.
4. Muzyka BC, Glick M. The hypertensive dental patient. J Am Dent Assoc 1997;128(8):1109-20.

HEPATITIS

Considerations in the management of patients with hepatitis include:

1. There are two types of viral hepatitis carriers, chronic active and chronic persistent. Patients with chronic persistent hepatitis carry the viral antigen but have no ongoing liver disease while chronic active hepatitis patients have ongoing hepatocellular necrosis, elevated liver function tests (LFT's) and are likely to be in declining health.
2. A key issue in managing hepatitis B is the "e" antigen (HBeAg) which, when shedding, makes the carrier ten times as infectious as when they are no longer shedding this antigen. Therefore, dental personnel and patients are most infectious during this period.
3. By convention, patients are considered carriers of hepatitis B or hepatitis C when they have not seroconverted (produced antibodies) after a six-month period.
4. When treating these patients, consider their immune systems, how their disease is managed (interferon, ribaviron, for example), their risk of bleeding and their ability to detoxify drugs (especially narcotics).
5. Alcoholic patients on Antabuse (disulfiram) will react violently to anything containing alcohol including mouth rinses.
6. Patients undergoing drug rehabilitation undergo random urinalysis and drug screening. If narcotic analgesics are to be prescribed, the drug rehabilitation program must be advised in advance.

Medical consultation should request the following information:

1. Liver function tests [ALT (SGPT); AST (SGOT); Alk Phos (drug and alcohol abuse); bilirubin (ability to detoxify medications)]
2. INR and platelet count
3. Hepatitis B [HBsAg; HBcAb; HBeAg; HBsAb]
4. Hepatitis C [HCVAb (exposure); HCV RNA (viral replication)]

References:

1. Gillcrist JA. Hepatitis viruses A, B, C, D, E and G: implications for dental personnel. J Am Dent Assoc 1999;130(4):509-20.
2. Golla K, Epstein JB, Cabay RJ. Liver disease: Current perspectives on medical and dental management. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005; 98(5):516-21.

HIV/AIDS

HIV infection and AIDS has entered its third decade since the first cases of AIDS were reported in 1981. Approximately 1 million individuals in the U.S. have been infected with HIV and 400,000 have died of AIDS. First introduced in 1996, highly active antiretroviral therapies (HAART) have improved the length and quality of life for HIV-infected persons who have access to these expensive medications and are able to adhere to complex drug regimens.

The dentist in the era of AIDS:

1. Provides routine dental care for HIV-infected individuals.
2. Understands the significance of oral lesions associated with HIV disease, and performs evaluations, diagnostics, and institutes treatment.
3. Collaborates with other health care workers and social support systems involved in the overall care of HIV -infected patients.
4. Becomes involved in HIV-related education of other health care workers in the lay community.
5. Acts as a resource to HIV infected colleagues.

MOST U.S. STATES AND TERRITORIES REQUIRE PRE- AND POST-TEST COUNSELING PRIOR TO PERFORMING HIV TESTING. FAILURE TO COUNSEL MAY RESULT IN LEGAL ACTION.

Pertinent HIV tests include (but are not limited to):

1. In order for an individual to be considered HIV positive, two consecutive ELISA tests followed by one Western Blot test must be positive for HIV antibody (HIVAb, anti-HIV).
2. CD4 cell count usually will determine disease stage and thus influence appropriate treatment planning.
3. HIV-1 RNA will provide the viral load for these patients which is essentially a measure of viral replication. The goal of antiretroviral therapy is obtaining and maintaining an undetectable viral load. Viral load will determine the level of viremia, efficacy of antiretroviral therapy, disease progression and prognosis, thus influencing appropriate treatment planning.
4. Platelet count (PLT) should be obtained prior to oral surgery to ensure a PLT level of at least 50,000.
5. INR should be below 2.5 to allow for routine extractions in our dental clinics performed by students. While the literature states that an INR of 3.5-4.0 is acceptable, this is in the context of a procedure performed by an experienced clinician. Therefore, members of the Department of Oral and Maxillofacial Surgery have the prerogative to allow for extractions with an INR above 2.5 on a case-by-case basis.
6. WBC and differential should be obtained prior to oral surgery to determine the need for prophylactic antibiotics. Prophylactic antibiotics need to be considered when the neutrophil count is below 500.

References:

1. Baccaglini L, Atkinson JC, Patton LL, Glick M, Ficarra G, Peterson DE. Management of oral lesions in HIV-positive patients. Oral Surg Oral
2. Clinician's Guide to Treatment of HIV-infected Patients. Patton LL and Glick M, editors, American Academy of Oral Medicine, New York, 3rd edition, Copyright 2001.
3. Epstein JB, Cabay RJ, Glick M. Oral malignancies in HIV disease: changes in disease presentation, increasing understanding of molecular pathogenesis, and current management. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005;100(5):571-8.
4. Glick M, Abel SN, Muzyka BC. Dental complications after treating patients with AIDS. J Am Dent Assoc 1994;125(3):296-301.
5. Patton LL, Shugars DC. Immunologic and viral markers of HIV-1 disease progression: implications for dentistry. J Am Dent Assoc 1999;130(9):1313-22.

HYPERTENSION

Patient management, and medical consultation should be based on:

1. The patient's hypertension stage.
2. History, signs or symptoms of target organ involvement or uncontrolled diabetes mellitus (because of occlusive microvascular pathology).
3. The medical control of the hypertension (stable or labile).
4. The patient's medication regimen.
5. The patient's level of compliance.
6. Whether the patient is under current medical care.

CATEGORY	SYSTOLIC		DIASTOLIC	LIFESTYLE MODIFICATION
Normal	**<120**	**and**	**<80**	**Encourage**
Prehypertension	**120-139**	**or**	**80-89**	**Yes**
Hypertension				
Stage 1	**140-159**	**or**	**90-99**	**Yes**
Stage 2	**≥160**	**or**	**≥100**	**Yes**

TARGET ORGAN INVOLVEMENT:

1. **Cardiovascular (CAD, PVD)**
2. **Cerebrovascular (TIA, CVA)**
3. **Renal (glomerulosclerosis)**
4. **Ocular (retinopathy)**

GUIDELINES:

1. **Physician referrals are suggested for all stages of hypertension in patients who are not currently under medical care or in cases where patient compliance or blood pressure controls are suspect.**
2. **Physician referrals are also recommended for patients in all stages of hypertension with a history of target organ disease or poorly controlled diabetes mellitus in all stages of hypertension..**
3. **Patients with stage 1 hypertension, who are asymptomatic and without any history or signs of target organ disease, routine dental care can be performed.**
4. **In patients with stage 2 hypertension, or in any patient with target organ involvement (regardless of stage), all dental treatment should be limited to emergency care, preferably including the use of antibiotics and oral analgesics until the dentist consults further with the physician.**

References:

1. Little JW. The impact on dentistry of recent advances in the management of hypertension. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2000;90(5):591-9.
2. Muzyka BC, Glick M. The hypertensive dental patient. J Am Dent Assoc 1997;128(8):1109-20.
3. Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure. The seventh report of the joint national committee on detection, evaluation and treatment of high blood pressure. JAMA 2003;89(19): 2560-72.

INFECTIVE ENDOCARDITIS PREVENTION

Patient management, and medical consultation should be based on:

1. History of Prosthetic Cardiac Valve
2. History of Previous IE
3. History of 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 6 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. History of Cardiac Transplantation Recipients Who Develop Cardiac Valvulopathy
5. The Nature of the Dental Procedure to be Performed.

ANTIBIOTIC PREMEDICATION IS ONLY NECESSARY FOR THE CONDITIONS LISTED ABOVE. WHEN NECESSARY, PATIENTS WILL RECEIVE ANTIBIOTIC PREMEDICATION AS PER THE RECOMMENDATION OF THE AMERICAN HEART ASSOCIATION/AMERICAN DENTAL ASSOCIATION

NONVALVULAR DEVICES DO NOT REQUIRE PREMEDICATION

TALKING POINTS FOR EXPLAINING THE NEED FOR ANTIBIOTICS TO PATIENTS ARE REFERENCED IN APPENDIX A.

TABLE OF NONVALVULAR DEVICES NOT REQUIRING ANTIBIOTIC PREMEDICATION ARE REFERENCED IN APPENDIX B.

AMERICAN HEART ASSOCIATION ANTIBIOTIC PREMEDICATION REGIMENS ARE REFERENCED IN APPENDIX C

References:

1. Wilson W, Taubert KA, Gewitz M, Lockhart PB, Baddour LM, Levison M, et al. Prevention of infective endocarditis guidelines from the american heart association. A guideline from the american heart association rheumatic fever, endocarditis, and kawasaki disease committee, council on cardiology, cardiovascular disease in the young, and the council on clinical care and council on cardiovascular surgery and anesthesia, and the quality of outcomes research interdisciplinary working group. J Am Dent Assoc 2007;138(6):739-60.

2. Baddour LM, Bettmann MA, Bolger AF, Epstein AE, Ferrieri P, et al. Nonvalvular cardiovascular device related infections. [AHA Advisory Committee] Circulation 2003; 108 (16):2015-31.

PREGNANCY

Patient management, and medical consultation should be based on:

1. The assumption that pregnancy is not a disease state.
2. The trimester of pregnancy.
3. Previous history of complicated pregnancy ($P_xG_xA_x$).
4. Risk of complication during current pregnancy.

Emergency dental care must be performed during all trimesters of pregnancy.

Elective dental care should be performed during the second or third trimester of pregnancy.

All patients should be encouraged to perform impeccable oral hygiene during the term of the pregnancy to ensure against pregnancy-related oral pathology.

Use of a double lead apron to protect the patient's abdomen and flank is prudent. Only necessary radiographs should be exposed.

The use of acetaminophen is preferred over aspirin and nonsteroidal antinflammatory medications. Tetracycline, benzodiazepine, and barbiturate medications must be avoided.

Narcotics should be used with caution.

Nitrous oxide is contraindicated.

References:

1. Fiese R, Herzog S. Issues in dental and surgical management of the pregnant patient. Oral Surg Oral Med Oral Pathol 1988; 65(3):292-7.
2. Michalowicz BS, DiAngelis AJ, Novak MJ, Buchanan W, Papapanou PN, Mitchell DA, Curran AE, Lupo VR, Ferguson JE, Bofill J, Matseoane S, Deinard AS, Rogers TB. Examining the safety of dental treatment in pregnant women. J Am Dent Assoc 2008; 139(6):685-95.
3. Moore PA. Selecting drugs for the pregnant dental patient. J Am Dent Assoc 1998;129(9):1281-6.

PROSTHETIC JOINTS (TOTAL HIP AND KNEE REPLACEMENT)

Patient management, and medical consultation should be based on:

1. The clinician is encouraged to consult with the orthopaedic surgeon to determine if there are any special considerations that might affect the clinician's decision on whether or not to premedicate.
2. The treating clinician is ultimately responsible for making treatment recommendations for his/her patients based on the clinician's professional judgment.
3. Any perceived potential benefit of antibiotic prophylaxis must be weighed against the known risks of antibiotic toxicity; allergy; and development, selection and transmission of microbial resistance.

"ANTIBIOTIC PROPHYLAXIS IS NOT INDICATED FOR DENTAL PATIENTS WITH PINS, PLATES AND SCREWS, NOR IS IT ROUTINELY INDICATED FOR MOST DENTAL PATIENTS WITH TOTAL JOINT REPLACEMENTS"

"GIVEN THE POTENTIAL ADVERSE OUTCOMES AND COST OF TREATING INFECTED JOINT REPLACEMENT, THE AAOS RECOMMENDS THAT CLINICIANS CONSIDER

ANTIBIOTIC PROPHYLAXIS FOR ALL TOTAL JOINT REPLACEMENT PATIENTS

PRIOR TO ANY INVASIVE PROCEDURE THAT MAY CAUSE BACTEREMIA. THIS IS PARTICULARLY IMPORTANT FOR THOSE PATIENTS WITH ONE OR MORE OF THE FOLLOWING RISK FACTORS":

PATIENTS AT POTENTIAL INCREASED RISK OF HEMATOGENOUS TOTAL JOINT INFECTION

- **All Patients with Prosthetic Joint Replacement**
- **Immunocompromised/Immunosuppressed Patients**
- **Inflammatory Arthropathies:**
  (e.g.: Rheumatoid Arthritis, Systemic Lupus Erythematosus)
- **Drug-Induced Immunosuppression**
- **Radiation-Induced Immunosuppression**
- **Patients With Comorbidities (e.g.: Diabetes, Obesity, HIV, Smoking)**
- **Previous Prosthetic Joint Infections**
- **Malnourishment**
- **Hemophilia**
- **HIV Infection**
- **Insulin-Dependent (Type 1) Diabetes**
- **Malignancy**
- **Megaprostheses**

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS ANTIBIOTIC PREMEDICATION REGIMENS ARE REFERENCED IN APPENDIX D

References:

1. Antibiotic prophylaxis for bacteremia in patients with joint replacements. Information statement of the American Academy of Orthopaedic Surgeons. Http://www.aaos.org/about/papers/advistmt/1033.asp, February, 2009.

RENAL DISEASE (END STAGE)

Patients with End Stage Renal disease (ESRD) may require:

1. Hemodialysis (requires modification to dental management)
2. Peritoneal Dialysis (does not require any modifications to dental management)

The most common causes for ESRD are:

1. Diabetes
2. Hypertension
3. Systemic Lupus Erythematosus
4. HIV-Associated Renal Disease (Nephropathy)

Severe renal failure requiring dialysis and transplantation usually occurs at **blood urinary nitrogen (BUN) levels above 100 mg/dl and creatinine levels above 10 mg/dl.**

MANAGEMENT OF THE HEMODIALYSIS PATIENT

1. **MOST HEMODIALYSIS PATIENTS UNDERGO DIALYSIS 3 TIMES PER WEEK**

2. **THE BEST TIME TO PROVIDE DENTAL CARE IS:**

    a. The afternoon following a morning dialysis session or
    b. The day after the dialysis session

3. **ANTIBIOTIC PROPHYLAXIS IS NOT ROUTINELY RECOMMENDED FOR PATIENTS ON HEMODIALYSIS (SEE APPENDIX B)**

4. **MONITOR BLOOD PRESSURE AND VITAL SIGNS PATIENTS ON**

5. **CHRONIC HEMODIALYSIS ARE AT INCREASED RISK FOR TRANSMISSION OF INFECTIOUS DISEASES (HEP B, C AND HIV)**

6. **THE PATIENT'S PHYSICIAN SHOULD BE CONSULTED TO ASSESS THE ADEQUACY OF METABOLIC CONTROL. SERUM ELECTROLYTE, BUN, CREATININE, CALCIUM, AND PHOSPHATE LEVELS SHOULD BE DETERMINED. PATIENTS WITH HYPERKALEMIA, ACIDOSIS, AND OTHER BIOCHEMICAL ABNORMALITIES SHOULD HAVE THEIR METABOLIC STATUS OPTIMIZED PRIOR TO TREATMENT.**

7. **CAREFUL PRESCRIPTIONS OF DRUGS THAT ARE METABOLIZED IN THE KIDNEY AND REQUIRE RENAL DOSAGE MODIFICATIONS. (SEE APPENDIX E)**

8. **PATIENTS ARE MORE SUSCEPTIBLE TO INFECTIONS**

9. **PATIENTS MAY BE ANEMIC AND HAVE AN INCREASED RISK OF BLEEDING DUE TO PLATELET AGGREGATION DEFICIENCIES**

10. **EMPHASIZE IMPORTANCE OF ORAL HYGIENE AND MAINTAINING GOOD ORAL HEALTH, ESPECIALLY IN THOSE PATIENTS SCHEDULED TO HAVE A RENAL TRANSPLANT**

References

1. Baddour LM, Betmann MA, Bolger AF, Epstein AE, Ferrieri P, Gerber MA, et al. Nonvalvular cardiovascular device-related infections. Circulation 2003; 108:2015-31.
2. DeRossi S, Glick M: Dental considerations for the patient with renal disease receiving hemodialysis, J Am Dent Assoc 1996; 127:211-219.
3. Kerr AR. Update on renal disease for the dental practitioner. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001; 92(1):9-16.
4. Shariff G, Brennan MT, Kent ML, Fox PC, Weinrib D, Burgess P, Lockhart PB. Relationship between oral bacteria and hemodialysis access infection. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005; 98(4):418-22.
5. Tokars J, Miller ER, Alter MJ et al: National surveillance of dialysis-associated diseases in the United States, 1997, Semin Dial 2000; 13:75-85.
6. Zachee P, Vermylen J, Boogaerts M: Hematologic aspects of end-stage renal failure, Ann Hematol 1994; 69:33-40.

STEROID THERAPY

Patient management , medical consultation and the need for steroid supplementation should be based on:

1. The surgical stress the dental procedure is likely to induce.
2. Patients underlying disease (the reason they are taking steroids).
3. The steroid regimen currently employed.

There are no uniformly accepted guidelines for steroid supplementation. Current evidence suggests that most patients who are managed with chronic corticosteroids and undergoing routine dental therapy do not require supplementation as long as pain and anxiety are well controlled. However, patients on chronic corticosteroid therapy may remain at-risk for adrenal suppression. Medical consultation with the patient's physician will assist the dental practitioner in determining if a need for steroid supplementation exists.

NON-SURGICAL DENTAL PROCEDURES REQUIRE NO SUPPLEMENTATION.

It is imperative to ensure good pain control both pre- and post-operatively.

General anesthesia, infection and pain can increase the risk of adrenal crisis in susceptible patients.

References

1. Miller C.S., Little JW, Falace DA. Supplemental corticosteroids for dental patients with adrenal insufficiency. J Am Dent Assoc 2001;132(11):1570-9.
2. De Rossi SS, Glick M. Lupus erythematosus: considerations for dentistry. J Am Dent Assoc 1998;129(3): 330-9.

Steroid Supplementation Guidelines

ROUTINE DENTAL PROCEDURES INCLUDING EXTRACTIONS MANAGED WITH LOCAL ANESTHESIA

* Supplementation is not usually necessary if the patient is currently taking steroids. Ensure effective local anesthesia and adequate post-operative pain control.

* Administer normal maintenance dose on the day of the procedure if patient has discontinued regular steroid usage within the previous 14-30 day period.

* No supplementation is generally required if the patient has a previous history of regular steroid usage which has been discontinued for greater than 14-30 days or is using topical or inhalation steroids.

* Monitor blood pressure during procedure.

EXTREMELY ANXIOUS PATIENT MANAGED WITH LOCAL ANESTHESIA AND\ORCOMPLICATED OR STRESSFUL PROCEDURE MANAGED WITH LOCAL ANESTHESIA

* Double the patient's steroid regimen on the day of the procedure and the day after the procedure (if significant post-operative pain is anticipated) for patients currently taking steroids.

* Double the normal maintenance dose on the day of the procedure if the patient has discontinued regular steroid usage within the previous 14-30 day period.

* No supplementation is generally required if the patient has a previous history of regular steroid usage which has been discontinued for greater than 14-30 days.

* Monitor blood pressure during procedure.

DENTAL PROCEDURES REQUIRING GENERAL ANESTHESIA

* Administer parenteral corticosteroids in a hospital setting using 100 mg hydrocortisone one hour before procedure and double the daily maintenance dose on the following day (if post-operative pain is anticipated).

* Monitor blood pressure during procedure.

ALTERNATE DAY REGIMEN

* For routine dental procedures, treat patient on the day they normally take their steroid medication. No change in the steroid regimen is necessary.
* For an extremely anxious patient or a complicated or stressful procedure managed with local anesthesia, double the patient's steroid regimen on the day of the procedure and the day after the procedure (if significant post-operative pain is anticipated).

* Monitor blood pressure during procedure.

TUBERCULOSIS

Patient management, and medical consultation should be based on:

1. History of tuberculosis
2. Patient with active disease
3. Immune competence of patient
4. Patient who has traveled or emigrated from an endemic region
5. Patients who have had contact with TB positive patients
6. IV drug abusers
7. High-risk racial or ethnic minority populations

Guidelines:

1. Patients should be encouraged to voluntarily disclose their T.B. status.

2. All patients with a positive history of tuberculosis, regardless of when the disease was last active, or when they last received treatment, will be referred to their physician for a medical consultation in order to ascertain their risk of infecting others and their ability to withstand the proposed dental treatment. Centers for Disease Control guidelines state that elective dental treatment should be deferred until a physician confirms that the patient does not have infectious TB. If the patient is diagnosed as having active TB, elective dental treatment should be deferred until the patient is no longer infectious.

3. No patient with active tuberculosis will be treated at the College of Dental Medicine due to the special needs treatment facilities that provides engineering controls such as TB isolation rooms (ensure ten air exchanges per hour) and air filtration. Standard facemasks do not protect against TB transmission.

4. All patients who do not have a private physician have the personal responsibility of seeking out appropriate medical testing and care to manage their disease and ensure the safety of the College of Dental Medicine's patients, faculty, students and staff.

5. All patients who have been diagnosed with HIV disease or AIDS will have been routinely screened for tuberculosis. Examination of their medication list will disclose whether they are on anti-tubercular medications

6. CDC guidelines clearly state that the overall risk borne by dental health care workers for exposure to a patient with active TB disease is probably quite low. Only one transmission (1982) has been reported in a dental setting.

References:

1. Kohn WG, Collins AS, Cleveland, JL. Guidelines for infection control in dental health-care settings – 2003. MMWR 2003; 52(RR17): 1-68.
2. Eng H, Lu S, Yang C, et al. Oral tuberculosis. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1996;81(4):415-20.

APPENDIX A

TALKING POINTS WHEN SPEAKING WITH PATIENTS AND PHYSICIANS

- **"IE Is Much More Likely To Result From Frequent Exposure To Random Bacteremias Associated With Daily Activities Than From Bacteremia Caused By A Dental, GI Tract, Or GU Tract Procedure."**

- **"Prophylaxis May Prevent An Exceedingly Small Number Of Cases Of IE, If Any, In Individuals Who Undergo A Dental, GI Tract, Or GU Tract Procedure.**

- **"The Risk Of Antibiotic-Associated Adverse Events Exceeds The Benefit, If Any, From Prophylactic Antibiotic Therapy.**

- **"Maintenance Of Optimal Oral Health And Hygiene May Reduce The Incidence Of Bacteremia From Daily Activities And Is More Important Than Prophylactic Antibiotics For A Dental Procedure To Reduce The Risk Of IE"**

APPENDIX B

NONVALVULAR DEVICES

PROPHYLAXIS NOT RECOMMENDED

PACEMAKERS

IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS (ICD's)

LEFT VENTRICULAR ASSIST DEVICES (LVAD)

TOTAL ARTIFICIAL HEARTS

VENTRICULOATRIAL SHUNTS

PERIPHERAL VASCULAR STENTS

HEMODIALYSIS PROSTHETIC VASCULAR GRAFTS

INTRA-AORTIC BALLOON COUNTERPULSATION CATHETERS

CORONARY ANGIOGRAPHY AND PERCUTANEOUS CORONARY ARTERY INTERVENTION

CORONARY ARTERY STENTS

VASCULAR CLOSURE DEVICES

VENA CAVA FILTERS

APPENDIX C

AMERICAN HEART ASSOCIATION PREMEDICATION REGIMEN

DRUG OF CHOICE:

AMOXICILLIN 2 gm 3O-60 MINUTES PRIOR TO THE DENTAL PROCEDURE

IF ALLERGIC TO PENICILLINS OR AMPICILLIN:

CLINDAMYCIN 600 mg 3O-60 MINUTES PRIOR TO THE DENTAL PROCEDURE

CEPHELAXIN 2 gm 3O-60 MINUTES PRIOR TO THE DENTAL PROCEDURE

AZITHROMYCIN 500 mg 3O-60 MINUTES PRIOR TO THE DENTAL PROCEDURE

CLARITHROMYCIN 500 mg 3O-60 MINUTES PRIOR TO THE DENTAL PROCEDURE

APPENDIX D

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS PREMEDICATION REGIMEN

DRUG OF CHOICE:

AMOXICILLIN 2 gm 60 MINUTES PRIOR TO THE DENTAL PROCEDURE

IF ALLERGIC TO PENICILLINS OR AMPICILLIN:

CLINDAMYCIN 600 mg 60 MINUTES PRIOR TO THE DENTAL PROCEDURE

CEPHELAXIN 2 gm 60 MINUTES PRIOR TO THE DENTAL PROCEDURE

CEPHRADRINE 2 gm 60 MINUTES PRIOR TO THE DENTAL PROCEDURE

APPENDIX E

DRUGS MODIFICATIONS FOR HEMODIALYSIS PATIENTS

Drug	Route of Elimination in Metabolism	Removed by Dialysis	Dosage Adjustment for Renal Failure: Method	GFR, mL/min: >50	Co-50	<10	Supplement Dose After Hemodialysis
ANALGESIC							
Aspirin	Liver (kidney)	Yes	I	q4h	q6h	Avoid	Yes
Acetaminophen	Liver	Yes (HD); No (PD)	I	q4h	q6h	q8h	No
Ibuprofen (Motrin)	Liver	?	—		No adjustment		No
Propoxyphene (Darvon)	Liver (kidney)	No	DR	100%	100%	Avoid	No
Codeine	Liver	?	DR	100%	75%	50%	No
Meperidine (Demerol)	Liver	?	DR	100%	75%	50%	No
ANESTHETIC							
Lidocaine (Xylocaine)	Liver (kidney)	No	—		No adjustment		N/A
ANTIMICROBIAL							
Acyclovir (Zovirax)	Kidney	Yes	I & DR	q8h	q12-24h	50% q24-48h	Yes
Amoxicillin, Penicillin V	Kidney (liver)	No	I	q8h	q8-12h	q24h	Yes
Cephalexin (Keflex)	Kidney	Yes	I	q8h	q12h	q12h	Yes; 50%of usual dose after HD
Clindamycin (Cleocin)	Liver	No	—	100%	100%	100%	No
Erythromycin	Liver	No	DR	100%	100%	50%-75%	No
Ketoconazole (Nizoral)	Liver	No	—	100%	100%	100%	No
Metronidazole (Flagyl)	Liver (kidney)	Yes	DR	100%	100%	50%	Yes (HD); No (PD)
Tetracycline (Doxycycline)	Kidney (liver)	No	I	q8-12h	q12-24th	q24h	No
BENZODIAZEPINE							
Diazepam (Valium); Triazolam (Halcion)	Liver	?	—		No adjustment		No
CORTICOSTEROID							
Dexamethasone	Local site and liver		—		No adjustment		No

Modified from Proctor R et al. Oral and dental aspects of chronic renal failure. J Dent Res 2005;84:199-208, and Singh G. Renal disease. Med Clin North Am 2005;89:240.

DR, Dosage reduction; I, increased interval between doses; GFR, glomerular filtration rate; HD, hemodialysis; PD, peritoneal dialysis.