Guideline on Antibiotic Prophylaxis for Dental Patients at Risk for Infection

Originating Committee
Clinical Affairs Committee

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1990

Revised
1991, 1997, 1999, 2002, 2005, 2007[Δ]

Purpose
The American Academy of Pediatric Dentistry (AAPD) recognizes that numerous medical conditions predispose patients to bacteremia-induced infections. Because it is not possible to predict when a susceptible patient will develop an infection, prophylactic antibiotics are recommended when these patients undergo procedures most likely to produce bacteremia. This guideline is intended to help practitioners make appropriate decisions regarding antibiotic prophylaxis for dental patients at risk.

Methods
This guideline is based on a review of current dental and medical literature pertaining to postprocedural bacteremia-induced infections. A MEDLINE search was performed using the keywords "subacute bacterial endocarditis", "bacteremia", "antibiotic prophylaxis", and "dental infection".

Background
Bacteremia is anticipated following invasive dental procedures.[1,2] Only a limited number of bacterial species commonly are implicated in resultant postoperative infections. An effective antibiotic regimen should be directed against the most likely infecting organism, with antibiotics administered shortly before the procedure. When procedures involve infected tissues, additional doses may be necessary.

Antibiotic usage may result in the development of resistant organisms. Utilization of antibiotic prophylaxis for patients at risk does not provide absolute immunity from infection. Postprocedural symptoms of acute infection (eg, fever, malaise, weakness, lethargy) may indicate antibiotic failure and need for further medical evaluation.

Appropriateness of antibiotic prophylaxis should be decided on an individual basis. Some medical conditions that may predispose patients to postprocedural infections are discussed below. This is not intended to be an exhaustive list; rather, the categorization should help practitioners identify children who may be at increased risk. If a patient reports a syndrome or medical condition with which the practitioner is not familiar, it is appropriate to contact the child's physician to determine susceptibility to bacteremia-induced infections.

Recommendations
Patients with cardiac conditions[Δ]
Numerous cardiac conditions place patients at risk for endocarditis following dental manipulation. The AAPD endorses the American Heart Association's (AHA) guideline on prevention of infective endocarditis (IE).[3] The 2007 AHA guideline recommends IE prophylaxis only for those whose underlying cardiac conditions are associated with the highest risk of adverse outcome.[3] Such conditions include prosthetic heart valves, previous history of IE, unrepaired cyanotic congenital heart disease (CHD), completely repaired congenital heart defect with prosthetic material or device 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 device, and cardiac transplantation recipients who develop valvulopathy.[3] In addition to those diagnoses listed in the AHA guidelines, patients with a history of intravenous drug abuse[4] may be at risk for developing bacterial endocarditis due to associated cardiac anomalies. Consultation with the patient's physician may be necessary to determine susceptibility to bacteremia-induced infections.

For patients with high-risk cardiac conditions, IE prophylaxis is recommended for all dental procedures that involve manipulation of the gingival tissue or periapical region of teeth or perforation of oral mucosa.[3] Table 1 lists the suggested prophylaxis regimens.

[Δ] *Only the section on Patients with Cardiac Conditions was amended May, 2007 to reflect newly published recommendations by the American Heart Association regarding antibiotic prophylaxis for patients at risk for infectious endocarditis.*

Table 1. REGIMENS FOR A DENTAL PROCEDURE

Situation	Agent	Regimen: Single Dose 30 to 60 min Before Procedure: Adults	Children
Oral	Amoxicillin	2 g	50mg/kg
Unable to take oral medication	Ampicillin OR Cefazolin or ceftriaxone	2 g IM or IV 1 g IM or IV	50 mg/kg IM or IV 50 mg/kg IM or IV
Allergic to penicillins or ampicillin-oral	Cephalexin *† OR Clindamycin OR Azithromycin or clarithromycin	2 g 600 mg 500 mg	50 mg/kg 20 mg/kg 15 mg/kg
Allergic to penicillin or ampicillin and unable to take oral medication	Cefazolin or ceftriaxone† OR Clindamycin	1g IM or IV 600 mg IM or IV	50 mg/kg IM or IV 20 mg/kg IM or IV

IM indicates intramuscular; IV, intravenous

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

† Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema, or urticaria with penicillins or ampicillin

Patients with compromised immunity

Patients with a compromised immune system may not be able to tolerate a transient bacteremia following invasive dental procedures. This category includes, but is not limited to, patients with the following conditions:

1. human immunodeficiency virus (HIV);
2. severe combined immunodeficiency (SCIDS);
3. neutropenia;
4. immunosuppression;
5. sickle cell anemia;
6. status post splenectomy;
7. chronic steroid usage;
8. lupus erythematosus;
9. diabetes;
10. status post organ transplantation.

Discussion of antibiotic prophylaxis for patients undergoing chemotherapy, irradiation, and hematopoietic cell transplantation appears in a separate AAPD guideline.[5]

Patients with shunts, indwelling vascular catheters, or medical devices

Bacteremia following an invasive dental procedure may lead to colonization of shunts or indwelling vascular catheters. Vascular catheters, such as those required by patients undergoing dialysis, chemotherapy, or frequent administration of blood products, are susceptible to bacterial infections. Ventriculoatrial (VA) or ventriculovenus (VV) shunts for hydrocephalus are at risk of bacteremia-induced infections due to their vascular access. In contrast, ventriculoperitoneal (VP) shunts do not involve any vascular structures and, consequently, do not require antibiotic prophylaxis. The AAPD endorses the recommendations of the American Dental Association and the American Academy of Orthopaedic Surgeons for management of patients with prosthetic joints.[6] Antibiotic prophylaxis is not indicated for dental patients with pins, plates, and screws, nor is it indicated routinely for most dental patients with total joint replacements. Antibiotics may be considered when high-risk dental procedures (Table 2) are performed for dental patients within 2 years following implant surgery or for patients who have had previous joint infections. Consultation with the child's physician may be necessary for management of patients with other implanted devices (eg, Harrington rods, external fixation devices).

References

1. Lockhart PB, Brennan MT, Kent ML, Norton JH, Weinrib DA. Impact of amoxicillin prophylaxis on the incidence, nature, and duration of bacteremia in children after intubation and dental procedures. Circulation. 2004;109(23):2878-84.
2. Roberts GI, Watts R, Longhurst P, Gardner P. Bacteremia of dental origin and antimicrobial sensitivity following oral surgical procedures in children. Pediatr Dent 1998;20(1):28-36.
3. Wilson W, Taubert KA, Gewitz M, et al. Prevention of infective endocarditis:)Guidelines from the American Heart Association. Circulation e-published April 19, 2007. HYPERLINK "http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.106.183095" http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.106.183095 Accessed May 10, 2007.

Table 2. DENTAL PROCEDURES ASSOCIATED WITH HIGHER INCIDENCE OF BACTEREMIA

Dental extractions
Periodontal procedures including surgery, subgingival placement of antibiotic fibers/strips, scaling and root planning, probing, recall maintenance
Dental implant placement and replantation of avulsed teeth
Endodontic instrumentation or surgery only beyond the apex
Initial placement of orthodontic bands, but not brackets
Intraligamentary and intraosseous local anesthetic injections
Prophylactic cleaning of teeth or implants where bleeding is anticipated

4. Dajani AS, Taubert KA. Infective endocarditis. In: Allken DA, Gutgesell HP, Clark EB, Driscoll DJ, eds. Moss and Adams' Heart Disease in Infants, Children, and Adolescents. New York, NY: Lippincott Williams & Wilkins; 2001:1297-308.
5. American Academy of Pediatric Dentistry. Clinical guideline on dental management of pediatric patients receiving chemotherapy, hematopoietic cell transplantation, and/or radiation. Pediatr Dent 2005;27(suppl):170-5.
6. American Dental Association, American Academy of Orthopaedic Surgeons. Advisory Statement: Antibiotic prophylaxis for dental patients with total joint replacements. J Am Dent Assoc 1997;128(7):1004-7.