

## Cardiac Diseases and Therapies

### ENDOCARDITIS

#### ANTIBIOTIC PROPHYLAXIS-PREVENTION OF BACTERIAL ENDOCARDITIS

Endocarditis usually develops in patients with underlying valvular heart disease who develop bacteremia with organisms likely to cause endocarditis. The vast majority of cases of endocarditis occur in the absence of any specific predisposing procedure. However, some surgical and dental procedures involving mucosal surfaces or contaminated tissues cause transient bacteremia. The incidence of endocarditis following most procedures in patients with underlying cardiac disease is very low. In general, infective endocarditis is more likely to be associated with daily activities that provide frequent exposure to transient bacteremias than with bacteria caused by dental, gastrointestinal or genitourinary procedures. Maintaining good oral health and hygiene may reduce the incidence of bacteremia from daily activities and is more important than prophylactic antibiotics for a dental procedure in reducing the risk of infective endocarditis.<sup>1</sup> Furthermore, the risk of adverse events related to antibiotic use may exceed the risk of infective endocarditis; and endocarditis may still occur after the use of prophylactic regimens.

#### CARDIAC CONDITIONS ASSOCIATED WITH THE HIGHEST RISK OF ADVERSE OUTCOME FROM ENDOCARDITIS - WHERE PROPHYLAXIS FOR DENTAL PROCEDURES IS REASONABLE

- Prosthetic cardiac valves or prosthetic material used for cardiac repair
- Previous infective endocarditis
- Unrepaired cyanotic congenital heart disease, including palliative shunts and conduits
- During the first 6 months after complete repair of a congenital heart defect with prosthetic material or device
- Repaired congenital heart disease with residual defects that inhibit endothelialization
- Cardiac transplant recipients who develop cardiac valvulopathy

**Note:** Except for the above conditions, antibiotic prophylaxis is no longer recommended for any other congenital heart disease.

#### DENTAL PROCEDURES IN PATIENTS LISTED ABOVE - WHERE ENDOCARDITIS PROPHYLAXIS IS REASONABLE

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

**Note:** The following procedures and events do not need prophylaxis: routine anesthetic injections through non-infected tissue, dental radiography, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of deciduous teeth, bleeding from trauma to the lips or oral mucosa.

#### OTHER PROCEDURES FOR WHICH ENDOCARDITIS PROPHYLAXIS IS REASONABLE

Surgical procedures involving the respiratory mucosa may lead to transient bacteremia. The risk of endocarditis as a direct result of endoscopy is small. After most gastrointestinal endoscopy procedures, the types of organisms producing bacteremia are unlikely to cause endocarditis. The rates of bacteremia do not increase with biopsy. For high risk patients, i.e., those listed above, prophylaxis may be considered for invasive procedures.

#### Respiratory tract - invasive treatment with incision or biopsy

- Tonsillectomy or adenoidectomy
- Surgical operations that involve respiratory mucosa
- Bronchoscopy
- Invasive treatment of established infection (e.g., drainage of abscess or empyema)

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##### PROPHYLACTIC REGIMENS FOR DENTAL PROCEDURES

Prophylactic antimicrobial therapy should be directed against *Viridans* group streptococci.

##### Standard General Prophylaxis for Patients at Risk:

###### Oral Regimens<sup>a</sup>

Amoxicillin<sup>b</sup> 2 g PO given 30 to 60 minutes  
before procedure (children 50 mg/kg)

###### *Penicillin allergic patients:*

Clindamycin 600 mg PO 30 to 60 minutes  
before procedure (children 20 mg/kg)

**or**

Cephalexin<sup>c</sup> 2 g PO 30 to 60 minutes  
before procedure (children 50 mg/kg)

**or**

Azithromycin *or* 500 mg PO 30 to 60 minutes  
Clarithromycin before procedure (children 15 mg/kg)

###### Unable to Take Oral Medication<sup>c</sup>

Ampicillin 2 g IM<sup>c</sup> or IV 30 to 60 minutes before  
procedure (children 50 mg/kg)

###### *Penicillin allergic patients:*

Clindamycin 600 mg IM<sup>c</sup> or IV 30 to 60 minutes  
before procedure (children 20 mg/kg)

**or**

Cefazolin<sup>d</sup> 1 g IM<sup>c</sup> or IV 30 to 60 minutes before  
procedure (children 50 mg/kg)

##### PROPHYLACTIC REGIMENS FOR OTHER PROCEDURES

Antibiotic prophylaxis is reasonable for procedures on respiratory tract or infected skin, skin structures, or musculoskeletal tissue only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from infective endocarditis.

**Use the same regimens as above for the patients at risk.**

**Note:** If the infection is known or suspected to be caused by *Staphylococcus aureus*, the regimen should contain an agent active against *Staph. aureus*, such as an antistaphylococcal penicillin or cephalosporin, or Vancomycin in patients unable to tolerate a beta-lactam. Vancomycin should be administered if the infection is known or suspected to be caused by a Methicillin-resistant strain of *Staph. aureus*.

<sup>a</sup> Oral regimens are more convenient and safer. Parenteral regimens are more likely to be effective; they are recommended especially for patients with prosthetic heart valves, those who have had endocarditis previously, or those taking continuous oral Penicillin for rheumatic fever prophylaxis.

<sup>b</sup> Amoxicillin is recommended because of its excellent bioavailability and good activity against streptococci and enterococci.

<sup>c</sup> Cephalosporins should not be used in patients with immediate-type hypersensitivity reactions to Penicillin.

<sup>d</sup> Cephalosporins should not be used in patients with immediate-type hypersensitivity reactions to Penicillin.

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##### PROPHYLACTIC REGIMENS FOR GENITOURINARY OR GASTROINTESTINAL PROCEDURES ARE **NOT** RECOMMENDED

Only enterococci are likely to cause endocarditis after lower gastrointestinal or genitourinary procedures; however, no published data demonstrate a conclusive link between procedures of the GI or GU tract and the development of IE. No studies demonstrate that administration of antimicrobial prophylaxis prevents infective endocarditis in association with procedures performed on the genitourinary or gastrointestinal tract.

##### REFERENCES

1. Wilson W, Taubert KA, Gewitz 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 Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. *Circulation*. 2007;116:1736-54.
2. Nishimura RA, Carabello BA, Faxon DP et al. ACC/AHA 2008 guideline update on valvular heart disease: focused update on infective endocarditis: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines: Endorsed by the Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *Circulation*. 2008;118:887-96.

*Originally adapted from:* Prevention of Bacterial Endocarditis: Recommendations by the American Heart Association by the Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease. *JAMA* 1997;277:1794-1801  
*Updated by:* N. Daneman, MD - March 2005  
*Reviewed by:* W.L. Gold, MD, Infectious Disease Service - March 2005  
*Updated by:* Valentina Jelincic, BScPhm - November 2008

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