Prevention of Infective Endocarditis Bacterial per AHA 2007 Update

Guidelines 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

Recommendations for GI or GU Tract Procedures

Administration of antibiotics solely to prevent endocarditis is **not recommended** for patients who undergo a **genitourinary** or **gastrointestinal tract procedures**. These changes are intended to define more clearly when infective endocarditis prophylaxis is or is not recommended and to provide more uniform and consistent global recommendations.

Enterococci are part of the normal flora of the GI tract. These microorganisms may cause intra-abdominal infection or infection of the hepatobiliary system. Such infections are often polymicrobial, with a mix of aerobic and anaerobic Gramnegative and Gram-positive microorganisms, but amongthese varied bacteria, only enterococci are likely to cause IE. Enterococci may cause urinary tract infections, particularly in older males with prostatic hypertrophy and obstructive uropathy or prostatitis.
The administration of prophylactic antibiotics solely to prevent endocarditis is not recommended for patients who undergo GU or GI tract procedures, including diagnostic esophagogastroduodenoscopy or colonoscopy (***Class III, LOE B***). This is in contrast to previous AHA guidelines that listed GI or GU tract procedures for which IE prophylaxis was recommended and those for which prophylaxis was not recommended.[1] A large number of diagnostic and therapeutic procedures that involve the GI, hepatobiliary, or GU tract may cause transient enterococcal bacteremia. The possible association between GI or GU tract procedures and IE has not been studied as extensively as the possible association with dental procedures.[145] The cases of IE temporally associated with a GI or GU tract procedure are anecdotal, with either a single or very small number of cases reported.[83] No published data demonstrate a conclusive link between procedures of the GI or GU tract and the development of IE.[145] Moreover, no studies exist that demonstrate that the administration of antimicrobial prophylaxis prevents IE in association with procedures performed on the GI or GU tract.

TABLE 5. Regimens for a Dental Procedure

	Regimen: Single Dose 30 to 60 min **Before** Procedure		
Situation	Agent	Adults	Children
Oral	**Amoxicillin**	2 g	50 mg/kg
Unable to take oral med – **NPO**	**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 **pen**icillins 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 penicillins or ampicillin **and NPO**	Cefazolin or ceftriaxone† **OR** Clindamycin	1 g IM or IV 600mg IM or IV	50 mg/kg IM or IV **OR** 20 mg/kg IM or IV

*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.

TABLE 3. Cardiac/Heart Conditions Associated With the Highest Risk of Adverse Outcome From Endocarditis for Which Prophylaxis With Dental Procedures Is Recommended

- **Prosthetic cardiac valve**
- **Previous Infectious Endocarditis**
- **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)
- **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 6 months** after the procedure.

TABLE 4.

Dental Procedures for Which Endocarditis Prophylaxis Is Recommended for Patients in Table 3

- ***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 noninfected tissue, taking dental radiographs, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of deciduous teeth, and bleeding from trauma to the lips or oral mucosa.

TABLE 6. **Summary of Major Changes in Updated Document**

We concluded that **bacteremia resulting from daily activities** is much **more likely** to cause IE than bacteremia associated with a dental procedure.

We concluded that **only an extremely small number of cases of IE** might be **prevented by antibiotic** prophylaxis even if prophylaxis is 100% effective.

Antibiotic prophylaxis is not recommended based solely on an increased lifetime risk of acquisition of IE.

Limit recommendations for IE prophylaxis only to those conditions **listed in Table 3**.

Antibiotic prophylaxis is **no longer recommended for any other form of CHD**, except for the conditions listed in Table 3.

Antibiotic prophylaxis is **recommended** for **all dental procedures** that involve **manipulation of gingival tissues** or **periapical** region of teeth **or perforation** of oral **mucosa** only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from IE (Table 3).

Antibiotic prophylaxis is recommended 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 IE (Table 3).

Antibiotic prophylaxis solely to prevent IE is **not recommended** for GU or **GI tract procedures**.

The writing group reaffirms the procedures noted in the 1997 prophylaxis guidelines for which endocarditis prophylaxis is not recommended and extends this to other common procedures, including ear and body piercing, tattooing, and vaginal delivery and hysterectomy.

Conclusions—The major changes in the 2007 updated recommendations include the following:

(1) The Committee concluded that **only an extremely small number of cases of infective endocarditis might be prevented by antibiotic prophylaxis** for dental procedures even if such prophylactic therapy were 100% effective.

(2) Infective endocarditis **prophylaxis for dental** procedures should be recommended **only for** patients with underlying **cardiac conditions** associated with the **highest risk** of **adverse outcome** from infective endocarditis.

(3) For patients with **these underlying cardiac conditions**, prophylaxis is recommended for all **dental procedures** that involve **manipulation of gingival tissue** or the **periapical region** of teeth or **perforation** of the oral mucosa.

(4) Prophylaxis is not recommended based solely on an increased lifetime risk of acquisition of infective endocarditis.

(5) Administration of antibiotics solely to prevent endocarditis is **not recommended** for patients who undergo a genitourinary or **gastrointestinal tract procedure**. These changes are intended to define more clearly when infective endocarditis prophylaxis is or is not recommended and to provide more uniform and consistent global recommendations. **(*Circulation*. 2007;115:&NA;-.)**

The AHA Guidelines on Prevention of Infective Endocarditis: Implications for At-Risk Patients Who Undergo GI Endoscopic Procedures

David A. Johnson, MD, FACG, FACP Medscape Gastroenterology. 2007; Posted 07/06/2007

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

Wilson W, Taubert KA, Gewitz M, et al. *Circulation*. 2007; April 19; [Epub ahead of print]

Summary Although infective endocarditis is an uncommon disease, this infection has potentially life-threatening consequences. Obviously, the primary goal would be prevention. As such, for more than 50 years, the American Heart Association (AHA) has recommended that patients deemed at "cardiac risk" for infective endocarditis should receive prophylactic antibiotics. As relevant to the gastroenterology setting, this has been the standard of care for at-risk patients who undergo endoscopic procedures. Despite this "standard," there has been little evidence to support these long-standing AHA recommendations. The present task force of experts from the AHA committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease -- along with an international group of experts -- reviewed data on the effectiveness of prophylaxis in preventing infective endocarditis in patients who undergo a dental, gastrointestinal, or genitourinary procedure.

There was consensus that the development of infective endocarditis occurs as a result of a complex interaction between the bloodstream pathogen with matrix molecules and platelets at sites of endocardial cell damage. All cases of infective endocarditis develop from a common sequence that involves formation of a nonbacterial thrombus, bacteremia, adherence of the bacteria to the nonbacterial thrombus, and then proliferation of the bacteria within a vegetation.

Data were supportive to warrant a new recommendation for gastrointestinal and genitourinary procedures. On the basis of analyses of the relevant literature in regard to procedure-related bacteremia and infective endocarditis, the administration of antibiotics solely to prevent infective endocarditis was not recommended, and specifically is not recommended for patients who undergo endoscopy or colonoscopy. The committee concluded that the bacteremia risks associated with daily activities (eg, toothbrushing, defecation) were more likely to cause bacteremia than were the endoscopic procedures. In fact, they cited the **transient bacteremia** that is associated with routine daily activities: **toothbrushing and flossing** (20% to 68%), use of a wooden **toothpick** (20% to 68%), use of water irrigation devices (7% to 50%), and **chewing food** (7% to 51%). For dental procedures, the committee recommended prophylaxis, although the identification of "high-risk" patients was refined and limited to include those with prosthetic cardiac valves, previous infective endocarditis, and congenital heart disease (selected and limited new definitions), and cardiac transplant patients with cardiac valvulopathy. Of note is that the committee reported that there was no evidence to support the need for antibiotic prophylaxis in patients who have had recent coronary bypass surgery or coronary stent placement. The use of antibiotics for the prevention of infection of prosthetic joints or for prevention of bacterial peritonitis (in patients with ascites) was beyond the scope of this report.

Viewpoint
These updated recommendations are a welcome addition and will help define a new standard of care. The recommendations made for gastrointestinal practice were classified as Class III, Level of Evidence B. This means that for this condition (infective endocarditis), there is evidence and/or general agreement that the treatment (antibiotic prophylaxis for gastrointestinal procedures) is not useful/effective, and in some cases may be harmful. The data to support this recommendation has Grade B support, meaning that the data are derived from nonrandomized studies.

There has been a tremendous increase in the frequency of antibiotic-resistant strains of pathogens, particularly with respect to *Enterococcus* strains resistant to penicillins, vancomycin, and aminoglycosides: All of these agents have been recommended as prophylactic antibiotics in prior AHA guidelines. It will understandably take time for cardiologists to recognize these new guidelines, and perhaps even more so, for patients to feel comfortable with the major changes. However, **gastroenterologists should** heed these new recommendations -- antiobiotic prophylaxis solely to prevent infective endocarditis is not recommended for patients undergoing gastrointestinal procedures -- and **incorporate the changes immediately into their endoscopic practice.**

Abstract **David A. Johnson, MD, FACG, FACP**, Professor of Medicine; Chief of Gastroenterology, Eastern Virginia School of Medicine, Norfolk, Virginia. President, The American College of Gastroenterology.

Simple SBE Guide:

Warranting Conditions

[cardiac] **prosthetic** heart valve; **previous** infective endocarditis; cardiac **transplant w/ valvulopathy**; **unrepaired cyanotic congenital heart** dz; repaired congenital heart defect w/in 6 mo or w/ residual defects at site of or adjacent to prosthetic patch/device

Warranting Procedures

[dental] all procedures involving gingival tissue or periapical region manipulation or oral mucosa perforation
[resp. tract] invasive procedures involving respiratory **mucosa incision or biopsy**
[GI/GU] **no** endocarditis prophylaxis recommended

Regimens timing of administration all regimens should be given as single dose 30-60min before procedure

[standard] amoxicillin 2000 mg PO
[NPO] ampicillin 2000 mg IM/IV or cefazolin or ceftriaxone 1000 mg IM/IV

[PCN allergy] cephalexin 2000 mg PO or clindamycin 600 mg PO or azithromycin or clarithromycin 500 mg PO; Info: may use any equivalent 1st or 2nd generation cephalosporin dose; do not use cephalosporin if hx of anaphylaxis, angioedema, or urticaria w/ PCN
[PCN allergy, NPO] cefazolin or ceftriaxone 1000 mg IM/IV or clindamycin 600 mg IM/IV; Info: do not use cephalosporin if hx of anaphylaxis, angioedema, or urticaria w/ PCN
[PCN resistance] clindamycin 600 mg PO or azithromycin or clarithromycin 500 mg PO; Info: use if pt regularly uses PCN for other secondary infxn prevention
[PCN resistance, NPO] clindamycin 600 mg IM/IV; Info: use if pt regularly uses PCN for other secondary infxn prevention

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