Oral Health Topics

Antibiotic Prophylaxis Prior to Dental Procedures

Key Points

- Compared with previous recommendations, there are currently relatively few patient subpopulations for whom antibiotic prophylaxis may be indicated prior to certain dental procedures.
- In patients with prosthetic joint implants, a January 2015 ADA clinical practice guideline, based on a 2014 systematic review states, "In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection."
- According to the ADA Chairside Guide, for patients with a history of complications associated with their joint replacement surgery who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered after consultation with the patient and orthopedic surgeon; in cases where antibiotics are deemed necessary, it is most appropriate that the orthopedic surgeon recommend the appropriate antibiotic regimen and, when reasonable, write the prescription.
- For infective endocarditis prophylaxis, 2007 guidelines by the American Heart Association, written with input from the ADA and approved by the CSA as they relate to dentistry in 2008, support premedication for a smaller group of patients than previous versions. This change was based on a review of scientific evidence, which showed that the risk of adverse reactions to antibiotics generally outweigh the benefits of prophylaxis for many patients who would have been considered eligible for prophylaxis in previous versions of the guidelines. Concern about the development of drug-resistant bacteria also was a factor.
- 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 (see "Patient Selection," in the main text). 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.

Introduction

Recommendations for antibiotic prophylaxis prior to certain dental procedures have existed historically for two groups of patients:

- those with heart conditions that may predispose them to infective endocarditis; and
- those who have a prosthetic joint(s) and may be at risk for developing hematogenous infections at the site of the prosthetic.

However, compared with prior recommendation statements, there are currently relatively few patient

subpopulations for whom antibiotic prophylaxis may be indicated prior to certain dental procedures.

Prevention of Prosthetic Joint Infection

In 2014, the ADA Council on Scientific Affairs assembled an expert panel to update and clarify the clinical recommendations found in the 2012 evidence report and 2013 guideline, *Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures*.[1, 2]

As was found in 2012, the updated systematic review undertaken in 2014 and published in 2015 found no association between dental procedures and prosthetic joint infections.[3] Based on this evidence review, the 2015 ADA clinical practice guideline states,[3] "In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection."

A co-published editorial by Meyer[4] also states:

> "The new CSA guideline clearly states that for most patients, prophylactic antibiotics are not indicated before dental procedures to prevent [prosthetic joint infections]. The new guideline also takes into consideration that patients who have previous medical conditions or complications associated with their joint replacement surgery may have specific needs calling for premedication. In medically compromised patients who are undergoing dental procedures that include gingival manipulation or mucosal inclusion, prophylactic antibiotics should be considered only after consultation with the patient and orthopedic surgeon. For patients with serious health conditions, such as immunocompromising diseases, it may be appropriate for the orthopedic surgeon to recommend an antibiotic regimen when medically indicated, as footnoted in the new chair-side guide."

The ADA encourages dental professionals to review the full 2015 guideline[3] and take this recommendation into account, consult with the patient's orthopedic surgeon as needed, and consider the patient's specific needs and preferences when planning treatment. According to the ADA Chairside Guide, in cases where antibiotics are deemed necessary, it is most appropriate that the orthopedic surgeon recommend the appropriate antibiotic regimen and, when reasonable, write the prescription.

Prevention of Infective Endocarditis

With input from the ADA, the American Heart Association (AHA) released guidelines for the prevention of infective endocarditis in 2007,[5] which were approved by the CSA as they relate to dentistry in 2008.[6]

The current guidelines support infective endocarditis premedication for a smaller group of patients than previous versions. This change was based on a review of scientific evidence, which showed that the risk of adverse reactions to antibiotics generally outweigh the benefits of prophylaxis for many patients who would have been considered eligible for prophylaxis in previous versions of the guidelines. Concern about the development of drug-resistant bacteria also was a factor.

Also, the data are mixed as to whether prophylactic antibiotics taken before a dental procedure prevent infective endocarditis. The guidelines note that people who are at risk for infective endocarditis are regularly exposed to oral bacteria during basic daily activities such as brushing or flossing.

Patient Selection

The current infective endocarditis guidelines state that use of preventive antibiotics before certain dental procedures is reasonable for patients with:

- prosthetic cardiac valve or prosthetic material used for cardiac valve repair
- a history of infective endocarditis
- a cardiac transplant that develops cardiac valvulopathy
- the following congenital (present from birth) heart disease:[a]
  - unrepaired cyanotic congenital heart disease, including palliative shunts and conduits
  - a 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[b]
  - any repaired congenital heart defect with residual defect at the site or adjacent to the site of a prosthetic patch or a prosthetic device (that inhibit endothelialization)

[a] Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of congenital heart disease.

[b] Prophylaxis is reasonable because endothelialization of a prosthetic material occurs within six months after the procedure.

Dental Procedures

Prophylaxis is recommended for the patients identified in the previous section for all dental procedures that involve manipulation of gingival tissue or the periapical region of the teeth, or perforation of the oral mucosa.

Additional Considerations About Infective Endocarditis Antibiotic Prophylaxis (when indicated)

Sometimes patients forget to premedicate before their appointments. The recommendation is that the antibiotic be given before the procedure. This is important because it allows the antibiotic to reach adequate blood levels. However, the guidelines to prevent infective endocarditis[5, 6] state, “If the dosage of antibiotic is inadvertently not administered before the procedure, the dosage may be administered up to 2 hours after the procedure.”

Another concern that dentists have expressed involves patients who require prophylaxis but are already taking antibiotics for another condition. In these cases, the guidelines for infective endocarditis[5, 6] recommend that the dentist select an antibiotic from a different class than the one the patient is already taking. For example, if the patient is taking amoxicillin, the dentist should select clindamycin, azithromycin or clarithromycin for prophylaxis.

Other patient groups also may merit special consideration, which is discussed more fully in the guidelines.

In 2015, The Lancet published a study out of the United Kingdom that reported a correlation between institution of more limited antibiotic prophylaxis guidelines by the National Institute for Health and Clinical Evidence (NICE) in 2008 and an increase in cases of infective endocarditis.[7] Because of the retrospective and observational nature of the study, the authors acknowledged that their “data do not

establish a causal association." At this time, the ADA recommends that dentists continue to use the AHA guidelines discussed above. Dental professionals should periodically visit the ADA website for updates on this issue.

References

1. American Academy of Orthopaedic Surgeons/American Dental Association. Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures: Evidence-based Guideline and Evidence Report. American Academy of Orthopaedic Surgeons 2012. http://www.aaos.org/Research/guidelines/PUDP/PUDP_guideline.pdf. Accessed February 3, 2016.
2. Rethman MP, Watters W, 3rd, Abt E, et al. The American Academy of Orthopaedic Surgeons and the American Dental Association clinical practice guideline on the prevention of orthopaedic implant infection in patients undergoing dental procedures. J Bone Joint Surg Am 2013;95(8):745-7.
3. Sollecito TP, Abt E, Lockhart PB, et al. The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints: Evidence-based clinical practice guideline for dental practitioners--a report of the American Dental Association Council on Scientific Affairs. J Am Dent Assoc 2015;146(1):11-16 e8.
4. Meyer DM. Providing clarity on evidence-based prophylactic guidelines for prosthetic joint infections. J Am Dent Assoc 2015;146(1):3-5.
5. 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(15):1736-54.
6. 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. J Am Dent Assoc 2008;139 Suppl:3S-24S.
7. Dayer MJ, Jones S, Prendergast B, et al. Incidence of infective endocarditis in England, 2000-13: a secular trend, interrupted time-series analysis. Lancet 2015;385(9974):1219-28.

ADA Resources

Professional Resources

- ADA Council on Scientific Affairs, Combating Antibiotic Resistance
- ADA Council on Scientific Affairs, Antibiotic Interference with Oral Contraceptives
- Infective Endocarditis: Legal sidebar (PDF)
- IE guideline tables (PDF)
- Search JADA for articles related to antibiotic prophylaxis
- Search the ADA Catalog for products related to antibiotic prophylaxis
- ADA Library Services

Patient Resources

JADA "For the Patient" page: What is antibiotic prophylaxis?

Additional Resources

- American Heart Association downloadable wallet card for patients

Prepared by: Center for Scientific Information, ADA Science Institute
Last Updated: May 26, 2016

Disclaimer