Guest Editorial

American Dental Association guidance for utilizing appropriate use criteria in the management of the care of patients with orthopedic implants undergoing dental procedures

Approximately 332,000 primary total hip arthroplasties and 719,000 primary total knee arthroplasties were performed in the United States in 2010; 96% of hip replacement and 98% of knee replacement surgeries were performed on patients 45 years and older. Reported infection rates for such operations range from 0.8% to 2.2%. Infections can be caused by introduction of microorganisms at the time of surgery, hematogenous seeding, or contiguous spread of infection from an adjacent site. Infections of total joint replacements can result in failure of the initial surgical procedure and the need for extensive revision, prolonged antibiotic treatment, functional impairment, considerable cost of care, and even death.

In 2014, the American Dental Association (ADA) Council on Scientific Affairs (CSA) assembled an expert panel to update and clarify the clinical recommendations found in a 2012 joint ADA and American Academy of Orthopaedic Surgeons (AAOS) evidence report and guideline. In accord with the 2012 ADA/AAOS evidence report, the updated ADA systematic review (published in the January 2015 issue of The Journal of the American Dental Association) found no statistically significant association between dental procedures and prosthetic joint infections (PJI). On the basis of the review of the evidence, the 2015 ADA Clinical Practice Guideline stated, “In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.”

The ADA panel found no association between dental procedures and PJIs and no scientifically based efficacy for using antibiotics to prevent PJIs. The panel did acknowledge that there may be special circumstances in which a clinician may consider antibiotic prophylaxis despite the lack
of scientific evidence. However, the guidelines did not list any special circumstances.

DEVELOPMENT OF APPROPRIATE USE CRITERIA FOR THE MANAGEMENT OF THE CARE OF PATIENTS WITH ORTHOPEDIC IMPLANTS UNDERGOING DENTAL PROCEDURES

Because there is weak evidence that some patients with certain medical conditions, diseases, and disorders may be at higher risk of experiencing PJIs independent of dental procedures, the AAOS contacted the ADA to participate in the development of appropriate use criteria (AUC) to assist orthopedic surgeons and dentists in managing the care of these patients. (Note: The AAOS began developing AUC in 2011 as a tool to implement evidence-based clinical practice guidelines. AUC are created to inform clinicians for whom a procedure should be performed. This involves using clinician expertise and experience, in conjunction with the relevant evidence, to rate the appropriateness of various treatments in a set of hypothetical, but clinically realistic, patient scenarios. For more information, visit http://www.orthoguidelines.org/go/auc/.) Although dental treatment is not considered a risk factor for PJIs, the AAOS and ADA convened a group of subject matter experts to consider if antibiotic prophylaxis might be appropriate in any of these higher-risk patients.

To create the AUC, the AAOS used the RAND/University of California Los Angeles Appropriateness Method (RAM). The process involved reviewing the available evidence, compiling a list of potential treatment might theoretically create a higher risk of experiencing PJIs. The following medically complex patient populations and related issues were used to develop a matrix to gain consensus on any potential benefit from antibiotic prophylaxis until more definitive scientific data becomes available:

- planned dental procedure;
- immunocompromised status;
- glycemic control;
- history of periprosthetic or deep PJIs of the hip or knee that required an operation;
- time since hip or knee joint replacement procedure.

Once approved by the writing panel, the theoretical risk scenarios were presented to a separate expert voting panel (made up of ADA and AAOS representatives) to determine the appropriateness of antibiotic prophylaxis for each scenario (that is, when antibiotic prophylaxis is “rarely appropriate,” “may be appropriate,” or “appropriate”). The voting panel identified relatively few patient subpopulations for whom antibiotic prophylaxis might be indicated before certain dental procedures. Of 64 total prophylactic antibiotic voting items, 8 (12%) items were rated as “appropriate,” 17 (27%) items were rated as “may be appropriate,” and 39 (61%) were rated as “rarely appropriate.” A Web-based application of the AUC is available at www.orthoguidelines.org/go/auc.

A consensus of American Dental Association—appointed expert panel members and American Dental Association Council on Scientific Affairs members agreed that this tool could benefit dentists, physicians, and patients by reducing antibiotic prescriptions.

TAKE-HOME MESSAGES

There is no evidence to support an association between dental procedures and risk of experiencing PJIs. The parameters that were used as potential scenarios for the AUC, in which antibiotic prophylaxis may be appropriate, do not indicate an increased risk of experiencing PJIs due to hematogenous spread (bacteremia) from dental procedures or possibly other daily, oral health–related hygiene behaviors. These scenarios may indeed have some added risk of developing PJIs in a small number of patients, but they are independent of dental treatment.

The AUC is a decision-support tool to supplement clinicians in their judgment regarding antibiotic prophylaxis for patients with a prosthetic joint who are undergoing dental procedures. It is not intended as the standard of care or as a substitute for clinical judgment. As developed, the AUC could facilitate the treatment of defined “high risk” and “immune compromised” patients. It affects a narrow cohort of patients for whom antibiotic prophylaxis might be considered. Although there was not complete consensus on all aspects of the AUC development process or outcomes, a consensus of ADA-appointed expert panel members and CSA members agreed that this tool could benefit dentists, physicians, and...
patients by reducing antibiotic prescriptions.

Discussion of available treatment options applicable to each patient relies on communication between the patient, dentist, and orthopedic surgeon, weighing the potential risks and benefits for that patient. Prophylactic antibiotics before any clinical procedure that may cause bacteremia are chosen based on the nature and susceptibility of microflora at the treatment site; as well as the possible economic and health impact to patients and populations. Any perceived potential benefit of antibiotic prophylaxis must be weighed against the known risks of antibiotic use, including Clostridium difficile infection, allergic reaction, and the development, selection, and transmission of antimicrobial resistance factors.

It is appropriate for the dentist to make the final judgment to use antibiotic prophylaxis for patients potentially at higher risk of experiencing PJI (independent of dental treatment) using the AUC as a guide, without consulting the orthopedic surgeon. However, if the orthopedic surgeon recommends antibiotic prophylaxis or the patient prefers it, despite the dentist’s recommendation against premedication, the prescription should be provided by the surgeon.

The 2015 ADA clinical practice guideline is valid and should continue to inform clinical decisions for dental patients in ambulatory settings. The guideline states clearly that the “[e]vidence fails to demonstrate an association between dental procedures and PJI or any effectiveness for antibiotic prophylaxis. Given this information in conjunction with the potential harm from antibiotic use, using antibiotics before dental procedures is not recommended to prevent PJI.” The CSA and ADA-appointed expert panel members encourage dental health care professionals to continue to use the 2015 ADA clinical practice guideline, consult the AUC as needed, and respect the patient’s specific needs and preferences when considering antibiotic prophylaxis before dental treatment.

CONCLUSIONS

"In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection."5


Copyright © 2017 American Dental Association. All rights reserved.

American Dental Association Council on Scientific Affairs Antibiotic Prophylaxis Working Group. ADA-Appointed Members of the Expert Writing Panel: Elliot Abt, DDS, MS, MSC; John W. Hellstein, DDS, MS; Peter B. Lockhart, DDS; Angelo J. Mariotti, DDS, PhD; Thomas P. Sollecito, DMD, FDSRCS Ed; Edmond L. Truelove, DDS, MSD. ADA-Appointed Members of the Expert Voting Panel: Steven Armstrong, DDS, PhD; Scott S. De Rossi, DMD; Joel B. Epstein, DMD, MSD; Joel M. Laudenbach, DMD; Lauren L. Patton, DDS; Thomas M. Paumier, DDS; Robert J. Weyant, DMD, DrPH. Commentary Authors: Elliot Abt, DDS, MS, MSC; Peter B. Lockhart, DDS; Thomas M. Paumier, DDS; Thomas P. Sollecito, DMD, FDSRCS Ed; Joel B. Epstein, DMD, MSD; Marcelo W.B. Araujo, DDS, MS, PhD; James M. Lyznicki, MS, MPH. All other Working Group members and the Council on Scientific Affairs approved the document.

Address correspondence to Dr. Araujo at American Dental Association, 211 E. Chicago Ave., Chicago, IL 60611, e-mail araujom@ada.org.

Disclosure. None of the authors reported any disclosures.

The ADA expert panel members thank the following ADA staff members for their leadership and support throughout this project: Alfonso Carrasco Labra, DDS, MSc, PhD(c); and Michael Valerio, PhD.


LETTERS

JADA welcomes letters from readers on articles that have appeared in The Journal. The Journal reserves the right to edit all communications and requires that all letters be signed. Letters must be no more than 550 words and must cite no more than 5 references. No illustrations will be accepted. A letter concerning a recent JADA article will have the best chance of acceptance if it is received within 2 months of the article’s publication. For instance, a letter about an article that appeared in April JADA usually will be considered for acceptance only until the end of June. Letters regarding articles published online ahead of print will be published after the article appears in print if the letter is selected for publication. You may submit your letter via e-mail to jadaletters@ada.org; by fax to 1-312-440-3538; or by mail to 211 E. Chicago Ave., Chicago, IL 60611-2678. By sending a letter to the editor, the author acknowledges and agrees that the letter and all rights of the author in the letter sent become the property of The Journal. Letter writers are asked to disclose any personal or professional affiliations or conflicts of interest that readers may wish to take into consideration in assessing their stated opinions. The views expressed are those of the letter writer and do not necessarily reflect the opinion or official policy of the Association. Brevity is appreciated.

ELECTRONIC CIGARETTE HAZARDS

I would like to thank Drs. Harrison and Hicklin for their November JADA article titled “Electronic Cigarette Explosions Involving the Oral Cavity” (JADA. 2016;147[11]:891-896). As they pointed out, there have been multiple instances of significant injuries to users of these products, some of which have been nearly fatal. The authors also provide an excellent discussion of the makeup of these products and their impact on users on multiple levels. It appears that every month new studies are revealing more troubling findings about these products.

In addition, in the November issue of Environmental Science and Technology, Khlystov and Samburova concluded that aerosols produced by flavored electronic cigarette (e-cigarette) liquids contain dangerous levels of hazardous chemicals that are known to cause cancer in humans. Another study published in the June issue of Pediatrics showed that teens who used e-cigarettes were 6 times more likely to try cigarettes. In the November 8 issue of JAMA, a study from the University Southern California showed that adolescents who vaped more frequently were associated with a higher risk of more frequent and heavy cigarette smoking 6 months later.

The good news is that as of May 2016, the US Food and Drug Administration will regulate all tobacco products including e-cigarettes, vaporizers, vape pens, cigars, hookah pens, electronic pipes, tobacco, and pipe tobacco. Manufacturers will need to submit all the ingredients and component parts of these products and meet other rigid standards. Vape shops that mix or prepare liquids containing nicotine are considered manufacturers and will need to comply with these new US Food and Drug Administration requirements. As of August 8, 2016, e-cigarette sales to minors will be banned throughout the United States.

Clearly, much research still needs to be done to ensure that e-cigarettes are an effective and safe cessation aid. Dental health care professionals need to stay informed on this topic, as their patients will look to them for guidance on how these products will affect their oral and overall health, as well as serve as a resource to help guide them in their efforts to quit nicotine and tobacco use.

RETHINKING DENTAL INSURANCE

In the November Health Policy Perspectives column, “Time to Rethink Dental ‘Insurance’” (Vujicic M. JADA. 2016;147[11]:907-910), Dr. Vujicic presented information from the Health Policy Institute of the American Dental Association. My 39 years of providing general dental care both here and at a rural dental clinic in Honduras cause me to have questions about this information. My experience finds that even though people cite cost as the main reason for not visiting the dentist, fear and the fact that it can just be unpleasant to go to the dentist are often the real reasons. I am a dentist and my wife is my dentist, and I must admit that I do not enjoy dental treatment. Compare this with the percentage of adults undergoing a colonoscopy. People avoid this not because of cost but because it is unpleasant. Colon cancer is preventable, but this does not overcome the dislike of the procedure. Cost is not the issue. I see this with patients who have full dental coverage and do not use the benefit. I believe that many of the patients

http://dx.doi.org/10.1016/j.jada.2016.12.005

Copyright © 2017 American Dental Association. All rights reserved.


60 JADA 148(2) http://jada.ada.org February 2017