

## Advisory Statement

### Antibiotic Prophylaxis for Dental Patients with Total Joint Replacements

American Dental Association; American Academy of Orthopaedic Surgeons

An expert panel of dentists, orthopaedic surgeons and infectious disease specialists, convened by the American Dental Association (ADA) and the American Academy of Orthopaedic Surgeons (AAOS) performed a thorough review of all available data to determine the need for antibiotic prophylaxis to prevent hematogenous prosthetic joint infections in dental patients who have undergone total joint arthroplasties. The result is this report, which has been adopted by both organizations as an advisory statement. The panel's conclusion: Antibiotic prophylaxis is not indicated for dental patients with pins, plates and screws, nor is it routinely indicated for most dental patients with total joint replacements. However, it is advisable to consider premedication in a small number of patients (Table 1) who may be at potential increased risk of hematogenous total joint infection.

Approximately 450,000 total joint arthroplasties are performed annually in the United States. Deep infections of these total joint replacements usually result in failure of the initial operation and the need for extensive revision. Due to the use of perioperative antibiotic prophylaxis and other technical advances, deep infection occurring in the immediate postoperative period resulting from intraoperative contamination has been markedly reduced in the past 20 years.

Patients who are about to have a total joint arthroplasty should be in good dental health prior to surgery and should be encouraged to seek professional dental care if necessary. Patients who already have had a total joint arthroplasty should perform effective daily oral hygiene procedures to remove plaque (e.g. manual or powered toothbrushes, interdental cleaners, oral irrigators) to establish and maintain good oral health. The risk of bacteremia is far more substantial in a mouth with ongoing inflammation than in one that is healthy and employing these home-oral hygiene devices.<sup>1</sup>

Bacteremias can cause hematogenous seeding of total joint implants, both in the early postoperative period and for many years following implantation.<sup>2</sup> It appears that the most critical period is up to two years after joint placement.<sup>3</sup> In addition, bacteremias may occur in the course of normal daily life<sup>4-6</sup> and concurrently with dental and medical procedures.<sup>6</sup> It is likely that many more oral bacteremias are spontaneously induced by daily events than are dental treatment-induced.<sup>6</sup> Presently, no scientific evidence supports the position that antibiotic prophylaxis to prevent hematogenous infections is required prior to dental treatment in patients with total joint prostheses.<sup>1</sup> The risk/benefit<sup>7,8</sup> and cost/effectiveness<sup>7,9</sup> ratios fail to justify the administration of routine antibiotic prophylaxis. The analogy of late prosthetic joint infections with infective endocarditis is invalid as the anatomy, blood supply, microorganisms and mechanisms of infection are all different.<sup>10</sup>

It is likely that bacteremias associated with acute infection in the oral cavity,<sup>11,12</sup> skin, respiratory, gastrointestinal and urogenital systems and/or other sites can and do cause late implant infection.<sup>12</sup> Any patient with a total joint prosthesis with acute orofacial infection should be vigorously treated as any other patient with elimination of the source of the infection (incision and drainage, endodontics, extraction) and appropriate therapeutic antibiotics when indicated.<sup>1,12</sup> Practitioners should maintain a high index of suspicion for any unusual signs and symptoms (e.g. fever, swelling, pain, joint warm to

touch) in patients with total joint prostheses.

Antibiotic prophylaxis is not indicated for dental patients with pins, plates and screws, nor is it routinely indicated for most dental patients with total joint replacements. This position agrees with that taken by the Council on Dental Therapeutics,<sup>13</sup> the American Academy of Oral Medicine,<sup>14</sup> and is similar to that taken by the British Society for Antimicrobial Chemotherapy.<sup>15</sup> There is limited evidence that some immunocompromised patients with total joint replacements (Table 1) may be at higher risk for hematogenous infections.<sup>13, 16-22</sup> Antibiotic prophylaxis for such patients undergoing dental procedures with a higher bacteremic risk (as defined in Table 2), should be considered using an empirical regimen (Table 3). In addition, antibiotic prophylaxis may be considered when the higher risk dental procedures (as defined in Table 2) are performed on dental patients within two years post implant surgery,<sup>3</sup> on those who have had previous prosthetic joint infections, and on those with some other conditions (Table 1).

Occasionally, a patient with a total joint prosthesis may present to the dentist with a recommendation from his/her physician that is not consistent with these guidelines. This could be due to lack of familiarity with the guidelines or to special considerations about the patient's medical condition which are not known to the dentist. In this situation, the dentist is encouraged to consult with the physician to determine if there are any special considerations that might affect the dentist's decision on whether or not to premedicate, and may wish to share a copy of these guidelines with the physician, if appropriate. After this consultation, the dentist may decide to follow the physician's recommendation, or, if in the dentist's professional judgment, antibiotic prophylaxis is not indicated, may decide to proceed without antibiotic prophylaxis. The dentist is ultimately responsible for making treatment recommendations for his/her patients based on the dentist's professional judgment. Any perceived potential benefit of antibiotic prophylaxis must be weighed against the known risks of antibiotic toxicity, allergy, and development, selection and transmission of microbial resistance.

This statement provides guidelines to supplement practitioners in their clinical judgment regarding antibiotic prophylaxis for dental patients with a total joint prosthesis. It is not intended as the standard of care nor as a substitute for clinical judgment as it is impossible to make recommendations for all conceivable clinical situations in which bacteremias originating from the oral cavity may occur. Practitioners must exercise their own clinical judgment in determining whether or not antibiotic prophylaxis is appropriate.

The ADA/AAOS Expert Panel consisted of: Robert H. Fitzgerald Jr., MD; Jed J. Jacobson, DDS, MS, MPH; James V. Luck Jr., MD; Carl L. Nelson, MD; J. Phillip Nelson, MD; Douglas R. Osmon, MD; and Thomas J. Pallasch, DDS. Staff Liaisons: ADA-Clifford W. Whall Jr., PhD; AAOS-William W. Tipton Jr., MD.

**Table 1. Patients at Potential Increased Risk of Hematogenous Total Joint Infection<sup>12,16-22</sup>**

- A. All patients during the first two (2) years after prosthetic joint replacement.
- B. Immunocompromised/immunosuppressed patients
  - o Inflammatory arthropathies (e.g.: rheumatoid arthritis, systemic lupus erythematosus)
  - o Drug -induced immunosuppression
  - o Radiation-induced immunosuppression
- C. Patients with co-morbidities (e.g.)
  - o Previous prosthetic joint infections
  - o Malnourishment

- Hemophilia
- HIV infection
- Insulin-dependent (Type 1) diabetes
- Malignancy

**Table 2. Incidence Stratification of Bacteremic Dental Procedures\***

HIGHER INCIDENCE<sup>1</sup>

- Dental extractions
- Periodontal procedures including surgery, subgingival placement of antibiotic fibers/strips, scaling and root planing, probing, recall maintenance
- Dental implant placement and replantation of avulsed teeth
- Endodontic (root canal) 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

LOWER INCIDENCE<sup>2</sup>

1. Clinical judgment may indicate antibiotic use in selected circumstances that may create significant bleeding.
  - Restorative dentistry<sup>2</sup> (operative and prosthodontic) with/without retraction cord
  - Local anesthetic injections (nonintraosseous and nonintraosseous)
  - Intracanal endodontic treatment; post-placement and buildup
  - Placement of rubber dam
  - Postoperative suture removal
  - Placement of removable prosthodontic/orthodontic appliances
  - Taking of oral impressions
  - Fluoride treatments
  - Taking of oral radiographs
  - Orthodontic appliance adjustment
2. This includes restoration of carious (decayed) or missing teeth.

\*Adapted from: Prevention of Bacterial Endocarditis: Recommendations by the American Heart Association, from the Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease, Council on Cardiovascular Disease in the Young. Reprinted with permission of the *Journal of the American Medical Association*.<sup>23</sup>

**Table 3. Suggested antibiotic prophylaxis regimens\***

Patients not allergic to penicillin: cephalexin, cephradine or amoxicillin: 2 grams orally 1 hour prior to dental procedure.

Patients not allergic to penicillin and unable to take oral medications: cefazolin 1 gram or ampicillin 2 grams IM/IV 1 hour prior to the procedure.

Patients allergic to penicillin: clindamycin: 600 mg orally 1 hour prior to the dental procedure.

Patients allergic to penicillin and unable to take oral medications: clindamycin 600 mg IV, 1 hour prior to the procedure.

\*No second doses are recommended for any of these dosing regimens.

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