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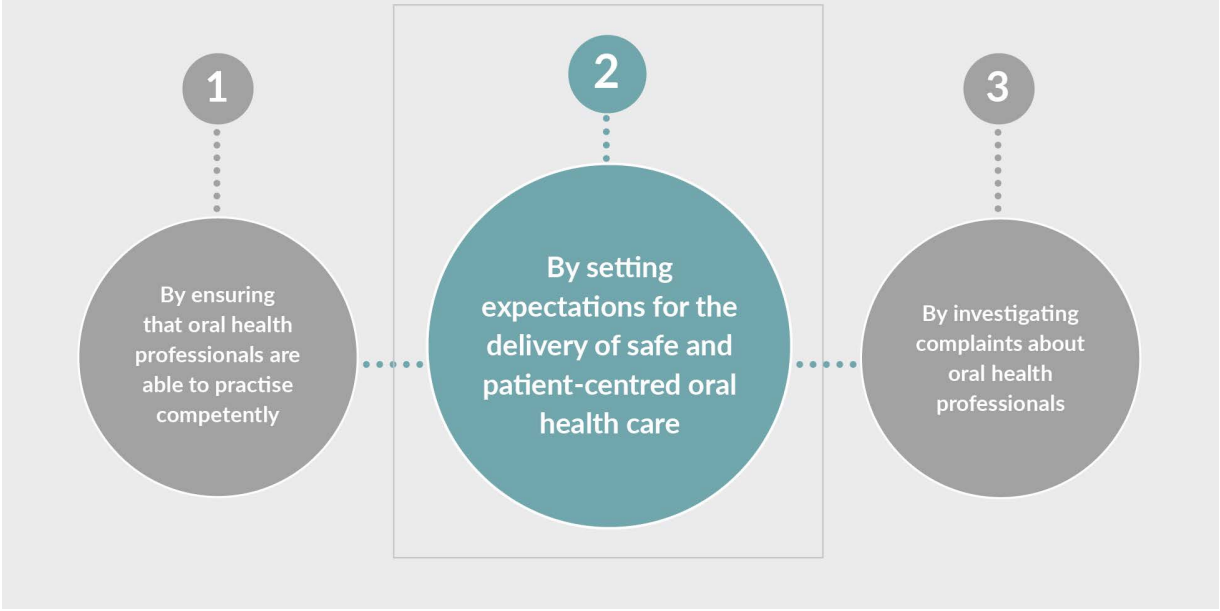
Expectations for clinical and ethical practice

Interpretation Guidelines: Treatment of Clients with Orthopaedic Joint Replacement

Applies to Dental Hygienists

There are three main ways that the BC College of Oral Health Professionals protects the public:



The British Columbia College of Oral Health Professionals (BCCOHP) was created on September 1, 2022 through the amalgamation of four health regulatory colleges: the College of Dental Hygienists of BC, the College of Dental Surgeons of BC, the College of Dental Technicians of BC, and the College of Denturists of BC. All current requirements for standards of clinical and ethical practice issued by the four colleges remain in place upon amalgamation. This document was created by the College of Dental Hygienists of British Columbia and will be updated to reflect the amalgamation.

Treatment of Clients with an Orthopaedic Joint Replacement

May 5, 2020 Update: The CDHBC Interpretation Guidelines are under review. The content of these guidelines remains in place at this time; however, they need to be applied in the context of the new Dental Hygienists Regulation and CDHBC Bylaws. Readers are welcome to contact the CDHBC office if they have questions about the application of these guidelines in the interim time.

PURPOSE

To provide guidelines for antibiotic premedication for clients with an orthopaedic joint replacement.

BACKGROUND

Historically, antibiotic prophylaxis prior to dental treatment was routinely prescribed to those who had a prosthetic joint replacement. The rationale was related to the risk of bacteremia-associated hematogenous seeding of bacteria onto joint implants following invasive dental/dental hygiene treatment causing potential prosthetic joint infection (PJI) and failure.

Invasive dental/dental hygiene treatment has been defined as "procedures that involve manipulation of oral soft tissues, manipulation of the periapical area of teeth, or oral mucosa perforation".[1,2] These would include, but are not limited to the following dental hygiene procedures: scaling, root planning, probing, polishing teeth (where bleeding is anticipated), initial placement of orthodontic bands, intraligamentary anesthesia injections, subgingival placement of antibiotic fibers or strips and suture removal.

Throughout the years, there have been many changes to the recommendations for prophylactic antibiotic coverage for clients with prosthetic joints who are seeking dental/dental hygiene treatment. In recent years there has been increased concern about antimicrobial resistance.[1,2,4-7] With overexposure, infectious organisms have adapted and are not being killed by antibiotics that were previously effective. With this there has been a recent advocacy for antimicrobial stewardship, with a focus on "appropriate selection, dosing, route and duration of antimicrobial therapy." [3,6-7] This has led to a critical investigation on the effectiveness of prophylactic antibiotic coverage for those with prosthetic joints.

The following provides a brief history of decisions by the American Academy of Orthopedic Surgeons (AAOS) and the American Dental Association (ADA) since 2003:

- 2003 – AAOS/ADA recommended that antibiotic prophylaxis be given for a period of 2-years following the placement of a prosthetic joint. After the initial 2-year period, antibiotic prophylaxis was only recommended for those presenting with co-morbidities.[8,9]
- 2009 – AAOS recommended the consideration of antibiotic prophylaxis coverage for life, prior to any dental treatment that may cause bacteremia.[9,10]
- 2012 – AAOS/ADA - Recommended that dental practitioners consider discontinuing the practice of routinely prescribing prophylactic antibiotics for those with hip and knee prosthetic joints prior to dental procedures.[1,9,11]
- 2015 – ADA Council on Scientific Affairs (CSA) reviewed the 2012 AAOS/ADA literature with the addition of four more case-controlled studies. Updated conclusions were made and subsequently published which included:[4]
    - The evidence failed "to demonstrate an association between dental procedures and PJI or any effectiveness for antibiotic prophylaxis" (with moderate certainty).[4]
    - Those with prosthetic joints do not require antibiotic prophylaxis prior to dental procedures to prevent PJI.
    - The need for caution in overprescribing antibiotics due to the potential harm from antibiotic use, including antibiotic resistance.
- 2016 - AAOS and ADA jointly published the *Appropriate Use Criteria* (AUC) *for the Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures* (see Table 1).[12]
    - These provide a list of risk factors for possible PJI, such as immunocompromised status and glycemic control.
    - These also provide details on the most current antibiotic prophylactic regimen for those who present with a prosthetic joint and one or more risk factors and/or immunocompromised status.

RECOMMENDATIONS

In addition to the recent changes as noted above, in the summer of 2016, the Canadian Orthopedic Association (COA), the Canadian Dental Association (CDA) and the Association of Medical Microbiology and Infections Disease (AMMI) Canada also reviewed current evidence and have posted their consensus statement related to joint replacement and dental care on the CDA website.[3] These conclusions and recommendations align closely with those clinical recommendations made by the ADA CSA in 2015. The Consensus Statement and Recommendations of these Canadian organizations are as follows:[3]

- Patients should not be exposed to the adverse effects of antibiotics when there is no evidence that such prophylaxis is of any benefit.

- Routine antibiotic prophylaxis is not indicated for dental patients with total joint replacements, nor for patients with orthopedic pins, plates and screws.
- Patients should be in optimal oral health prior to having total joint replacement and should maintain good oral hygiene and oral health following surgery. Orofacial infections in all patients, including those with total joint prostheses, should be treated to eliminate the source of infection and prevent its spread.

Further to this, the October 21, 2016 CDA Oasis identifies the need to consider the client's overarching medical status when considering prophylactic antibiotic.[13]

The AAOS/ADA's 2016 *Appropriate Use Criteria (AUC) for the Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures* defines high-risk as those clients who are immunocompromised and/or have glycemic control concerns. The dental hygienist plays an important role in completing a thorough medical history and medication review to screen for conditions that require medical clearance for care and/or a determination to be made about antibiotic coverage. Table 1 summarizes the high risk conditions that have been identified by the AAOS and ADA.

Table 1:
Adapted from the AAOS/ADA 2016 published *Appropriate Use Criteria* (AUC) *for the Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures*[12]

Clinical situations for which a client with a prosthetic joint needs to be referred to the orthopedic surgeon or primary care physician due to a high risk or immunocompromised status when planning dental procedures that involve:
manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.[12]

Client Profile	Status	Consultation/Referral
Immunocompromised Status/Conditions:	• AIDS • Cancer, undergoing chemotherapy • Rheumatoid arthritis and taking biologic disease modifying agents (e.g., tumor necrosis factor alpha, prednisone) • Solid organ transplant • Inherited diseases of immunodeficiency (e.g., congenital agammaglobulinemia, congenital IgA deficiency) • Bone marrow transplant	Refer to orthopedic surgeon for determination of prophylactic antibiotic coverage needs

Diabetic Glycemic Control:	• HbA1c ≥ 8 or (need to be within 3-6 months) • Blood Glucose ≥ 11.1 mmol/L (200 mg/dl) • No reading	Delay treatment until consultation with the primary care physician for an HbA1c or blood glucose test
In addition to any of the above:	• History of periprosthetic or deep prosthetic joint infection that required an operation	Refer to orthopedic surgeon for determination of prophylactic antibiotic coverage needs
For more detailed information see the AAOS Ortho Guidelines : http://www.orthoguidelines.org/go/auc/default.cfm?auc_id=224995&actionxm=Terms		

For circumstances where antibiotic prophylaxis is warranted, the AAOS has adopted the American Heart Association (AHA) 2007 prophylactic antibiotic regimen as published in the *Circulation* 2007 article titled *Prevention of Endocarditis.*[12] The AAOS has made a minor revision by removing Clindamycin and Cefazolin as antibiotic options to reflect current medical practice, as outlined in Table 2:

Table 2: Prophylactic Regimen:[12]

Situation	Agent	Regimen – Single Dose 30-60 minutes before procedure
Oral	Amoxicillin	*Adults:* 2.0 g Children: 50 mg/kg orally, *1 hour before procedure*
Unable to take oral medications	Ampicillin or ceftriaxone	*Adults:* 2.0 g IM or IV* (ampicillin)1.0 g IM or IV (ceftriaxone) Children: 50 mg/kg, 1M or IV within 30 minutes of procedure
Allergy to oral penicillins or ampicillin	Cephalexin** †	*Adults:* 2.0 g Children: 50 mg/kg orally, *1 hour before procedure*
	Azithromycin or clarithromycin	*Adults:* 500 mg Children: 15 mg/kg orally, *1 hour before procedure*
Allergic to Penicillin or ampicillin and unable to take oral medications	Ceftriaxone †	*Adults:* 1.0 g IM or IV Children: 50 mg/kg IM or IV, within 30 minutes of procedure
	Azithromycin or clarithromycin	*Adults:* Equivalent Dose 500mg IV Children: Equivalent Dose IM or IV within 30 minutes of procedure

IM indicates intramuscular; IV, intravenous
*Intramuscular injections should be avoided in persons receiving anticoagulants
***Or other first or second generation oral cephalosporin in equivalent adult or pediatric dosages*
† Cephalosporins should not be used with individuals with a history of anaphylaxix, angioedema or uticaria, to penicillins or ampicillin.

From: American Academy of Orthopeadic Surgeons. Appropriate Use Criteria: AP Drugs From AHA Statement. 2012 Available from: https://aaos.webauthor.com/go/auc/terms.cfm?auc_id=224965&actionxm=Terms

Timing of Antibiotic Administration

In conversations with the AAOS, it was confirmed that there is insufficient research on the effectiveness of post-operative antibiotic dosing in the event that a client, who has a prosthetic joint, inadvertently forgets to take the antibiotic prophylaxis. Until further

research has been conducted the AAOS has adopted the 2007 AHA post-operative dosing recommendations.[14]

The AHA recommendation is as follows: an antibiotic for prophylaxis should be administered in a single dose before invasive dental/dental hygiene procedure. If the dosage of antibiotic is inadvertently not administered before the procedure, the dosage may be administered up to 2 hours after the procedure. This protocol should be reserved for emergency situations and may not be used simply for the convenience of the office or the dental hygienist.

Registrants are encouraged to visit the following websites for the most current information on antibiotic premedication for clients with prosthetic joints:

The American Academy of Orthopaedic Surgeons: www.aaos.org
The American Dental Association: www.ada.org
The Canadian Dental Association: www.cda-adc.ca

POLICY

As outlined in the CDHBC Code of Ethics Statements the dental hygienist is responsible for ensuring the health and welfare of the client and that dental hygiene services are provided in a safe environment using current knowledge and skills.15 As well, dental hygienists must ensure that assessments, implementation strategies and documentation align with the CDHBC Practice Standards. A thorough review and analysis of the health history and medication profile information are required. This is necessary in order to screen for the presence of any risk factors or conditions that would require any modifications, considerations or referrals for a client with a prosthetic joint, prior to providing dental hygiene care.

The routine use of antibiotic prophylaxis is not required for most clients with a prosthetic joint replacement prior to dental hygiene procedures. If such a client presents with one or more risk factors such as an immunocompromised condition and/or poor or unknown glycemic control (as outlined in Table 1), the dental hygienist should consult with the orthopedic surgeon for a determination about appropriate antibiotic prophylaxis.[4] Ideally, the orthopaedic surgeon should be consulted for a prescription, however if this is not possible, another health care provider with prescribing rights may be engaged to provide an appropriate prescription (e.g. physician or dentist). A collaborative approach with the client's physician or dentist is recommended. **The decision for antibiotic prophylaxis coverage, and any directions provided must be clearly documented in the client's chart**.

It has been shown that asymptomatic transient bacteremia can occur after common oral activities such as tooth brushing, chewing gum, or using dental floss.[2,9,16] As such, dental hygienists should educate and encourage clients, who have had a prosthetic joint, in the

effective daily removal of oral biofilm to maintain a healthy oral cavity.[11] It is also recommended that prior to having a prosthetic joint, the client should be in optimal oral health and maintain this post-surgery.[3,9]

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