CDHO
COLLEGE OF DENTAL HYGIENISTS OF ONTARIO

Guideline: Recommended Antibiotic Prophylaxis Regimens for the Prevention of Infective Endocarditis and Hematogenous Joint Infection

The need for antibiotic prophylaxis for the prevention of infective endocarditis and hematogenous joint infection (the latter in the setting of joint replacement) should be considered on an individual basis in conjunction with the healthcare provider most familiar with the client's specific condition. Treatment decisions should be made in light of all circumstances presented by the client. Treatments and procedures applicable to the individual client rely on mutual communication between client, dental hygienist, physician, dentist, and other healthcare practitioners. The dental hygienist is ultimately responsible for making the decision whether or not to proceed with dental hygiene services.

Regarding infective endocarditis, antibiotic prophylaxis is reasonable only for clients with the highest risk of adverse outcomes who undergo dental/dental hygiene procedures that involve manipulation of either gingival tissue or the periapical region of teeth or perforation of the oral mucosa. (The range of heart conditions constituting "highest risk" has been reduced by reputable authorities — in particular, the American Heart Association — in recent years.)

Regarding clients with total joint replacements or orthopaedic pins, plates, and screws, routine antibiotic prophylaxis is **not** indicated for dental/dental hygiene procedures. (This current recommendation by reputable authorities — in particular, the Canadian Orthopaedic Association [COA], the Canadian Dental Association [CDA], and the Association of Medical Microbiology and Infectious Disease [AAMI] Canada — constitutes much more restrictive use of antibiotic prophylaxis than has historically been the case.)

Additional CDHO information on **infective endocarditis** (and antibiotic prophylaxis for dental hygiene procedures):

- CDHO Fact Sheet — Infective Endocarditis
- CDHO Advisory — Infective Endocarditis Associated with Certain Heart Conditions

Additional CDHO information on **joint replacement** (and antibiotic prophylaxis for dental hygiene procedures):

- CDHO Fact Sheet — Joint Replacement
- CDHO Advisory — Joint Replacement

INFECTIVE ENDOCARDITIS

The following recommendations are based on the 2021 "American Heart Association Scientific Statement: Prevention of Viridans Group Streptococcal Infective Endocarditis", which updates the 2007/2008 AHA infective endocarditis guidelines. These recommendations are provided to aid dental hygienists in their clinical judgment regarding antibiotic prophylaxis for clients who have had medications prescribed for prevention of infective endocarditis prior to dental hygiene procedures. For considerations on whether prophylactic

antibiotic coverage is required or recommended for a specific medical condition (whether related to infective endocarditis or not), please consult the CDHO Knowledge Network. In particular, please consult the Infective Endocarditis Fact Sheet.

Table 1 — Antibiotic Prophylaxis Regimens for Clients at Highest Risk of Adverse Outcome from Infective Endocarditis Who Are Undergoing Dental/Dental Hygiene Procedures (based on 2021 "American Heart Association Scientific Statement: Prevention of Viridans Group Streptococcal Infective Endocarditis", which updates 2007/2008 AHA Guidelines)

Clinical situation	Medication	Single dose 30–60 minutes pre-procedure	
		Adults	Children
Person able to take oral medication	amoxicillin	2 g	50 mg/kg
Person unable to take oral medication	ampicillin	2 g IM[i] or IV[ii]	50 mg/kg IM/IV
	cefazolin	1 g IM or IV	50 mg/kg IM or IV
	ceftriaxone	1 g IM or IV	50 mg/kg IM or IV
Person allergic to penicillins or ampicillin but able to take oral medication[iv]	cephalexin[iii/v]	2 g	50 mg/kg
	azithromycin	500 mg	15 mg/kg
	clarithromycin	500 mg	15 mg/kg
	doxycycline	100 mg	<45 kg, 4.4 mg/kg> 45 kg, 100mg
Person allergic to penicillins or ampicillin and unable to take oral medication	cefazolin	1 g IM or IV	50 mg/kg IM or IV
	ceftriaxone[v]	1 g IM or IV	50 mg/kg IM or IV

i IM = intramuscular
ii IV = intravenous
iii or other first- or second-generation oral cephalosporin in equivalent adult or paediatric dosage
iv Clindamycin is no longer recommended for antibiotic prophylaxis for dental/dental hygiene procedures. It may cause more frequent and severe reactions than other antibiotics used for antibiotic prophylaxis.
v Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema, or urticaria with penicillins (including ampicillin).

Note: Prior or ongoing antibiotic use for another condition should be considered before prophylactic antibiotics are prescribed, because resistant organisms may develop. If the need for prophylaxis closely follows prior antibiotic exposure or is coincident with ongoing antibiotic use, a prophylactic antibiotic from a different antibiotic class is likely indicated.

Table 2 — Antibiotic Prophylaxis Regimens for Adult Clients at Highest Risk of Adverse Outcome from Infective Endocarditis Who Require Multiple Dental Hygiene Appointments Within a 9-Day Period (no penicillin allergy) [based on Pickett FA and Gurenlian JR. Preventing Medical Emergencies: Use of the Medical History in Dental Practice (3rd edition). Baltimore/Philadelphia: Wolters Kluwer Health; 2015. (Box 8-4, p. 97)], with modification based on 2021 "American Heart Association Scientific Statement: Prevention of Viridans Group Streptococcal Infective Endocarditis"[i]

Appointment (on different days)	Drug Regimen (30–60 minutes before appointment)
First	amoxicillin
Second	macrolide (e.g., clarithromycin or azithromycin)
Third	cephalosporin (e.g., cephalexin)[ii]
Fourth (or Fifth, depending on possible antecedent staggered use of cephalosporin + doxycycline; see note ii below)	amoxicillin

The recommendations in Table 2 are for adult clients, with **no penicillin allergy**, who are at highest risk for **infective endocarditis** (due to the specified heart conditions and the dental procedures listed in the 2007 AHA protocols), and as augmented in the 2021 AHA Statement).

i Clindamycin is no longer recommended for antibiotic prophylaxis for dental/dental hygiene procedures.

ii Doxycycline is a consideration ahead of, or after, cephalosporin in a multiple appointments scenario.

Decision-making Using the Antibiotic Prophylaxis Recommendations in Table 2

These recommendations are for clients returning for multiple appointments within the 9-day period, but on **different** days. One of the best ways to eliminate this need for a "rotational schedule" of the antibiotics is to schedule the client's multiple appointments at least 10 days apart. Using the same antibiotic between dental hygiene appointments that are scheduled **within a 9-day period** increases the risk of antibiotic resistance and may reduce the efficacy of the drug.

Another way to reduce risk of antibiotic resistance is to complete as much treatment as reasonably possible at one appointment. For example, antibiotic resistance is less likely to occur if the client has two appointments for debridement and half the mouth is treated under antibiotic prophylaxis at each appointment rather than if the client has four appointments for separate quadrant debridement under antibiotic prophylaxis.

If a rotational schedule is needed for a client who is allergic to penicillin, eliminate **amoxicillin** in the rotation. Depending on the nature of the penicillin allergy, cephalosporins may be contraindicated; if so, one of the **macrolide antibiotics** or **doxycycline** should be considered instead.

Multiple Appointments on Same Day

If a client requires premedication and has multiple appointments on the same day, **Table 2** does not apply. If appropriate, the client should take an additional dose of the **same drug**, not a **second alternative drug**. The determination regarding whether an additional dose is required — as well as the amount of the drug needed — depends on a number of variables, including the half-life of the drug, the age of the client, and whether or not

the client has any impairments (e.g., liver) that would slow down the absorption, distribution, metabolism, and excretion process. If unsure whether an additional dose is needed, the dental hygienist should consult with the prescriber and/or a pharmacist.

Table 3 — Bacteremic Dental Procedures (based on 2007/2008 guidelines of the American Heart Association, in conjunction with 2021 AHA Statement)

Antibiotic Prophylaxis Recommended[1] **Dental procedures that involve manipulation of gingival tissue or the periapical region of the teeth or perforation of the oral mucosa[2]**
Scaling and root planing of teeth
Periodontal procedures • Curetting tissue • Periodontal probing • Periodontal surgery • Subgingival placement of antibiotic fibers and strips
Tooth extraction
Suture removal
Biopsies
Prophylactic cleaning of teeth or implants where bleeding is anticipated
Dental implant placement and replantation of avulsed teeth
Endodontic instrumentation or surgery only beyond the apex
Placement of orthodontic bands
Intraligamentary and intraosseous local anaesthetic injections
1 Table 3 lists dental procedures that may increase the risk of infective endocarditis as per AHA guidelines. 2 The following procedures and events do not need prophylaxis: routine anaesthetic injection through non-infected tissue, taking radiographs, placement of removable prosthetic 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.

Other Considerations for Antibiotic Prophylaxis

Occasionally, a client may present with a recommendation for, or against, prophylactic antibiotic coverage from a physician that is not consistent with the CDHO or AHA guidelines. The dental hygienist is to consult with the physician (primary or specialized care provider) to determine if there are any special considerations that would affect a decision whether to pre-medicate, bearing in mind that antibiotic prophylaxis is indicated only for clients with the highest risk of adverse outcomes who undergo dental/dental hygiene procedures that involve manipulation of either gingival tissue or the periapical region of teeth or perforation of the oral mucosa. The dental hygienist should have a copy of the CDHO fact sheet or advisory specific to the medical condition and

make the document available to the physician for consultation if appropriate. The need for antibiotic coverage for the client should be considered on an individual basis in conjunction with the client's physician (primary or specialized care provider). The medical/dental antibiotic recommendation/decision should be documented by the dental hygienist; however, the dental hygienist is ultimately responsible for making the decision whether to proceed with dental hygiene services.

What Happens When an Individual Has Not Taken the Required Prophylactic Antibiotics 30 to 60 Minutes Prior to Treatment?

Dental hygienists are reminded that they are responsible for the treatment they render. If the dental hygienist does not believe that it is in the best interest of the client to proceed with treatment, the dental hygienist must not do so. It is both unethical and illegal for the dentist to insist that treatment be performed by the dental hygienist when there are doubts as to the medical condition of the client. To provide maximum protection against sub-acute bacterial endocarditis, **prophylactic antibiotics must be administered 30 to 60 minutes prior to the commencement of any procedure that might induce bleeding**. The dental hygienist should always ask if the client has taken the medication and document that fact. The CDHO takes the position that dental hygienists are responsible for informing the client of the possible consequences of treatment that may occur if the required prophylactic antibiotics have not been taken within the specified time period. If, following a detailed explanation of the risks and benefits of prophylactic coverage to the client and if the dental hygienist is confident that the client understands the ramifications, then the dental hygienist may choose to proceed or not to proceed based on whether the risks outweigh the benefits. Documentation of all of the facts is essential. As a precaution, every client who requires prophylactic antibiotics should have a physician's letter in his/her file. In the occasional situation where the client has forgotten to take the prophylactic antibiotic and has failed to notify the dental hygienist prior to the commencement of treatment, the antibiotic may be administered at that time (up to 2 hours after the procedure). THIS PROTOCOL IS FOR EMERGENCIES ONLY AND MAY NOT BE USED FOR EXPEDIENCY OF THE APPOINTMENT OR THE CONVENIENCE OF THE OFFICE.

JOINT REPLACEMENT

The evidence-based 2016 COA/CDA/AMMI "Consensus Statement on Patients with Total Joint Replacements having Dental Procedures" states that routine antibiotic prophylaxis is not indicated for clients with total joint replacements, nor for clients with orthopaedic pins, plates, and screws.

For considerations on whether prophylactic antibiotic coverage is required or recommended for a specific medical condition (whether related to joint replacement or not), please consult the CDHO Knowledge Network. In particular, please consult the Joint Replacement Fact Sheet; **the vast majority of clients with prosthetic joints do not require, nor are recommended to be given, prophylactic antibiotics**.

Other Considerations for Antibiotic Prophylaxis for Hematogenous Joint Infection

Occasionally, a client with a joint replacement may present with a recommendation for prophylactic antibiotic coverage from a physician/surgeon that is not consistent with this CDHO guideline or with the 2016 Consensus Statement of the Canadian Orthopaedic Association, the Canadian Dental Association, and the Association of Medical Microbiology and Infectious Disease (i.e., routine antibiotic prophylaxis is not indicated). The dental hygienist is to consult with the physician/surgeon (primary or specialized care provider) to determine if there are any special considerations that would affect a decision to pre-medicate, bearing in mind that routine

antibiotic prophylaxis is not indicated for dental/dental hygiene procedures for clients with total joint replacements, pins, plates, or screws. The dental hygienist should have a copy of the CDHO fact sheet or advisory specific to the medical condition and make the document available to the physician/surgeon for consultation if appropriate. If it is still deemed appropriate by the physician/surgeon (i.e., the prescriber) to proceed with antibiotic prophylaxis, then this medical/dental antibiotic recommendation/decision should be documented by the dental hygienist. The dental hygienist is ultimately responsible for making the decision whether to proceed with dental hygiene services.

ADDITIONAL INFORMATION

Periodic updates on antibiotic prophylaxis will be published on-line by the CDHO, including in its Knowledge Network. This was formerly done in the now discontinued official CDHO publication *Milestones*, including: https://cdho.org/wp-content/uploads/2023/09/Milestones_201902.pdf#page=23

For further information on **specific medical conditions that may require prophylactic antibiotics** prior to invasive dental hygiene procedures, please consult the CDHO Knowledge Network.

OTHER RESOURCES

Infective Endocarditis and Antibiotic Prophylaxis

American Heart Association

- 2021 AHA Scientific Statement: Prevention of Viridans Group Streptococcal Infective Endocarditis
- 2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease
- American College of Cardiology / American Heart Association 2008 Guideline Update on Valvular Disease: Focused Update on Infective Endocarditis
- Infective Endocarditis
- Prevention of Infective Endocarditis: Guidelines From the American Heart Association [2007]

Canadian Dental Association

- CDA Position on Prevention of Infective Endocarditis

American Association of Endodontists

- Antibiotic Prophylaxis 2017 Update

American Dental Association

- Oral Health Topics – Antibiotic Prophylaxis Prior to Dental Procedures

Other

- Pickett FA and Gurenlian JR. Preventing Medical Emergencies: Use of the Medical History in Dental Practice (3rd edition). Baltimore/Philadelphia: Wolters Kluwer Health; 2015.

Joint Replacement and Antibiotic Prophylaxis

Canadian Orthopaedic Association

- Consensus Statement – Patients with Total Joint Replacement having Dental Procedures – 2016

Canadian Dental Association

- Consensus Statement: Dental Patients with Total Joint Replacement

American Dental Association

- Oral Health Topics – Antibiotic Prophylaxis Prior to Dental Procedures

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