



Taking the Bite Out of Tooth Pain

A Toolkit on Using Antibiotics
Wisely for Managing Tooth
Pain in Adults



This toolkit was reviewed and supported by:



Consult your professional organizations or provincial regulator regarding eligibility for continuing education credits for accessing and utilizing this toolkit and associated resources.

Executive Summary

Rationale

Antimicrobial resistance is recognized as one of the top ten global public health threats by the World Health Organization.¹ In Canada, the proportion of infections resistant to antimicrobials is anticipated to increase from 26% in 2018 to 40% by 2050.² Additionally, in 2021, nearly 73.6%, of the total antimicrobial consumption in Canada consisted of antibiotics from groups commonly prescribed for tooth pain, exceeding the World Health Organization's country specific target benchmark of 60%.³

Historically, dentists have prescribed antibiotics for tooth pain; however this practice is not supported by evidence, as the majority of tooth pain cases can be managed with a dental procedure, pain medication, or both.^{4,5} Dental prescriptions are an important contributor to the problem of antimicrobial resistance for the following reasons:

- Research has shown that up to 80% of antibiotics prescribed by dentists are considered unnecessary.^{6,7}
- In 2022, dentists accounted for 9.6% of all antibiotic prescriptions in Canada.⁸
- The overall proportion of antibiotics prescribed by Canadian dentists is rising.⁹

The unnecessary use of antibiotics not only contributes to this global threat but can also cause side effects to patients and, occasionally, more serious harms. Antibiotics must be reserved for serious infections where there is evidence of clinical effectiveness.⁴

Purpose

The focus of this toolkit is on managing tooth pain and determining when it is appropriate to prescribe antibiotics. The guidance in this toolkit applies to adult patients, including those with medical complexity, who are capable of producing an immune response to a bacterial challenge.

Target Audience

This toolkit is intended for dentists, physicians, and other health care professionals managing adults presenting with tooth pain in settings where dental treatment may or may not be immediately available.

Choosing Wisely Canada Recommendation:

Don't prescribe antibiotics for toothache or localized dental abscess.

- The Canadian Association of Hospital Dentists

Contents

Standardized Approach to Managing Tooth Pain in Adults	
Dental Settings	5
Non-Dental Settings	6
Antibiotic Guidelines	7
Tooth Pain Prescription	8
Poster	8
Frequently Asked Questions (FAQ)	9
Health Care Providers	
Patients	
Quality Improvement in Your Practice	10
References	11

Dental Settings

Standardized Approach to Managing Tooth Pain in Adults

Symptom(s)	Clinical Finding(s)	Treatment	Recommendation	Tools
Pain Only	Vital Tooth	Investigate further to identify and treat cause	Pain Management ^{10,11,12}	 Tooth Pain Prescription  Poster  FAQ - Patients
	Non-Vital Tooth	Root canal therapy or dental extraction		
Pain and Swelling	Non-Vital Tooth with localized periapical abscess with/ without drainage	Root canal therapy, or dental extraction +/- incision and drainage of the abscess	Pain Management ^{10,11,12}	 Antibiotic Guidelines  FAQ - Health Care Providers  FAQ - Patients
	Non-Vital Tooth with periapical abscess and Systemic Involvement (i.e., fever, trismus, malaise, spreading facial swelling)	Root canal therapy or dental extraction +/- incision and drainage of the abscess	Pain Management + Antibiotic ^{13,14,15} Re-evaluate efficacy of treatment after 2 days/48 hours in person, virtually, or via phone call	

Non-Dental Settings

Standardized Approach to Managing Tooth Pain in Adults

Symptom(s)	Recommendation	Tools
Pain +/- Localized Swelling (i.e., adjacent to the tooth root)	Pain Management ^{10,11,12} + Recommend dentistry follow up for definitive diagnosis and management	 Tooth Pain Prescription  Poster  FAQ - Patients
Pain +/- Localized Swelling (i.e., adjacent to the tooth root) and Systemic Involvement (i.e., fever, malaise, trismus, spreading swelling to face)	Pain management ^{10,11,12} and Antibiotic ^{13,14,15} + Recommend urgent dentistry follow-up for definitive diagnosis and management	 Antibiotic Guidelines  FAQ - Health Care Providers  FAQ - Patients

Antibiotic Guidelines:

Treatment For Tooth Pain With Systemic Signs of Infection

Standardized approach for stable adult outpatients with tooth pain, when antibiotics is recommended as per the tables above:

Condition	Antibiotic
Without reported allergy to Penicillin, Ampicillin or Amoxicillin	Amoxicillin 500 mg oral every 8 hours x 5 days ^{13,14} OR Penicillin V potassium 600 mg oral every 6 hours x 5 days ^{13,14}
With non-severe reported allergy to Penicillin, Ampicillin or Amoxicillin (e.g., Ucomplicated rash, itching, nausea, vomiting, diarrhea) ¹⁶	Implement PEN-FAST Calculator to rule out allergy. If allergy cannot be ruled out: Cefuroxime* 500 oral every 6 hours x 5 days ^{14,15} <i>*Considered non-cross reactive with Penicillin¹⁵</i>
With severe reported allergy to Penicillin, Ampicillin or Amoxicillin a. Immediate type reaction (i.e., hives, wheeze, shortness of breath, anaphylaxis) ¹⁵	Cefuroxime* 500 oral every 12 hours x 5 days <i>*Considered non-cross reactive with Penicillin¹⁵</i>
b. Other severe reaction to Penicillin: (i.e., delayed type reactions like Stevens Johnson Syndrome (SJS) /Toxic Epidermal Necrolysis (TEN), Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) OR severe allergy to other beta lactam (i.e., immediate type reaction to cephalosporin) ^{14,15}	Azithromycin (loading dose of 500 mg oral on day 1, followed by 250 mg for an additional 4 days) + Metronidazole 500 mg oral every 12 hours x 5 days ^{14,15}

Dental Pain Management Tools

RX Dental

Patient name: _____
Date: _____

Antibiotics are not needed to treat your dental symptoms today. Using antibiotics when they are not needed can cause harmful side effects and make them less effective in the future when we really need them to treat infections.

The symptoms you present with today suggest:

Tooth pain (cause not yet known)
 Localized abscess (a pocket of pus near the tooth)
 Dry socket (pain after the tooth has been removed)
 Dental decay (a cavity)
 Post-operative pain (pain after dental surgery)
 Other: _____

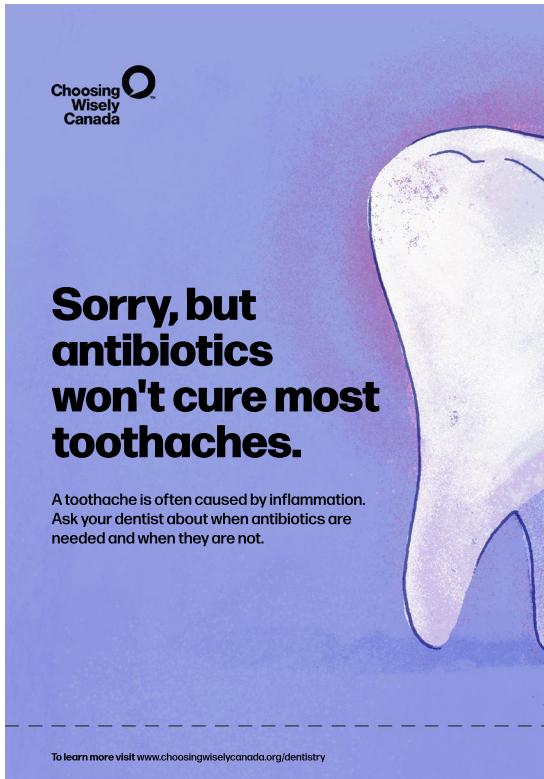
How to help you feel better and treat symptoms:

Ibuprofen* (e.g. Advil, Motrin) 400-600 mg every 6-8 hours as needed for up to _____ days
 Acetaminophen (e.g. Tylenol) 500-1000 mg every 4-6 hours as needed for up to _____ days

*Only to be used if no other conditions that could cause issues like renal or liver failure, history of gastrointestinal bleeding. Ibuprofen is first line medication recommended for mild to moderate tooth pain. For severe pain, you can take a combination of Ibuprofen and Acetaminophen using the doses above. Do not exceed maximum daily dose of Acetaminophen (4000 mg) or Ibuprofen (1200 mg-2400 mg). If no history of congestive heart disease, risk of cardiac attack or strokes.

Saltwater rinse/gargle
 Ice pack - apply to the sore areas
 Heat pad - apply to the sore area
 Other treatment (Please specify): _____

Next Steps:
 Please contact your dentist for further assessment and definitive dental treatment



Tooth Pain Prescription

Provides other ways to manage tooth pain when antibiotics are not needed.

How to Implement:

- Print, complete, review, and give it to the patient
- Scan or take a screenshot and email it using secure and approved methods
- On a video call, fill it out and share your screen so that your patient can take a screenshot or photo
- Incorporate it into the patient's record

Download

Poster/Screensaver

An effective way to educate and set expectations before and during a visit.

How to Implement:

- Print and hang them in the waiting area or examination rooms
- Use them as screensaver on your clinic computers, waiting room televisions, practitioner's website, social media pages
- Hang them in visible spaces, and/or add the information in a message playing while patients are waiting on hold over the phone
- Incorporate it into the patient's record

Download

Frequently Asked Questions (FAQ)

Frequently Asked Questions
For Health Care Providers

Choosing Wisely Canada

Why is 5 days recommended as the standardized length for antibiotic treatment?
The optimal duration of antibiotics used for dental infections is currently unknown, although there is evidence-based literature showing that a three versus seven days duration for managing infections in other parts of the body was non-inferior. Evidence is emerging in the dental literature that also supports three day courses. Given these trends in literature for overall duration, we recommend 5 days until stronger evidence is available.¹²

If the first line antibiotic treatment for tooth pain with systemic signs of infection fails, without a reported allergy to Penicillin, Amoxicillin or Amoxicillin, how should I proceed?

- Reevaluate for an additional source of infection (most common reason for treatment failure)
- Implement appropriate management of the infection
- Consider complementing first line treatment with oral Metronidazole 500 mg every 8 hours x 5 days¹²
- OR
- Discontinuing first line treatment and prescribing oral Amoxicillin/Clavulanic (500/125 mg), every 8 hours x 5 days¹²

My patient is immunocompromised. What is the standardized approach for assessment and management of adult patients with tooth pain?
The American Dental Association evidence-based clinical practice guideline on antibiotic use for the management of non-vital tooth with localized peripulpal abscess with/without drainage, has adopted a list of conditions which may constitute an immunocompromised patient.³ These include:

1. Patient with Acquired Immune Deficiency Syndrome (AIDS) with a CD4 T cell count of <200 cells/mm³ or Human Immunodeficiency virus (HIV) with an AIDS defining opportunistic illness⁴
2. Patients with cancer undergoing immunosuppressive chemotherapy with febrile (Celsius 38.3°/Fahrenheit 100.4) neutropenia (Absolute Neutrophil Count (ANC) <2000) OR severe neutropenia irrespective of fever (ANC <500)
3. Patients with chronic conditions with concomitant use of potent immunosuppressive drugs, such as biologic agents (e.g. tumor necrosis factor alpha inhibitors) or steroids (e.g., prednisone >10 mg per day). Please note, methotrexate, hydroxychloroquine, azathioprine, and other medications with a similar potency should NOT be considered immunocompromising agents
4. Patients with solid organ transplant on immunosuppressants
5. Inherited diseases of immunodeficiency (e.g., congenital agammaglobulinemia, congenital IgA deficiency)
6. Patients with stem cell transplant in one of the following phases of treatment:
 - a. Pretransplantation period
 - b. Firstengraftment period (approximately 0-30 days posttransplantation)
 - c. Postengraftment period (approximately 30-100 days posttransplantation)
 - d. Late postengraftment period (100 days posttransplantation) while still on immunosuppressive medications to prevent Graft Versus Host Disease (GVHD) (typically 36 months post transplantation)

Antibiotics Before a Dental Procedure
Your Questions Answered

Choosing Wisely Canada

Antibiotics won't help with tooth pain and should only be used in certain situations before dental procedures. Here are some examples of when to talk to your health care provider about antibiotics:

Do you have a penicillin allergy?

- If you had a mild reaction, like a rash, to penicillin more than 5-10 years ago, in most cases you will not be considered to have an allergy to it. Your provider might suggest a direct oral challenge, where you take a small dose to check for a reaction. This is often as safe as a skin test, with less than a 1% chance of a serious reaction.
- If you had a reaction in the **last 5 years**, depending on the type of reaction, the antibiotic may need to be avoided completely, and a skin test may be needed.

Heart condition?

Antibiotics are only helpful for patients with certain congenital heart conditions, valve replacements, or history of heart valve infection. There is no evidence that antibiotics are helpful for patients with other types of heart conditions, but they can cause harmful side effects if used when they are not needed.

Heart device?

If you have a heart device not located in your heart valves or if you have other implanted devices, you do not need antibiotics before a dental procedure. There is no evidence that antibiotics help in these cases, but they can cause harmful side effects if used when they are not needed.

Joint replacement?

You do not need antibiotics before a dental procedure for joint replacement, orthopedic plates, plates, and screws. There is no evidence that antibiotics help in these cases, but they can cause harmful side effects if used when they are not needed.

Medical condition?

Some patients with certain medical conditions, such as heart valves, may need antibiotics before dental procedures, even if they do not have signs of infection, like fever, trouble opening their mouth, feeling unwell, or facial swelling. Talk to your health care provider about your medical condition before a dental procedure.

This information is for you to use when talking with your health care provider. It is not a substitute for medical advice and treatment.

For Health Care Providers

Common questions about antibiotic treatments before a dental procedure.

Download

For Patients

Common questions about why antibiotics may not be needed before a patient's dental procedure.

Download

Quality Improvement in Your Practice

Measuring your Improvement

How do I know my efforts to practice antimicrobial stewardship are working?

Evaluate the appropriateness and effectiveness of your antibiotic prescribing using any of the following strategies:

1. Ask your patients if they have read the posters or FAQ in your office. Do they have any questions?
2. Ask your office staff to phone patients 24-48 hours after a consult or a dental procedure where you may have otherwise prescribed antibiotics but instead performed definitive dental treatment to see if their pain has improved.⁹
3. Follow up with patients who have been prescribed antibiotics three days later to see if their pain and swelling has improved and if they are feeling better.
4. Audit your clinical practice to see how you are managing patients who present with dental pain to better understand the situations where an antibiotic is truly necessary in your practice.²⁴
5. Are you following the practices noted above?
6. When do you do something different? Why?
7. Monitor return office visits or, where applicable, Emergency Department visits for same issue.

Additional Clinician Resources

Antimicrobial Stewardship in Dentistry

 www.bccdc.ca/health-professionals/clinical-resources/antimicrobial-stewardship/dental-antimicrobial-stewardship

Antibiotics in Dental Care

 www.antibioticwise.ca/topics/antibiotics-and-dental-care

Antibiotics and Dental Care

 www.cda-adc.ca/en/oral_health/talk/antibiotics

References

1. World Health Organization. No Time to Wait: Securing the Future From Drug-Resistant Infections. 2020.
2. Council of Canadian Academies, 2019. When Antibiotics Fail. Ottawa (ON): The Expert Panel on the Potential Socio-Economic Impacts of Antimicrobial Resistance in Canada. Council of Canadian Academies.
3. Thompson, W., et al. Tackling Antibiotic Resistance: Why Dentistry Matters. *Int Dent J*, 2021. 71(6): p. 450-453. PMID: 33581869.
4. Public Health Agency of Canada. 2021. Canadian Antimicrobial Resistance Surveillance System Report. Ottawa ON.
5. Cope, A.L., et al. Antibiotic Prescribing in UK General Dental Practice: A Cross-Sectional Study. *Community Dent Oral Epidemiol*, 2016. 44(2): p. 145-53. PMID: 26507098.
6. Suda, K.J., et al. Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures, 2011 to 2015. *JAMA Netw Open*, 2019. 2(5): p. e193909. PMID: 31150071.
7. Lockhart, P.B., et al., Evidence-Based Clinical Practice Guideline on Antibiotic Use For the Urgent Management of Pulpal- and Periapical-Related Dental Pain and Intraoral Swelling: A Report From the American Dental Association. *J Am Dent Assoc*, 2019. 150(11): p. 906-921 e12. PMID: 31668170.
8. Canadian Antimicrobial Resistance Surveillance System (CARSS). Antimicrobial Use. Government of Canada. Last updated: 2023/11/24.
9. Marra, F., et al., Antibiotic Prescribing By Dentists Has Increased: Why? *J Am Dent Assoc*, 2016. 147(5): p. 320-7. PMID: 26857041.
10. Moore, P.A., et al., Benefits and Harms Associated with Analgesic Medications Used in the Management of Acute Dental Pain: An Overview of Systematic Reviews. *J Am Dent Assoc*, 2018. 149(4): p. 256-265 e3.
11. Aminoshariae, A., et al., Evidence-Based Recommendations for Analgesic Efficacy to Treat Pain of Endodontic Origin: A Systematic Review of Randomized Controlled Trials. *J Am Dent Assoc*, 2016. 147(10): p. 826-39. PMID: 27475974.
12. Choosing Wisely Canada. Pain Medicines: What to Do if You Have Heart Problems or Kidney Disease.
13. Cooper L, Stankiewicz N, Sneddon J, Smith A, Seaton RA. Optimum Length of Treatment With Systemic Antibiotics in Adults With Dental Infections: A Systematic Review. *Evid Based Dent*. 2022 Sep 7. doi: 10.1038/s41432-022-0801-6. Epub ahead of print. PMID: 36071280.
14. American Dental Association. Evidence-Based Clinical Practice Guideline on Antibiotic Use for the Urgent Management of Pulpal- and Periapical-Related Dental Pain and Intraoral Swelling.
15. Bugs & Drugs. Management of β -Lactam Allergy.
16. Patterson RA, Stankewicz HA. Penicillin Allergy. [Updated 2023 Jun 20]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan.
17. Wilson, W.R., et al. Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement From the American Heart Association. *Circulation*, 2021. 143(20): p. e963-e978.
18. Centers for Disease Control and Prevention 2014. Revised Surveillance Case Definition for HIV Infection - United States. 2014.

19. Lockhart, P.B., et al. Evaluation of Patients Labeled With a Penicillin Allergy to Promote Antimicrobial Stewardship in Dental Practice. *J Am Dent Assoc*, 2024. 155(7): p. 565-573 e1. [PMID: 38703160](#).
20. Khan, D.A., et al. Drug Allergy: A 2022 Practice Parameter Update. *J Allergy Clin Immunol*, 2022. 150(6): p. 1333-1393. [PMID: 36122788](#).
21. Beacher, N., M.P. Sweeney, and J. Bagg. Dentists, Antibiotics and Clostridium Difficile-Associated Disease. *Br Dent J*, 2015. 219(6): p. 275-9. [PMID: 26404991](#).
22. Cuevas-Gonzalez MV et al. Antimicrobial Resistance in Odontogenic Infections: A Protocol for Systematic Review. *Medicine (Baltimore)*. 2022 Dec 16;101(50):e31345. [PMID: 36550913](#).
23. BC Centre for Disease Control. Rethink Clindamycin for Dental Patient Safety. Therapeutics Initiative. March-April 2024. [PMID: 39432703](#).
24. NHS England. [Antimicrobial Resistance in Dentistry - Audit](#).

This toolkit was prepared by:

Dr. Caroline Fulop, BScH, DMD

Division of Dental and Maxillofacial Surgery, The Ottawa Hospital

Dr. Susan Sutherland, DDS, MSc

Department of Dental and Maxillofacial Sciences, Sunnybrook Health Sciences Centre

Associate Professor, University of Toronto

Dr. Mercedes Magaz MD, MHSc

Quality Improvement Specialist, CQuIPS

Dr. Olivia Ostrow, MD, FAAP

Associate Director, CQuIPS

Division of Pediatric Emergency Medicine, Hospital for Sick Children

Associate Professor, Department of Pediatrics, University of Toronto

Dr. Jerome Leis MD, MSc, FRCPC

Division of Infectious Diseases, Sunnybrook Health Sciences Centre

Associate Professor, Department of Medicine, University of Toronto

Benoit Soucy, DMD, MSc

Chief Knowledge Officer, Canadian Dental Association

Susan Taylor, RN, BScN, MBA

Director, Quality, Royal College of Dental Surgeons of Ontario

LouAnn Visconti, BSc, DDS, MSc

Diploma Orthodontic Specialist

Dr. Jennifer Young, MD, CCFP-EM

Physician Advisor, College of Family Physicians of Canada

This toolkit was peer-reviewed by:

Dr Brian Rittenberg BA, DDS, Msc, FRCD

Assistant Professor, Division Head, Oral and Maxillofacial Surgery,

Mount Sinai Hospital/Sinai Health System

Dr. Sara Banham, HBSc, DMD

Dr. Elaine S. Bland, BM, MRCGP, CCFP(PC), FCFP, MAvMed

Medical Director, Southwood Hospice

Medical Lead Mental Health, Calgary Foothills Primary Care Network