

Therapeutics Initiative

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Plain Language Summary

Is Clindamycin a Good Antibiotic for Dental Infections?

Background

Dentists sometimes prescribe the antibiotic drug clindamycin in British Columbia for dental infections, although it can cause serious harm. Sometimes it is even given to prevent infection before dental work is done. This Therapeutics Letter stresses patient safety when choosing the best antibiotic for dental care.

Why is clindamycin usually not the best drug for dental infections?

Most dental infections come from bacteria in the mouth. Clindamycin is not any better than other antibiotics at treating these dental infections and can cause more harms. Recent research shows that other antibiotics are just as good at healing dental infections.

What are the risks of using clindamycin?

Clindamycin can cause diarrhea, stomach inflammation, and other problems. The most serious risk is developing *Clostridioides difficile* colitis. This is a severe infection of the colon. Studies have found that clindamycin is much more likely to cause this infection than other antibiotics. Even a single dose can lead to serious reactions that can be life-threatening.

What about patients who say they are allergic to penicillin?

Many patients believe or were told as children that they are allergic to penicillin. Many studies have shown they may not be truly allergic or have outgrown the allergy. Dentists should ask questions about allergies and consider using cefuroxime instead, which is safe for most people with a penicillin allergy.

Antibiotics are overused in dentistry

Research shows that antibiotics may be prescribed before dental procedures to try to make sure an infection does not start. Guidelines recommend against using antibiotics for this purpose. Whether antibiotics are really needed to prevent infections before dental work in patients with heart conditions has also been questioned.

Choosing the right antibiotic

The Bugs & Drugs program <https://www.bugsanddrugs.org> updates advice for antibiotic use in dental care. Dentists should avoid using clindamycin as the first choice for dental infections. Safer alternatives, like cefuroxime, should be used especially for patients with penicillin allergies.

Conclusion

To protect patients from possible harm, clindamycin for dental infections is not a good choice. Other antibiotics should be used, and only when necessary. For more guidance, visit the Bugs & Drugs website.



Abstract

Background: Clindamycin is frequently prescribed by dentists in British Columbia (BC) for dental infections despite its significant propensity for harm, particularly in causing *Clostridioides difficile* colitis. Clindamycin accounts for 12% of antibiotic prescriptions from BC dentists, compared to 5% in Australia and a mere 0.5% in the UK. These disparities cannot be explained solely by differences in dental health.

Aims: This Therapeutics Letter highlights the risks associated with clindamycin use in dental practice, provides guidance on antibiotic use in dental infections, and recommends alternatives for patients with reported penicillin allergies.

Recommendations: Dentists are advised against using clindamycin for prophylaxis or initial treatment of dental infections due to its high risk of causing *Clostridioides difficile* colitis, increased mortality compared to amoxicillin, and potential for severe adverse reactions. Given the high prevalence of reported penicillin allergies, dentists are encouraged to consider cefuroxime as a safe alternative for most patients. The Bugs & Drugs program offers updated guidance for pre-operative dental prophylaxis and treatment of active infections, aligned with the guidance from the American Dental Association (ADA) and other authoritative bodies.



<https://ti.ubc.ca/letter148>

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BC Centre for Disease Control
Provincial Health Services Authority

Rethink clindamycin for dental patient safety

Summary:

- Do not use clindamycin for prophylaxis or initial treatment of dental infections, because it has the highest propensity among antibiotics to cause *Clostridioides difficile* colitis.
- Clindamycin increases death, compared with amoxicillin.
- About 10% of people report penicillin allergy; but skin-testing and oral challenges show the true rate is less than 0.5%.
- Cefuroxime is a safe option for most patients who have true penicillin allergy.
- See Bugs & Drugs for recommendations for prophylaxis and treatment of dental infections: www.bugsanddrugs.org

This Letter provides guidance for antibiotic use to prevent and treat dental infections, with specific emphasis on patient safety. Because of its outsized harms, clindamycin is rarely the best antibiotic choice. However, dentists in British Columbia prescribe it frequently. Clindamycin comprises 12% of antibiotic prescriptions from dentists in BC, compared with 5% for dentists in Australia and 0.5% in the UK. Differences in dental health do not account for this disparity.¹

Clindamycin is not more effective

Most dental infections are polymicrobial, originating from endogenous oral flora. Clindamycin is active against certain aerobic gram-positive cocci (including some *Staphylococci* and *Streptococci*) and against anaerobic gram-negative rod-shaped bacteria (some *Bacteroides* and *Fusobacteria*). Clindamycin is not more efficacious than alternatives. A 2021 systematic review of antibiotics as adjuvants to dental procedures for management of acute dentoalveolar infections (with or without systemic signs and symptoms) found that all of the assessed treatment regimens – whether no antibiotic, narrow-spectrum antibiotics, broad-spectrum antibiotics, or clindamycin specifically – are equally likely to achieve clinical resolution.² The Australian authors recommend against broad-spectrum antibiotics like clindamycin as first-line therapy for non-severe infections in otherwise healthy patients. They also question whether antibiotics are required when drainage can be established surgically.



Clindamycin causes significant harm to patients, especially *Clostridioides difficile*

Clindamycin often causes diarrhea and gastritis, but its worst effect is to reduce the normal gut microbiome's resistance to colonization by pathogens.³ A 2013 meta-analysis of observational studies in outpatients determined that clindamycin poses a relative risk for *C. difficile* infections that exceeds any other class of antibiotic: nearly 17-fold above baseline, 6-fold higher than penicillins, and 3-fold higher than cephalosporins.⁴ A 2022 retrospective cohort study of a US claims database showed that of the ten most frequently prescribed outpatient antibiotics, clindamycin was most strongly associated with *C. difficile* infection. Azithromycin, doxycycline, and penicillin VK were least associated.⁵

Even a single dose of antibiotics can cause significant harms. This includes death, and clindamycin is particularly concerning. Observational data from the Yellow Card adverse drug reaction (ADR) reporting system in England show that among nearly 3 million patients who received a single 2-gram dose of oral amoxicillin, there were no fatal reactions, and <23 non-fatal reactions per million prescriptions. In contrast, a single 600mg dose of oral clindamycin was reported to cause 13 fatal and 149 non-fatal reactions per million prescriptions, most of which were from *C. difficile* infections. ADRs from clindamycin were similar after single or multiple doses.⁶ In the United States, clindamycin carries a Black Box warning: "...Because [clindamycin] therapy has been associated with severe colitis which may end fatally, it should be reserved for serious infections where less toxic antimicrobial agents are inappropriate..."⁷

What to do when patients report a penicillin allergy?

First, question the allergy. Up to 10% of people report a penicillin allergy, but of these, more than 95% will test negative upon skin testing or oral challenge. Fewer than 0.5% of people have a true allergy.⁸ IgE-mediated hypersensitivity also declines substantially over time.⁹



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Beta-lactam cross-reactivity between penicillin and cephalosporins depends on the similarity of side chain structure.¹⁰ Because its side chain does not resemble that of amoxicillin, **cefuroxime is the recommended alternative** for dental infections, as opposed to cephalexin.⁹ **Very rare but severe reactions such as Stevens-Johnson syndrome remain contraindications to prescribing any beta-lactam.** The Figure below offers a decision tree to help patients and clinicians (including dentists) navigate reported allergy status.

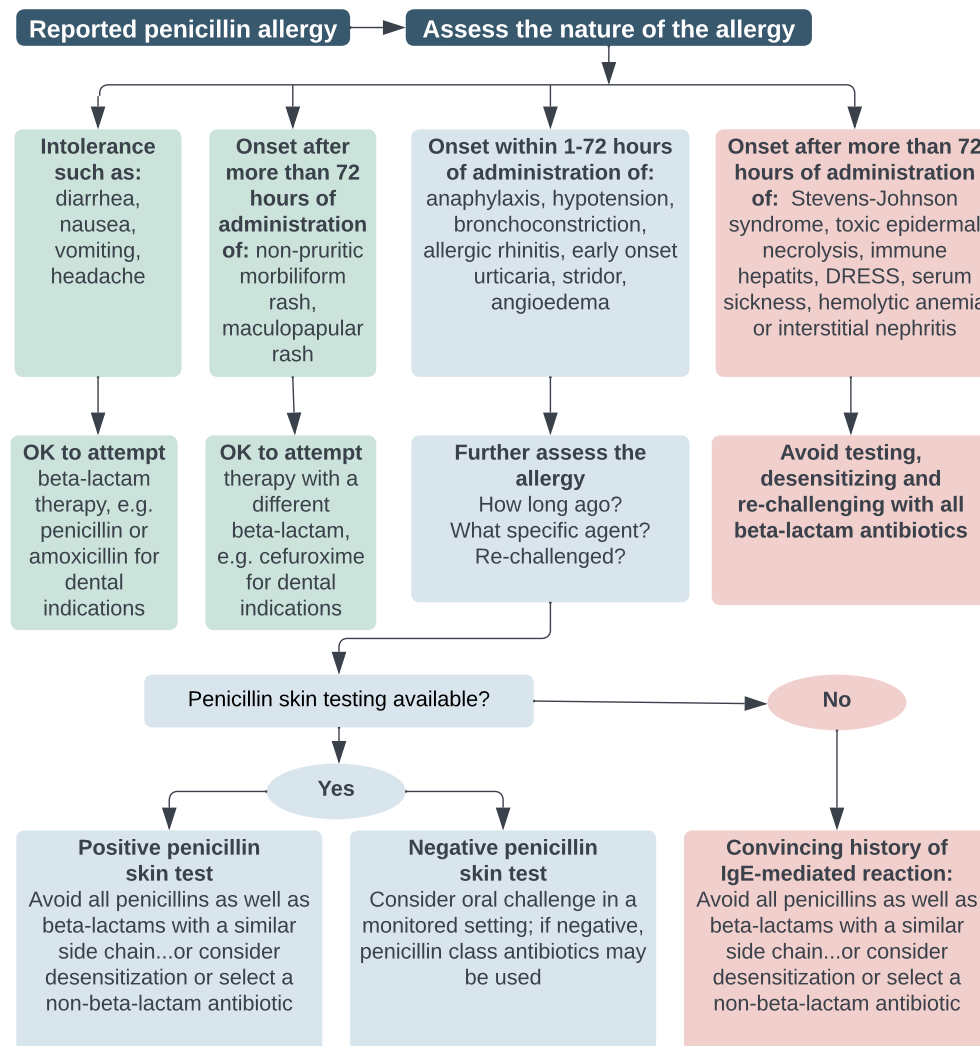
Antibiotics are overused for prophylaxis and as adjuvants for dental procedures

A retrospective cohort study of about 170,000 US dental visits between 2011 and 2015 found that 80% of prescriptions for antibiotics prior to dental procedures were unnecessary, when compared with recommendations in national guidelines.¹¹ The American Dental Association (ADA) has issued clear guidance against use of antibiotics for minor ailments such

as toothache or localized dental abscess.¹² Four Cochrane reviews concluded that there is insufficient evidence to promote use of antibiotics as prophylaxis or adjuvant treatment for most dental procedures in healthy patients.¹³⁻¹⁶ In a consensus statement, the Canadian Dental Association and partner organizations recommend against antibiotic prophylaxis for patients with prosthetic joints.¹⁷

Using antibiotic prophylaxis to prevent infective endocarditis (IE) arising from dental procedures in patients with cardiac comorbidities is now being questioned. The United Kingdom National Institute for Health and Care Excellence (NICE) recommended in 2008 against antibiotic prophylaxis for preventing IE in any patient, even people at high risk.¹⁸ Since then, prescriptions for single doses of amoxicillin and clindamycin have declined radically in the UK, without a convincing increase in incidence of IE or death associated with IE.¹⁹ In the 5 years after Sweden issued similar recommendations, there was no increase in cases of streptococcal IE (the principal organism of concern for dental procedures), even among high-risk individuals.²⁰

Figure: Decision tree for evaluation of penicillin allergy²¹



Which antibiotic, if any, is right for my patient?

Bugs & Drugs is a program supported by BC and Alberta public funds. It periodically updates recommendations for pre-operative dental prophylaxis in select populations. It also offers recommendations for treatment of active infections, concordant with the ADA guidance that drainage or other definitive tooth-preserving dental treatment is the mainstay of management. Antibiotics are indicated only for infections with systemic involvement.¹³

See the Bugs & Drugs website (or scan the QR code below) for detailed guidance, including for those with penicillin allergy.



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