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| **Responsible Antibiotic Use in Dentistry: A Focus on Antibiotic Stewardship** |
| Chicago Department of Public Health Guidelines for Antibiotic Use in Dentistry |

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Scope of these guidelines for antibiotic prescribing in dentistry:

**Introduction**

**Treatment: #1) Acute oral bacterial infection (cellulitis or abscess)**

 **#2) Acute Pericoronitis**

 **#3) Sinus infection that presents with dental symptoms**

 **#4) Chronic periodontal disease**

**Prophylaxis: #1) Prevention of surgical site infections**

 **#2) Prevention of infective endocarditis**

 **#3) Prevention of prosthetic joint infections**

**Introduction:**

Dentists prescribe 10% of all outpatient antibiotic prescriptions, writing more than 25.7 million prescriptions each year. General and specialty dentists are the third highest prescribers of antibiotics in all outpatient settings in the US.1 Reports from 2017-2019 suggest that 30-85% of dental antibiotic prescriptions are “suboptimal or not indicated”.2-4

We hope a summary of available literature in these Chicago Department of Public Health (CDPH) dental prescribing guidelines will help guide more judicious use of antibiotics in your dental practice. Please use the previously distributed Dental Toolkit binder as references for additional resources and literature on dental antimicrobial stewardship.

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| **TREATMENT REGIMENS** |

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| **#1) Acute oral bacterial infection (cellulitis or abscess):**5,6 |
| **Management** |
| Depending on the extent of the infection and any signs of systemic spread of infection (fever or malaise), or if the patient is immunosuppressed/otherwise medically compromised, antibiotics can be considered. Primary treatment is the surgical resolution of the dental problem; antibiotics are secondary to that process. |
| **Treatment**  |
| When pulpotomy, pulpectomy, nonsurgical root canal treatment, incision for drainage of abscess (Definitive, Conservative Dental Treatment or DCDT) or extraction are an immediate option (same day), antibiotics are **not indicated** as adjunct to care in mostly all cases. * **Do not** prescribe oral systemic antibiotics as adjunct to DCDT or extraction for immunocompetent adults with irreversible pulpitis, pulp necrosis, and symptomatic apical periodontitis or localized acute apical abscess unless they present with extraoral or severe intraoral swelling, and/or exhibit signs of systemic illness.

Evidence suggests that nonsteroidal anti-inflammatory drugs such as ibuprofen 400-600mg PO QID with meals and at bedtime plus acetaminophen 1000mg PO QID combination therapy is effective in managing dental pain.3, 7 The types of bacterial organisms associated with oral infections are relatively limited, and the majority are sensitive to penicillins. Based on this, the drugs of choice are: amoxicillin 500mg PO TID for 3-7 days (or alternatively penicillin V potassium 500mg PO QID for 3-7 days). Although both amoxicillin and penicillin are first-line treatment, amoxicillin is preferred over penicillin because it is more effective against various gram-negative anaerobes and its lower incidence of gastrointestinal side effects. As an alternative for patients with a history of penicillin allergy, but without a history of anaphylaxis, angioedema, or hives with penicillin, ampicillin, or amoxicillin, prescribe cephalexin 500mg PO QID for 3-7 days.8 Dentists should have a low threshold to add metronidazole to cephalexin therapy in patients with a delayed response to antibiotics. For an alternative for patients with a severe reaction to penicillin, ampicillin, or amoxicillin (anaphylaxis, angioedema, or hives) prescribe azithromycin 500mg PO x1, then 250mg for 4 days. Bacterial resistance rates for azithromycin are higher than for other antibiotics. Alternative to a beta-lactam or azithromycin is clindamycin 300mg PO QID for 3-7 days. Clindamycin substantially increases the risk of developing *Clostridioides difficile* infection, even after a single dose.9 Dentists should reevaluate patients within 3 days (for example, in-person visit or phone call). **Dentists should instruct patients to discontinue antibiotics 24 after symptoms resolve, irrespective of reevaluation after 3 days.** In cases that failed to respond to amoxicillin or penicillin, consider broadening antibiotic therapy to either complement first-line treatment with metronidazole 500mg PO TID for 7 days or discontinue first-line treatment and prescribe amoxicillin-clavulanate 500mg/125mg PO TID for 7 days.  |
| **#2) Acute Pericoronitis10-11**  |
| **Management** |
| Acute Pericoronitis is treated with local measures unless there is facial swelling, trismus or systemic involvement (such as fever and malaise).  |
| **Treatment** |
| Extraction is the treatment of choice if tooth is recommended for removal. If extraction is not performed, treatment for localized tissue swelling and soreness is irrigation in the office and at home. Adjustment of opposing dentition may be considered if traumatic. For patients with localized tissue swelling and soreness, fever < 101°F, mild trismus and/or facial swelling, antibiotics are recommended. The recommended systemic antibiotic regimen is:* Penicillin V K 500 mg PO QID (consider a loading dose of 1,000 mg). Duration is 3-7 days.
* Alternative is clindamycin 300 mg PO TID (consider a loading dose of 600 mg). Duration is 3-7 days.

For patients with symptoms consistent with major systemic involvement (localized tissue swelling and soreness, fever >101°F, severe trismus, facial swelling and/or malaise), immediate referral to an oral and maxillofacial surgeon is warranted. |
| **#3) Sinus infection that presents with dental symptoms:**5 |
| **Management** |
| After a detailed dental examination and appropriate periapical radiograph(s), if there is no evidence of dental pathology, then it is unlikely the sinus pain is coming from a dental source.  |
| **Treatment**  |
| Treating sinus pain with antibiotics as a means of ruling out a dental etiology is not appropriate. Sinus infections are most often viral and will improve without use of antibiotics. The patient should be referred to their Primary Care Provider for further management. |
| **#4) Chronic periodontal disease:5** |
| **Management/Treatment** |
| Chronic periodontal disease is not amendable to antibiotic management. Management includes mechanical cleaning, and maintaining a long-term healthy oral environment is essential. |

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| **PROPHYLAXIS REGIMENS** |

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| **#1) Prophylaxis to prevent surgical site infections:**5 |
| **Management/Treatment**  |
| In general, literature does not support the use of antibiotics prophylactically to prevent local infections in tissues proximal/adjacent to a surgical or dental procedural site, such as a dental extraction, endodontic procedure or an implant placement. An exception may be the surgical extraction of third molars, especially in situations where there is pericoronitis. The clinician is encouraged to use their clinical judgement to evaluate the patient’s health and the extent of the procedure relative to antibiotic use in such situations. The prophylactic effect of antibiotics occurs within the **first one or two doses** and antibiotic use **may be of** **detriment if continued for the next 3-7 days**, especially if there are no signs of infection at the surgical site. Best practices and responsible antibiotic stewardship suggests antibiotics should be reserved to manage an infection if it occurs, rather than used in hopes of preventing the infrequent infections that may be associated with such procedures in healthy immunocompetent patients. |
| **#2) Prophylaxis to prevent infectious endocarditis:**5,12-14 |
| **Background** |
| Infectious endocarditis (IE) is more likely to result from exposure to bacteremia associated with daily activities (i.e. chewing, brushing teeth) than from a dental procedure. Antibiotic prophylaxis (AP) may be prevented in a small number of IE cases, however the risk of antibiotic associated adverse drug reactions exceeds any expected benefit.  |
| **Management** |
| Selection of appropriate patient need, antibiotic type and dosage is critical. The American Heart Association (AHA) 2007 guidelines recommend AP when dental treatment involves manipulation of gingival tissue, manipulation of the periapical region of teeth, or perforation of the oral mucosa, and only for highest risk patients. Indications for AP to prevent IE prior to dental procedures include the following patients with highest cardiac risk factors for IE:* Prosthetic cardiac valves or materials for valve repair
* Prior infective endocarditis
* Congenital heart disease (CDH) such as unrepaired cyanotic CHD (including palliative shunts and conduits); completely repaired defects with prosthetics during the first 6 months after the procedure; repaired CHD with residual defects at or near the site of a prosthetic patch or device
* Cardiac transplant recipients with cardiac valvulopathy

In 2017 the AHA/American College of Cardiology expanded this AP recommendation to include: patients with transcatheter prosthetic valves and patients with prosthetic material used for valve repair such as annuloplasty rings and chords. The addition was based on observational studies for increased risk of IE.15  |
| **Treatment** |
| Regimens for IE prophylaxis include:* Amoxicillin 2Gm PO x1 30-60 minutes prior to the procedure, and ampicillin 2Gm IM or IV x1 30-60 minutes preop if unable to take oral medications.
* Patients with a penicillin allergy (non-severe reactions including rash) due to side-chain dissimilarity can safely be prescribed cephalexin 2Gm PO x1 30-60 minutes preop, and this is preferred over the alternative classes of antibiotics (macrolides and clindamycin) to optimize antibiotic coverage (and less risk of antibiotic resistance) in balance with a safer antibiotic side effect profile.
* Cefazolin has a unique R-1 side chain and is also associated with low to no risk of cross-reactivity with penicillins in patients unable to take oral medication (cefazolin 1Gm IM or IV 30-60 minute preop).
* In the case of a severe (history of anaphylaxis, angioedema, or hives) penicillin allergy, administer azithromycin 500mg PO x1 30-60 minutes preop.
* Alternatively, consider clindamycin 600mg (PO, IM or IV) 30-60 min preop. (or clarithromycin 500mg PO x1 30-60 min preop).
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|  **#3) Prophylaxis to prevent prosthetic joint infections:5, 13** |
| **Management**  |
| The best available evidence to date shows that dental procedures are not associated with a prosthetic joint infection (PJI) in the immunocompetent patient.16-18 In a case-control study of 339 patients with PJIs, Berbari et al19 matched cases with 339 control patients without infection and assessed dental procedure as “exposure”. In the immunocompetent patient, there was no statistical association between high-risk procedures (i.e. extractions, dental abscess treatment) without AP and PJI at six months or two years. The American Association of Orthopedic Surgeons’20 recommends prophylaxis for severely immunocompromised patients in the following categories: Stage 3 AIDS, patients undergoing immunosuppressive chemotherapy, immunosuppressed patients with solid organ transplants, and during certain stages of bone marrow transplantation. |
|  **Treatment** |
| If this practice is being recommended by an orthopedic surgeon and your clinician-to-clinician discussion of risk vs benefit is unable to persuade the surgeon and/or patient away from prophylaxis and the decision is made collectively to prescribe, the same regimen is followed as that of infective endocarditis prophylaxis.  |



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