

# TREATING ACUTE DENTAL INFECTIONS IN THE COMMUNITY AND APPROPRIATE REFERRAL TO AN EMERGENCY DEPARTMENT



Most patients with dental infections can be effectively treated with appropriate mechanical intervention and, where indicated, oral antibiotics (1-4). When detected early, most odontogenic infections may be safely managed by the general dentists. In a recent Canadian study, 50% of the patients referred to the ED with an acute dental infection (ADI) were not given IV therapy. The authors suggest most IV antibiotic therapies were possibly unnecessary and could delay definitive surgical management (5). This finding suggests an opportunity to reduce unnecessary referral to the ED for patients with ADIs.



## WHEN IS ED REFERRAL NECESSARY?

The decision for specialist referral is based upon the infection location, severity, surgical access, and status of host defences. Accurate assessment is necessary to manage any head and neck infection. Referral to an Emergency Department (ED) would be indicated if the patient has signs of a fascial space infection or systemic signs of severe infection (fever, tachypnea, tachycardia

or hypotension). These patients are at risk of developing a compromised airway and sepsis, respectively. Signs of a spreading fascial space infection warranting urgent referral to ED or an oral and maxillofacial surgeon are fever, rapid progression, trismus, odynophagia and periorbital cellulitis (1,2).

## CRITERIA FOR REFERRAL TO THE ED:<sup>1</sup> URGENTLY

- Difficulty breathing
- Difficulty swallowing
- Dehydration
- Moderate to severe trismus (interincisal opening <25 mm)
- Swelling extending beyond the alveolar process
- Malaise and toxic appearance
- Compromised host defenses
- Need for general anaesthesia

## ACUTE DENTAL INFECTION IS A SURGICALLY MANAGED DISEASE:

- The principles underlying the management of an odontogenic infection are first to establish surgical drainage (1-4).
- A common misconception about odontogenic infection is the need for antibiotics as the main treatment modality.
- Odontogenic infection is primarily a surgically managed disease process and antibiotics only serve an adjunctive role, if indicated at all (see Table1).



## OTHER BENEFITS OF APPROPRIATE ED REFERRAL AND USE OF FIRST LINE MECHANICAL INTERVENTIONS

- Reduce pressure on Emergency Departments. Appropriate referral of patients to the emergency services can reduce patient congestion and long wait times at the Emergency Department.
  - If referring to the ED, evaluation and management decisions will be made by the emergency room physicians in consultation with appropriate specialty services (e.g. maxillofacial surgery, ID etc.).
- Reduce risk of ADI recurrence. The over-reliance on IV antibiotic therapy through ED programs, the use of oral antibiotics as first-line treatment, and the deferral of definitive mechanical intervention can lead to increased risk of recurrent ADI as an unintended consequence. 36% of patients treated with IV therapies were treated for recurrent ADIs. (5). *Patient's expectations need to be managed with a clear explanation that mechanical intervention is the best therapy (5).*
- Reduce societal and healthcare costs. Attending the ED for daily or twice daily antibiotics would be disruptive to the patient and family/caregivers. This also increases healthcare and societal costs.
- Minimize risks associated with antibiotic use.
  - Unnecessary antibiotic use increases the risks of both *C. difficile* infection and future antimicrobial resistance. Also, it increases the cost to the patients.
  - At a population level, unnecessary antibiotics is the key driver for antimicrobial resistance.



### ALTERNATIVES TO PENICILLIN-METRONIDAZOLE IN TABLE 1 (P3):

Amoxicillin-clavulanate provides equivalent coverage of streptococci and anaerobes compared to penicillin-metronidazole, but it is more expensive, use is not recommended routinely. Amoxicillin with metronidazole is an alternative to penicillin +/-metronidazole.



### ASSESSING PENICILLIN/AMOXICILLIN/ CEPHALEXIN ALLERGY:

If penicillin, amoxicillin or cephalexin allergic, cefuroxime is first alternate, it has a different side chain so can be used unless severe skin reaction or patient experienced severe organ dysfunction or ICU admission as a result of allergy (7).



## MISCONCEPTIONS OF IV ANTIBIOTIC THERAPY

**IV therapy for an ADI is only beneficial in a few circumstances.**

1. Patients unable to take penicillin and failed alternative therapy despite best surgical management.
2. Patients with any of the conditions meeting the criteria for referral to the ED.

**Do not send patients to an ED for:**

1. IV clindamycin – this drug is bioequivalent (oral therapy is equivalent to IV therapy)
2. Failing therapy due to patient non-adherence with personal mechanical interventions or antibiotic regimen (if prescribed):
  - *Ensure patient has received mechanical intervention as the first-line treatment (1-4).*
  - *Educate patients regarding the importance (benefit) of adherence to prescribed medications (explain to patient the consequences of not taking antibiotics, check their understanding of this).*
  - *Consider using Pharmacy Blue Compass to determine the least costly medication option for patients with cost concerns; does not include dispensing fee (\$11) (6).*

## TREATMENT REGIMENS FOR THE MOST COMMON TYPES OF ADI IS SHOWN IN TABLE 1:

TYPE OF INFECTION	FIRST LINE MECHANICAL INTERVENTIONS	ANTIBIOTICS			
		Penicillin 300 to 600mg QID x 7 days +/- Metronidazole 500mg BID x 7 days (excellent oral bioavailability)	Cefuroxime 500mg PO BID with Metronidazole 500mg BID x 7 days (if penicillin beta-lactam allergy even anaphylaxis but not severe skin reaction see p2)	Doxycycline 100mg PO BID x 7 days or Clindamycin 150 to 300mg QID x 7 days ( excellent oral bioavailability). See allergy assessment p2	Other
Post operative peri-implantitis (moderate-severe/abscess)	Surgical drainage; consider removal of implant if unstable	First choice	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	Chlorhexidine gluconate mouthwash 0.12% BID x 3 weeks after toothbrushing
Pericoronitis (if systemic symptoms)	Consider removal of offending tooth; if unable/not suitable to do so, debride the infected area and consider surgical drainage	First choice	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	Irrigate infected area/rinse with chlorhexidine gluconate mouthwash 0.12% BID x 2 weeks
Refractory Periodontitis (Antibiotic if unresponsive to mechanical treatment)	Personal plaque/calculus control and professional debridement are essential	Alternate	First Alternate if beta-lactam allergy	Doxycycline is First choice; Clindamycin not optimal, as aggregatebacter (resistant), found in 1/3 of cases	
Periodontal abscess (consider extraction if recurrent). Antibiotic if systemic symptoms unresponsive to mechanical treatment	Personal plaque/calculus control and professional debridement; remove potentially trapped debris in inflamed periodontal pockets; surgical drainage of pocket and initiate root canal treatment (open and drain) if combined periodontal endodontic infection	First choice	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	Irrigate infected area/rinse with chlorhexidine gluconate mouthwash 0.12% BID x 2 weeks
Abscess- dentoalveolar, periapical	Surgical drainage (perform incision and drainage procedure) and initiate root canal therapy (open and drain); consider of removal of offending tooth	First choice	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	
Alveolar osteitis (dry socket) (usually 5-7 days after extraction)	Irrigation and sedative dressings (e.g. soluble aspirin, zinc oxide, and eugenol made from oil of cloves)	First choice (if systemic symptoms+/- unresponsive to mechanical intervention)	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	
Suppurative osteitis (usually 14 days after extraction)	Irrigation and sedative dressings (e.g. soluble aspirin, zinc oxide, and eugenol made from oil of cloves); removal of bony sequestra if present	First choice	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	
Acute necrotizing ulcerative gingivitis	Personal plaque/calculus control and professional debridement are essential	First choice (if systemic symptoms+/- unresponsive to mechanical intervention)	First Alternate if beta-lactam allergy	Clindamycin Second alternate if beta lactam allergy	May use oxygenating agents as adjuncts
Gingivitis – acute herpes simplex 1 Immunocompetent	Rx usually not indicated; supportive care for pain and maintenance of nutrition during oral viral infections (Benadryl rinse, xylocaine viscous, etc.)		First Alternate if beta-lactam allergy		Acyclovir 400mg TID or valacyclovir 500mg to 1g BID x 7 days
Gingivitis – acute herpes simplex 1 Immunocompromised	Supportive care for pain and maintenance of nutrition during oral viral infections (Benadryl rinse, xylocaine viscous, etc.)				Acyclovir 400mg 5 x a day or valacyclovir 500mg to 1g BID x 7-10 days

## REFERENCES



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