GUIDELINES FOR TREATMENT OF ODONTOGENIC INFECTIONS IN HOSPITALIZED ADULTS

<table>
<thead>
<tr>
<th>Clinical Setting</th>
<th>Empiric Therapy</th>
<th>Duration</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Suppurative (pyogenic) orofacial odontogenic infection, including:</td>
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<tr>
<td>• Acute apical periodontitis</td>
<td>1st line: Ampicillin-sulbactam 3 g IV q6h*</td>
<td>For acute apical periodontitis and acute dentoalveolar abscess:</td>
<td>• The most important element is surgical drainage and removal of necrotic tissue.</td>
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<tr>
<td>• Acute dentoalveolar abscess</td>
<td>PCN allergy without anaphylaxis, angioedema, or urticaria: Cefazolin 2 g IV q8h* + Metronidazole 500 mg IV/PO q8h</td>
<td>In the presence of surgical control: 5 days post drainage</td>
<td>• Blood cultures should be sent when systemic signs are involved</td>
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<tr>
<td>• Space infection around the face (local extension depends on the tooth involved):</td>
<td>Severe PCN or cephalosporin allergy (anaphylaxis, angioedema, hives): Levofloxacin 750 mg IV q24h* + Metronidazole 500 mg IV/PO q8h</td>
<td>In the absence of surgical control: Duration is dependent on clinical and/or radiographic improvement. Minimum of 7 days AND at least 3 days of clinical improvement</td>
<td>• If abscess is drained, aerobic and anaerobic bacterial cultures should be sent.</td>
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<tr>
<td>- Masticator space</td>
<td></td>
<td>Ludwig's angina: 3 weeks</td>
<td>• Strep anginosus, a prominent pathogen in these infections, is resistant to clindamycin &gt;20% of the time it is isolated in our hospital.</td>
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<tr>
<td>- Buccal space</td>
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<td></td>
<td>• Consider ID consult for Ludwig’s angina case</td>
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<tr>
<td>- Canine space</td>
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<td>• Coverage for Actinomyces may be considered in extensive infections, which would affect both coverage choices and duration.</td>
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<tr>
<td>- Parotid space</td>
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<td>Oral step-down options:</td>
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<tr>
<td>- Submandibular space</td>
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<td></td>
<td>• 1st line: Amoxicillin-clavulanate 875 mg PO BID*</td>
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<tr>
<td>- Submental space</td>
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<td>• PCN allergic, without anaphylaxis, angioedema, or urticaria: Cefuroxime 500 mg PO BID* + Metronidazole 500mg PO TID</td>
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<tr>
<td>- Vestibular space</td>
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<td>• Severe PCN allergic patients who do not tolerate cephalosporins: Levofloxacin 750 mg PO daily* + Metronidazole 500 mg PO TID</td>
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<tr>
<td>- Ludwig’s angina</td>
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<tr>
<td>• NOT including deep head and neck infection</td>
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<tr>
<td>Pathogens: Streptococcus viridans</td>
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<tr>
<td>Streptococcus anginosus</td>
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<tr>
<td>Peptostreptococci</td>
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<td>Prevotella</td>
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<td>Fusobacterium</td>
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<td></td>
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<tr>
<td>Porphyromonas</td>
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<tr>
<td>Bacteroides spp.</td>
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<td>Veillonella</td>
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<td>Actinomyces</td>
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<td>Propionobacterium</td>
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<tr>
<td>Capnocytophaga</td>
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<tr>
<td>Other uncommon pathogens: Staphylococci spp</td>
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<tr>
<td>Enteric Gram negative bacilli</td>
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### Clinical Setting

**Suppurative (pyogenic) orofacial odontogenic infection in:**

1. Severely immunocompromised patients
2. Patients who have severe sepsis and/or septic shock
3. Patients who had in-hospital surgical procedure in the past 90 days

**Pathogens:**
- *Streptococcus viridans*
- *Streptococcus anginosus*
- *Peptostreptococcus*
- *Prevotella*
- *Fusobacterium*
- *Porphyromonas*
- *Bacteroides spp*
- *Veillonella*
- *Actinomyces*
- *Propionibacterium*
- *Capnocyttophaga*
- *Staphylococcus spp*
- Enteric Gram negative bacilli including *P. aeruginosa*

### Empiric Therapy

1st line:
- **Vancomycin IV** (see nomogram, AUC goal 400-600)*
- + **Piperacillin-Tazobactam** 4.5 g IV q6h

PCN allergy without anaphylaxis, angioedema, or urticaia:
- **Vancomycin IV** (see nomogram, AUC goal 400-600)*
- + **Cefepime** 2 g IV q8h*
- + **Metronidazole** 500 mg IV/PO q8h

Severe PCN or cephalosporin allergy (anaphylaxis, angioedema, hives):
- **Vancomycin IV** (see nomogram, AUC goal 400-600)*
- + **Aztreonam** 2 g IV q8h*
- + **Metronidazole** 500 mg IV/PO q8h

**Duration**

For acute apical periodontitis and acute dentoalveolar abscess:
- Duration is dependent on surgical debridement, clinical & radiographic improvement. Minimum of 7 days AND at least 3 days of clinical improvement.
- Oral stepdown therapy depends on clinical improvement and microbiologic data.
- Ludwig’s angina: 3 weeks

### Comments

- Severely immunocompromised patients: neutropenia, allogeneic HSCT, HIV accompanied by CD4 <200 cells/mm³
- The most important element in surgical drainage and removal of necrotic tissue.
- ID consult is recommended
- Blood cultures should be sent when systemic signs are involved
- If abscess is drained, aerobic and anaerobic bacterial cultures should be sent.
- **Strep anginosus**, a prominent pathogen in these infections, is resistant to clindamycin >20% of the time it is isolated in our hospital.
- Coverage for Actinomyces may be considered in extensive infections, which would affect both coverage choices and duration.

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### Mandibular Osteomyelitis

**Pathogens:**
- *Streptococcus viridans*
- *Streptococcus anginosus*
- *Peptostreptococcus*
- *Prevotella*
- *Fusobacterium*
- *Porphyromonas*
- *Bacteroides spp*
- *Veillonella*
- *Actinomyces*
- *Propionibacterium*
- *Capnocyttophaga*

Other uncommon pathogens: *Staphylococcus spp*.

Enteric Gram negative bacilli including *Candida spp*.

Consider holding antibiotics until bone cultures can be obtained in hemodynamically stable patients.

1st line:
- **Ampicillin-sulbactam** 3 g IV q6h*

PCN allergy without anaphylaxis, angioedema, or urticaia:
- **Ceftriaxone** 2 g IV q24h*
- + **Metronidazole** 500 mg IV/PO q8h

Severe PCN or cephalosporin allergy (anaphylaxis, angioedema, hives):
- **Moxifloxacin** 400 mg IV/PO q24h

If mandibular osteomyelitis is secondary to contiguous spread of exposed bone from Osteoradionecrosis leading to the skin, then would **recommend the addition of vancomycin** to empiric therapy.

**Duration**

Final regimen pending microbiologic data.

Duration to be determined by clinical improvement and serial evaluation, Typically 6 weeks.

**Comments**

- ID consult strongly recommended.
- When osteomyelitis is suspected, it is advised to attempt surgical debridement of necrotic bone, and to send purulence and bone for pathology as well as anaerobic bacterial, aerobic bacterial and Actinomyces culture to help guide therapy.
- In the setting of mandibular osteomyelitis caused by tooth extraction or odontogenic infection, the typical oral flora are expected pathogens.

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### Revision History

<table>
<thead>
<tr>
<th>Antimicrobial Subcommittee Approval:</th>
<th>unknown</th>
<th>Originated:</th>
<th>02/2018</th>
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<tbody>
<tr>
<td>P&amp;T Approval:</td>
<td>02/2018</td>
<td>Last Revised:</td>
<td>03/2021</td>
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</table>

The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider’s professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

* Dose may need to be adjusted for renal dysfunction.

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