



## Anaerobes in Aspiration Pneumonia

**Aspiration pneumonia:** infectious condition caused by bacterial organisms translocated from oropharyngeal or upper gastrointestinal contents to the lung via macroaspiration events.<sup>1</sup>

### Why was anaerobic coverage ever recommended?

In the 1920s-70s, several studies identified anaerobes as major etiologic pathogens for patients presumed to have aspiration pneumonia.<sup>2</sup> However, majority of patients in these studies were often evaluated late in their disease courses after development of an empyema or lung abscesses.<sup>1</sup>

### Are anaerobes really that common?

Anaerobes in aspiration pneumonia are rare. One study conducted in 1993 in 52 ICU patients with community-acquired aspiration pneumonia found the most common pathogens were *S. pneumoniae*, *S. aureus*, *H. influenzae*, and Enterobacterales.<sup>3</sup> Another study assessed the incidence of anaerobes in 25 patients with ventilator-associated aspiration pneumonia and found only one case with an anaerobic organism.<sup>4</sup> In a 2003 study with 67 institutionalized elderly patients with severe aspiration pneumonia, enteric gram-negative bacilli, anaerobes, and *S. aureus* was isolated in 49%, 16%, and 12% cases, respectively. In that same study, out of 7 cases with anaerobic organisms receiving therapy without anaerobic coverage, 6 (86%) had effective clinical response. The patient with clinical failure had *K. pneumoniae* growing in addition to a *Fusobacterium* spp.<sup>5</sup>

### When is empiric anaerobic coverage indicated?

The 2019 American Thoracic Society & Infectious Diseases Society of America community acquired pneumonia (CAP) guidelines **suggest AGAINST routinely** adding anaerobic coverage for suspected aspiration pneumonia unless lung abscess or empyema is suspected.<sup>6</sup> Others, have also recommended anaerobic coverage in patients with severe periodontal disease who macroaspirate due to greater diversity and inoculums of anaerobic bacteria.<sup>2</sup>

### What to use for anaerobic coverage

1. Ampicillin-sulbactam – Excellent activity against common CAP pathogens and broad anaerobic activity; moderate *C. difficile* infection risk.
2. Piperacillin-tazobactam – Excellent activity against nosocomial pathogens and broad anaerobic activity; moderate *C. difficile* infection risk.
3. Metronidazole – Can be given in combination with cephalosporin/fluoroquinolone based pneumonia regimens; high *C. difficile* infection risk when used in combination.
4. Clindamycin – Can be given in combination with cephalosporin/fluoroquinolone based pneumonia regimens, but will significantly increase the risk of *C. difficile* infection.
5. Meropenem – Use should be preserved for drug-resistant gram-negative infections. Excellent anaerobic activity, but high *C. difficile* infection risk.

**Key takeaway:** Routine coverage for anaerobes is not recommended in patients with suspected aspiration pneumonia unless patients have radiographic evidence of an anaerobic environment such as lung abscess, empyema, or necrotizing pneumonia. Empiric anaerobic coverage can also be considered in patients with severe periodontal disease and macroaspiration.

### References:

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