



## Anaerobes in Diabetic Foot Infections

Diabetic foot infections (DFIs) are a common and serious complication among patients with uncontrolled diabetes, often resulting from neuropathy, poor circulation, and impaired wound healing.<sup>1</sup> As these wounds become more chronic, the infections evolve into polymicrobial processes involving a mixture of gram-positive cocci, gram-negative bacilli, and anaerobic organisms. However, despite the well-recognized polymicrobial nature of these infections, the specific virulence and clinical impact of anaerobic organisms remain poorly understood. Is broad anaerobic coverage required in treatment of DFIs?

### What is the prevalence of anaerobes in DFIs?

In a review of 41 published papers, including a total of 9,709 patients, anaerobes were identified with conventional culture in a weighted average of 17% of patients.<sup>2</sup> When gene sequencing was used, the weighted average was 83.8%. These findings suggest that traditional culture methods significantly underestimate both the prevalence and diversity of anaerobes. The review also makes note that anaerobes were most frequently isolated in deeper, malodorous, and long-standing ulcers.

### What are the most common anaerobes isolated from DFIs?

The most commonly reported anaerobes are *Peptoniphilus*, *Finexgoldia*, *Anaerococcus*, *Porphyromonas*, *Bacteroides*, *Prevotella*, *Fusobacterium*, and *Clostridium*.<sup>2</sup>

### When is anaerobic coverage recommended by guidelines?

The 2023 International Working Group on the Diabetic Foot (IWGDF) and Infectious Disease Society of America (IDSA) guideline on diabetes-related foot infections provides recommendations on empiric antimicrobial coverage.<sup>3</sup> Recommendations state that addition of anaerobic coverage is indicated for moderate to severe wounds with necrosis, ischemic limb or gas formation. These wounds create a favorable, low oxygen environment for anaerobic bacterial growth and proliferation.

### What is the evidence?

There are limited clinical studies evaluating clinical outcomes in DFI focusing on anaerobic coverage. A small, randomized trial evaluated the role of metronidazole in DFIs with confirmed presence of anaerobes (*Peptostreptococcus*, *Bacteroides*, and *Clostridium*) by PCR.<sup>4</sup> Among 32 patients, 16-week complete wound healing was seen among 13 of 17 patients (76.5%) in metronidazole arm compared to 12 of 15 patients (80%) in non-metronidazole arm. The study concluded that metronidazole may not be mandatory for treatment of DFI. Notable, the specific antibiotics used in the non-metronidazole arm were not specified. In another small open label, randomized controlled trial, ceftriaxone monotherapy was compared with levofloxacin and metronidazole.<sup>5</sup> Clinical, microbiological, and wound healing outcomes were similar between groups.

**Key Takeaway:** Anaerobic bacteria presence in DFI is often under-identified by conventional culture. Broad anaerobic coverage in DFIs is generally indicated only in the presence of necrosis, ischemia, or gas formation. Limited available data suggests that routine anaerobic coverage does not significantly impact outcomes.

### References:

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