DIABETIC FOOT INFECTION

Grade it, probe it, perfuse it · antibiotics do not heal an ischemic or undrained foot

PROBE THE BONE
and check the pulses

GRADE THE INFECTION *IWGDF / IDSA classification — grade decides setting and route*

Grade	Features	Setting, route and duration
1 — Uninfected	Ulcer with **no purulence and no signs of inflammation**	**No antibiotics.** Offloading, wound care and glycemic control. Treating a colonized ulcer breeds resistance without healing it.
2 — Mild	Skin and subcutaneous tissue only, **erythema 0.5–2 cm** around the ulcer	**Oral, outpatient.** Cover **staphylococci and streptococci** only, e.g. amoxicillin-clavulanate or cephalexin. **1–2 weeks.**
3 — Moderate	**Erythema > 2 cm**, or involvement of **deeper structures** (abscess, fasciitis, joint, bone), without systemic upset	Usually admit. **Broader cover including anaerobes** and Gram-negatives. **1–3 weeks** for soft tissue.
4 — Severe	Any of the above **plus systemic inflammatory response** (fever, tachycardia, leukocytosis, hypotension, metabolic derangement)	**Admit, IV, urgent surgical review.** Broad-spectrum empiric cover; de-escalate on deep tissue culture.

Add "(O)" to grade 3 or 4 when osteomyelitis is present, because it changes the duration far more than the grade does. **Swab cultures of the ulcer surface are near-useless** — they grow colonizers. **Send deep tissue or bone taken at debridement**, and take blood cultures in moderate or severe disease (positive in around 15%).

THE THREE QUESTIONS *ask all three on the first encounter*

1. IS THE BONE INVOLVED?

Probe-to-bone: a sterile blunt probe reaching bone through the ulcer raises the odds of osteomyelitis substantially (likelihood ratio around 6, and a positive predictive value near 90% in a high-prevalence foot). **ESR above 70 mm/h is roughly 90% specific. Plain films lag by 2–3 weeks**; **MRI is the standard** at about 90% sensitivity. **Bone biopsy is the definitive answer** when it will change management.

2. IS THERE BLOOD SUPPLY?

Palpate dorsalis pedis and posterior tibial, then measure the ABI. Below 0.9 means peripheral arterial disease; below 0.5 means critical limb ischemia and the wound will not heal on antibiotics alone. **Beware a falsely normal or high ABI above 1.3** from medial arterial calcification, which is common in diabetes — use **toe pressures or TBI** instead. **Refer for revascularization before expecting healing.**

3. IS THERE SOMETHING TO DRAIN?

Abscess, necrotic tissue and dead bone need surgery, not a longer antibiotic course. Urgent debridement for grade 4, deep abscess, gas in the tissues or rapidly spreading infection. **Offloading is treatment, not advice** — total contact casting or equivalent, because a foot that keeps bearing weight will not heal whatever you prescribe.

ANTIBIOTICS AND DURATION *the surgical answer changes the duration*

1. **Mild, no recent antibiotics:** target **staphylococci and streptococci only.** Amoxicillin-clavulanate 875/125 mg BID, dicloxacillin, or clindamycin if penicillin-allergic. **Do not add Gram-negative or anaerobic cover reflexively** in a mild infection.
2. **Moderate to severe, or chronic and previously treated:** broaden to cover **Gram-negatives and anaerobes** (amoxicillin-clavulanate, or piperacillin-tazobactam, or a carbapenem where resistance is likely). **Add MRSA cover** (vancomycin or linezolid) for prior MRSA, recent hospitalization, or high local prevalence. **Cover *Pseudomonas* only with a reason** — macerated wounds, warm climates, prior isolation.
3. **Soft tissue duration is short: 1–2 weeks for mild, 1–3 weeks for moderate or severe.** Stop when the infection has resolved, not when the ulcer has closed — **an open but uninfected ulcer does not need antibiotics.**
4. **Osteomyelitis: 6 weeks if infected bone remains. If all infected bone is resected with clean margins, treat as a soft tissue infection instead** — days to about a week. **The operation, not the antibiotic, is what shortens the course**, so ask the surgeon what was left behind before you set a stop date.

EMPIRIC REGIMENS *then de-escalate on deep tissue culture*

Situation	Regimen	Notes
Mild, no recent antibiotics	**Amoxicillin-clavulanate 875/125 mg PO BID**, or dicloxacillin 500 mg PO QID	Gram-positive cover is enough. **Clindamycin 300–450 mg QID** if penicillin-allergic; **doxycycline or TMP-SMX** if MRSA is a concern.
Moderate	**Amoxicillin-clavulanate 1.2 g IV TID**, or ceftriaxone 2 g daily + metronidazole 500 mg TID, or **ertapenem 1 g daily**	Adds Gram-negative and anaerobic cover. **Ertapenem does not cover *Pseudomonas***, which is usually fine here.
Severe, or limb-threatening	**Piperacillin-tazobactam 4.5 g IV q6–8h**, or meropenem 1 g IV q8h	Broad, including *Pseudomonas* and anaerobes. **Pair with urgent surgical review** — the antibiotic is the adjunct here, not the treatment.
Add MRSA cover if	**Vancomycin** (AUC/MIC 400–600) or **linezolid 600 mg BID**	Prior MRSA, recent hospitalization, high local prevalence, or failure on a beta-lactam. **Linezolid has the better tissue penetration**; watch platelets beyond 14 days.
Add *Pseudomonas* cover only if	Piperacillin-tazobactam, cefepime, or ciprofloxacin	**A reason is required:** macerated or water-exposed wounds, warm climate, prior *Pseudomonas* isolate. **Do not cover it reflexively.**

LIMB-THREAT RED FLAGS *these change the call from ward to OR*

SURGICAL EMERGENCY

Gas in the tissues, crepitus, rapidly advancing erythema, bullae or skin necrosis, or pain out of proportion. This is necrotizing infection until the operating room proves otherwise — **do not wait for imaging.**

SYSTEMIC COMPROMISE

Fever, tachycardia, hypotension, leukocytosis, or an unexplained rise in glucose or ketones. New glycemic instability is often the earliest signal that a foot infection has become systemic.

VASCULAR EMERGENCY

ABI below 0.5, TBI below 0.4, rest pain, or absent pedal pulses with tissue loss. Critical limb ischemia: **vascular referral takes priority over adjusting antibiotics.**

PEARLS & PITFALLS

- **Do not treat an uninfected ulcer.** Grade 1 needs offloading and wound care; antibiotics here select resistance and change nothing.
- **Surface swabs grow colonizers.** Deep tissue or bone at debridement is the only culture worth acting on.
- **A normal ABI in a diabetic foot can be false.** Medial calcification stiffens the vessels; use toe pressures if the ABI is above 1.3.
- **Probe-to-bone is a bedside test worth doing every time.** It shifts the probability of osteomyelitis more than any blood result.
- **Antibiotics cannot heal an ischemic foot.** If the ABI is below 0.5, the referral matters more than the prescription.
- **Ask what bone was left behind.** Clean resection turns a 6-week course into a few days; residual infected bone does the reverse.

References: IWGDF/IDSA guideline on diagnosis and treatment of diabetes-related foot infection · IWGDF guidance on peripheral artery disease and offloading · Lipsky et al. IDSA diabetic foot infection guideline, *Clin Infect Dis*.

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