

Diabetic Foot Infections

EMPIRIC TREATMENT

Is this a diabetic foot infection (DFI)?	Diabetic patient with <u>foot ulcer</u>	+	<u>Two or more of:</u> <ul style="list-style-type: none"> • Redness • Warmth • Swelling or induration • Tenderness or pain • Purulent discharge
Initial Management	<ul style="list-style-type: none"> • Baseline bloodwork • Deep wound culture after cleaning and debriding wound • Foot X-Ray • ABI and toe pressures if not done within past 12 months and no easily palpable dorsalis pedis/posterior tibialis pulses • Good glycemic control • Pressure off-loading 		
Classification			Duration (days)
Ulcer without infection	No antibiotics. Wound care only.		-
Infection without ulcer in a diabetic patient	This is <u>cellulitis</u> , not a diabetic foot infection. Refer to “Skin and Soft Tissue Infections” chapter for guidance.		-
Mild DFI <i>≤2cm surrounding redness</i> <i>No deep tissue involvement</i> <i>No systemic toxicity</i>	cephalixin 500-1000 mg PO QID <i>If MRSA suspected:</i> ADD TMP/SMX DS 1-2 tab PO BID OR doxycycline 100 mg PO BID <i>If severe beta-lactam allergy:</i> clindamycin 450 mg PO TID		7-14
Moderate DFI <i>>2cm surrounding redness</i> OR <i>Deep tissue involvement:</i> <i>Abscess</i> <i>Osteomyelitis (OM)</i> <i>Septic arthritis</i> <i>No systemic toxicity</i>	amoxicillin-clavulanate 875-125 mg one tab PO BID ¹ OR ceftriaxone 2 g IV q24h +/- metronidazole 500 mg PO/IV q12h <i>If MRSA suspected:</i> ADD TMP/SMX DS 1-2 tab PO BID OR doxycycline 100 mg PO BID OR vancomycin ² <i>If severe beta-lactam allergy:</i> moxifloxacin 400 mg PO q24h OR clindamycin 450 mg PO TID AND ciprofloxacin 500 mg PO BID		≥14
Severe DFI <i>Systemic toxicity:</i> <i>HR > 90/min</i> <i>RR > 20/min</i> <i>T >38°C or <36°C</i> <i>WBC>12 or <4x10⁹/L or >10% bands</i>	ceftriaxone 2 g IV q24h AND metronidazole 500 mg PO/IV q12h OR piperacillin-tazobactam 3.375 g IV q6h <i>If ESBL colonized or infected:</i> meropenem 500 mg IV q6h <i>If MRSA suspected:</i> ADD vancomycin ² <i>If severe beta-lactam allergy:</i> moxifloxacin 400 mg PO/IV q24h		≥14
MRSA coverage can be discontinued after 48 hours if cultures don't show MRSA.			

Doses may require adjustment in renal insufficiency.

¹. Only if no osteomyelitis or septic arthritis present.

². For vancomycin dosing, refer to “Vancomycin Dosing and Therapeutic Monitoring”

Microbiology

- *S. aureus* and beta-hemolytic streptococci are the most common pathogens in DFI.
- Deep tissue involvement increases risk of gram negative bacilli.
- *Pseudomonas* and *Enterococcus* are common colonizers in diabetic foot ulcers, especially when identified on sub-optimally collected specimens. Expanding antimicrobial coverage to include *Pseudomonas* or *Enterococcus* when found on culture is only necessary if patient is failing initial empiric regimen.
- Necrotic, gangrenous, or foul-smelling wounds may involve mixed anaerobes.

Diagnosis

- Obtain deep wound culture after cleaning and debriding wound. Superficial culture results correlate poorly with true pathogen.
- If probing the ulcer base goes directly to bone, this is highly suggestive of osteomyelitis. Obtain a plain X-ray. Further imaging is usually unnecessary except when required for surgical planning.
- Imaging:
 - Plain X-ray of the involved area should be done as baseline.
 - MRI is the most sensitive and specific imaging modality to diagnose soft-tissue complications or osteomyelitis.
 - Bone scan is helpful to rule out osteomyelitis if negative, but a positive result is not specific. False negatives may be seen in severe peripheral arterial disease. It can be combined with SPECT/CT to provide better three-dimensional localization.
 - White blood cell-labelled radionuclide scan has good performance to detect osteomyelitis. It can be combined with SPECT/CT to provide better three-dimensional localization.
- Assessment for peripheral arterial disease should be done for every diabetic with a foot ulcer. If dorsalis pedis or posterior tibialis pulses are not easily palpated, ankle-brachial index (ABI) and toe pressures should be done (if not done in past 12 months).
 - ABI <0.9 is abnormal. Consider vascular imaging and referral to vascular surgeon.
 - Toe pressure <30 mmHg is highly correlated to failure of medical management alone. Consider urgent vascular imaging and referral to vascular surgeon.

Oral Step-Down

- Oral step-down can occur when patient is clinically improving and without systemic toxicity.
- If osteomyelitis is diagnosed, oral step-down can be considered using agents with good oral bioavailability: fluoroquinolones (ciprofloxacin, moxifloxacin, levofloxacin), clindamycin, doxycycline, or trimethoprim-sulfamethoxazole. If oral step-down is not possible because of severity, intolerance, or resistance, then intravenous therapy should be continued; consider transition to outpatient parenteral antimicrobial therapy.

Duration

- For mild DFI, 1-2 weeks of antibiotics is usually sufficient. Moderate-severe DFI should receive 2-3 weeks.
 - If osteomyelitis is diagnosed, treat for 6 weeks.
- Treatment can be discontinued when signs and symptoms of infection have resolved. Antibiotics need not be continued until the wound has fully healed.
- If patient undergoes surgical debridement, post-operative antibiotic duration is as follows:
 - Radical resection/amputation with no residual infection: 2-5 days post-operatively
 - Resection with residual infection: 4-6 weeks post-operatively