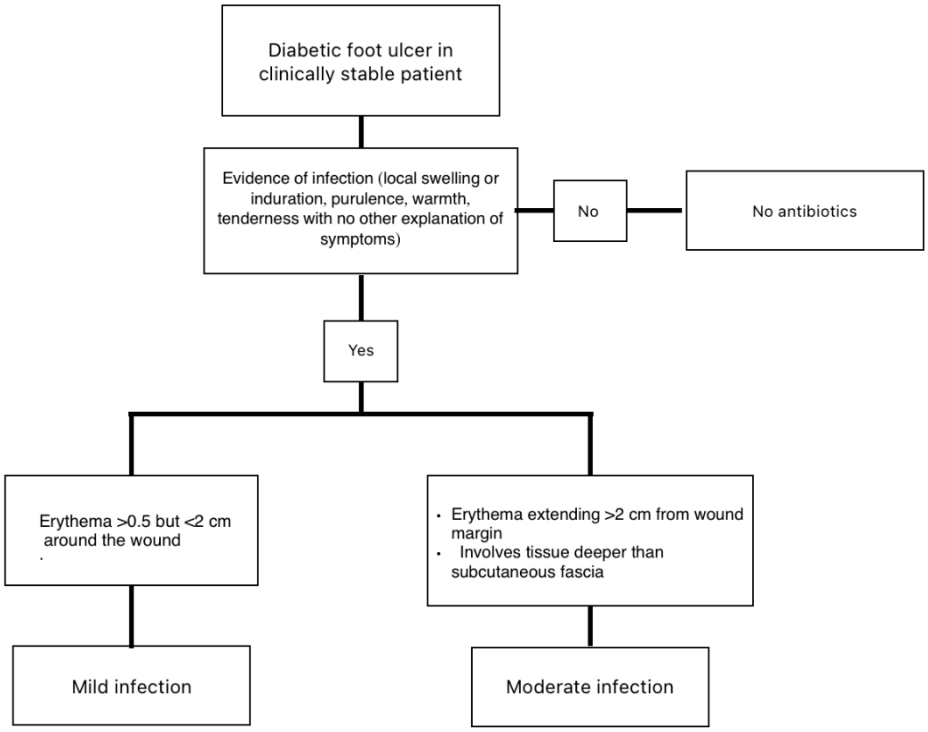
SHC Clinical Pathway: Diabetic Foot Infection

Background

- Diabetic foot ulcers are often chronic ulcers due to poor wound healing and blood flow; they do NOT require antibiotics unless complicated by infection.
- Antibiotic therapy is often not urgently needed for diabetic foot infection (DFI), which ranges from mild, moderate, and severe skin and soft tissue infection (SSTI) to osteomyelitis



Management considerations

Wound cultures

- Superficial swabs should be avoided as they have low sensitivity and specificity and are not clinically useful (1)
- Obtain deep tissue biopsy after cleaning and debriding the infected wound to allow for culture-directed antibiotic management (1)

Role for imaging

- Patients with DFI should be evaluated for osteomyelitis with a plain film x-ray
- MRI can be considered in patients with equivocal plain film X-rays with other supportive features of osteomyelitis (such as positive probe to bone testing, elevated inflammatory markers if obtained) (1)
- X-ray and MRI are the diagnostic modalities of choice; however CT scan can also be considered for surgical planning in severe or necrotizing infections

Role for antibiotics

- In a clinically stable patient undergoing evaluation for osteomyelitis with further imaging/plan for debridement, HOLD antibiotics pending deep tissue biopsy to increase yield

Empiric Antibiotic Guidelines for Diabetic Foot Infection (DFI)

Clinical classification (per IWGDF/IDSA guidelines) (1)	Pathogens	Management & Empiric treatment	Duration of treatment
Mild (2 or more criteria): • Local swelling or induration • Erythema >0.5 but <2 cm around the wound • Local tenderness or pain • Local increased warmth • Purulent discharge • No other explanation of symptoms (i.e. trauma, gout)	Gram positive cocci (Staph and strep spp most common)	Cephalexin 1g PO q8h If purulent drainage or previous MRSA SSTI within 1 year, consider alternative regimen: TMP-SMX DS 1-2 PO BID	7 days*
Moderate • Criteria as above with no systemic symptoms • Erythema extending >2 cm from wound margin • Involves tissue deeper than subcutaneous fascia +/- osteomyelitis ***	Gram positive cocci +/- Gram negative rods (Enterobactereles spp most common) No role for empiric Pseudomonas coverage unless isolated from prior wound/biopsy cultures from affected site within 1 year	Amoxicillin/clavulanate 875/125 mg PO BID If purulent drainage or previous MRSA SSTI within past 1 year, consider alternative regimen: TMP-SMX DS 1-2 PO BID	10 days** for soft tissue infection Consult ID for further guidance if osteomyelitis is suspected
Severe • Systemic symptoms (T > 38 C or < 36 C, WBC > 12, > 2 SIRS criteria) • Hypotension • Necrotizing infection +/- osteomyelitis**	Likely polymicrobial, including Gram positive cocci, Gram negative rods, anaerobes. Include MRSA coverage, but no role for empiric Pseudomonas coverage unless isolated from prior wound/biopsy cultures within past 1 year OR necrotizing infection	Obtain blood cultures and consult surgical team immediately IV vancomycin (dose per pharmacy) PLUS IV ceftriaxone 2g daily PLUS metronidazole 500 mg PO BID OR IV piperacillin/tazobactam 4.5 g q8h extended infusion If history of ESBL organism isolated from wound/biopsy culture within 1 year: IV ertapenem 1g q24h <u>If concern for necrotizing infection:</u> IV vancomycin (dose per pharmacy) PLUS IV piperacillin/tazobactam 4.5 g q8h extended infusion PLUS IV clindamycin 600-900 mg q8h	Variable (consult ID for further guidance)

*Can extend course up to 2 weeks depending on clinical response, extent of vascular disease

***Based on similar clinical outcomes with 10 vs. 21 days of antimicrobials from single pilot RCT (note that patients included in this trial had undergone surgical debridement)* (2) *May be reasonable to extend therapy to 2 weeks if no debridement.*

****Note that the presence of osteomyelitis in and of itself does not impact severity assessment*

FAQ Section:

What if my patient with DFO (diabetic foot osteomyelitis) has undergone surgical debridement or amputation?

In cases of debridement or amputation, a "proximal" bone culture is often obtained and sent for histopathology to evaluate for residual infection. This ultimately helps inform antibiotic duration. Infectious diseases should always be consulted in order to determine appropriate antibiotic duration. See below for different ranges recommended by guidelines in different clinical scenarios (3):

Type of surgical intervention	Duration of antibiotics
Curative amputation with negative margins	0-48 hours
Debridement with positive intra-op cultures or margins	3-6 weeks
No surgical intervention	6 weeks

Can I use MRSA nares to help guide antibiotic choice?

Data for use of MRSA nasal swabs in SSTIs are mixed. NPV for MRSA in wound cultures range from 73%-93% and positive predictive value (PPV) range from 34%-86% (4,5). This in part depends on the MRSA prevalence in a particular community. Some studies support the use of MRSA nasal swabs in the management of DFI, but most have been conducted in patient populations that have low-to-moderate MRSA prevalence and do not apply to our patient population at SHC (6). When clinical suspicion of an MRSA infection is low in a hemodynamically stable patient, it is recommended to withhold anti-MRSA therapy altogether, rather than guiding therapy based on MRSA colonization status.

Sources:

(1) *IWDGF Guidelines on the Prevention and Management of diabetes-related foot disease* . (2023). IWDGF Guidelines . https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-Guidelines-2023.pdf
(2) Truong T, Gariani K, Richard JC, et al. Moderate to severe soft tissue diabetic foot infections: a randomized, controlled, pilot trial of post-debridement antibiotic treatment for 10 versus 20 days. Ann Surg 2022; 276:233–8.
(3) Cortes-Penfield NW, Armstrong DG, Brennan MB, Fayfman M, Ryder JH, Tan TW, Schechter MC. Evaluation and Management of Diabetes-related Foot Infections. Clin Infect Dis. 2023 Aug 14;77(3):e1-e13. doi: 10.1093/cid/ciad255. PMID: 37306693; PMCID: PMC10425200.
(4) Mergenhagen KA, Starr KE, Wattengel BA, Lesse AJ, Sumon Z, Sellick JA. Determining the Utility of Methicillin-Resistant Staphylococcus aureus Nares Screening in Antimicrobial Stewardship. Clin Infect Dis. 2020 Aug 22;71(5):1142-1148. doi: 10.1093/cid/ciz974. PMID: 31573026.
(5) Liu C, Holubar M. Should a MRSA Nasal Swab Guide Empiric Antibiotic Treatment? NEJM Evid. 2022 Dec;1(12):EVIDccon2200124. doi: 10.1056/EVIDccon2200124. Epub 2022 Nov 22. PMID: 38319836.
(6) Mergenhagen KA, Starr KE, Wattengel BA, Lesse AJ, Sumon Z, Sellick JA. Determining the Utility of Methicillin-Resistant Staphylococcus aureus Nares Screening in Antimicrobial Stewardship. Clin Infect Dis. 2020 Aug 22;71(5):1142-1148. doi: 10.1093/cid/ciz974. PMID: 31573026.

Document Information

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