Management of diabetic foot ulcers

1. **Determine cause, e.g. ill fitting shoes.**

2. **Clinical Grading (e.g. University of Texas grading system).**

   A-D: no infection or ischaemia (A), infection (B), ischaemia (C), both (D).

   0-III: epithelialized (0), superficial (I), penetrates to tendon or capulse (II), penetrates to bone or joint (III).

3. **Ulcer treatment.**

   a. **Relief of pressure.**
   Non weight bearing is essential.
   Mechanical unloading.

   b. **Restoration of skin perfusion.**
   Arterial revascularization procedures if required.

   Treat smoking, hypertension and dyslipidemia.

   c. **Treatment of infection.**
   Superficial ulcer.
   Extensive debridement with removal of all necrotic tissue and oral antibiotics aimed at Staphylococcus aureus and streptococci. No topical antibiotics.

   Deep (limb-threatening) infection - Surgical drainage as soon as possible (emergency referral) with removal of necrotic or poorly vascularized tissue, including infected bone. Revascularization if necessary. Broad-spectrum antibiotics intravenously, aimed at Gram-positive and negative micro-organisms, including anaerobes.

   d. **Metabolic control and treatment of comorbidity.**

   Optimal diabetes control, if necessary with insulin. Treat oedema and malnutrition.

   e. **Local wound care.**
   Frequent wound inspection.
   Frequent wound debridement.
   Absorbent, non-adhesive, non-occlusive dressings.
   Footbaths are contra-indicated as they induce maceration of the skin.

   f. **Instruction of patient and relatives.**
   Appropriate self-care and recognition, as well as reporting of signs and symptoms of (worsening) infection, such as fever, changes in local wound conditions or hyperglycemia.

   g. **Determining the cause and preventing recurrence.**
   Determine cause as ulceration is a recurrent disease. Prevent ulcers on contralateral foot and give heel protection during bed rest. Patient must be included in a comprehensive foot-care program with life-long observation.

Foot infection/ Infected ulcers

1. **Diagnosis.**
   Diagnose wound infections clinically (recognizing that the inflammatory response may be mitigated by diabetic complications), by the presence of purulent secretions or local evidence of inflammation, or occasionally systemic toxicity.

   Laboratory tests, including cultures, may suggest but do not establish the presence of infection, with the exception of reliably obtained deep bone cultures in suspected osteomyelitis.

2. **Non-antimicrobial treatment.**
   a. Consult a diabetic foot care team or specialist, where available.
   b. Correct any metabolic derangements, optimize wound care, and assess vascular status.
   c. Hospitalize patients: with a severe infection, needing multiple or complex diagnostic or surgical procedures; having critical foot ischemia; needing intravenous therapy; or unlikely to comply with therapy.
   d. In case of severe infection, consult appropriate specialists promptly for any necessary invasive diagnostic or surgical procedures.

3. **Antimicrobial therapy.**

   a. **General principles.**

   1. Prescribe for all clinically infected wounds immediately, but not for uninfected wounds.
   2. Select the narrowest spectrum therapy possible for mild or moderate infections.
   3. Choose initial therapy based on the commonest pathogens and known local antibiotic sensitivity data.
   4. Adjust (broaden or constrain) empiric therapy based on the culture results and clinical response to the initial regimen.

   b. **Specific choices.**

   1. Cover staphylococci and streptococci in almost all cases.
   2. Broaden the spectrum if necessary based on the clinical picture, or previous culture or current Gram-stained smear results.
   3. Topical therapy for mild superficial infections has not been adequately studied; oral therapy is effective for most mild to moderate infections; parenteral therapy (at least initially) is advisable for severe infections.
   4. Choose agents that have demonstrated efficacy in treating complicated skin and soft tissue infections. These include semi-synthetic-penicillins, cephalosporins, penicillin-ß-lactamase inhibitors, clindamycin, fluoroquinolones, carbapenems, and oxazolidinones.
   5. Treat soft tissue infections for 1-2 weeks if mild infections, and about 2-4 weeks for most that are moderate and severe. When the clinical evidence of infection has resolved antibiotic therapy can be stopped.

4. **Therapy of osteomyelitis.**

   A. Consider surgically removing any infected and necrotic bone, if possible.
   B. Unless all infected bone is resected, provide antibiotic treatment (with parenteral therapy, at least initially) for at least 4 weeks.
   C. Treating for several months with highly bioavailable oral agents (especially fluoroquinolones) without surgical resection may be effective in selected patients.