TIME TO OPTIMISE WOUND MANAGEMENT

The TIME[4] framework can be used to apply wound bed preparation to practice and addresses the different pathophysiological underlying abnormalities:

TISSUE MANAGEMENT

Debride the ulcer (usually sharp, but also larval, hydrosurgical and autolytic)
Remove necrotic/sloughy tissue and callus, as appropriate
Visualise underlying tissue, **reduce** pressure and **stimulate** healing
Repeat if necessary for ongoing maintenance

INFLAMMATION/INFECTION CONTROL

Classify infected DFUs as **mild**, **moderate** or **severe**
Direct antibiotic therapy based on chronicity and previous exposure to antimicrobial therapy
For severe infections, **start** patients quickly on broad-spectrum antibiotics, pending culture results (see IDSA guidelines — www.idsociety.org)
Do not use antibiotics as a preventative measure in the absence of clinical signs of infection
Use topical antimicrobial agents with antibiotics in wounds diagnosed as infected OR in isolation when there is a clinical suspicion that the wound has increased bioburden (eg stalled, discoloured granulation tissue and/or increased exudate)

MOISTURE BALANCE

Assess the wound thoroughly
Select wound dressing according to tissue type and to optimise exudate management
Use dressings designed to create a moist wound environment to support progression towards wound healing
Reassess regularly, as the status of the diabetic foot can change very quickly, especially if infection has not been appropriately addressed

EPITHELIAL EDGE ADVANCEMENT

Monitor for indications the wound is in a healing trajectory
Review and reassess patient and wound management if epithelial advancement fails
Aim to achieve optimisation of tissue management, infection, moisture control, disease management, offloading and adherence

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STEPS TO AVOIDING AMPUTATION

A Diagnosis of diabetes
Aim: Prevent the development of a diabetic foot ulcer

1. Implement DFU prevention care plan and involve the multidisciplinary team
2. Perform annual general foot examination
3. Review regularly and provide patient education

B. Development of diabetic foot ulcer
Aim: Treat the ulcer and prevent infection

1. Determine cause of ulcer
2. Agree treatment aims and implement care plan:
   - Initiate antibiotic treatment if infection suspected; consider topical anti-microbial therapy
   - Review offloading device; ensure footwear accommodates dressing
   - Optimise glycaemic control for diabetes management
   - Refer to vascular services if limb ischaemia is suspected
   - Educate patient on how to self-manage and when to raise concerns

C. Development of vascular disease
Aim: Prevent complications associated with ischaemia

1. Refer to vascular specialist for revascularisation to improve blood flow in patients with ischaemic/neuroischaemic ulcer
2. Offer all patients with identified peripheral arterial disease best medical therapy for cardiovascular risk
3. Optimise diabetes control

D. Ulcer becomes infected
Aim: Prevent life- or limb-threatening complications

1. For mild infections: treat with systemic antibiotics and consider topical antimicrobials as adjunctive therapy
2. For moderate or severe infections: treat with appropriately selected empiric antibiotics. Modify using the culture results and sensitivity reports
3. Offload pressure and optimise glycaemic control
4. Consider therapy directed at biofilm in wounds slow to heal or not progressing in a timely way

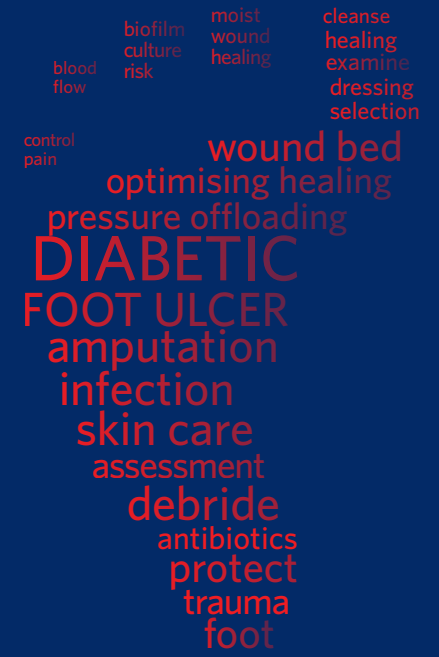
WHERE AMPUTATION IS UNAVOIDABLE

1. Implement skin and wound care plan to manage surgical wound and optimise healing
2. Review regularly and implement prevention care plan to reduce risk of recurrence or further DFU on contralateral limb

Adapted from International Best Practice Guidelines[5]

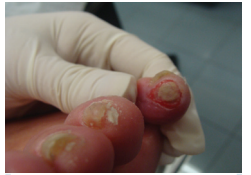
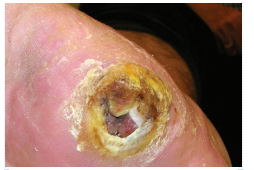
QUICK GUIDE

DIABETIC FOOT ULCER
WOUND MANAGEMENT



Wounds International

OPTIMISING DFU WOUND MANAGEMENT

Classification of ulcer (based on Wagner and University of Texas/ Armstrong)[1-3]	0	I Non-infected	I Infected	II Non-infected	II Infected	III Non-infected	III Infected
							
Description	Severely deformed foot at risk of ulceration	Superficial ulcer, not involving tendon, capsule or bone	Superficial ulcer, not involving tendon, capsule or bone, with signs of infection	Deep ulcer with no bony involvement	Deep ulcer with signs of infection	Deep ulcer penetrating to bone or joint	Deep ulcer with evidence of osteomyelitis
Wound treatment objective Note: in an ischaemic foot, revascularise in the first instance	• Maintain skin integrity	• Provide clean wound bed for granulation tissue	• Remove slough/callus • Reduce bacterial load • Prevent/remove biofilm • Manage exudate/ odour	• Remove slough/callus • Provide clean wound bed for granulation tissue • Prevent/remove biofilm • Manage exudate	• Remove slough/callus • Reduce bacterial load • Prevent/remove biofilm • Manage exudate/ odour	• Remove slough/callus • Provide clean wound bed for granulation tissue • Prevent/remove biofilm • Manage exudate	• Remove slough • Reduce bacterial load • Prevent/remove biofilm • Manage exudate/ odour
Local wound treatment							
Wound bed preparation	Skin care (eg Trixo®/ Linovera®)	Use antiseptic wound irrigation solution and/or gel (eg Prontosan® Wound Irrigation Solution, Prontosan® Wound Gel, Prontosan® Wound Gel X)				Caution is advised*	
Primary dressing		Absorbent/low-adherent moist dressing (eg Askina® Foam/ Askina® DresSil)	Antimicrobial dressing (eg Askina® Calgitrol® Paste)	Absorbent/low-adherent moist dressing (eg Askina® Foam/ Askina® DresSil)	Antimicrobial dressing (eg Askina® Calgitrol® Paste)	Absorbent/low-adherent moist dressing (eg Askina® Foam/ Askina® DresSil)	Antimicrobial dressing (eg Askina® Calgitrol® Paste)
Secondary dressing	Polyurethane film or low-adherent dressing/wound contact layer (eg Askina® Derm/Askina® SilNet)						
GOAL: PREVENTION OF AMPUTATION							

References

1. Wagner FW. The dysvascular foot: a system of diagnosis and treatment. *Foot Ankle* 1981; 2: 64-122.
2. Lavery LA, Armstrong DG, Harkless LB. Classification of diabetic foot wounds. *J Foot Ankle Surg* 1996; 35: 528-31.
3. Armstrong DG, Lavery LA, Harkless LB. Validation of a diabetic wound classification system. The contribution of depth, infection, and ischemia to risk of amputation. *Diabetes Care* 1998; 21(5): 855-9.
4. European Wound Management Association (EWMA). Position document: *Wound bed preparation in practice.* London: MEP Ltd, 2004.
5. International Best Practice Guidelines. *Wound Management in Diabetic Foot Ulcers.* Wounds International, 2013. Available from: www.woundsinternational.com

*** NOTE:** As Grade III DFUs may involve exposed cartilage, special caution is advised. Some products (eg Prontosan®) are contraindicated for the use on hyaline cartilage. In all cases, a careful risk:benefit assessment should be performed. Decisions on product use must lie with the attending physician and normal saline should be used instead of Prontosan® where indicated.