Desloughing algorithm

Holistic patient assessment

- Do a holistic assessment to establish the cause of the wound and slough
- Address any contributing pathophysiology — for example, offload pressure, improve perfusion, optimise comorbidities and manage infection

Wound assessment

- Establish a baseline from which to measure success
- Document the wound surface area, depth and percentages of tissue types
- Assess the colour and consistency of exudate
- Note any signs and symptoms of increasing bioburden/infection

Goal setting

- Define the expected outcome of treatment
- Choose an intervention (see treatment pathway, *right*)
- Set a realistic timeframe
- Agree goals/outcomes with the patient

Reassess and evaluate whether the goal has been met

Yes	No
• Define new goal of treatment and timeframe	• Reassess the pre-existing condition, patient-related factors and wound bed to establish the reason for failure and if the initial diagnosis was correct • Consider an alternative method of desloughing • Consider referral to a specialist service for advice

Treatment pathway

Slough characteristics

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Slough associated with biofilm/bioburden	Wet superficial slough	Thick slough	Dry adherent slough
• Surfactant cleansing e.g. Prontosan or Octenilin • Mechanical desloughing/larvae • Antimicrobials matched to the exudate levels	• Surfactant cleansing e.g. Prontosan or Octenilin • Autolytic/mechanical desloughing matched to the exudate levels		• Autolytic desloughing • Select products to hydrate the slough

References

Ayello E, Baranoski S, Kerstein M, Cuddigan J (2004) Wound debridement. In: Baranoski S, Ayello E (eds). *Wound Care Essentials: Practice Principles*. Lippincott Williams and Wilkins: Philadelphia, 117–25

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National Institute for Health and Care Excellence (NICE) (2014) The Debrisoft monofilament debridement pad for use in acute or chronic wounds. www.nice.org.uk/guidance/mtg17

Size	Pack size	Product code	NHS code	Pip code
Pad 6 x 6cm	10	506444	ELZ404	367-8877
Pad 10 x 10cm	10	506446	ELZ405	367-8885
Pad 15 x 20cm	10	506447	ELZ406	367-8893
Rope with probe 2.5 x 40cm	5	550181	ELZ454	372-5272
Rope with probe 5 x 40cm	5	506443	ELZ407	367-8901

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Your guide to desloughing wounds

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BJN British Journal of Nursing

JWC journal of wound care

What is slough?

Slough is a consequence of the inflammatory phase of wound healing. It comprises dead white blood cells, fibrin, cellular debris and liquefied devitalised tissue.

In acute wounds, neutrophils remove dead and devitalised tissue and ingest debris and bacteria. After this, the activity of neutrophils changes and the redundant cells undergo programmed cell death (apoptosis). This cellular debris is forced out onto the wound surface, where it can be seen as slough. This natural process causes minimal tissue damage. The wound then proceeds to the next stage of healing (proliferation).

Chronic wounds, in contrast, get stuck in the inflammatory phase of healing. Increased inflammation is associated with the continual breakdown of debris and remodelling of tissue. Matrix metalloproteinase (MMP) levels increase, resulting in degradation of the proteins and growth factors that promote healing. The number of white cells also rises. Cell death increases, resulting in the greater production of slough.

Slough is a source of nutrients for bacteria, providing an environment for bacterial proliferation. It is also linked with wound chronicity, resulting in biofilm formation (Percival and Suleman, 2015). Failure to remove slough prolongs the inflammatory phase and impairs healing (*Figure 1*).

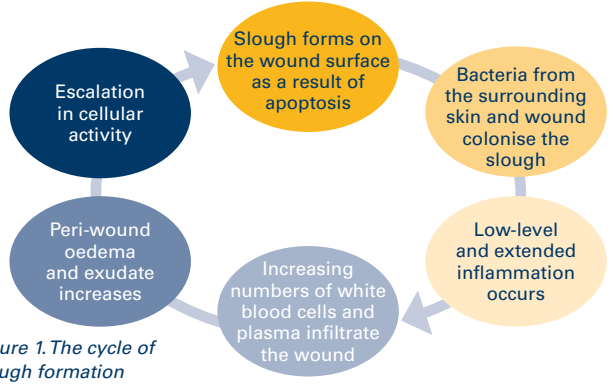

Figure 1. The cycle of slough formation

Characteristics

Slough should not be confused with necrotic tissue, which is caused by a loss of blood supply (*Table 1*). Like slough, necrotic tissue is a food source for bacteria, so must be removed (debrided). Methods of debriding devitalised tissue are: surgical (quickest), hydrosurgical, ultrasound, sharp, enzymatic, mechanical, autolytic and larvae.

Table 1. Differences between slough and necrosis

	Sloughy tissue	Necrotic tissue
Cause(s)	Consequence of the wound-healing process	Consequence of disease, injury, infection and/or unrelieved pressure
Pathology	Cellular debris caused by programmed cell death (apoptosis)	Interruption in blood supply to the skin results in local ischaemia, cell death and dehydration
Made up of	Redundant white blood cells, fibroblasts and other cellular components of healing	Cellular debris in the form of fibrous proteins (e.g collagen) and proteoglycans (e.g. components of the extracellular matrix)
Colour	Yellow or creamy yellow, white, grey/black	Black, brown or grey
Description	Adherent, viscous, slimy and stringy	Dry, hard, thick and leathery. It is usually firmly attached

The clinical appearance of slough in a wound can vary:

- Slough is likely to be patchy in acute wounds, but will be more fibrous and cover a greater surface area in chronic wounds
- Due to its slimy, soft, viscous texture, slough is difficult to separate from healthy tissue. Therefore, sharp debridement is impossible
- It can be either loosely attached or firmly adherent to the wound bed, hence the need to desloughing
- It can be grey/black if it is heavily colonised with anaerobic bacteria, but will still be slimy and stringy (Grothier, 2015)

Desloughing

A comprehensive assessment must be undertaken before determining whether to desloughing or debride the wound. Desloughing involves two options:

- Natural desloughing (autolysis) – where the body's own enzymes slowly rid the wound of debris. In a moist environment, phagocytic cells and MMPs can soften and liquefy the sloughy tissue, which is digested by macrophages (Ayello et al, 2004)
- Assisted desloughing – this is carried out when the natural process of autolysis cannot cope with the amount of slough present. It involves the use of dressings and other wound-care technologies. It can be further defined as either mechanical or autolytic.

To facilitate **autolytic desloughing**, a moist wound environment must be created. This is usually achieved with dressings that either donate fluid to the wound (such as occlusive dressings or hydrogels), or absorb excess exudate (such as foams, calcium alginates and Hydrofibres).

Mechanical desloughing is a relatively new method that facilitates the removal of slough. Examples are UrgoClean (Urgo Medical) (*Figure 2*) and monofilament debridement pads (National Institute for Health and Care Excellence (NICE), 2014).

Desloughing requires some exudate to be effective. It is not recommended for clinically infected wounds, those with a high potential for anaerobic infection or if there is ischaemia in the limb or digits (Ayello et al, 2004).

A desloughing algorithm and a treatment pathway are described overleaf.

Figure 2. Mechanical desloughing with UrgoClean