

Section 5: Wound Infection

Infection is the invasion of living tissue by pathogenic micro-organisms. The presence of bacteria is normal and does not always indicate that a wound is infected. Patient factors such as immunosuppression, poor nutritional status, metabolic disease, ischaemia or presence of a foreign body may affect their ability to control bacterial load.

Type	Management Aims	Action	Other Considerations
Stage 1 (Colonised) <u>2 or more signs of contamination/colonisation present but wound healing is progressing normally;</u> <u>Low to moderate exudate level</u> <u>Minimal pain</u> <u>Minimal odour</u> <u>Slough/necrosis evident</u>	1. Prevent infection Maintain skin integrity 2. Consider debridement	1. DO NOT SWAB 2. Debride if required 3. Optimise healing using appropriate dressing 4. Identify aetiology of wound and refer to appropriate specialists i.e. Vascular, Dermatology 5. If no progress after 2 weeks, review wound management plan If signs of localised infection, see Stage 2	In some people signs and symptoms of infection may be masked eg diabetes, vascular, immunocompromised. Clinical judgement should be used to determine when antimicrobial dressings should be used. When dealing with deep wounds it may be necessary to exclude osteomyelitis. Debridement The presence of slough and necrosis delays healing. Debridement can be achieved by selecting a dressing that debrides, e.g. hydrogel, honey, fibrous hydrocolloid. Other options for debridement are Debrisoft (following suitable trial of dressings that debride), Larvae therapy (specialist treatment) or sharp debridement (if suitably trained).
Stage 2 (Localised) 2 or more signs of localised infection present and healing is not progressing normally; - Increased exudate levels - Presence of malodour - Pain in or around wound site - Evidence of hypergranulation - Discolouration or bleeding of granulation tissue - Presence of slough/necrosis	- Treat the localised infection - Prevent the spread of infection - Prevent deterioration of wound - Maintain skin integrity	1. DO NOT SWAB 2. Consider the use of a biofilm disrupting cleansing solution 3. Select antimicrobial dressing 4. Monitor wound progress. If no progress at 2 weeks; - If no signs of infection, stop and refer back to Stage 1 - If wound is improving, continue treatment and review in 1 week until no signs of infection - If static, consider alternative antimicrobial dressing choice 5. If infection appears to be spreading please refer to Stage 3	Wound Swabs Wound swabs should only be taken for infection that is spreading or when systemic infection is suspected. Wounds should be cleansed as normal. The swab should be moved across the wound surface in a zig-zag motion, at the same time as being rotated between the fingers. Patient Information Chronic Wound Patient information leaflet is available to provide information to patients about how they can expect their wound to be managed and includes information about wound infection. Link to PIL (Staffnet link) Circulation If circulation is compromised e.g. vascular, diabetic patients, please refer for specialist advice. See section 15: Referral pathways. Black toes would require an urgent referral. NB* Please see WMF section according to wound types for guidance on treatment choice

Stage 3 (Spreading Infection) 2 or more signs of infection present and wound is deteriorating; - Evidence of localised cellulitis/erythema - Increased pain - Increased exudate or is thick, haemopurulent or purulent - Localised oedema - Increased malodour	- Identify organism - Treat the infection - Prevent systemic infection - Maintain Skin integrity	Swab wound* and implement NEWS monitoring for signs of systemic infection/sepsis - Start topical antimicrobial - Consider starting systemic antibiotics (Link Abx Guidance) - Monitor wound progress. Review at 2 weeks; - Review systemic antibiotic when swab result available (NB* Please be aware of likely colonisers in chronic wounds and ulcers) - Review wound management plan - See Stage 2, point 4 for actions 5. If signs of systemic infection evident, refer to Stage 4	
Stage 4 (Systemic Infection) 1 or more signs of systemic infection present: May lead to sepsis if not treated; - Spreading cellulitis - Pus/abscess - Patient systemically unwell - Raised white cell count/CRP - Wound breakdown+/satellite lesions evident	- Identify organism - Treat infection - Maintain skin integrity - Monitor for signs of sepsis	SWAB the wound* and implement NEWS monitoring for signs of systemic infection/sepsis - Consider SEPSIS6*; blood cultures/FBC/CRP/U&Es - Select Antimicrobial dressings and start systemic antibiotics*, monitor closely - If rapid deterioration, escalate as necessary, immediate referral for urgent medical advice/hospital admission - Monitor wound progress. Review at 2weeks; - Review systemic antibiotic when swab result available (NB* Please be aware of likely colonisers in chronic wounds and ulcers) - Review wound management plan - See Stage 2, point 4 for actions	

Scottish Ropper Ladder for Infected Wounds

Antimicrobial Dressings

Antimicrobial dressings are indicated for the short term treatment of localised infection; and in combination with systemic antibiotics for the treatment of spreading or systemic infection. Antimicrobial dressings should not be used to heal wounds or where symptoms of infection are not present. Where antimicrobial dressings are used, they should be reviewed after 2 weeks. If the wound is unchanged at two weeks, it is recommended that an alternative antimicrobial dressing is selected. Antimicrobial dressings should not routinely be continued beyond 4 weeks. Table 1: Antimicrobial Dressings Selection Tool can be used to guide users to the most appropriate antimicrobial dressing based on the characteristics of the wound. Cost should be considered alongside patient and wound-specific factors to ensure a cost effective treatment course is selected.

- Honey Dressings - have antimicrobial and anti-inflammatory properties and promote autolytic debridement. This osmotic effect may cause pain and analgesia may be required. Patients with diabetes should have their control monitored whilst using topical honey, especially when applied to large areas. Honey dressings should be avoided in patients with extreme sensitivities to honey, bee stings or bee products.
- Iodine Dressings - release free iodine when exposed to wound exudate which acts as an antiseptic on the wound surface. Systemic absorption may occur from large wounds or with prolonged use. Caution in those with severe renal impairment or history of thyroid disease. Contra-indicated in children, those receiving lithium, thyroid disorders, pregnancy or breastfeeding. Inadine® has the propensity to dry out and adhere to the wound surface and requires frequent dressing changes.
- Cutimed Sorbact - is recommended for the treatment of local infection. Bacteria and fungi are physically and irreversibly bound to the dressing and are removed with each dressing change. Cutimed sorbact should be used as a primary dressing. Swabs can be unfolded and used under compression bandaging or be used to dress toes.
- Other Antimicrobial Dressings - Flaminal® is a dressing with enzymatic antimicrobial activity. Experience with these dressings is limited and therefore it may be prudent to limit their use to mild infection until their place in therapy has been established.
- Silver Dressings - silver ions exert an antimicrobial effect in the presence of wound exudate and have broad antimicrobial activity. Practitioners should ensure good wound bed contact and conformability for full benefit from these dressings. Silver dressings are a second line choice when treatment with an alternative antimicrobial dressing has failed.
- Topical Antibiotic Creams - are not recommended.
- Systemic Antibiotics - are used for the treatment of spreading or systemic infection for a duration of 7 days. There is no evidence of benefit or improved wound healing in wounds that are colonised or locally infected. Inappropriate use of antibiotics can lead to resistant infections. Refer to [Tayside Antibiotic Guide](#) for more information.

Malodour

Malodour can be the most distressing symptom for patients, family and care givers. See Wound Complications: Fungating Wounds for management advice.

Secondary Dressings

See WMF section according to wound type for appropriate choice of secondary dressings.

Table 1: Antimicrobial Dressing Selection Tool

Antimicrobial Dressing		Exudate Level			
Type	Product	Nil	Low	Medium	High
Honey	L-Mesitran ointment*		√		
	Actilite tulle*		√		
	Medihoney apinate*			√	√
Iodine	Inadine*		√		
	Iodosorb powder		√	√	√
	Iodosorb ointment*		√	√	
Cutimed sorbact	Swab		√	√	√
Flaminal	Hydro*		√		
	Forte*		√	√	
Silver	Aquacel Ag+ Extra			√	√
	Aquacel Ag+ Ribbon			√	√

Key: √ suitable □ not advised * If circulation is compromised, use only under the direction of a specialist

References:

1. Healthcare Improvement Scotland (2018) Resources to Guide the Management of Suspected Infection in Chronic Wounds. Available online: http://www.healthcareimprovementscotland.org/our_work/patient_safety/tissue_viability/infection_in_chronic_wounds.aspx (accessed 4 November 2022)
2. Wounds UK Best Practice Statement. The use of topical antimicrobial agents in wound management. London: Wounds UK, 2013 (3rd Ed).
3. World Union of Wound Healing Societies (WUWHS). Wound Infection in Clinical Practice. An International Consensus. London: Medical Education Partnership Ltd. International Wound Journal: Vol 5; 3, 2008.
4. National Prescribing Centre. Evidence-based prescribing of advanced wound dressings for chronic wounds in primary care. MeReC Bulletin 2010; 21(01): 1-7.
5. Silver dressings – do they work? Drug & Therapeutics Bulletin. 2010; 48(4): 38-42.
6. Wounds International. Ten top tips for taking a wound swab. Available at: www.woundsinternational.com
7. Wounds UK. The Scottish Ropper Ladder for infected wounds: a 5-year journey from concept to national tool. NHS Lothian, Scotland: Wounds UK, 2018; 14(04): 30-35

Faster

Slower

Surgical	Sharp	Larvae	Mechanical	Autolytic	
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Please always consider a referral to the appropriate specialist to carry out conservative sharp debridement and complete regular wound assessments, documenting any changes.

Warning! Sharp debridement should not be undertaken unless appropriate training and experience have been gained.

Tissue Type	*Wound Dressings and Treatments (please consider the different options below, and note that these products should not all be used at the same time)	
	Concern of Infection and/or Biofilm	No Concern of Infection and/or Biofilm
	(Please refer to the NHS Scotland Ropper Ladder for Infected Wounds)	
Stringy Slough 	- Mechanical debridement pad - Flaminal Hydro/Forte - Larval Therapy	- Mechanical debridement pad - ActivHeal Hydrogel - Aquacel Extra - Larval Therapy
Thick Tenacious Slough 	- Medihoney Apinate - Larval Therapy	- ActivHeal Hydrogel - Larval Therapy

Refer to appropriate specialist for in-depth assessment of blood flow before considering debridement.
Please always refer to Podiatry for full guidance on foot wounds.

**Soft Islands of Necrosis 	- Flaminal Hydro/Forte - L-Mesitran Ointment	ActivHeal Hydrogel
**Black/Brown Eschar (hard tissue) 	- Flaminal Hydro - Medihoney Apinate - L-Mesitran Ointment	ActivHeal Hydrogel

*Always refer to the NATVNS wound cleansing pathway, the NHS Tayside Wound Management Formulary and the International Consensus Document on Debridement June 2024 – Journal of Wound Care throughout the treatment period.

In some cases, it is **not appropriate to remove necrotic tissue, e.g. where there is ischaemia or the patient has been deemed unsuitable for reconstruction following assessment by the vascular surgeon. **If there is no blood supply, keep it dry.**