INESSS
LE SAVOIR PREND FORME

Decision Support Tool - January 2024

WOUND CARE

OPTIMAL TREATMENT PLAN BASED ON THE ETIOLOGY OF THE WOUND, THE RISK OF INFECTION, THE TYPE OF TISSUE AND THE AMOUNT OF EXUDATE

Click on the underlined words for more details, and on tabs to navigate

This clinical tool is intended for use by health care professionals. It is provided as a guide and does not replace the judgment of the clinician who conducts the activities reserved to him or her by law or by regulation. This document was designed on the basis of clinical recommendations developed by the INESSS using a systematic approach and supported by the scientific literature as well as by the knowledge and experience of Quebec clinicians and experts. The content of this tool excludes newborns and young children. A tool to guide the wound assessment and determination of wound healability, as well as a dressing specifics reminder, are also available to support decision-making. For more information, visit inesss.qc.ca.

BACKGROUND

- Optimal wound care is based on improving both the person's overall health and intervening in the wound according to a treatment plan.
- The treatment plan determines the steps to be taken and the type of dressings to be used based on the characteristics of the wound - the type of tissue, exudate, infectious risk and vascular supply.
- The same treatments principles apply to both chronic and acute wounds in regards:
  - to prevent and to treat infection;
  - to control moisture;
  - to promote healing.

TREATMENT PRINCIPLES

- Assessing the wound and evaluate its healability is essential for determining the treatment plan.

  For more details, please refer to the Wound Care: Assessing the Wound and Determining healability tool.
- A wound located on the lower or upper limbs requires vascular supply assessment before defining a treatment plan.
  - If vascular supply is uncertain, refer to a specialist or experienced colleague prior to any intervention or refer for further vascular assessment.

! *The treatment of a wound located on the limbs with inadequate vascular supply can represent major safety issues for the individual's health.*

SOMMAIRE

Québec

CLEANSING

- The cleansing technique should be chosen according to the microbial load, the healing stage and the type of tissue observed.
- It is preferable to use a neutral solution.
- No neutral solution is superior to one another:
  - aqueduct water and physiological saline are effective and safe;
  - the use of well water is not ideal but can be chosen if it meets safety standards. Well water may contain high levels of contaminants (e.g., arsenic, nitrates-nitrites) above the standard required in the *Drinking Water Quality Regulations* and may be harmful to the healing process. ***Boiling the water will only serve to concentrate the contaminants without removing them.***

DEBRIDEMENT

- Vascular supply must be adequate and verified **before** debridement and selection of a semi-occlusive dressing. Otherwise, there is a risk of causing injury.
- The preferred wound debridement method in a curable wound or a wound in maintenance is the conservative sharp wound debridement.
- Combined action of several types of debridement is possible - e.g., conservative sharp debridement followed by autolytic or enzymatic or chemical or mechanical debridement.

APPLICATION OF AN ANTISEPTIC/ANTIMICROBIAL SOLUTION

- Application of an antiseptic/antimicrobial solution is required in the presence of biofilm, an infected wound or a high risk of infection.
- The product is chosen based on the desired target effect - e.g., antimicrobial spectrum, bactericidal or bacteriostatic effect, performance on biofilm.
- This step is usually followed by a rinse with a neutral solution, unless otherwise indicated.

CHOOSING THE OPTIMAL DRESSING

- Several dressings reach the same treatment objective.
- Using semi-occlusive dressings leading to a reduced frequency of dressing changes is preferable unless otherwise indicated - e.g. dry heel necrosis.
- Various types of dressings can be applied to a wound depending on its evolution.

  For more details, consult the dressing specifics reminder.

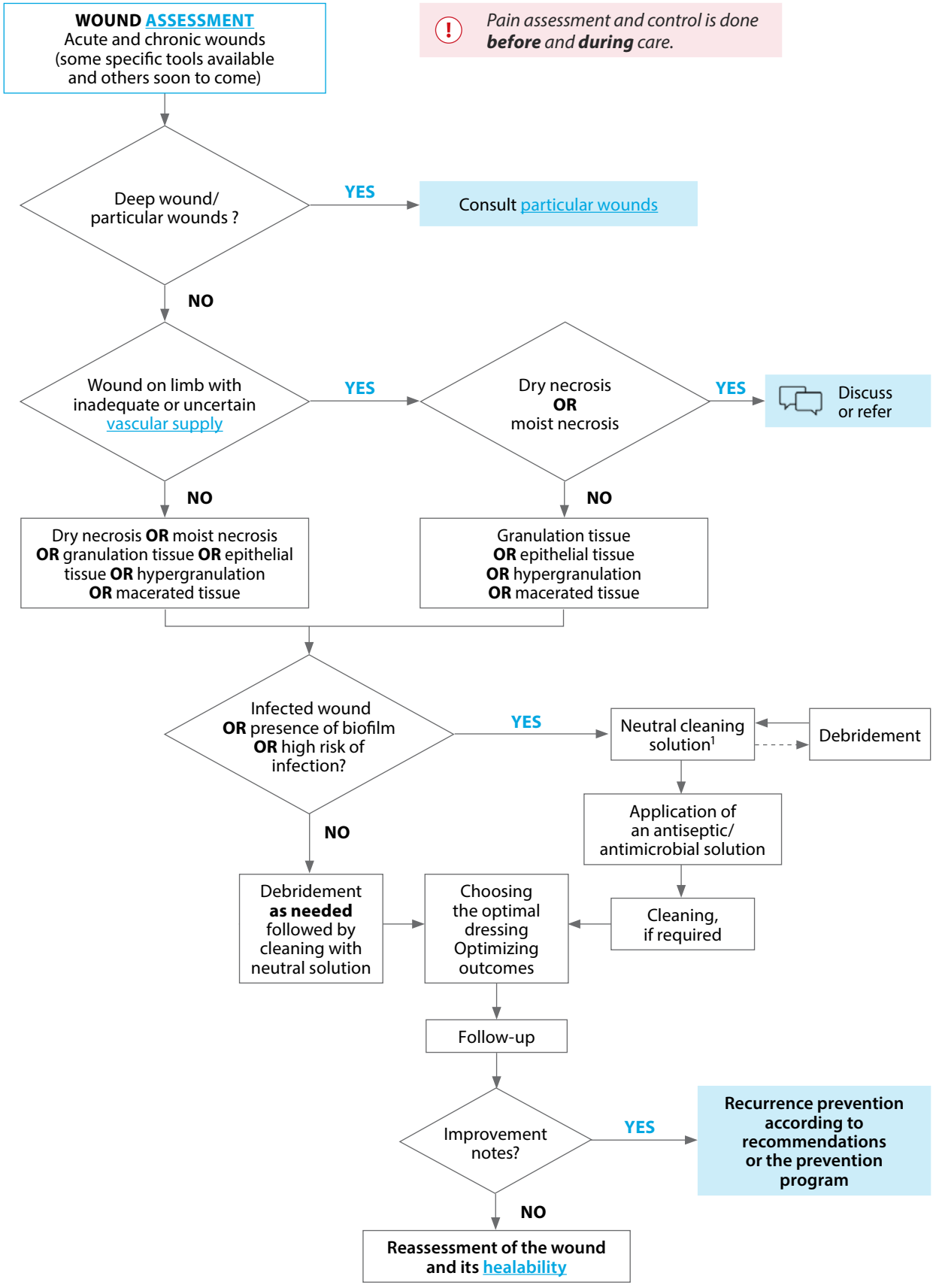
OPTIMIZING OUTCOMES

- Optimal wound management includes:
  - managing comorbidities and eliminating or modifying causative and risk factors that impede healing;
  - optimization of nutrition and hydration, and lifestyle changes;
  - related care such as compression therapy, leg elevation, mobility, and the use of pressure redistribution devices.

ANTIBIOTIC THERAPY

- The application of a topical antibiotic to a wound is not advised when biofilm is suspected or known to be present, due to poor performance on biofilm.
- Systemic antibiotic therapy is generally not advised unless there is a deep soft tissue infection, systemic infection or bone exposure, and on the advice of a specialist.

DECISION-MAKING ALGORITHM



1. In some cases, an antiseptic/antimicrobial solution may be used at the cleaning stage to facilitate debridement.

- - - ► Discuss with a wound specialist OR refer to the emergency department or to a clinician who can make a diagnosis

As indicated or recommended by a specialist.

ASSESSMENT OF THE VASCULAR SUPPLY FOR A WOUND ON A LIMB

- Wound healability is directly associated with the quality of vascular supply.
- A vascular assessment should be performed in all individuals who **present a wound on a lower or upper limb**.
- Symptoms and signs of peripheral atherosclerotic vascular disease (PAD) should be investigated **before**:
  - any type of debridement – e.g., autolytic, conservative sharp, enzymatic;
  - compression therapy.

  Further vascular assessment may be required at the onset of a new wound in the presence of PAD.

VASCULAR ASSESSMENT FOR A WOUND ON AN UPPER LIMB

Assessment

- Check for abnormal clinical signs - e.g., coldness, pallor, pain, slow capillary return.
- Pulse palpation.

VASCULAR ASSESSMENT FOR A WOUND ON A LOWER LIMB

When in doubt, consult an experienced colleague or a specialist

First assessment

- Check for abnormal clinical signs - e.g., coldness, pallor, pain, slow capillary return.
- Palpation of dorsalis pedis and posterior tibial artery pulses.
- Auscultation of femoral sounds and inspection of legs and feet.

Second assessment

- Ankle-brachial pressure index (ABPI) at the dorsalis pedis and posterior tibial artery in the supine position.
- If required, toe brachial index or toe pressure.

In-depth assessment

- Clinical signs of inadequate or uncertain vascular supply-non-palpable or weak pulses, critical ABPI values-should be confirmed by arterial wave quality analysis with the portable Doppler by an appropriately qualified professional, vascular laboratory, vascular surgeon, or other.

! *The ABPI is less accurate in some **diabetic individuals** or **chronic renal failure**, or with **advanced age** or **cardiac arrhythmias** due to possible calcification of the arteries.*

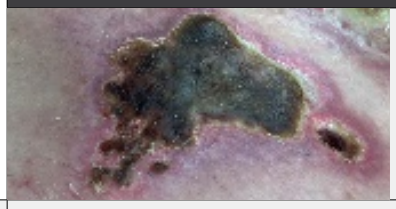
Vascular assessment by at least TWO methods to determine adequate vascular supply in a limb				
Vascular supply	**Presence of palpable pulses**	**Ankle-brachial pressure index (ABPI)**	*If available in the care facility and if knowledge for interpreting values*	
			Toe brachial Index (TBI)	**Toe pressure (TP, mmHg)**
Uncertain or inadequate 💬 Indicates calcified vessels	No	ABPI > 1.4	If non-compressible arteries identified by ABPI are present, measurement of the toe brachial index or toe pressure is recommended	
Adequate ABPI of 0.9 to 1.4 reduces the possibility of PAD	Yes	1.0 < ABPI ≤ 1.4	TBI > 0.7 [2]	TP ≥ 70
Uncertain/Grey area [1] May suggest mild PAD	Weak	0.8 ≤ ABPI ≤ 1.0	0.6 < TBI ≤ 0.7	TP < 70
Inadequate ABPI < 0.5 indicates significant to severe PAD 💬	No	ABPI < 0.8	TBI ≤ 0.6	TP < 70
Limb-threatening chronic critical ischemia 💬	Non	IPSCB < 0,4	IOB ≤ 0,2	PO < 30

Adapted from AHA 2016, HSE 2018, and Wounds Canada (Beaumier *et al* 2020).

💬 Consultation with a specialist or an experienced colleague

1. ABPI values between 0.91 and 0.99 correspond to a grey area that requires assessment of the clinical picture - e.g., modifiable or non-modifiable risk factors.
2. A toe brachial index value of more than 0.75 generally rules out PAD.

TREATMENT PLAN

	DRY NECROSIS		
		**Characteristics**	Black or brownish crust with a leathery texture that covers the wound
Location	**Limbs**		**Other than limbs**
Vascular supply	Vascular assessment required (!) ***If vascular supply is uncertain**, discuss with an experienced specialist or colleague **before** any intervention or refer for further vascular investigation.*		Vascular assessment based on clinical judgment
	Inadequate vascular supply	**Adequate vascular supply**	
Cleansing[1]/ debridement	✗ **Do not clean**[2] ✗ **Do not debride**	✓ **Debride** using the optimal and safe method. ✗ **Do not debride** dry black heel necrosis. *Consult a specialist or an experienced colleague.*	
Treatment objective	• Keep dry • Avoid infection[3]	• Prevent infection[3] • Maintain optimal moisture levels - no maceration, no drying out	
Antiseptic/ antimicrobial	• Apply 10 % povidone-iodine or 2% alcohol-**free** chlorhexidine to prevent infection	• If dry black necrosis on heel, apply 10% povidone-iodine. • If required, choose **antiseptic/antimicrobial** as per desired characteristic - e.g., bactericidal vs. bacteriostatic, effect on biofilm, antimicrobial spectrum, cytotoxicity. • If yeast or fungus, possible use of an antimycotic: miconazole, nystatin, clotrimazole, econazole, ketoconazole, terbinafine	
Type of dressing[4] Refer to the dressing specifics reminder to guide decision-making	• If necessary, cover with a dry dressing to protect the necrosis from surrounding moisture. ✗ Do not use semi-occlusive dressings or dressings that promote autolytic debridement.	• Use dressings that promote autolytic debridement. • Add moisture as needed: hydrogel, hydrophilic. • Light to moderate exudate: absorbent acrylic, hydrocolloid[4], hydrocellular foam • Moderate to heavy exudate: alginate[4], hydrofiber[4], hydrocellular foam ✗ If dry black necrosis on the heel, leave open to room air. A semi-occlusive dressing should be avoided in this case.	
If malodorous wound	• Not applicable	• After assessing the microbial load, use a commercial (e.g., Metrogel® 0.75-1%, Flagyl® 10%) or homemade metronidazole preparation as needed, depending on the clinical setting and product availability[5]. Use a secondary dressing depending on the level of wound exudate. Ensure compatibility with the dressing used. • Odour-masking dressing (e.g., activated charcoal dressing).	
(!) **Clinical aspects/ precautions**	💬 *Promptly refer the person to a to a specialized department for further assessment.*	• **If there is a lot of exudate or the size and depth of the wound** requires reduction, or there is a high risk of amputation: consider NPWT based on clinical judgment. • **If healing is delayed despite optimal treatment:** reassess the etiology of the wound, considering atypical wounds, and consider NPWT and skin substitutes or bioactive dressings based on clinical judgment. • **If dry black necrosis on the heel:** rapidly refer the patient to a specialized department for a more in-depth assessment.	

1. Basic cleansing generally required unless otherwise specified.
2. Maintain personal hygiene by not putting water directly on the wound.
3. The presence of necrosis promotes wound infection.
4. In the presence of copious exudate, some dressings, such as hydrocolloids, alginates and hydrofibers, may promote biofilm formation. If so, consider using an antimicrobial agent (based on expert opinion).
5. Indication not recognized by Health Canada.

Photo: Dr. Chantal Vallée, specialist in internal medicine, Hôpital Charles LeMoyne.

✓ Indicated ✗ Non-indicated 💬 Discuss/refer

TREATMENT PLAN FOR OTHER TISSUE TYPES ON NEXT PAGE

	MOIST NECROSIS		
		**Characteristics**	Yellow or greyish debris, wet, filamentous in texture, loosely attached to the wound bed

Location	**Limbs**		**Other than limbs**
Vascular supply	Vascular assessment required		Vascular assessment based on clinical judgment
	ⓘ ***If vascular supply is uncertain**, discuss with an experienced specialist or colleague **before** any intervention or refer for further vascular investigation.*		
	Inadequate vascular supply	**Adequate vascular supply**	
Cleaning[1]/ debridement	ⓘ *Debride in a **non-extensive** manner and as per the comfort and competence of the professional after assessment of the risks and benefits following discussion with an expert and/or a specialized team*	✓ **Debride** using the optimal and safe method	
Treatment objective	• Prevent and control infection • Control moisture • Revascularization	• Prevent infection • Maintain optimal moisture levels - no maceration, no drying out	
Antiseptic/ antimicrobial	• Cadexomer iodine and a secondary dressing • depending on the level of exudate. • Povidone iodine 10% especially if arterial ulcer, to maintain in a dry environment.	• If required, select antiseptic/antimicrobial according to the desired characteristic - e.g., effect on biofilm, bactericidal vs. bacteriostatic, antimicrobial spectrum, cytotoxicity. • If yeast or fungus, possible use of an antimycotic: miconazole, nystatin, clotrimazole, econazole, ketoconazole, terbinafine	
Type of dressing[4] Refer to the dressing selection checklist to guide decision-making		• Use dressings that promote autolytic debridement • **Add moisture as needed:** hydrogel, hydrophilic • **Light to moderate exudate:** absorbent acrylic, hydrocolloid, hydrocellular foam • **Moderate to heavy exudate:** alginate, hydrofiber, hydrocellular foam, highly absorbent pad.	
If malodorous wound	• Not applicable	• After assessing the microbial load, use a commercial (e.g., Metrogel® 0.75-1%, Flagyl® 10%) or homemade metronidazole preparation as needed, depending on the clinical setting and product availability5. Use a secondary dressing depending on the level of wound exudate. Ensure compatibility with the dressing used.	
ⓘ **Clinical aspects/ precautions**	💬 *Promptly refer the person to a specialized department for further assessment*	• **If there is heavy wound discharge or if the size and depth of the wound** requires reduction, or there is a high risk of amputation: consider NPWT. • **based on clinical judgement.** • **If healing is delayed despite optimal treatment**: reassess the etiology of the wound, considering atypical wounds, and consider NPWT and skin substitutes or bioactive dressings based on clinical judgment.	

1. Basic cleansing generally required unless otherwise specified.
2. Maintain personal hygiene by not putting water directly on the wound.
3. The presence of necrosis promotes wound infection.
4. In the presence of copious exudate, some dressings, such as hydrocolloids, alginates and hydrofibers, may promote biofilm formation. If so, consider using an antimicrobial agent (based on expert opinion).
5. Indication not recognized by Health Canada. Photo: Mélanie Fauteux, Stomotherapist Nurse

✓ Indicated ✗ Non-indicated 💬 Discuss/refer

TREATMENT PLAN FOR OTHER TISSUE TYPES ON NEXT PAGE

	GRANULATION TISSUE	EPITHELIAL TISSUE	MACERATED TISSUE	HYPERGRANULATION
				
Characteristics	• Bright red, shiny, granular tissue. • Healthy tissue, normal healing	• Pink, dry, shiny, pearly tissue, very fragile • Islands of epithelial cells in the centre	• Whitish appearance and thickening of the skin (caused by excess exudate)	• Raspberry red tissue, overgrowth of granulation tissue above the level of the skin or epithelial tissue. Caused by excess moisture, infection or excessive occlusivity
Cleaning[1]/ debridement	✓ Remove necrotic tissue as needed		✓ **Debride** necrosis according to optimal and safe method or remodel the edges if desquamated epidermis	✓ Chemical **cauterization** with silver nitrate. • Can be painful.
Treatment objective	• Promote wound filling by granulation • Protect new tissue • Maintain optimal moisture levels no maceration, no drying out	• Promote re-epithelialization and wound closure • Protect new tissue • Maintain optimal moisture levels no maceration, no drying out	• Reduce inflammation and itching • Reduce moisture and absorb exudate • Preserve integrity of surrounding skin	• Remove hypergranulation tissue, unless malignant wound • Reduce moisture and control exudate - frequent dressing may be sufficient treatment • Prevent infection • If infection or biofilm, monitor and re-establish microbial load balance
Antiseptic/ antimicrobial	• If required, select antiseptic/antimicrobial according to desired characteristic - e.g., effect on biofilm, bactericide vs. bacteriostatic, antimicrobial spectrum, cytotoxicity. • If required, possible use of antimycotic products against yeast or fungus: miconazole, nystatin, clotrimazole, econazole, ketoconazole, terbinafine			
Type of dressing Refer to the dressing specifics reminder to guide decision-making	• **No to light exudate:** hydrogel, hydrophilic • **Light to moderate exudate:** hydrocolloid[4], adhesive or non-adhesive hydrocellular foam, highly absorbent dressing • **Moderate to high exudate:** absorbent dressing, e.g., alginate[4], hydrofibers[4], hydrocellular foam, highly absorbent dressing		• **Moderate to high exudate:** hydrophilic, hydrocellular foam, or super absorbent dressing, zinc paste dressing for venous ulcers • For fragile skin, use non-adhesive or silicone-based dressings	• **Moderate to high exudate:** absorbent dressing, e.g., alginate[4], hydrofibers/gelling fibers[4], hydrocellular foam
If malodorous wound	• After assessing the microbial load, use a commercial (e.g., Metrogel® 0.75-1%, Flagyl® 10%) or homemade metronidazole preparation as needed, depending on the clinical setting and product availability.[5] Use a secondary dressing depending on the level of wound exudate. Ensure compatibility with the dressing used. • Odour-masking dressing (e.g., activated charcoal dressing)			• Not applicable
! **Clinical aspects/ precautions**	• Depending on the level of exudate from the wound, select dressings that can be left in place longer to promote re-epithelialization.		• Protect the surrounding skin with a skin protector. • Frequent dressing changes may be necessary.	• Mechanical stress may induce hypergranulation. • If a malignant wound is suspected, consult a specialist

Photos: granulation, epithelial and hypergranulation, Mélanie Fauteux, Stomotherapist nurse at the clinique de plaies complexes du CISSS Chaudière-Appalaches; macerated tissue authorized by Wounds Canada.

✓ Indicated ✗ Non-indicated Discuss/refer

TREATMENT PLAN FOR OTHER TISSUE TYPES ON NEXT PAGE

	SKIN TEAR	PARTIAL THICKNESS BURNS (2nd DEGREE)		CLOSED SURGICAL WOUND (SUTURED)
		PHLYCTENE-FREE	PHLYCTENES	
				
Characteristics	• Linear tear with partial or complete loss of the skin flap	• Pink, painful, moist dermis	• Lifting of the epidermis that forms a bulge filled with clear fluid	• Clean, dry, or slightly exuding wound, presence of sutures with small scar
Cleaning[1]/ debridement	✓ **Debride if devitalized skin flap** ✗ Do not debride if viable skin flap	✗ **Do not debride** • If necessary, consult a specialist or an experienced colleague	✓ **Debride phlyctenes** if filled with clear fluid and > 6 mm diameter or if located on joints, hands, feet.	✗ No cleaning required until the first post-op dressing change, provided there is no evidence of excessive exudate or wound infection
Treatment objective	• Preserve and reapproximate viable skin flaps, if possible • Avoid trauma, manage exudate, avoid infection, control the pain	• Cool/irrigate the burn if indicated, avoiding hypothermia • Manage exudate, avoid infection, control pain	• Drain the fluid or remove the detached epidermis (de-roofing) to accelerate re-epithelialization and reduce the risks of infection	• Protect and cover the wound • Manage exudate as needed • Prevent microbial infection
Antiseptic/ antimicrobial	• If required, select antiseptic/antimicrobial according to the desired characteristic - e.g., effect on biofilm, bactericidal vs. bacteriostatic, antimicrobial spectrum, cytotoxicity. • If required, possible use of antimycotic products against yeast or fungus: miconazole, nystatin, clotrimazole, econazole, ketoconazole, terbinafine			
Type of dressing Refer to the dressing specifics reminder to guide decision-making	• Avoid sutures, staples or fasteners • Non-adherent and semi-occlusive dressings are preferred • Tissue glue possible if type I skin tear • **Light to moderate exudate:** absorbent acrylic, interface/tulle[6], hydrocellular foam - siliconized and WITHOUT adhesive border • **Moderate to high exudate:** absorbent acrylic, hydrocellular foam, hydrofiber[4]	• Preferred semi-occlusive or bioactive dressing • Interface/tulle[6] • **Light to moderate exudate: bioactive dressing, hydrocolloid - frequent change to avoid maceration** • **Moderate to heavy exudate: absorbent acrylic, hydrocellular foam - siliconized and WITHOUT adhesive border and fixation[7]**, alginate, hydrofiber	• Preferred semi-occlusive dressings • Absorbent acrylic • Hydrocellular foam (**WITHOUT** adhesive border) and fixation7	• Semi-occlusive dressing • Adhesive absorbent dressing • Allow wound to air after 48 hours **OR** • Dry non-adherent dressing (do not apply to a closed surgical wound that is oozing) • In case of superficial dehiscence: fill the dead space and consider alginate and hydrofiber dressings • In case of deep dehiscence: notify the surgeon
If malodorous wound	• Not applicable			
! **Clinical aspects/ precautions**	• Indicate the direction of withdrawal of the dressing to avoid trauma *If deep structures exposed or inadequate vascular supply, refer the person rapidly to a specialized department*	• Avoid the use of silver sulfadiazine *If debridement is necessary, promptly refer the individual to a specialized department*	• Avoid the use of greasy substances - e.g., ointments or cream *If bloody phlyctenes, promptly refer the individual to a specialized department*	*If surgical site complication (e.g., dehiscence or infection), follow up with the appropriate surgeon*

6. The use of semi-occlusive dressings is often preferred
7. If necessary and depending on the location of the wound, the fixation dressing could be added only to the edges and not to the entire hydrocellular foam dressing, or it could be fenestrated to maintain the semi-occlusive nature of the primary dressing.

Photos: skin tear: from Valerie Chaplain's article; burns: NSW; surgical wound Wounds Canada.

✓ Indicated ✗ Non-indicated Discuss/refer

TREATMENT PLAN FOR OTHER TISSUE TYPES ON NEXT PAGE

	TRAUMATIC WOUND		
	LACERATION	**ABRASION**	**PUNCTURE WOUND** (e.g., bite)
			
Characteristics	• Skin tear, regular and clean or irregular, superficial, or deep, with possible skin flaps. May contain foreign matter (e.g., glass, gravel) and involve deep structures.	• Surface lesion involving dermis and epidermis with irregular edges. May contain foreign matter (e.g., soil, gravel, sand). Often accompanied by erythema, but little bleeding.	• Superficial or deep wounds caused by the penetration of sharp objects whose edges are generally close together, with more or less profuse bleeding.
Cleaning/ Debridement	• If necessary, loosen hair by removing it with a lubricant, depilatory cream, scissors/trimmer, or razor. Clean the wound so that no hair penetrates, thereby reducing the risk of infection. • Clean/irrigate thoroughly with water or physiological solution (NaCl 0.9%) inside and around the wound - be aware of cat bites. • Remove necrotic tissue, debris, and foreign matter (pay particular attention to organic debris, e.g., grass clippings).		
Treatment Objective	• Control pain. If necessary, use local analgesia (e.g., LET gel) and/or systemic analgesia (e.g., acetaminophen, ibuprofen, opiate) **BEFORE** the procedure to allow time for action. • Stop bleeding. • Close the wound - if applicable. • Prevent or control infection by administering post-exposure prophylaxis (PEP, e.g., antibiotic, tetanus, rabies, HBV, HIV) or antibiotic treatment.		
Antiseptic/ Antimicrobial	✓ Use of antiseptic/antimicrobial solution possible (e.g., before wound closure, in case of bite, wound is soiled)		
Closure	✓ First-line closure possible if: - there is little or no tissue loss and the edges can be drawn together; - clean wound with no symptoms or signs of infection. • The closure method (e.g., tissue/surgical glue, closure strips, staples, sutures) should be chosen according to wound type, depth, location, aesthetic importance, and risk of infection.		
	• If there are no contraindications, the use of surgical glue is recommended in children, especially in cases of facial or scalp lacerations. • In certain situations, the use of skin closure strips may also be considered. • For deeper, irregular wounds, under tension, or in mobile areas, sutures or staples may be used - if possible, absorbable sutures are recommended.	• The wound is usually left to heal under controlled conditions. (!) *Monitor regularly for infection*	• If the condition of the wound allows, it can be closed by primary intention healing. • If presence of symptoms and signs of infection or in doubt, the wound may be left open for a short period to control infection and optimize cleaning before being closed. ✗ *Do not use surgical glue on bites.*
Type of dressing Consult the dressing specifics reminder to help you make the right decision.	Depending on the type of wound or closure: • Leave the wound open or cover with a semi-occlusive dressing (e.g., absorbent acrylic or non-adherent interface/tulle dressing6) for the first few days after the procedure to control pain/seepage. • To fill dead space: use a non-adherent primary dressing (e.g., alginate4 or hydrofiber4) in wounds with medium to heavy exudate. • For infected wounds or those at high risk of infection: use an antimicrobial dressing if possible.		

✓ Indicated ✗ Not indicated Discuss/Refer

TREATMENT PLAN FOR OTHER TISSUE TYPES ON NEXT PAGE

	TRAUMATIC WOUND *(suite)*		
	LACERATION	**ABRASION**	**PUNCTURE WOUND** (e.g., bite)
			
Antibiotic prophylaxis Consult the clinical support tool	✓ Consider using a 1st-generation cephalosporin (e.g., cephalexin, cefadroxil) in high-risk infection situations, including: • soiled, foreign-matter or highly contaminated wounds; • deep wounds to hands, feet, or genitals; • injuries involving tendons, ligaments, bones, or joints; • individual whose immunity is compromised by a health condition or its treatment; • people with asplenia or advanced liver disease; • late treatment beyond 12-24 hours.	✓ Recommended for cat bites, or deep tissue damage after a bite from another traditional domestic animal (e.g., dog). ✓ Considered for bites from traditional pets other than cats, or human bites in situations with a high risk of infection. **First choice:** • Amoxicillin/Clavulanate **Alternative options:** • **Adult** : TMP-SMX or doxycycline + [clindamycine **OR** metronidazole **OR** moxifloxacine][7] • **Children** : TMP-SMX **OR** doxycycline + [clindamycine][7] ! *Doxycycline is recommended for human bites*
Other post-exposure prophylaxis (PEP)	• Administration of anti-tetanus PEP to be considered according to the clinical situation.	• Administration of anti-tetanus, anti-rabies, hepatitis B, or HIV PEP to be considered according to the clinical situation.
Antibiotic therapy	• The severity of the infection generally guides the choice of antibiotic treatment. • Oral treatment: the antibiotics used, and the dosage, are generally the same as for antibiotic prophylaxis. The duration, however, is longer. • IV treatment: to be considered for certain infected wounds (e.g., severe, deep infection following a cat bite). After clinical improvement, it is possible to switch to an oral treatment with similar microbial activity. ! *If necessary, adjust antibiotic therapy after obtaining wound culture results.*	
! **Clinical aspects/ precautions**	💬 A microbiology-infectiology consultation may be necessary in the following situations: • in the case of a human bite, to assess the need for PEP and ensure follow-up against HIV, HBV or HCV; • in the case of a bite in a person with asplenia, advanced liver disease, or compromised immunity; • if the bite was made by a non-traditional domestic animal, farm animal, wild animal, or exotic animal; • if the wound is highly contaminated.	

Acronyms: IV: intravenous; LET: lidocaine/epinephrine/tetracaine; PEP: post-exposure prophylaxis; HBV: hepatitis B virus; HCV: hepatitis C virus; HIV: human immunodeficiency virus.

4. In the presence of copious exudate, some dressings, such as hydrocolloids, alginates and hydrofibers, may promote biofilm formation. If so, consider using an antimicrobial agent (based on expert opinion).
6. The use of semi-occlusive dressings is often preferred.
7. For anaerobic coverage if necessary.

✓ Indicated ✓ Could be considered ✗ Not indicated 💬 Discuss/Refer

CLEANSING

→ Cleansing of the wound and periwound skin removes excess exudate, superficial devitalized tissue, debris, foreign bodies and biofilm, known to provide an environment for infection and delayed wound healing.

Why	• Reduce the risk of infection • Prevent the invasion of microorganisms into healthy tissue
When	• As often as necessary taking into account the underlying spaces • Before the assessment • Before and after debridement • During dressing changes
Contraindication	• Ischemic wounds with dry black necrosis without underlying fluctuation • Black dry necrosis on the heel • **In both cases:** maintain in a dry environment by application of 10% povidone-iodine or 2% alcohol-free chlorhexidine until assessed by a vascular surgeon.
Precautions	• Irritating solutions or solutions that change the pH of the skin are not recommended • Wounds should be dry without rubbing and without friction • Take necessary steps to prevent splashing and contamination of other areas/surfaces
How	• An analgesic could be administered 20 to 30 minutes before cleansing, if necessary • With neutral solution, ideally at room or body temperature • Irrigation with liquid jets, dabbing, immersion/dipping, forceps • Up to the upper limb of the wound if it is located on the legs • Volume should be adjusted according to the extent of the wound (100-200 ml/cm^2 of wound) and the level of contamination • Bathing or showering with tap water could be considered for cleansing venous ulcers treated with a compression bandage • Dabbing, soaking, and drying with cotton swab or absorbent cotton should be avoided.

NEUTRAL SOLUTIONS

→ Water and saline are safe and equivalent neutral solutions for wound cleansing[8].

→ The decision to use aqueduct water rather than sterile physiological saline is a matter of clinical judgment based on the clinical situation, and the availability of products and facilities.

- This decision should be based on:
  - the quality of the water available (if potable water is not available, boiled, and cooled water or distilled water may be used)
  - the condition of the wound
  - the individual's general condition

NEUTRAL SOLUTIONS	CHARACTERISTICS	PRECAUTIONS	INDICATIONS	CONTRA-INDICATIONS
Aqueduct water[9]	• Hypotonic • Compatible with any silver dressing • As effective as 0.9% NaCl • Not antiseptic • No action on biofilm	• Check the quality of the water with the municipality • If drinking water is not available, boil for at least 1 minute and let cool down	• Acute or chronic wound	• None
Sterile water		• Discard 24 hours after opening		
Sterile NaCl (physiological saline solution)	• Isotonic • Compatible with all types of wounds • No toxicity • Not antiseptic • No action on biofilm	• Discard 24 hours after opening • Not always effective on dirty and necrotic wounds		• Possible incompatibility with some silver-based dressings

8. Based on the findings of a systematic review and the opinion of experts and clinicians consulted. There is no evidence to suggest that the use of tap water increases or reduces the risk of wound infection.
9. Use decision based on water quality, wound, person's condition, immune system, and comorbidities.

CLEANING TECHNIQUES ON NEXT PAGE

CLEANSING TECHNIQUE

→ Cleansing with irrigation or forceps is considered mechanical debridement

TECHNIQUE	DESCRIPTION	OBJECTIVES	ADDITIONAL INFORMATION
Low pressure irrigation **(< 8 psi)**	• Smooth flow and gentle spray e.g., with needleless syringe, sprayer, gentle	• Hydrates the wound • Facilitates assessment and visual examination	• Does not disturb healthy tissue • Possible on fragile skin or wounds with granulation
High pressure Irrigation **(8 to 15 psi)**	• Steady flow with high pressure - e.g., using a 30- or 60-mL syringe with an 18- or 20-G needle, placed at a 45^0 angle and approximately 10 cm from the wound	• Dislodges devitalized/necrotic tissue • Removes debris and foreign bodies from the wound surface • Can be used as a mechanical debridement	• Useful for dirty wounds • Local pain or bleeding possible • *Risk of trauma if pressure is too high (> 15 psi)* (!) ***Do not use for skin tears or painful wounds*** *- e.g., malignant wounds - and re-epithelializing wounds, as high irrigation may dislodge proliferating keratinocytes.*
Compress	• Wet or dry woven compress depending on the level of exudate		
Immersion/ Soaking	• Moistened woven compress	• Hydrates the wound • Weakens biofilm, depending on the type of solution used e.g., PHMB	• Requires minimal contact time, debridement and cleansing (!) ***Risk of maceration***

DEBRIDEMENT

→ Before performing debridement:

- Verify vascular supply by at least two methods (palpable pulses and (ABPI) or by checking clinical signs (coldness, pallor, pain). Consult an experienced colleague if necessary.
- Know the indications, contraindications, and specific aspects of each method.
- **Have the necessary skills** and equipment and follow the policies of your institution.
- Obtain the individual's consent.

→ The debridement method chosen may depend on the availability of methods and pain tolerance.

(!) ***For non-healable wounds, comfort care is recommended, and debridement is not sought.***

Action	• Removal of non-viable tissue	
Why	• Inspect wound - e.g., depth and exposure of underlying tissue • Disrupt biofilm • Reduce the risk of infection	• Optimize the effect of topical treatments • Stimulate wound healing
When	• Presence of - moist or dry necrotic tissue - Calluses - Biofilm - Infection	- Excess exudate - Foreign body and debris - Phlyctenes larger than 6 mm in diameter filled with clear fluid
Contraindication (!) *In case of doubt, consult a specialist*	• Dry ischemic necrosis • Dry black necrosis of the heel • Wounds with healthy granulation	• Viable skin flap - replace if not infected • Deep burns - surgical debridement by a specialist
Precautions	• **Bleeding disorders:** assess risk level if active debridement • Removal of calluses with caution if poor vascular supply (!) ***Necrotic and ischemic open wound on lower or upper extremity:*** *non-extensive debridement followed by antimicrobial agent*[1] • Malignant wound • Hypergranulation	• Devitalized tissue in open wounds localized to the heels, toes, and fingers, considering major structures proximity • Risk of pathergy in certain atypical wounds e.g., vasculitis or Pyoderma gangrenosum - during active debridement (mechanical or conservative sharp). Topical anti-inflammatory therapy required in these circumstances
How	• Consider the use of topical or oral pain medication before or during debridement. Consult debridement methods.	

1. If the wound with moist necrosis and vascular supply is localized on a lower or upper limb, a consultation with a specialist or an experienced colleague should be promptly requested prior to any intervention for a thorough assessment of the vascular supply. If this wound is localized elsewhere on the body, the necrosis can be debrided without a thorough assessment of arterial function.

DEBRIDEMENT WITH OR WITHOUT NECROSIS AND METHODS ON NEXT PAGE

WOUNDS WITH DRY NECROSIS

No debridement possible for:
- *Dry necrosis on lower or upper limb with inadequate vascular supply*
- *-Dry black necrosis on the heel*

→ Debridement methods for:
- Curable wound
- Maintenance wound not localized on a lower or upper limb
- Maintenance wound localized on a lower or upper limb and adequate vascular supply

PREFERRED METHODS		
Debridement	**Indications Examples**	**Specificities**
Conservative sharp wound debridement (CSWD)	• Acute or chronic wound • Callus • Infected or non-infected wound, or with suspected or confirmed biofilm	• Expertise required
Surgical	• Necrotizing Fasciitis • Large area of necrotic tissue	• Performed by a specialized physician

OTHER OPTIONS		
Debridement	**Indications Examples**	**Specificities**
Autolytic	• Acute or chronic wound without complications • Small amount of necrosis	• Not optimal in some people - e.g., advanced age, poor health • Avoid if infection or risk of infection
	• Semi-occlusive and occlusive dressings promote autolytic debridement • Refer to the treatment plan and dressing specifics checklist to select the appropriate dressing for the clinical situation	
Chemical	• Acute or chronic wound • Wound with suspected or confirmed biofilm	• Sodium hypochlorite (Dakin)-(0.25%)
Enzymatic	• Acute or chronic wound • Shallow wound • Atypical wound - e.g., Pyoderma gangrenosum	• Collagenase (Santyl™): exception drug (code DE158) reimbursed by the RAMQ • Avoid if infection or risk of infection
Mechanical	• Acute or chronic wound • Infected or non-infected wounds, or with suspected or confirmed biofilm • Pyoderma gangrenosum with systemic immunosuppressive therapy	• Methods not recommended: - Wet-to-dry technique - Whirlpool bath
Mechanical ultrasound	• Acute or chronic wound • Complex wound	• Expertise required

DEBRIDEMENT WITH OR WITHOUT NECROSIS AND METHODS ON NEXT PAGE

WOUNDS WITH MOIST NECROSIS

Debridement not recommended for:
- *Open necrotic limb wound with inadequate or uncertain vascular supply*

→ Debridement methods for:
- Curable wound
- Maintenance wound not localized on a lower or upper limb
- Maintenance wound localized on a lower or upper limb with adequate vascular supply

PREFERRED METHODS		
Debridement	**Indications Examples**	**Specificities**
Conservative sharp wound debridement (CSWD)	• Acute or chronic wound • Infected or non-infected wound, or with suspected or confirmed biofilm • Wound with limited presence of underlying spaces or tunnels ***Open wound on a limb with inadequate or uncertain vascular supply:*** *non-extensive debridement could be considered after risk/benefit assessment following discussion with an expert and/or specialized team. In this case, debride and apply an iodine-based antimicrobial agent (e.g., iodine cadexomer) pending urgent consultation with a specialist*	• Expertise required
Surgical	• Necrotizing Fasciitis • Large area of necrotic tissue	• Performed by a specialist physician

OTHER OPTIONS		
Debridement	**Indications Examples**	**Specificities**
Autolytic	• Acute or chronic wound without complications • Small amount of necrosis	• Not optimal in some people - e.g., advanced age, poor health • Avoid if infection or risk of infection
	• Semi-occlusive and occlusive dressings promote autolytic debridement • Refer to the treatment plan and dressing specifics reminder to select the appropriate dressing for the clinical situation	
Chemical	• Acute or chronic wound • Wound with suspected or confirmed biofilm	• Hypochlorite de sodium (Dakin)-(0,25 %), nitrate d'argent
Enzymatic	• Acute or chronic wound • Shallow wound • Atypical wound - e.g., Pyoderma gangrenosum	• Collagenase(Santyl™): exception drug (code DE158) reimbursed by the RAMQ • Avoid if infection or risk of infection
Mechanical	• Acute or chronic wound • Infected or non-infected wounds, or with suspected or confirmed biofilm • Pyoderma gangrenosum with systemic immunosuppressive treatment	• Methods not recommended - Wet-to-dry technique - Whirlpool bath
Mechanical ultrasound	• Acute or chronic wound • Complex wound ***Open wound on a limb with inadequate vascular supply:*** *proceed according to clinical judgment*	• Expertise required

DEBRIDEMENT WITH OR WITHOUT NECROSIS AND METHODS ON THE FOLLOWING PAGES

WOUNDS WITHOUT NECROSIS

The debridement on an upper or lower limb requires a thorough vascular assessment beforehand. Refer to an experienced colleague, specialist, or specialized service if vascular supply to an upper or lower limb is inadequate or uncertain.

→ Debridement methods for:

- Curable wound/maintenance wound **not localized** on a lower or upper limb
- Curable wound/maintenance wound **localized** on a lower or upper limb and adequate vascular supply

OPTIONS		
Debridement	**Indications Examples**	**Specificities**
Autolytic	• Shallow open wound ⊗ Not recommended for open wound on a limb with inadequate vascular supply	• Not optimal in some individuals - e.g., advanced age, poor health • Avoid if infection or risk of infection
	• Semi-occlusive and occlusive dressings promote autolytic debridement • Refer to the treatment plan and dressing specifics reminder to select the appropriate dressing for the clinical situation	
Chemical	• Hypergranulation	• Silver nitrate reduces hypergranulation
Conservative sharp wound debridement (CSWD)	• Suspected or confirmed biofilm • Suspected or confirmed infection • Foreign bodies and blood clots • Bulky debris • Non-viable skin flap from a tear • Phlyctenes larger than 6 mm in diameter and filled with clear fluid ! ***Open wound on a limb with inadequate vascular supply:*** *proceed according to clinical judgment*	• Collagenase (Santyl™): exception drug (code DE158) reimbursed by the RAMQ • Avoid if infection or risk of infection
Mechanical by irrigation of 8 to 15 psi, or with pad	• Acute or chronic wound • Infected or non-infected wounds, or with suspected or confirmed biofilm • Pyoderma gangrenosum with systemic immunosuppressive therapy ! ***Open wound on a limb with inadequate vascular supply:*** *proceed according to clinical judgment*	• Methods not recommended: - Wet-to-dry technique - Whirlpool bath

SPECIFICS FOR DEBRIDEMENT METHODS IN WOUND CARE

Only a health care professional with the required knowledge and skills can perform debridement. If necessary, various supervision methods can be implemented - e.g., supervision by an expert in the field.

! *Obtain consent before debridement and follow your facility's guidelines*

! *Ensure that you have authorization from the health care setting in order to be insured in case of a dispute*

DEBRIDEMENT METHODS ON THE FOLLOWING PAGES

DEBRIDEMENT	INDICATIONS	CONTRAINDICATIONS	CONSIDERATIONS
Autolytic Selective destruction of non-viable tissue by activating the wound's natural enzymes. Can be performed in conjunction with other types of debridement	• Uncomplicated acute and chronic wounds • Small to moderate amount of non-viable tissue • Minimal amount of	• Acute infection or sepsis • Risk of infection • PAD • Macerated or high-exudate wounds or those at risk of infection • Deep cavities • Product sensitivity	• Slowest form of debridement • Cost of use and time of care • Repeated application required • Requires scarification of dry necrosis • Risk of infection and odor due to anaerobic bacteria • Risk of maceration and irritation of the surrounding skin
Biologic Therapy with fly larvae that liquefy and ingest the soft and moist necrotic tissue. Direct application of the larvae in the wound cleaned with water, without occlusive dressing or films.	• Acute and chronic wounds containing moist necrotic tissue • Alternative to surgical, autolytic, or enzymatic debridement • Infected necrotic wounds	• PAD • Infected wounds not routinely treated • Atypical wounds • Wounds that communicate with a cavity or internal organ, near major blood vessels or on the face • Wounds that tend to bleed or with anticoagulants treatment • Dry necrosis • Deep cavities • Known allergy to larvae • People of advanced age and septic arthritis	• Faster than autolysis • Higher cost than autolytic • Patient consent required • Physician or nurse practitioner prescription required • Availability of medical grade larvae • Short larval life span • Increased exudate • Perilesional skin protection required • Application may be time consuming
Chemical Non-selective removal of necrotic tissue using chemical agents such as silver nitrate and some surfactants - e.g., Dakin solution, honey containing peroxidase, chlorhexidine with 0.015% ketramide	• Acute and chronic wounds containing necrotic tissue • Hypergranulation • Biofilm	• PAD • Macerated wound • Significant exudate • Wound at risk of infection	• Non-selective debridement • Slower than conservative sharp wound debridement • High pH may be harmful to granulation tissue • May cause irritation to surrounding skin (long use)

DEBRIDEMENT METHODS ON THE FOLLOWING PAGES

DEBRIDEMENT	INDICATIONS	CONTRAINDICATIONS	CONSIDERATIONS
Surgical Excision of devitalized tissue to the point of bleeding by surgical techniques under systemic, area, or local anesthesia	• Sepsis or other emergency clinical condition - e.g., cellulitis, abscess, necrotizing fasciitis, osteomyelitis, ischemic and infected arterial ulcer, gas-producing infection - that may lead to death or amputation • Hard eschar • Pyoderma gangrenosum in the presence of systemic immunosuppression in order to avoid worsening the condition	• Inadequate vascular supply • Bleeding disorders • Non healable wounds • Unstable clinical condition • Palliative or end-of-life care • Refusal of consent by the conscious individual	• Selective and rapid • Severe bleeding • Painful • Out of the scope of nursing practice • Risks associated with anesthesia • Reserved medical activity • Requires a safe environment (e.g., hospital, clinic) • High cost
Conservative sharp wound debridement (CSWD) Minor surgery with scalpel, scissors, or forceps Specialized training required	• Acute and chronic wounds containing dry, poorly adherent or moist necrotic tissue • Calluses • Wounds with limited wall separation or limited tunneling • Improved quality of life by removing devitalized tissue to reduce malignant wound odor	• Uncontrolled pain • Severe PAD • Increased risk of exposure to blood vessels as in atypical wounds • Presence of adherent tissue that does not allow distinguishing between viable and non-viable tissue • Presence of exposed bones, ligaments and tendons or localized wounds in the temporal areas, face, neck, armpits, and groin • End of life and palliative care	• High risk of bleeding requires expert consultation • Faster than autolysis • Efficiente technique at low cost • Need to soften dry tissue prior to debridement to limit bleeding risk and ensure removal of devitalized tissue only. • Possible to perform this technique in immunosuppressed individuals with the addition of an antimicrobial • Risk of complications may require discontinuation of treatment - e.g., infection, bleeding, pain. • Environmental assessment required in home care setting. • Specialized training • Sterile equipment required

DEBRIDEMENT METHODS ON THE FOLLOWING PAGE

DEBRIDEMENT	INDICATIONS	CONTRAINDICATIONS	CONSIDERATIONS
Enzymatic Selective degradation of necrotic tissues by the application of enzymes in the form of an ointment. Collagenase is the only product available in Canada. It is found in an ointment marketed under the name Santyl®.	• Acute and chronic wounds with moist or dry devitalized tissue and maintained in a moist environment. • Shallow wounds • Atypical wounds - e.g., Pyoderma gangrenosum • Alternative or combined action to conservative surgical debridement	• Significant inadequate vascular supply • PAD • Dry necrosis that is not maintained in a moist environment or cannot be debrided • Macerated skin, significant exudate or at risk of infection • Infection or sepsis • Sensitivity to collagenase	• Slower than conservative sharp wound debridement • Expensive product • Requires scarification of dry necrosis • Requires a prescription • Incompatible with many antimicrobial agents - e.g., silver or iodine • Risk of maceration and irritation of perilesional skin • Protection of perilesional skin required • Quick and easy daily application • Suitable for all care settings
Mechanical by irrigation or dabbing Removal of non-viable tissue using mechanical force Performed in conjunction with other types of debridement	• Curable acute and chronic wounds and maintenance • Infected and non-infected wounds • Wounds with biofilms • Poorly adherent moist necrosis • Adequate vascular supply • Pyoderma gangrenosum only in the presence of systemic immunosuppression to control inflammation and not worsen the condition.	• Very friable wound bed that tends to bleed • Uncontrollable or intolerable pain • Presence of severe PAD • Wet-to-dry debridement should be avoided	• Slow process • Inexpensive equipment • Costly in terms of staff time • Non-selective for very friable wound beds • Compatible with many antimicrobial agents • Bleeding and pain • Ineffective on hard dry necrosis • Requires caregiver time
Mechanical by ultrasound Mechanical debridement by pulsed frequency	• Chronic wounds with no sign of improvement or deterioration • If no other options are possible • Inadequate vascular supply • Wounds located near vital organs • Unstable clinical condition, anticoagulants treatment or at high risk of bleeding • Access to a hospital	• Dense and dry necrosis • Tumor • Abscess • Gangrene	• Possible pain • Sterile and reusable equipment required • Expertise required • High risk of bleeding • Requires a safe clinical environment

ANTISEPTIC AND ANTIMICROBIAL SOLUTIONS

→ The use of a specific antiseptic or antimicrobial solution depends on a variety of factors, including:

- wound characteristics - e.g., confirmed bacterial presence, suspected biofilm;
- Individual characteristics - e.g., wound healability, hypersensitivities;
- solution availability;
- compatibility of various dressings or treatments with each other;
- risk-benefit balance.

→ Antiseptic/antimicrobial solutions do not promote bacterial antibiotic resistance.

Why	• Control or eradication of suspected or confirmed biofilm • Treatment of infection • Prevention of infection * *The presence of biofilm can limit the effect of some antiseptic and antimicrobial agents and lead to wound infection*
When	• When the wound is: - locally infected - with a strong suspicion: · of infection - (e.g., friable, purplish granulation) · of biofilm - foul odor and malignant - ischemic and black dry necrosis on the heel - dirty - in the presence of devitalized tissue • non-revascularizable or non-revascularized arterial ulcer • use in prophylaxis if: - non-healable wound - wound in maintenance - wound communicating with an organ or a functional structure - wound at high risk of infection - e.g., malignant wound, immunosuppression, and person with uncontrolled diabetes - contaminated wound after debridement
Contraindication	• Daily use to improve wound healing
Precautions	• The choice of antiseptic or antimicrobial solution should consider the hypersensitivity of the perilesional skin of the venous ulcer
How	• Clean, and if necessary debride, before and after application of antiseptic/antimicrobial solution, except in the case of ischemic dry necrosis • Requires direct contact with the wound to be effective • Protection of the surrounding area during application - especially when a cytotoxic solution is used • Can be used at the cleansing stage • In combination with debridement if appropriate • For a severely ischemic wound or a non-revascularizable or non-revascularized arterial ulcer: - Keeping the wound bed dry is recommended with 10% povidone-iodine to avoid infection

ANTISEPTIC AND MICROBIAL SOLUTIONS ON NEXT PAGE

→ Antiseptic/antimicrobial solutions have a different antimicrobial spectrum, mechanism of action, action on biofilm and cytotoxicity depending on their concentration

ANTISEPTIC/ANTIMICROBIAL (non-exhaustive list) In alphabetical order and according to their characteristics, including their performance on biofilm				
ANTISEPTIC SOLUTION [1]	**CHARACTERISTICS**	**PRECAUTIONS**	**INDICATIONS**	**CONTRAINDICATIONS**
Acetic acid (diluted vinegar) Several dilutions possible according to the objectives of care (from 0.5% to 1%)	• Antibacterial, especially against *Pseudomonas aeruginosa* • Destroys biofilm (*P. aeruginosa* and *S. aureus*) • Bacteriostatic • Cytotoxicity[2] varies according to the concentration	• Contact time of 5 to 10 minutes. *Prolonged use or on large wounds may cause acidosis* • Rinse with water or saline solution after application • Burning or itching sensation possible	• Wound infected with **Pseudomonas aeruginosa*** or at risk of infection * *Green to bluish exudate with distinct fruity odor*	• Clean wound with granulation tissue • Do not use to irrigate wounds with underlying space, tunnel, and sinus
PHMB combined with a surfactant (betaine) Example: Protonsan	• Broad spectrum antibacterial, antiviral, antifungal • Bactericide • Surfactant disrupts biofilm when applied before debridement • Low cytotoxicity2	• Contact time of 10 to 15 min to be efficient - do not irrigate the wound • Wound must be cleaned and debrided afterwards	• Compatible with all types of dressings • Can be applied over a long period without cytotoxic effect	• 3rd degree burns **Incompatibility** • Sodium hypochlorite (Dakin)
Povidone iodine Examples: Proviodine® 10 % - Betadine® 10 %	• Broad spectrum antibacterial, antiviral, antifungal • Bactericidal after three applications over a 3-day period • Disrupts biofilm after several applications • Prolonged persistence effect (3 days) • High cytotoxicity[2]	• Contact time of 1 to 5 min. • Little benefit if used in combination with an iodine dressing • Local skin reaction possible • Rinse with water or saline after application, except for ischemic dry necrosis	• Iodine solution is the **first choice for dry necrosis with insufficient blood supply** • Infected wounds or wounds at risk of infection, presence of biofilm • Wound with light to heavy exudate • Pre and postoperative asepsis	• Clean wound with granulation tissue • Dirty wound (loss of effectiveness) • Pregnancy and breastfeeding • Renal insufficiency • Thyroid problems • Children < 12 years old **Incompatibility** • Chlorhexidine • Collagenase (Santyl®) • Antimicrobial dressings
Octenidine hydrochloride (OCT) 0.05% to 2.0% combined or not with surfactant	• Broad spectrum antibacterial, antifungal, antiviral • Bactericide • Limits the development of biofilm • Available in gel or irrigation solution • Non-cytotoxic - very well tolerated by the skin	• Fast onset of action (1 min)	• Pre and postoperative asepsis, wound care and sutures • **Gel:** burns • **Acute wounds:** 0.1% solution: • **Chronic wounds:** 0.05% solution • Useful against treatment-resistant microorganisms when combined with phenoxyethanol	• Not applicable

1. It is recommended to consult the brochures of the proposed commercial solutions before using them.
2. For surrounding skin cells.

ANTISEPTIC AND MICROBIAL SOLUTIONS ON NEXT PAGE

ANTISEPTICS/ANTIMICROBIALS (non-exhaustive list) In alphabetical order and according to their characteristics, including their performance on biofilm				
ANTISEPTIC SOLUTION[1]	**CHARACTERISTICS**	**PRECAUTIONS**	**INDICATIONS**	**CONTRAINDICATIONS**
Hypochlorous acid-HOCl (Vashe solution)	• Hypochlorous acid-HOCl (Vashe solution) - Broad spectrum antibacterial, antiviral, antifungal • Bactericide • Performance against biofilm to be determined • Treatment of spores • Non-cytotoxic[2] – Very well tolerated by the skin	• Contact time from 3 to 10 minutes to be effective • If blood is present, exudate may appear greenish • Rinse with water or saline solution after application	• Safe use for the pediatric population • Can be used on deep structures e.g.,bones, tendons, ligaments	• Allergy or sensitivity (known or suspected) to HOCl **Incompatibility** • Do not use in combination with biological debridement
Chlorhexidine WITHOUT alcohol, 0.5% to 2%.	• Solution combined with alcool is preferred only prior to surgery • Broad spectrum antibacterial, antiviral, antifungal • Bacteriostatic or bactericidal depending on the concentration • Not very effective on biofilm given current knowledge • Prolonged action • Cytotoxic[2]	• Drying and burning sensation possible • Contact time from 30 sec. to 2 min. which depends on the type of wound (!) *Must not come into contact with the eyes, genital mucosa, and the ear canal*	• 1st cleaning of a wound with debris • Pre and postoperative asepsis • Dry necrotic wound in maintenance or without healing potential when povidone-iodine cannot be used • Superficial or deep wound • Infected wound or wound at risk of infection	• Clean wound with granulation tissue • Wound with non-accessible cavity or narrow sinus • Newborns **Incompatibility** • Povidone iodine • Sodium hypochlorite (Dakin) • Anionic agents (surfactants)
Sodium hypochlorite (Dakin) - bleach Several possible dilutions according to care objectives (from 0.005% to 0.125%)	• Broad spectrum antibacterial, antiviral, antifungal • Bactericide • Little to no effect on biofilm according to current knowledge • Treatment of spores • Cytotoxicity[2] varies according to concentration	• Contact time varies from 30 sec. to 4 min. depending on the type of microorganism	• Infected wound or wound at risk of infection • Malignant wound • Necrotic wound • Malodorous wound	• Clean wound with granulation tissue **Incompatibility** • Cleaning solutions (other than saline) • Hydrocellular foam dressings
Hydrogen peroxide Several dilutions possible depending on care objectives (from 0.25% to 1%)	• Antibacterial • Bactericidal • No effect on biofilm according to current knowledge • Effervescent effect allowing for easier removal of non-viable tissue and debris • Cytotoxicity[2] variable depending on concentration	• Limited data supporting the use of this antiseptic • May dry out the wound • Rinse with water or saline after application	• Infected wound or wound at risk of infection • Necrotic wound • Presence of clots, hematoma or debris	• Clean wound with granulation tissue • Sinus, tunnel, or cavity closed due to gas embolism formation

1. Consultation of brochures of the proposed commercial solutions is recommended before use.
2. For surrounding skin cells.

OPTIMIZING OUTCOMES

- There are several common components to effective wound management.
- Some components are specific to the management of a particular wound.
- Some symptoms or signs observed during assessment may be the result of underlying causes.

COMMON FACTORS TO FOCUS ON IN WOUND MANAGEMENT

- Controlling comorbidities
- Eliminate or modify risk factors
- Correction of inadequate vascular supply through revascularization
- Optimization of nutrition and hydration
- Pain control
- Pressure unload
- Lifestyle changes - e.g., smoking cessation
- Infection prevention
- Individual's decision

CHRONIC WOUNDS	
Arterial Ulcer	• Positioning of legs below heart level • Proper foot hygiene
Venous ulcer	• Compression therapy if vascular supply permits • Elevation of the legs above the level of the heart for 30 minutes several times a day • Practice exercises that strengthen the calf muscle • Decrease: - prolonged standing or sitting position - crossing of the legs
Mixed ulcer	• Modified compression therapy with non-elastic bandages if 0.5 ≤ IPSCB < 0.8 (!) ***Avoid compression if IPSCB < 0.5*** *(consult the section on vascular supply)*
Diabetic foot ulcer	• Pressure redistribution by medical devices, adequate footwear • Control of blood sugar level • Control of ischemia and infection • Regular participation in physical activity • Weight management in case of overweight or obesity • Monitor feet and good foot hygiene
Pressure injury	• Encourage mobilization and repositionning for pressure redistribution • Optimization of nutrition and hydration, especially for pressure lesions • Incontinence and moisture control
Moisture associated skin damage	• Removal of moisture sources or reduction of exposure when total removal is not possible • Reduction of friction in affected areas • Protection from maceration of the surrounding area

ACUTE WOUND	
Skin tear	• Daily use of emollient - e.g., no-rinse, alcohol-free, pH-balanced skin cleanser • Reduce frequency of bathing, if possible, or reduce water temperature
Burn	• Daily use of an emollient (closed burn only) • Reduce frequency of bathing if possible or decrease water temperature
Surgical wound	• Post-operative pain management • Control of edema in people with a lower limb dehiscent wound

COMPRESSION THERAPY AND OTHER UNDERLYING CAUSES ON THE NEXT PAGE

USE OF COMPRESSION THERAPY

→ Before considering compression therapy to treat a venous ulcer, it is imperative to assess the vascular supply. If in doubt, consult an experienced colleague or a specialist.

VASCULAR ASSESSMENT OF A LOWER LIMB BY AT LEAST 2 METHODS		
Vascular supply	**Ankle-brachial systolic pressure index (ABPI)**	**Use of compression as per ABPI values**
Uncertain or inadequate *Suggests calcified vessels*	ABPI > 1.4	Consult a vascular or diabetes specialist
Adequate *ABPI 0.9 to 1.4 reduces the possibility of PAD*	1.0 < ABPI ≤ 1.4	Possible
Uncertain/grey area *Could suggest mild PAD*	0.8 ≤ ABPI≤ 1.0	Possible with caution. Prescription required if ABPI less than 0.9
Inadequate *Suggests significant to severe PAD*	ABPI < 0.8	Modified compression possible with precautions if **ABPI ≥ 0.5** and after consulting a specialist (!) *ABPI values < 0.5 make the use of compression impossible and require urgent consultation with a specialist*

OTHER MATTERS TO CONSIDER IN CASE MANAGEMENT

→ Some signs and symptoms may indicate underlying causes.

EXAMPLES OF SYMPTOMS	POSSIBLE UNDERLYING CAUSES
Excessive leg discharge	• Heart problem • Venous problem • Malnutrition
Abnormal vascular supply	• PAD • Venous insufficiency
Decreased sensation	• Possible diabetic neuropathy
Leg edema	• Cirrhosis • Nephrotic syndrome • Venous problem
Skin tear	• Fragile skin caused by: - advanced age - use of specific medications - skin problems - e.g., psoriasis, eczema

FOLLOW-UP

SOME CONSIDERATIONS WHEN REMOVING DRESSINGS

- If the dressing adheres to the wound bed, it can be moistened with physiological saline (0.9% NaCl) or water.

ITEMS TO DOCUMENT AT DRESSING CHANGES

- Assessment criteria for the wound and surrounding skin, wound size
- General impression of wound progress.
- Frequency of dressing changes - e.g., increased, or decreased or similar.
- Level of dressing saturation with exudate.
- Decrease in percentage of necrotic tissue, if relevant.
- Signs of complications.
- Adherence to prescribed treatment - e.g., daily use of compression stockings, use of a pressure-relieving boot.

HEALING PROGRESSION ASSESSMENT

- For an acute wound, the healing process follows generally an expected time frame, which may take up to four weeks.
- For a chronic wound, complete healing of the wound is likely to be expected at twelve weeks if there is at least a 40% reduction in the wound size after four weeks of optimal treatment. This projection is applicable to diabetic foot ulcer, venous ulcer and pressure ulcer.

<table>
<tr><th colspan="2">Wound monitoring techniques</th></tr>
<tr><td colspan="2">1. Clinical visual cues with photography, if available</td></tr>
<tr><td>Example of findings
• 1st visit: diffuse shape, medium size, suspicious</td><td>Example of findings
• 2nd visit: Better defined edges, smaller wound, healthy color</td></tr>
<tr><td colspan="2">2. Calculated clinical benchmarks (percentage of healing)</td></tr>
<tr><td>Difference in wound area
Area 1st visit (cm²) - area 2nd visit (cm²)
 
</td><td>Percentage of healing between the two visits
Difference in area/wound area (cm²) 1st visit x 100
 
</td></tr>
<tr><td colspan="2">Symptoms and signs of local, deep soft tissue, or systemic infection should be looked for in addition to taking photos or measuring the reduction of the wound area between the visits.</td></tr>
</table>

FREQUENCY OF REASSESSMENT

- Once a week or more frequently depending on:
  - Deterioration risk, or wound complications, or the individual's condition
  - Type of wound - e.g., weekly for atypical wounds
  - Type of dressings used - e.g., at least once every two weeks if the wound is treated with an antimicrobial dressing
  - Reassessment of healability

LIST OF CLINICAL BENCHMARKS ON THE NEXT PAGE

HEALING PROGRESSION ASSESSMENT

CHARACTERISTICS		IMPROVEMENT SIGNS	DETERIORATION SIGNS
Wound	**Size and depth**	• Decrease	• Increase
	Edges	• Attached	• Underlying Spaces • Maceration • With hyperkeratosis
	Color	• Decrease in redness	• Redness or purplish-brown non-whitening wound color
Tissue	**Granulation (quantity, quality)**	• Increase, raspberry red	• Decrease • Crumbly • Bleeds
	Devitalized	• Decrease	• Increase
Exsudate	**Color, viscosity, consistency**	• Decrease • Brightening	• Increase • Color changed from clear to opaque • Thickening from liquid to viscous • Purulent
	Quantity - frequency of dressing change	• Reduction	• Increase
Surrounding area	**Maceration[1], excoriation, erythema or edema of the perilesional skin**	• Decrease	• Increase
Symptoms and signs See Symptoms and Signs of an Infected Wound or Biofilm for more details	**Warmth and local inflammation**	• Decrease	• Increase, emerging
	Malodor	• Disappearance, attenuation	• Increase, emerging
	Pain	• Decrease	• Increase, emerging, loss[2]
	Other signs of infection	• Decrease	• Induration • Appearance of grooves and underlying spaces • Any other signs of local, deep soft tissue or systemic infection Moistured associated skin damages: • Presence of blisters or satellite lesions, • severe inflammation and denudation of the epidermis

1. Epithelialization can be mistaken for macerated tissue.
2. Loss of pain may indicate a complication.

PARTICULAR WOUNDS

Wound Type	Care Objectives	Examples of Dressings to Consider (non-exhaustive list)
(non-exhaustive list)	• Absorb and manage odors • Treat the underlying cause	• Possible use of a commercial or homemade preparation of metronidazole1 in conjunction with an antimicrobial dressing • Possible use of a charcoal dressing, with or without silver • It is important to treat the cause of the malodour **before** applying a charcoal dressing
Painful wound	• Prevent or relieve pain • Avoid the use of adherent dressings • Promote the use of non-adherent dressings impregnated or based on silicone or lipocolloid	• Possible use of a hydrocellular foam dressing with ibuprofen *Should be combined with pharmacological and non-pharmacological interventions*
Deep, cavity, sinus, tunnel, or undermining wound	• Fill dead space without compacting	• Alginate • Hydrofiber • Cotton gauze wick
	Method to fill the dead space • If possible, only one piece of dressing/ribbon should be used to avoid leaving a piece in the wound • If necessary, pieces should be tied together using sterile gloves • It is important not to fill too much to avoid compression of the walls • A bit of ribbon should always protrude from the cavity to facilitate removal • The appropriate secondary dressing should be applied depending on the level of wound	
	Dressing removal • The dressing should be gently removed using sterile forceps • If the dressing adheres to the wound bed, it can be moistened with physiological saline solution (0.9% NaCl) or water • It is important to check that all material has been removed; if more than one ribbon is used, check the exact count of ribbon used during application and removal.	
Poor tissue quality (e.g., significant moist necrosis)	• Promote autolytic debridement • Control the microbial load if necessary	• Possible use of a hypertonic dressing *Can be used in infected or non-infected wounds*
Recalcitrant wound despite the optimal care and treatment plan	• Restore the micro-environmental balance of the wound and promote granulation	• Biological active dressing *If necessary, consult a specialist or an experienced colleague*

MAIN REFERENCES

References are available in the INESSS report associated with this tool.

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