

British Columbia Provincial Nursing Skin and Wound Committee
Guideline: Wound Management for Adults & Children

Developed by the BC Provincial Nursing Skin & Wound Committee in collaboration with Wound Clinicians from:



Title	Guideline: Wound Management for Adults & Children
Practice Level	<ul style="list-style-type: none"> • Nurses in accordance with health authority/agency policy/standards. • Nurses in accordance with their scope of practice, additional education and competency may perform conservative sharp and biological wound debridement. • Clients with wounds require an interprofessional holistic approach to provide comprehensive, evidence-based management including assessment and treatment of wounds. • This clinical practice guideline focuses solely on the role of the nurse as one member of the interprofessional team providing client care.
Background	<ul style="list-style-type: none"> • Many internal and external factors affect wound healing. A logical, systematic approach to developing a plan of care for the management of a client with a wound is required. This guideline is developed using the Wound Prevention and Management Cycle framework as presented by Wounds Canada⁴⁶. It is cyclical and involves five steps: <ul style="list-style-type: none"> • <u>Assess/reassess</u>: Assess the client and the wound to determine the factors contributing to the cause of the wound. This includes identifying environmental and systemic challenges, risks and factors that may impact wound healing. • <u>Establish the goal of care</u>: Set goal of care in consultation with the client/family and the interprofessional team. • <u>Assemble the team</u>: Select the interprofessional team members based on client's needs. • <u>Determine and implement the overall care plan/wound treatment plan</u>: The overall care plan addresses the client concerns, environment and system issues, risks/causative factors and indicates the treatment plan for local wound care interventions. • <u>Evaluate</u>: <ul style="list-style-type: none"> a. Evaluate the overall care plan, b. Evaluate the wound treatment plan, and c. Evaluate if the goals are met. Ensure that the plan of care is sustainable. If goals are unmet, reassess and begin the cycle again. • Wound healability is one factor that contributes to the overall goal of care. Wounds are classified as healing, non-healing, and non-healable (see Definitions). Based upon the presence or absence of these factors the classification of wound healability is determined. • The overall goal of care is based upon the wound healability and is determined in collaboration with the client/family, and the interprofessional team. <ul style="list-style-type: none"> ○ To Heal a Healable Wound ○ To Maintain a Non-healing Wound ○ To Monitor/Manage a Non-Healable Wound • Wound healability is determined by the following: <ul style="list-style-type: none"> ○ the presence of adequate circulation in the area of the wound, ○ the client's medical conditions (e.g., poor vascularity, immuno-compromise or diabetes mellitus), ○ the ability to treat the cause of the wound, ○ the wound size, ○ the length of time the wound has been open, and ○ the presence of risk factors impacting wound healing. • Wounds normally heal in a predictable trajectory with overlapping phases, though for some wounds healing may be slower. <ul style="list-style-type: none"> ○ Wounds heal following four general phases: hemostasis, inflammation, proliferation/repair, and maturation/remodeling (see Appendix A). Wounds progress through the healing phases in a timely and uncomplicated manner over weeks to months. Some wound progress more slowly and/or may fail to move through the phases in an

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	<p>orderly, timely sequence of repair, and some wounds move through the repair phases without “restoring anatomic and functional results”^{16,p.91}</p> <ul style="list-style-type: none"> • Wound healability must be determined prior to use of debridement and moist wound healing. A moist wound bed environment accelerates healing by approximately 50% when compared to a dry wound bed environment. <ul style="list-style-type: none"> ○ Moist wound healing is not appropriate for dry, eschar-covered wounds on heels and ischemic limbs. • Develop a wound treatment plan following the key ten elements/interventions: <ul style="list-style-type: none"> ○ Cleanse to control bacterial burden and promote healing, ○ Debride to remove slough, necrotic tissue, and reduce bacterial burden, ○ Manage foreign body, exposed structures ○ Monitor/manage infection or inflammation to ensure bacterial balance and reduce inflammation, ○ Maintain moisture balance ○ Maintain thermal insulation ○ Manage dead space (i.e., wound packing/filling) ○ Support open wound edges to support cell migration and wound closure. ○ Protect the periwound skin, ○ Manage the closed wound.
Indications for Use	This guideline has been developed to guide the assessment and treatment of wounds.
Bookmarks	<p>Practice Level Background Indications for Use Related Documents Assessment Determination of Goals of Care Interventions</p> <ul style="list-style-type: none"> • Client Care Management • Wound Care Management • Wound Bed Prep <p>Client Clinical Outcomes Quality Assurance Indicators Documentation Definitions References/Bibliography Document Creation/Revision Dates Appendix A</p>
Related Documents	<p>Guideline Summary: Wound Bed Preparation for Adults & Children Procedure: Wound Cleansing Procedure: Wound Packing Guideline/Procedure: Conservative Sharp Wound Debridement Guideline/ Procedure: Biological (Maggot) Wound Therapy Guideline for Negative Wound Pressure Therapy (under development) Guideline: Assessment & Treatment of Wound Infection Guideline: Product Selection (under development) Product Information Sheets for Skin and Wound Care Products Documentation Tool: Wound Assessment & Treatment Flow Sheet (WATFS) E-Learning Module - How Wounds Heal E-Learning Module - Wound Assessment</p>

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Assessment and Determination of Goal of Care

Assessment

To develop a comprehensive overall plan of care and specific treatment plan, assess the following:

1. Assess for Client Concerns
 - a. Client's level of understanding about the wound, healability and risk factors.
 - b. Impact of the wound on client's daily life and body image.
 - c. Social and financial concerns and availability of support systems to address concerns (i.e., transportation, social isolation, and access to community supports).
 - d. Emotional, cognitive, behavioural or mental health concerns and the availability of support systems to address these concerns.
 - e. Quality of life issues that could impact treatment.
 - f. Impact of client's current environment on care.
 - g. Client and/or family preferences for treatment of the wound, treatment of risk factors and the goals of wound care.
 - h. Acknowledge culture and traditions.
 - i. Client and/or family ability and motivation to understand and adhere to the treatment plan.
2. Assess for presence of wound pain (pre-procedural, procedural, and post-procedural pain)
 - a. Type/etiology, (nociceptive (somatic or visceral), neuropathic, mixed/complex – ([see Definitions](#)) location, frequency and quality of pain.
 - i. Note: if pain is new or worsening consider infection.
 - b. Pain severity using client self-report, observation of non-verbal cues and/or a pain scale, for example see definitions.
 - c. Onset and duration of pain, and precipitating or alleviating factors.
 - d. Current pharmaceutical and non-pharmaceutical interventions for pain and their effectiveness.
 - e. Impact of pain on function, sleep hygiene/patterns, and mood.
3. Assess Client Specific Risk Factors for Wound Healability
 - a. Medical conditions that impact oxygenation i.e., hypotension, angina, myocardial infarction (MI), chronic obstructive lung disease (COPD), cancers, heart failure, anemia, or renal disease.
 - b. Medical conditions that impact tissue perfusion such as peripheral arterial disease.
 - c. Medical conditions or factors that impair immune status, such as diabetes, autoimmune conditions, immunosuppressants, and advanced age.
 - d. Medical conditions that impact sensation or mobility, i.e., diabetes mellitus, spinal cord injury (SCI), spina bifida, multiple sclerosis (MS), muscular dystrophy (MD), and/or cerebrovascular accident (CVA).
 - e. Medications that interfere with wound healing, e.g., non-steroidal anti-inflammatory drugs, anti-neoplastics, systemic corticosteroids, anticoagulants and vasopressors.
 - f. Advanced age.
 - g. End-of-life condition.
 - h. Reduced mobility, inactivity or lack of exercise.
 - i. Lifestyle factors such as cigarette smoking and substance use and client's motivation to quit.
 - j. Poor personal hygiene (e.g., skin care).
 - k. Living environmental not conducive to health (e.g., access to water, housing).
 - l. Prolonged surgical procedures and inter operative fluid balance.

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- m. Foreign body in wound bed (e.g., sutures, mesh, bone fragments, surgical implants) or unintentional (e.g., wood, glass, stones, wild maggots).
 - n. Methicillin-resistant Staphylococcus aureus (MRSA), Vancomycin-resistant Enterococci (VRE) colonization, Extended Spectrum Beta-Lactamase (ESBL), or other Antibiotic Resistant Organisms (AROs), if known.
 - o. Other sites of infection, e.g., urinary tract infections, respiratory infections.
 - p. Impaired/restricted nutritional status:
 - i. Restricted dietary intake related to a co-morbid condition (i.e., renal diet with protein restrictions).
 - ii. Low or high BMI, poor glycemic control, low body weight, appetite changes, cachexia, dehydration, edema, restrictive diet and prolonged nothing by mouth (NPO). Client wound healing is impaired when the pre-albumin is less than 180mg/L (female) and less than 215mg/L (males). Serum pre-albumin is a poor indicator of the client's nutritional status in acute illness, as it is a negative acute-phase reactant and may be decreased with infection and inflammation.
 - iii. Inadequate nutritional intake of protein, calories or fluids as evidenced by amount of daily calories, intake of protein, amount and type of fluid intake. Assess percentage (%) of meal intake or calorie counts.
 - iv. Possible causes of poor intake including difficulty swallowing, poor dentition, positioning, inability to feed self, gastrointestinal symptoms and pain.
 - v. Consistent access to healthy food (nutrition security).
 - q. The presence of abnormal hematological values.
 - r. Presence of moisture:
 - i. Urine and/or fecal incontinence.
 - ii. Excessive perspiration and evidence of moisture or maceration in skin folds.
 - iii. Heavily exudating wounds or skin conditions.
 - iv. Excessive edema leading to open areas and weeping skin.
 - v. Excessive saliva or mucous production.
 - vi. Drainage from tube/drain sites.
 - s. Autonomic dysreflexia and/or increased spasticity in clients with a spinal cord injury.
 - t. Allergies or sensitivities (e.g., latex allergies).
 - u. Access to health care resources.
4. Determine the causative factors (mechanism of injury or precipitating factor(s)) leading to the development of the wound, for example; pressure, moisture, friction/shear, inappropriate footwear, or insufficient compression.
5. Determine the Nursing Diagnosis – most common are as follows:
- Lower extremity ulcer - [Lower Limb Arterial / Venous/Mixed DST](#)
 - Diabetic with a foot ulcer - [Diabetic Ulcer DST](#)
 - Pressure injury over a bony prominence - [Pressure Injury DST](#)
 - Dehisced surgical incision - [Surgical Wound DST](#)
 - Skin Tear - [Skin Tear DST](#)
 - Skin damage related to moisture - [Moisture Associated Skin Damage DST](#)
 - Wound associated with a malignancy
6. Complete a Basic Lower Limb Assessment for any wound present below the knee. If assessment results are abnormal, for example signs and symptoms of arterial compromise, venous insufficiency

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or decreased sensation are present, complete an advanced lower leg assessment or refer to a Wound Clinician or vascular lab ([Lower Limb Assessment Basic & Advanced](#)).

7. Complete a Wound Assessment (Link to [Wound Assessment and Treatment Flow Sheet](#))
 - a. Assess the following:
 - i. History of current wound.
 - ii. Date of wound onset.
 - iii. History of previous wounds at same site, or other sites.
 - iv. Location of wound(s) at the same site.
 - v. Wound measurements including length, width, depth, undermining, sinus/tunnels.
 - vi. If wound probes to bone.
 - vii. Appearance of the wound bed including percentage of tissue type, presence of a foreign body and/or exposed underlying structures, e.g., tendon or bone, metal hardware, sutures, mesh.
 - viii. Characteristics and amount of the exudate.
 - ix. Presence of odour after cleansing.
 - x. Characteristics of the wound edges.
 - xi. Condition of the periwound skin.
 - b. Determine the wound healing phase such as: hemostasis, inflammation, proliferation/repair, and maturation/remodeling (see [Appendix A](#)).
8. Assess for Wound Infection ([Wound Infection Guideline](#) & [Wound Infection Summary](#))
 - a. Assess for clinical signs and symptoms of wound infection.
 - b. If 2 or more signs of infection are present, consider a potential wound infection.
 - c. If 1 or more signs of infection are present for clients with diabetes or peripheral arterial disease, consider a potential wound infection.
 - d. Consider potential osteomyelitis if wound probes to bone.

Determine the Goal of Care

Determination of the goal of care is based upon the client assessment findings and the wound healability classification.

1. Determine Wound Healability
 - a. Based on the overall wound assessment findings including the:
 - i. Presence of adequate circulation to wound area, the presence of adequate peripheral arterial circulation to support wound healing. For lower extremity wounds an ABI greater than 0.5 indicates that there is some potential for healing.
 - ii. Underlying cause of wound is identified (e.g., pressure, friction/shear, pressure redistribution, edema related to venous insufficiency, inappropriate diabetic footwear).
 - iii. Client's health history and medical conditions (e.g., poor vascularity, immuno-compromised or diabetes).
 - iv. Wound size.
 - v. Length of time the wound has been open.
 - vi. Presence of risk factors impacting wound healing, in assessment in #4.These factors can change over time and regular reassessment is indicated.
 - b. Classify the Wound Healability as: ([see Definitions](#))
 - Healing
 - Non-healing
 - Non-healable

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2. Determine the Goal of Care

The goal of care is based upon client factors and wound healability, it is determined in collaboration with the client/family and interprofessional team members. The goal of care may change over time and regular reassessment of the client's situation and the wound is indicated. There are three goals of care.

To Heal a Healing Wound

The focus of the client and interprofessional team is to heal the wound. Wound healing is anticipated when:

- a. The wound has potential to heal; adequate perfusion and ability to alleviate/mitigate the cause
- b. The client's risk factors for healability can be optimized or managed (e.g., nutrition, smoking, chronic disease(s), or mental health).
- c. The client and/or family are willing and able to participate in the care plan.
- d. Equipment/devices and resources are available to support healing.

Note: If wound healing is not meeting its expected trajectory, re-evaluate the etiology/nursing diagnosis, treatment and risk factors. Revise the care plan and consider advanced therapies to ensure that the wound is receiving optimal care in collaboration with the interprofessional team.

To Maintain a Non-healing Wound

The focus of the client and interprofessional team is to maintain the wound. These wounds are not healing as expected due to client, wound and/or health system barriers. This goal of care is appropriate when:

- a. The risk factors and/or underlying cause(s) of the wound cannot be sufficiently mitigated to promote healing in a timely fashion.
- b. Resources, equipment or supplies to support wound healing are not available or not used.
- c. The client and/or client's family are unwilling or unable to participate in the care plan.

Note: When these issues have been addressed such that wound healing is possible, reclassify the goal of care to 'To Heal'.

To Monitor/Manage a Non-healable Wound

The focus of the client and interprofessional is to monitor/manage the wound. These wounds are not able to heal. These wounds will deteriorate (slowly or rapidly) and therefore need to be closely monitored. Wound healing is not possible because:

- a. The underlying causes, such as malignancy, impending death or gangrene, cannot be treated.
- b. There is an insufficient level of arterial blood flow to the wound to support healing.
- c. The client's risk factors for healability such as systemic disease, medications or poor nutrition cannot be modified.

Interventions

Develop an overall care plan in collaboration with the client and/or family and interprofessional team that addresses the goal of care, identifies intended and unintended outcomes, client concerns, risk and causative factors, and incorporates the wound treatment plan, client education, and transition/discharge plans.

Client Care Management

1. Address Client Concerns
 - a. The plan of care should consider client and/or family abilities, concerns, preferences and motivation for treatment.
 - a. For assistance with financial concerns or for emotional and psychosocial counselling, if needed, refer to health care professional such as Social Work, or the Aboriginal Liaison (i.e., transportation, social isolation, and access to community supports).
 - b. Refer the client to the appropriate professionals for input to improve health, such as improved nutrition, offloading pressure, or exercise plans such as Occupational Therapy (OT), Physiotherapy (PT), and Registered Dietitian.
 - c. Provide support to clients and families when wounds are non-healable or develop at the end of the client's life such as Palliative Care services, or Social Work, Spiritual Care.
2. Manage/Provide Pain Relief (Pre-procedural, procedural, and post-procedural pain)
 - a. Assess and reassess client pain at regular intervals and note any increase in severity. An increase in pain could be related to infection or critical limb ischemia.
 - b. Use at least room temperature cleansing solutions.
 - c. Avoid over packing/filling tracts/tunnels.
 - d. Use dressings that are less likely to cause pain and trauma on removal from the wound and periwound skin (non-adherent dressings) or dressings that require less frequent changes.
 - e. Reduce wound pain by keeping the wound bed covered and moist if consistent with the goal of care. Protect the wound from cooler drafts of air (i.e., open windows).
 - f. Encourage positioning, repositioning and pressure redistribution as a means to reduce pain.
 - g. Refer OT/PT for redistribution of pressure and adaptive aids.
 - h. Encourage client to request a "time-out" during painful procedures. Client may perform hand hygiene and assist with removal of secondary or outer dressings.
 - i. Consider use of distraction techniques (i.e., music, deep breathing techniques, complementary and alternative medicine [CAM]).
 - j. If the client has nociceptive procedural wound pain and/or treatment-related pain, organize care to coordinate with analgesic administration allowing sufficient time for the analgesic to take effect.
 - k. Administer ordered analgesic medication regularly and in the appropriate dose to control pain. Refer the client to a Physician/NP if pain is not well controlled.
 - l. Refer to a Physician/NP or Pharmacist to determine the need for topical wound analgesics or anaesthetics.
 - m. Use appropriate medication to control neuropathic pain, if present.
3. Manage Client Risk Factors for Wound Healability
 - a. Encourage client to monitor and manage any pre-existing chronic disease(s). Consult a Physician/NP if changes occur.
 - b. Encourage client to take medication as prescribed. Consult Pharmacist as needed.
 - c. Refer to smoking cessation program and provide appropriate education.
 - d. Refer for harm reduction/substance use management, if available, and with client consent.

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- e. Collaborate with an OT/PT to:
 - i. Assess and recommend the use of equipment,
 - ii. Assess and recommend pressure redistribution devices, and
 - iii. To develop a mobilization and activation plan, if appropriate.
- f. Refer to Community Resources/Pharmacy for appropriate foot care/footwear and compression garments, as required.
- g. Promote adequate nutrition:
 - i. Consult with a Registered Dietitian (RD), if available if the wound is not healing and/or the client has one or more of the following:
 - Nutritional insecurity (inconsistent access to healthy food).
 - Nutritional risk factors such as low or high body mass index (BMI), dehydration, poor intake, poor glycemic control, total parental nutrition (TPN)/ tube feed.
 - Abnormal pre-albumin values in non-acute clients with chronic wounds.
 - A Braden nutrition subscale score of 2 or less.
 - Major burn injuries or a pressure injury Stage 3, Stage 4, Unstageable, or Deep Tissue Injury.
 - ii. Maximize the client's nutritional status through adequate protein and calorie intake unless contraindicated. Clients with chronic wounds should receive 35 kcal/kg of energy dense food per day including 1.5 grams of protein/kg.²⁶ Assess lab values related to renal functioning if increased protein is indicated. Client should avoid calorie reduced diets when a wound(s) is present.
 - iii. Reassess the need for protein supplements and additional fluids as the client's condition changes.
 - iv. Refer to Speech Pathologist/ OT If the client has difficulty swallowing.
 - v. Refer to a Dentist or Denturist if the client has experienced weight loss, as weight loss leads to shrinkage of the gums, or if client has poor dentition (i.e., dentures or partials broken, missing or lost, or has missing teeth).
 - vi. Encourage 1500-2000ml of fluid daily or 30ml or more per kg of body weight. Assess for renal or liver dysfunction and heart failure if increased fluid intake recommended. Offer fluids every 2 hours (Q2h) for adult clients with dehydration, fever, vomiting, profuse sweating, diarrhea or heavily draining wounds, unless contraindicated, e.g., organ failure.
 - vii. Document the percentage (%) of food and fluid and record any issues with diet tolerance or acceptance.

4. Address the mechanism of injury/causative factors

The causative factors and mechanism of injury must be addressed otherwise the wound will not heal in a timely manner or may not heal at all.

Wound Care Management

1. Develop and implement a wound treatment plan based upon the mechanism of injury and causative factors, the wound etiology and the initial wound assessment, identification of the wound healing trajectory and the goal of care.
2. Reassess the wound treatment plan at every dressing change (partial) and do a comprehensive (full) wound assessment weekly in order to:
 - a. Evaluate the current interventions;
 - b. Revise the overall care plan and wound treatment plan with documented rationale; and
 - c. Ensure the current goal of care is appropriate.

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3. Leave wound treatment plan in place for 2 weeks, unless there is a documented rationale for a change such as client intolerance to treatment plan, the wound shows signs and symptoms of deterioration/infection, or the treatment is no longer required.
4. Notify the Wound Clinician and/or Physician/NP if the wound deteriorates or if the wound does not show signs of healing at 3 weeks (after the 3rd full wound assessment - 21 days).
5. If the healable wound is not progressing within its' expected trajectory by 6 weeks:
 - a. Re-evaluate the wound healability,
 - b. Reclassify the healability of the wound, and
 - c. Re-evaluate the goal of care.
6. Preparing the wound bed is necessary to promote wound healing and includes the following key ten interventions:
 - Cleanse to control bacterial burden and promote healing
 - Debride to remove slough, necrotic tissue, and reduce bacterial burden
 - Manage foreign body, exposed structures
 - Monitor/manage infection or inflammation to ensure bacterial balance and reduce inflammation
 - Maintain moisture balance
 - Maintain wound thermal insulation/regulation
 - Manage the dead space (i.e., wound packing/filling)
 - Support open wound edges to encourage cell migration and wound closure
 - Protect the periwound skin
 - Manage the closed wound

A comprehensive evaluation of the wound is required in order to determine the necessary wound bed preparation interventions.

Interventions for Wound Treatment

1. Cleanse the Wound ([Wound Cleansing Procedure](#))

Use one of the following solutions/methods to cleanse the wound and the periwound skin:

- a. A minimum of 100mls of at least room temperature sterile normal saline (NS) or sterile water is used to cleanse the wound.
- b. When the local microbial burden is the chief concern, antiseptic solutions such as povidone iodine 10%, chlorhexidine 0.05%, betaine / polyhexanide (Prontosan), hypochloride, may be used for cleansing, based on the recommendation of a Wound Clinician or Physician/NP. These should only be used until the signs and symptoms of bioburden or local wound infection are resolved.
- c. In certain situations, negative pressure wound therapy (NPWT) instillation of cleansing solution may be used in conjunction with NPWT to promote a clean wound bed.
- d. **Dry, stable eschar on a lower limb/foot is to be kept dry:**
 - i. Do not cleanse with normal saline or tap water.
 - ii. Do not tub bath or soak.
 - iii. Protect the wound during showering.
 - iv. Paint the eschar and the 2.5cm of periwound skin with povidone iodine 10% or chlorhexidine 2%.
 - v. Moisturize the surrounding non-painted area.

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2. Debride the Wound

Wound debridement requires clinical assessment of healability, and clinical decision making on the type of debridement (if any) most appropriate. Debridement (the removal of slough/necrotic tissue from the wound) is one of the most important actions in facilitating wound healing. Debridement aids in the visualization of the wound edge/wound base and reduces the potential for a prolonged inflammatory phase which will lead to improving wound healing times.

The quicker the wound bed is debrided, the quicker the wound will heal. Therefore, regardless of which debridement method is chosen, there should be a reduced amount of slough/necrotic tissue with each dressing change, if not, then the debridement method needs to be reconsidered.

Note: It is important to note that with any debridement, the overall size of the wound will increase especially the depth. As well, there may be increased wound exudate as the slough/necrotic tissue 'liquifies'.

There are six debridement methods and the methods chosen is dependent upon:

- the client's clinical condition(s),
- wound healability,
- the type and amount of necrotic tissue (slough, wet, or dry eschar) present in the wound,
- signs and symptoms of infection (if present),
- wound pain,
- the clinical setting,
- the supports available, and
- the nurse's ability to carry out the skill; some of these debridement methods require additional education (refer to agency or health authority policies), or are completed by a Physician/ Surgeon/NP.

Debridement Methods

- a. Autolytic Debridement - Utilizes the body's enzymes and moisture to soften and break down devitalized tissue; this process can take days or weeks. It is important to recognize that as devitalized tissue breaks down the wound's exudate level will increase, therefore the periwound skin will need to be protected and an appropriate cover dressing is required to maintain moisture balance. Most wound care products can support autolytic debridement depending upon how they are used; the more effective products are:
 - Wound gels which add moisture to the wound bed.
 - Occlusive or semi-occlusive moisture retentive dressings to keep the wound moist.
 - Hypertonic saline dressings/gels which pull moisture from the surrounding wound area into the wound bed.
 - Honey based dressings which increase the osmolality of the wound bed and pull moisture from the surrounding wound area into the wound bed.
 - i. Autolytic debridement with occlusive dressings is contraindicated for infected wounds.
 - ii. Autolytic debridement may be further facilitated by scoring dry eschar. A Physician/NP/ Wound Clinician order is required. Before scoring eschar with a sharp instrument nurses must successfully complete additional education and then follow the CSWD Guideline/ Procedure (Health Authority/agency policy/standards must be in place to support this practice).
- b. Enzymatic Debridement - Utilizes a naturally occurring enzyme, collagenase, which degrades necrotic tissue when applied to the wound surface. Enzymatic debridement can take weeks before results are noted.
 - i. A Physician/NP order is required for collagenase. (e.g., Santyl is selective at removing non-viable tissue).

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- ii. Enzyme use can cause excessive exudate and irritation to periwound skin.
 - iii. A moist wound environment must be maintained when using collagenase.
 - iv. Enzymatic debridement may be facilitated by scoring a dry eschar. Before scoring eschar with a sharp instrument, nurses must successfully complete additional education and then follow the CSWD Guideline (Health Authority/agency policy/standards must be in place to support this practice).
 - c. Mechanical Debridement - Physically removes slough/debris and biofilm from the wound.
 - i. **Wet to dry dressings must not be used to mechanically debride wounds** as removing the dry adherent dressing is painful and will damage healthy tissue.
 - ii. Irrigation at 8-15psi and/or with the use of a wet or dry gauze to facilitate the loosening or removal of slough or debris is considered mechanical debridement.
 - d. Biological Debridement - Therapeutic use of sterile, live, medical grade maggots (fly larvae) for debriding moist necrotic tissue and slough. This type of debridement is: ([Maggot Debridement Therapy DST](#))
 - i. Very selective at removing devitalized tissue, and
 - ii. Can be used with infected wound and wounds with biofilm.
 - iii. A Physician/NP or Wound Clinician order is required for biological debridement.
 - iv. Before doing biological debridement, nurses must successfully complete additional education and then follow the Maggot Debridement Therapy DST. Health Authority/agency policy and standards must be in place to support this practice.
 - e. Conservative Sharp Wound Debridement (CSWD) - Removal of devitalized tissue (callous) and biofilm down to the level of viable tissue using a sterile scalpel, scissors, or a curette to create a clean wound bed ([CSWD DST](#)).
 - i. CSWD is less invasive than surgical debridement, should cause no or minimal pain, and may cause minimal bleeding.
 - ii. CSWD can be a one-time treatment or done as a series of treatments.
 - iii. A Physician/NP or Wound Clinician order is required for CSWD.
 - iv. CSWD must be done by a Wound Clinician, Physician/NP or RN/RPN; before doing CSWD, RNs/RPNs must successfully complete additional education and then follow the CSWD Guideline (Health Authority/agency policy/standards must be in place to support this practice).
 - v. Clinical setting must be considered when doing the CSWD procedure. Ensure that resources are available to manage any negative outcomes.
 - f. Surgical Debridement - Removal of devitalized tissue below the level of viable tissue. This is done by a Surgeon.
3. Manage foreign bodies/exposed structures
 - a. Report any new finding of foreign bodies/exposed underlying structure to Physician/NP/ Wound Clinician for further investigation and appropriate care plan.
 - b. Remove any 'free' bone fragments from the wound bed and send for C&S.
 - c. Consider use of a non-adherent contact layer to protect and ensure moisture balance for exposed tendon or bone to ensure that the structure does not dry out
 - d. Protect exposed mesh and hardware from infection; consider use of an antimicrobial/antiseptic contact layer/dressing.
 - e. Do not remove wound bed sutures; consult with Physician/Surgeon, NP for appropriate care. Remove only with an order.
4. Prevent or Treat Wound Infection ([Wound Infection Guideline](#) and [Guideline Summary](#))
 - a. Promote strategies to prevent wound infection.

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- b. Identify if wound has local infection, spreading infection or client has systemic infection and take appropriate action.
 - i. Local infection is treated with topical antiseptics/antimicrobial
 - ii. Spreading infection requires systemic (oral or IV) antibiotics as well as with a antimicrobials/antiseptic dressings
 - iii. System infection requires following the agency sepsis protocol
- c. Consult with a Physician/NP if 2 or more signs and symptoms of wound infection are present and take a swab for C&S, if indicated (Link to C&S Procedure).
- d. Treat diagnosed spreading infections as per Physician/NP orders.
- e. Consider use of CSWD to disrupt the biofilm through serial sharp debridement followed immediately by the use of antimicrobial dressings, topical antimicrobial agents, or antibiotics may help to reduce biofilm formation.

5. Manage moisture balance

- a. For a moist wound
 - Choose a wound filler/contact layer and cover dressing which will keep the wound bed moist (not too wet – not too dry) (Link to Product Selection Guideline – coming soon)
 - If the wound bed is too dry due to insufficient wound exudate, consider an application of a wound gel. Monitor its effectiveness and discontinue gel use when additional moisture is no longer required.
 - If the wound bed is too wet due to excessive amount of wound exudate, consider use of a more absorptive wound filler and/or cover dressing and increase the dressing change frequency.
 - If the wound bed is at the correct moisture level, maintain the balance with low absorptive or moisture retentive dressings
- b. For dry stable eschar on the lower limb/foot; unless directed otherwise by Physician/NP/Wound Clinician:
 - Paint the eschar and 2.5cm of the periwound skin daily, or every other day, with an antiseptic e.g. povidone iodine 10%. Do not wash off the previously applied iodine, apply a new layer and allow to air dry (Link to PISheet). If the client cannot use povidone iodine apply chlorhexidine 2% following the same steps above.
 - Protect the unpainted surrounding skin with a moisturizer, if needed.
 - Leave open to the air or apply a dry breathable protective dressing such as dry gauze, if indicated.
 - Do not use gels, foams, transparent dressings, or hydrocolloids or any other moisture retentive dressings.
- c. Manage hypergranulation tissue which may the result of too much moisture; a local wound infection; friction on the wound surface or the presence of a foreign body (e.g., a suture).
 - Treat the underlying cause as well as addressing the excess tissue.
 - Treatments such as topical steroid cream (prescription required) and absorptive foam dressings have proven somewhat effective in reducing hypergranulation tissue.
 - Collaborate with the Physician/NP or Wound Clinician if the client has hypergranulation tissue and consider use of Silver Nitrate (Link to PISheet).

6. Maintain wound thermal insulation/regulation (Link to Product Selection Guideline) by:

- Ensure the cleansing solutions are at least at room temperature.
- Minimize the time it takes to do the dressing change.
- Choose appropriate adherent cover dressing and ensure that the dressing is well-secured.
- Minimize the dressing change frequency.

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7. Manage any dead spaces ([Wound Packing Procedure](#))
 - a. Packing/filling material is any product that is used to gently fill a wound's dead space e.g., contact layer, sheet, ribbon, rope, NPWT foam/gauze.
 - b. The purpose of wound packing/filling of the dead space (cavity, undermining, sinus/tunnel) is to:
 - i. Gently pack/fill any dead space to facilitate the wound exudate and debris and to heal from the "bottom up".
 - ii. Facilitate the removal of exudate and debris.
 - iii. Encourage the growth of granulation tissue from the base of the wound to prevent premature closure and abscess formation.
 - c. If the wound opening is too small to pack notify the Physician/NP/Wound Clinician for a change of care plan.

8. Support an Open Wound Edge
 - a. Maintain an open wound edge to support epithelialization and prevent wound edges from rolling by properly packing/filling the wound. The longer the wound is open the more likely that the wound edge will roll inward (epibole)
 - b. If the wound edges are rolled under, consult with a Wound Clinician or Physician/NP for options to open the wound edge, e.g., silver nitrate and surgical intervention.

9. Protect the Periwound Skin ([MASD Guideline](#))
 - a. Keep the periwound skin clean, dry and intact.
 - i. Apply skin barriers, protectants or moisture barriers as needed to protect the periwound skin from moisture.
 - ii. Apply moisturizer to periwound skin.
 - b. If periwound excoriation or maceration is present due to excessive exudate, identify the cause and change to a more absorptive dressing, increase the frequency of dressing changes and apply a skin barrier around the wound, if necessary.
 - c. If dry periwound callous is present, notify the Wound Clinician/Physician/NP for potential CSWD.
 - d. Skin irritation, rash, erythema, and scaling may indicate a contact or allergic dermatitis or infection, especially a fungal infection. If this occurs, consult with a Wound Clinician or Physician/NP.

10. Manage the Closed Wound in the Maturation/Remodelling Phase

Ensure that the closed wound is protected for an extended period of time. The length of time to protect the closed wound depends upon the presence of risk factors as well as the type and underlying cause(s) of the wound. A closed wound may not be fully healed for up to 2 years.

 - a. Cleanse the skin gently with a pH-balanced, non-sensitizing skin cleanser.
 - b. Apply a moisturizer to the closed area. Avoid moisturizers with allergens such as perfume, lanolin, preservatives, emulsifiers and stabilizers.
 - c. Avoid hot water and excessive rubbing or friction over the closed area. Use a soft cloth to cleanse and pat the skin dry.
 - d. Protect the area from pressure, friction/shear and moisture. Refer to OT/PT for reassessment of positioning, equipment, or devices.
 - e. Inspect the area frequently for any new skin breakdown.
 - f. Teach the client and/or family strategies to prevent a recurrence of the wound.

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Client Education and Resources

1. Teach the client and/or family the following:
 - a. Factors and co-factor that lead to the development of a wound and prevent healing.
 - b. Chronic disease effects on wound healing processes.
 - c. The importance of adhering to the wound treatment plan.
 - d. Maintenance of clean well-moisturized skin.
 - e. Strategies to avoid lower extremity trauma.
 - f. Benefits of smoking cessation and attending a smoking cessation program.
 - g. Strategies for improving nutrition.
 - h. Strategies for managing pain before, during, and after dressing changes.
 - i. Signs of wound complications including wound deterioration, infection and increased pain and discuss communication strategies with health professional when wound complications occur.
 - j. The need for regular follow-up with a health care provider.
2. If the client and/or family participate in the actual care of the wound, teach them:
 - a. Hand hygiene procedures.
 - b. Signs and symptoms of wound infection and strategies to prevent infection.
 - c. Wound cleansing and dressing techniques.
 - d. Need for moisture balance, healing wound edges and healthy periwound skin.
 - e. Appropriate aseptic technique when changing the dressing.
 - f. Reportable changes in the wound.
 - g. Signs of complications including wound deterioration, infection and increased pain and the need to liaise with a health professional when these occur.
3. Teach the client and/or family the interprofessional roles of the wound care team.
4. Provide written materials that support or reinforce client teaching.

Transition/Discharge Planning

1. Client transition/discharge planning should be initiated during the initial assessment to support timely transition/discharge and optimal client independence.
2. When the client's care is being transitioned across sectors (acute care, community care, residential care, or between Health Authorities), the transitioning site must provide the current overall care plan that outlines the client care, wound healing goals, wound treatment plan and the most current wound assessment
3. The receiving site must review the transitioning site's overall care plan, wound assessment and the current wound treatment plan as a starting point in the development of its overall care plan for the client.

Client Clinical Outcomes

1. Intended Outcomes
 - a. The client's healing wound heals.
 - b. The client's non-healing wound does not deteriorate and remains infection free.
 - c. The client's non-healable wound may deteriorate and remains infection free.
 - d. The client's pain/other wound symptoms are managed.
2. Unintended Outcomes
 - a. The client's healing wound deteriorates.

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- b. The client's non-healing wound deteriorates and/or does not remain infection free.
- c. The client's non-healable wound becomes infected.
- d. The client's pain/ other wound symptoms are not managed.

Quality Assurance Indicators

The following quality assurance indicators could be used by the Health Authority/Agency/Facility to ensure that wound bed preparation was appropriately undertaken:

1. The wound healability classification was appropriate for the client medical condition and wound assessment.
2. The goal of care was appropriate for the overall client situation.
3. The goal of care was reassessed at the six week mark, and changed as needed.

Documentation

1. Document initial and ongoing wound assessment as per agency guidelines (Link to Wound Assessment & Treatment Flow sheet).
2. Document client/family education and written materials discussed (e.g., hand hygiene, wound infection prevention strategies).
3. Document care plans, clinical outcomes and care plan revisions as per agency guidelines.
4. If the client develops a wound, report the 'safety event' as per health authority/agency policy.

Definitions

Aseptic Technique - Technique used to limit the transfer of microorganisms from one person to another by minimizing the microbe count and preventing cross contamination; includes sterile, no-touch, and clean technique. The decision regarding the appropriate aseptic technique is made based on the client's clinical condition, the wound etiology, the wound location, the invasiveness of the dressing procedure, the goal of care, and agency policy.

- **Sterile Technique** - the use of sterile gloves, a sterile field, sterile tray, sterile instruments, sterile solution and sterile dressings. Only sterile gloved hands or instruments are used for direct contact with the wound.
- **No-Touch Technique** - the use of clean gloves and a sterile field, sterile tray, sterile instruments, sterile solution and sterile dressings. Only sterile instruments are used for direct contact with the wound.
- **Clean Technique** - the use of clean gloves (single client use, non-sterile), a clean field, a clean or sterile dressing tray, clean instruments (single client use), clean solution (single client use) and clean dressings. Clean gloved hands or instruments are used for direct contact with the wound.

Autonomic Dysreflexia (AD) - A syndrome affecting persons with a thoracic spinal cord injury characterized by uncontrolled hypertension, severe headaches, bradycardia, and pallor below and flushing above the cord lesions, and convulsions. Caused by simultaneous sympathetic and parasympathetic activity, may occur with bowel/bladder distension, pain or pressure injury.

Bacterial bioburden - The presence of bacteria that is sufficient to delay or stop wound healing without causing the classic inflammatory signs and symptoms of infection.

Biofilm - An invisible thin layer of microorganisms adhering to the surface of a structure, which may be organic or inorganic, together with the polymers that they secrete. Biofilms are present in 60% to 90% of chronic wounds and in 6% of acute wounds.² Biofilms are characterized by "significant tolerance to antibiotics and biocides"⁴⁷ Biofilms lead to chronic inflammation and interfere with healing, and are not routinely detected in laboratory tests e.g., C&S swabs.

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Body Mass Index (BMI) - a measure of body fat based on height and weight that applies to adult men and women.

Cleansing solutions - Wound cleansing solutions include sterile normal saline, sterile water, potable tap water and commercial cleansing agents. Topical antiseptic solutions chlorhexidine or povidone iodine may be used on the recommendation of a Physician/NP or Wound Clinician.

Children - Clients are considered children if they are 17 years and under.

Client - Recipient of care: in the community-client, in residential care-resident, and in acute care-patient.

Client/Family - Family is two or more individuals who come together for mutual aid. Families are self-defined, and family is 'who the client says their family is'; this is individualized.

Dead space- refers to sinus tracks/tunnels, undermining, cavity within a wound.

Debridement - The removal of non-viable tissue from the wound to support the development of granulation tissue which is necessary for healing to occur. Debridement takes several forms: autolytic, biological (larval), conservative sharp, enzymatic, maintenance, mechanical, and surgical/sharp debridement.

Epithelialization - Takes place following the formation of granulation tissue in the base of the wound and occurs as epithelial cells migrate across this new tissue to form a barrier between the wound and the environment.

Eschar, dry stable - Firm, dry necrotic tissue with an absence of drainage, edema, erythema or fluctuance. It is black or brown in color and is attached to the wound edges and wound base.

Eschar, soft boggy - Soft necrotic tissue which is black, brown, grey, or tan in color. It may be firmly or loosely attached to the wound edges and wound base; fluctuance and drainage may be present.

Fungating - A wound with cancerous or non-cancerous rapidly growing tissue which is cauliflower-like in appearance.

Goals of Care - The three goals are:

- **To heal the wound** - Wounds are healable when the cause can be treated, there is adequate blood flow for healing and risk factors that impede healing can be mitigated. Normal wound healing occurs in a predictable trajectory for that wound etiology.
- **To maintain the wound** - A healable wound that is not healing due to client, wound and/or health system barriers.
- **To monitor/manage the wound** - Wounds that are not able to heal due to underlying client conditions that cannot be mitigated such as insufficient blood supply, an inability to treat the cause of the wound (malignant wounds) or an inability to treat factors impacting wound healing.

Granulation tissue - New connective tissue and tiny blood vessels that form on the wound bed during the healing process. It appears as firm, red, moist, pebbled healthy tissue.

Hypergranulation tissue - Red, moist tissue raised above the level of the skin (proud flesh).

Infection - Presence of replicating microbial organisms in a wound associated with host injury; may be a local, spreading, or systemic infection.

Nursing Diagnosis - a clinical judgement which identifies a physical or mental condition as the cause of a client's signs or symptoms.

Pain Type/Etiology -

- nociceptive (somatic or visceral) - arises from stimulation of the pain receptors as a normal response to be pain; may be either somatic or visceral,
- neuropathic - arise from peripheral and central nervous systems, or
- mixed/complex - a combination of both nociceptive and neuropathic

Pain Scales - Pain is a multidimensional assessment, including physical, emotional, and functional domains. The following pain assessment scales have been designed for various age groups and conditions:

- Behavioural Pain Scale (BPS) - Used to quantify pain in intubated patients.
- CRIES - Used for neonates to rate their pain by assessing crying, level of oxygen use, vital signs, facial expression, and ability to sleep (sleeplessness).^{18,19}
- FLACC - Face, Legs, Arms, Cry, and Consolability is a behavioral pain scale used for clients from newborn to age 3 (based on nursing judgment).²⁰
- McGill Pain Questionnaire (McGill Pain Index) - A self-report scale for clients to rate the quality and intensity of pain related to the pressure ulcer.¹⁹
- Non-Communicative Patient's Pain Assessment Instrument (NOPPAIN) - This is an instrument used to record the clinician's observations and rating of pain behaviors in clients with dementia.
- Numeric Rating Scale (NRS) - The NRS involves asking the client to rate their pain from 0-10 (0= being no pain and 10 = worst possible pain).²¹

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- Pain Assessment in the Advanced Dementia Scale (PAINAD) - A tool used to rate pain for client's living with advanced dementia. This clinician-based tool is used to rate the client's pain after observing them for 5 minutes before scoring; the client is observed at rest, a pleasant activity, care-giving, or after pain med administration.
- Visual Analog Scale (VAS) - A VAS consists of a scale with face images depicting extremes of pain from no-pain to worst pain.²¹
- Wong-Baker FACES Pain Rating Scale - This is a visual rating scale that asks clients to choose the face on the scale that best depicts the pain there are experiencing. Clients rate their pain from 0 = does not hurt, to 10 = hurts as much as the client can imagine.

Product Information Sheet (PISheet) - PISheet(s) are developed by the Provincial Nursing and/or Interprofessional Skin & Wound Committee. PISheets are found on the British Columbia Patient Safety and Quality Council's Connecting Learners With Knowledge website <https://clwk.ca>

Slough - Soft, moist necrotic tissue that is brown, tan, yellow or green in colour. It may be thin or thick and the consistency may be fibrous, stringy or mucinous. It may be firmly or loosely attached to the wound edges and base.

Wound Healability (Wounds Canada, 2017)

- Healing - Causes and co-factors that can interfere with wound healing are not present or have been removed. Wound healing occurs in a predictable fashion. Wound may be acute or chronic.
- Non-Healing - Wound has healing potential but causes and co-factors that are interfering with wound healing have not yet been removed.
- Non-Healable - Causes and co-factors that are interfering with wound healing cannot be removed e.g., end-of-life care, in-operable limb ischemia.

Wound Healing Phase (see Appendix A) - The wound healing occurs in four phases - hemostasis, inflammation, proliferation/repair, and maturation/remodelling. Each phase is distinct yet overlaps with the others.

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Document Creation/Review

This guideline is based on the best information available at the time it was published and relies on evidence and avoids opinion-based statements where possible. It was developed by the Provincial Nursing Skin and Wound Committee and has undergone provincial stakeholder review.

Created By	British Columbia Provincial Nursing Skin and Wound Committee in collaboration with the Wound Clinicians from across all Health Authorities
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Appendix A: Wound Healing Phases

Wound healing typically occurs following a trajectory in overlapping phases. These phases can take weeks or months. The final phase of wound maturation/remodeling can take months to two years. ([E-Learning Module - How Wounds Heal](#)).

Wound Healing Phases - The wound healing occurs in four phases - hemostasis, inflammation, proliferation/repair, and maturation/remodelling. Each phase is distinct yet overlaps with the others.

- **Hemostasis:** After the injury, disruption of blood vessels and bleeding occurs and the coagulation pathway is activated. A fibrin clot is formed to stop bleeding. Platelets release over 12 growth factors and cytokines (proteins). Histamines are released and vasodilation begins. This phase usually occurs over the first 3 days (0-72 hours) after the injury.
- **Inflammatory phase:** Lymphocytes initiate the inflammatory response. Leukocytes (phagocytic), neutrophils and macrophages begin to clear the wound bed of any foreign bodies and microbes. Neutrophils arrive after the injury and peak activity at 24-48 hours. Macrophages arrive approximately 48-72 hours after the injury followed by lymphocytes. This is the wound 'clean-up' phase. Normal inflammation includes: redness, edema, and warmth and wound exudate. Unhealthy or prolonged inflammation may lead to infection and include: increased pain, redness, pus/increased exudate, bleeding, and flu-like symptoms.
 - Delayed wound closure is complicated by prolonged inflammation (high inflammatory cytokines), damaged extracellular matrix (ECM), high protease levels, low mitogenic cell activity, and senescent cells.¹⁴
 - Wounds that exhibit delayed healing fail to progress through the stages of healing and enter a state of prolonged inflammation.¹² When inflammation is prolonged, increased levels of matrix metalloproteases (MMPs) occur and these proteases degrade the healthy extracellular matrix (proteins and polysaccharides). This delay leads to potential development of biofilms and increased risk of infection (microbial loads).
- **Proliferative/repair phase:** This phase begins 3 days after the injury and lasts for several weeks. Granulation tissue begins to form and fibroblasts proliferate and deposit extracellular proteins. This extracellular matrix (ECM) is composed of collagen, fibronectin, and proteoglycans. Angiogenesis begins to form new capillaries in the wound space. Reepithelialisation occurs as marginal cells migrate across the provisional matrix. The final feature of proliferation is the beginning of wound contraction.
- **Maturation/Remodeling phase:** This phase begins about 21 days after the injury and lasts 1-2 years. The collagen laid down in the proliferative phase is replaced with cross-linking collagen that has greater tensile strength. Healed wound areas remain weaker than uninjured skin and generally have 80% tensile strength of unwounded skin.

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