

Developed by the BC Provincial Nursing Skin and Wound Committee in collaboration with Wound Clinicians from: 	
<b><u>TITLE</u></b>	<b>Guideline: Wound Bed Preparation for Healable and Non-Healable Wounds in Adults &amp; Children<sup>1</sup></b>
<b><u>Practice Level</u></b>	<ul style="list-style-type: none"> <li>• Nurses in accordance with health authority and agency policy.</li> <li>• Conservative sharp wound debridement (CSWD) is a <i>restricted activity</i> according to the Nurse's (Registered) and Nurse Practitioner Regulation. <sup>2</sup> CRNBC states that registered nurses must successfully complete additional education and follow an established guideline when carrying out CSWD.</li> <li>• Biological debridement therapy is a <i>restricted activity</i> according to the Nurse's (Registered) and Nurse Practitioner Regulation. <sup>3</sup> CRNBC states that registered nurses must follow an established guideline when carrying out biological debridement.</li> <li>• Clients <sup>4</sup> with wounds needing wound bed preparation require an interprofessional approach to provide comprehensive, evidence-based assessment and treatment. This clinical practice guideline focuses solely on the role of the nurse, as one member of the interprofessional team providing care to these clients.</li> </ul>
<b><u>Background</u></b>	<ul style="list-style-type: none"> <li>• Factors affecting wound healability include the presence of adequate circulation in the area of the wound, wound related factors such as the size and duration of the wound, the ability to treat the cause of the wound and the presence of risk factors impacting wound healing. While many wounds heal, others are determined to be non-healing or slow-to-heal based on the presence or absence of these factors.</li> <li>• Wound healability must be determined prior to debridement and moist wound healing. Although wound healing normally occurs in a predictable fashion, wound healing trajectories can be heterogeneous and non-uniform resulting in delayed wound healing for some clients.</li> <li>• Once it is determined that the wound is healable, wound bed preparation frames the approach to wound treatment. The goal of wound bed preparation is to remove the barriers to natural moist wound healing.</li> <li>• Moist wound healing is not appropriate for non-healable and healable dry arterial wounds.</li> <li>• The concept of wound bed preparation includes removing non-viable tissue through <b>Debridement</b>, controlling bacterial burden and <b>Infection / Inflammation</b>, maintaining <b>Moisture balance</b> and stimulating the wound <b>Edges</b> to encourage cell migration and wound closure (<b>DIME</b>).</li> <li>• Debridement is a key component when treating healable wounds. Moist necrotic tissue, slough and foreign materials in the wound can provide a medium for infection and prolong the inflammatory response which delays healing. Necrotic tissue and slough can be debrided by autolytic, biological (maggot therapy), enzymatic, mechanical, CSWD and surgical debridement. (See page 8)</li> <li>• Room temperature sterile normal saline and sterile water are the solutions of choice when irrigating wounds. Using potable tap water for wound irrigation may be acceptable in some situations but should be based on agency guidelines or direction from a wound clinician.</li> <li>• The choice of aseptic technique (sterile, no touch or clean technique) used to treat a wound is based on the clinical condition of the client, the etiology of the wound, goal of care, invasiveness of the dressing procedure and agency policy.</li> <li>• A moist wound environment accelerates healing by approximately 50% when compared to a dry wound environment.</li> <li>• Any condition that compromises the client's immune response will delay or stop wound healing.</li> <li>• Biofilm may be present in chronic wounds (60%), critically colonized or infected wounds (60 – 80 %) or wound that are not healing. <sup>22, 26</sup> It cannot be seen and standard culture methods do not capture the presence of biofilm present in the wound; the presence of biofilm can be determined by microbial DNA-based diagnostic tools.</li> </ul>

<sup>1</sup> Clients are considered to be children if they are 18 years of age and under.

<sup>2</sup> College of Nurses of British Columbia. (2010). Scope of practice for registered nurses: Standards, limits and conditions. Vancouver: Author.

<sup>3</sup> College of Nurses of British Columbia. (2010). Scope of practice for registered nurses: Standards, limits and conditions. Vancouver: Author.

<sup>4</sup> The term client includes recipients of care in the community (clients), residential care (residents and acute care (patients)).

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<b>Indications</b>	This decision support tool has been developed to guide the assessment and treatment of healable and non-healable wounds.
<b>Definitions</b>	<p><b>Allergy</b> – An acquired hypersensitivity to a substance (allergen) that does not normally cause a reaction.</p> <p><b>Aseptic Technique</b> – 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 technique chosen is based on the clinical condition of the client, etiology of the wound, location of the wound, invasiveness of the procedure, goal of care and agency policy.</p> <ul style="list-style-type: none"> <li>o <b>Sterile Technique</b> – the use of sterile gloves, a sterile field, sterile tray, sterile instruments, sterile solution and sterile dressings; only sterile gloved hands or sterile instruments are used for direct contact with the wound.</li> <li>o <b>No-Touch Technique</b> – the use of clean gloves and a sterile field, sterile tray, sterile instruments, sterile solution and sterile dressings or dressings appropriately saved using no-touch technique; only sterile instruments are used for direct contact with the wound.</li> <li>o <b>Clean Technique</b> – 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), clean dressings or dressings appropriately saved using clean technique; clean gloved hands or instruments are used for direct contact with the wound.</li> </ul> <p><b>Autonomic Dysreflexia</b> – A syndrome affecting persons with a spinal cord lesion above the mid-thoracic level; characterized by hypertension, bradycardia, severe headaches and convulsions as well as pallor below and flushing above the cord lesions. It is caused by simultaneous sympathetic and parasympathetic activity and may occur with bowel or bladder distension, pain or pressure ulcers.</p> <p><b>Bacterial bioburden</b> – The presence of bacteria that is sufficient to delay or stop wound healing without causing the classic inflammatory signs and symptoms of infection.</p> <p><b>Biofilm</b> – Biofilm is comprised of polymicrobial communities of bacteria attached to a wound surface and encased in a self-produced matrix of polymeric substance that protects them from the immune system and the effect of anti-microbials. Biofilm interferes with healing in chronic wounds. Identification of biofilm requires sophisticated techniques.</p> <p><b>Cleansing solutions</b> – Wound cleansing solutions include sterile normal saline, sterile water, potable water and commercial cleansing agents. Topical antiseptic solutions may be used on the recommendation of a physician / NP or wound clinician.</p> <p><b>Debridement</b> – The removal of non-viable tissue from the wound. It supports the development of granulation tissue which is necessary for healing to occur. Surgical debridement is not within nurse’s scope of practice; however nurses can carry out all other types of debridement. Because CSWD is a restricted activity nurses require additional education and must follow a guideline when carrying out this activity.</p> <p><b>Delayed healing</b> – Occurs when there is minimal or no change in wound size after 4 weeks of treatment.</p> <p><b>Epithelialization</b> – 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.</p> <p><b>Eschar, dry stable</b> – 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.</p> <p><b>Eschar, soft boggy</b> – 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.</p> <p><b>Fluctuance</b> – Indicates the presence of pus in an infected wound. Touching reddened skin over an area containing pus produces a soft boggy feel called fluctuance. Fluctuance may be surrounded by induration making it even more noticeable.</p> <p><b>Fungating</b> – A wound with cancerous or non-cancerous rapidly growing tissue which is cauliflower-like in appearance.</p> <p><b>Gangrene</b> – Death or decay of body tissue which may involve bacterial infection. Is usually due to loss of blood supply to the affected area and can be wet or dry.</p> <p><b>Granulation tissue</b> – 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.</p> <p><b>Healable wound</b> – 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. However wound healing trajectories can be heterogeneous and non uniform and some wounds present with a prolonged wound healing trajectory.</p>

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	<p><b>Hyper granulation tissue</b> – Granulation tissue which is in excess of what is needed for healing. Presents as beefy red, moist tissue that extends above the level of the skin (proud flesh) and is caused by excess moisture in the wound, friction on the wound surface, infection or a foreign body in the wound. Delays wound healing by preventing or slowing epithelial cell migration across the wound surface.</p> <p><b>Infection</b> – Presence of replicating organisms in a wound associated with host injury; may be localized in the wound or systemic.</p> <p><b>Kennedy Terminal Ulcer</b> – A sub group of pressure ulcers that most often occur in older adults with an illness that is terminal and may be a precursor to imminent death. These ulcers occur suddenly and first appear as an abrasion or blister but rapidly progress to Stage 2, 3, or 4 ulcers. They are usually located on the sacrum or coccyx and are yellow or black in color. They have irregular edges, are pear, butterfly or horse shoe shaped, are usually non-healable and may not be preventable.</p> <p><b>Maintenance Wound</b> – A healable wound that is not healing due to client, wound and/or health system barriers or that is slow-to-heal.</p> <p><b>Non-healable Wound</b> – Wounds that are not able to heal due to insufficient blood supply, an inability to treat the cause of the wound (malignant wounds) or an inability to treat factors impacting wound healing (immune compromised client).</p> <p><b>Potable water</b> – Tap water that is deemed safe to drink by local water authorities.</p> <p><b>Slough</b> - 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.</p>
<p><b><u>Related Documents</u></b></p>	<p>Guideline Summary: Wound Bed Preparation for Healable and Non-healable Wounds in Adults &amp; Children            Procedure: Wound Cleansing            Procedure: Wound Packing            Guideline / Procedure: Conservative Sharp Wound Debridement            Guideline / Procedure: Biological (Maggot) Wound Therapy            Guideline: Assessment &amp; Treatment of Wound Infection            Guideline: Product Selection            Product Information Sheets for Skin and Wound Care Products            Guideline: Assessment and Treatment of Diabetic Ulcers            Guideline: Assessment and Treatment of Pressure Ulcers            Guideline: Assessment and Treatment of Lower Limb Ulcers            Guideline: Assessment and Treatment of Surgical Wounds            Documentation Tool: Wound Assessment &amp; Treatment Flow Sheet</p>

## **Assessment and Determining Goals of Care**

### **Assessment**

To develop a comprehensive plan of care and determine treatment goals for wound bed preparation assess the following:

1. Client Concerns:
  - a. Clients 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.
  - 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 caregiver's preferences for treatment of the wound, treatment of risk factors and the goals of wound care.
  - h. Client and/or caregiver's ability and motivation to understand and adhere to the treatment plan.

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2. Risk Factors for Wound Healability:
  - a. Medical conditions that lead to poor tissue perfusion such as peripheral vascular disease, hypotension, angina / MI, COPD, heart failure, anemia, renal disease and being at the end of life.
  - b. Medical conditions that impact sensation or mobility, e.g. diabetes, spinal cord injury, MS, and CVA.
  - c. Advanced age.
  - d. Lifestyle factors such as cigarette and substance use and the motivation to quit, poor personal hygiene, inactivity or a lack of exercise.
  - e. Medications that interfere with wound healing, e.g. NSAIDS, anti-neoplastics, systemic corticosteroids, anticoagulants and vasopressors.
  - f. Conditions such as prolonged surgical procedures and inter operative fluid balance.
  - g. MRSA or VRE colonization.
  - h. Impaired nutritional status:
    - i. Overweight, poor glycemic control, low body weight, low serum pre albumin<sup>5</sup>, appetite changes, cachexia, dehydration, edema, restrictive diet and prolonged NPO.
    - ii. Inadequate nutritional intake of protein, calories or fluids as evidenced by % of intake at meals or calorie counts.
    - iii. Possible causes of poor intake including difficulty swallowing, poor dentition, positioning, inability to feed self, GI symptoms and pain.
  - i. Moisture:
    - i. Fecal and/or urinary 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.
  - j. Ability to mobilize and transfer.
  - k. Autonomic dysreflexia and / or increased spasticity in clients with a spinal cord injury.
  - l. Allergies, especially latex allergies.
3. Basic lower leg assessment for any wound present below the knee. If assessment results are abnormal, for example signs and symptoms of arterial compromise, venous insufficiency or decreased sensation are present, complete an advanced lower leg assessment or refer to a wound clinician for same. (Link to Basic and Advanced Lower Leg Assessment forms).
4. Wound Assessment: (Link to [Wound Assessment & Treatment Flow Sheet](#))
  - a. History of current wound and date of onset.
  - b. History of previous wounds at same site.
  - c. Location of wound(s).
  - d. Wound measurements including length, width, depth, undermining, sinuses and tunnels. Note if wound probes to bone.
  - e. Describe the wound bed noting percentage of tissue type, presence of a foreign body and/or exposed underlying structures, e.g. tendon or bone.
  - f. Describe the characteristics and amount of exudate.
  - g. Note the presence of odour after cleansing.
  - h. Describe the wound edges.
  - i. Describe the peri-wound skin.
5. Presence of wound pain associated with wound treatment.
  - a. Type, location, frequency and quality of pain.

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<sup>5</sup> Wound healing is impaired in clients with a pre-albumin less than 180 mg / L (female) or less than 215 mg / L (male). However, serum pre-albumin is a poor indicator of nutritional status in acute illness as it is a negative acute-phase reactant and may be decreased with infection and inflammation.

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- b. Pain severity using client self-report, observation of non-verbal cues and/or a pain scale, e.g. Wong Baker FACES Scale, Visual Analog Scale or Numerical Rating Scale. For clients with spinal cord impairment, note autonomic dysreflexia and / or increase spasticity
- c. Onset & duration of pain, and precipitating / alleviating factors.
- d. Current pharmaceutical and non-pharmaceutical interventions for pain and their effectiveness.
- e. Impact of pain on function, sleep and mood.

6. Wound Infection (Link to Wound Infection DST)

<b>Clinical Signs and Symptoms of Wound Infection</b>		
		
<b>Bacterial Bioburden / Localized Infection</b>	<b>Deep Infection</b>	<b>Systemic Infection</b>
Non-healing (minimal change in wound measurements after 3 weeks of care)	Onset of wound pain or increasing pain	General malaise (predominantly elderly, immune compromised or pediatric clients)
Increased volume of exudate	Increased volume of exudate	Fever (may be muted in elderly or immune compromised clients)
Red friable tissue	Peri wound warmth 2 cm or more	Rigor / chills
Necrotic debris in the wound	Peri wound edema & erythema 2 cm or more	Change in behaviour or cognition (especially in elderly clients)
Odour present after wound cleansing	Odour present after wound cleansing	Unexplained high blood sugar (in clients who are diabetic)
	Increased wound size and / or the development of sinus tracts and / or satellite wounds	Rapid heart rate and respirations
	Wound that probes to bone or exposed bone	Elevated white cell count
		Septic shock potentially leading to multi organ failure
<b>2 or more of the S &amp; S above are sufficient for a clinical diagnosis of potential or actual wound infection.</b>		

Adapted from:

1. Sibbald, G., et al. (2006). Increased bacterial burden and infection: The story of NERDS and STONES. *Advances in Skin and Wound Care*, 19(8):158.
2. Woo, K., et al. (2009). A cross-sectional validation study using NERDS and STONEES to assess bacterial burden. *Ostomy Wound Management*. 55(8): 40 – 48.
  - a. If the wound is not healing and 2 or more signs of bioburden / localized infection are present, treatment with an antimicrobial dressing is indicated. (Link to Product Selection DST)
  - b. If antimicrobial dressings are ineffective after 10 – 14 days and signs of localized and/or deep infection are present, consult with a physician / NP to determine if a swab for C & S <sup>6</sup> is indicated. (Link to Wound Culture Procedure). Notify the physician / NP if C & S results are abnormal or the wound probes to bone.
  - c. Wounds may be in a state of chronic inflammation as evidenced by erythema, induration, warmth and pain. It is important to determine if there is a change in these indicators, e.g. spreading erythema, which may be indicative of an evolving infection.
  - d. Diabetic Wounds
    - i. For clients with diabetes, 1 or more signs and symptoms of infection, especially if there is new or increasing pain, is sufficient to warrant a C & S swab.

<sup>6</sup> While taking a swab for culture and sensitivity is not considered a restricted activity in the Nurses (Registered) and Nurse Practitioners Regulation, some agencies may require an order before the nurse can take a swab for C & S.

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- ii. Diabetes may mute visible evidence of localized infection due to compromised arterial blood flow, blunting of the inflammatory process, and diminished sensation.
- iii. Uncontrolled blood sugars may also indicate an infection.
- iv. **Areas of wet gangrene and deep or systemic infection in diabetic wounds, especially if the wound probes to bone, are potentially limb or life threatening and require immediate medical attention.**

7. Determine Wound Etiology

- a. Lower extremity ulcer (Link to [Lower Limb Arterial / Venous DST](#) / [Diabetic Ulcer DST](#))
- b. Ulcer over a bony prominence (Link to [Pressure Ulcer DST](#)).
- c. Wounds following surgery (Link to [Surgical Wound DST](#)).
- d. Skin Tear (Link to [Skin Tear DST](#)).
- e. Ulcer associated with a malignancy. (Link to [Malignancy Wound DST](#))
- f. Skin damage related to moisture (Link to [Moisture Associated Skin Damage DST](#)).

### Determine Treatment Goals

Choose the appropriate goal of care based on analysis of assessment information and the definition for each goal. Decisions to categorize a wound as “healable”, “maintenance” or “non-healable” must be made in collaboration with the interdisciplinary team members involved in the client’s care and in consultation with the client/client’s caregivers.

### Assessment Information

1. The goal of care is determined following analysis of the overall assessment findings including:
  - a. Client and client’s caregiver’s willingness and ability to participate in and adhere to the care plan.
  - b. Client concerns.
  - c. Client risk factors for wound healability such as systemic disease, poor nutrition or medications that interfere with healing
  - d. The presence of adequate peripheral circulation to support wound healing. For lower extremity wounds an ABI greater than 0.5 indicates that there is some potential for healing.
  - e. Wound etiology.
  - f. Wound assessment including pain and signs and symptoms of infection.
  - g. Availability of resources, equipment and supplies.

### Goals of Care

1. **To Heal the Wound (Healable Wound):**

Wound healing is anticipated to occur according to a predictable trajectory. Wound healing is anticipated when:

- The wound’s underlying cause, such as pressure, can be treated.
- There is adequate arterial blood flow to perfuse the wound area.
- The client’s risk factors for healability can be optimized or managed.
- The client and/or client’s caregivers are willing and able to participate in the care plan.

If a measurable improvement does not occur after 3 weeks, refer the client to the wound clinician or physician / NP.

If a wound is slow to heal, re-evaluate the diagnosis, treatment and risk factors and revise the care plan as necessary to ensure that the wound is receiving the most appropriate care. If the wound does not show signs of healing with appropriate care the use of advanced wound therapies may be warranted.

2. **To Maintain the Wound (Maintenance Wound):**

Wounds that are not healing or are slow to heal may be designated as maintenance wounds, however these decisions are made by the interdisciplinary team members involved in the client’s care, in collaboration with the wound clinician or physician / NP.

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Maintenance wounds have the potential to heal but are impacted by client, wound and/or system factors that cannot be mitigated resulting in wound healing that is slow or stalled. The factors that are barriers to healing may change over time and periodic re-evaluation is indicated with maintenance wounds. Wound healing does not occur when:

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

### 3. To Monitor and Manage the Non-Healable Wound (Non-Healable Wound):

Non-healable wounds are sometimes called palliative wounds because their inability to heal may be due to an untreatable cause such as cancer. These wounds may be stable or may deteriorate over time. Wound healing is not possible because:

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

## Interventions

Develop a plan of care, in collaboration with the client and/or client's caregivers that incorporates client care, treatment of risk factors, wound care goals, wound management, intended and unintended outcomes, client education and discharge plans.

## **Client Care Management**

### 1. Client Concerns

- a. The plan of care should take into account client and/or family abilities, concerns, preferences and motivation for treatment.
- b. Refer to Social Work, if available for assistance with financial concerns or for emotional and psychosocial counselling, if needed.
- c. Refer the client to the appropriate professionals for input to improve health, such as improved diet, offloading or exercise plans, and thereby to improve wound healing.
- d. Provide support to clients and families when ulcers are unhealable or develop at the end of life and incorporate client and client's caregiver's wishes into the plan of care.

### 2. Treat Risk Factors for Wound Healability

- a. Refer for appropriate footwear as required.
- b. Encourage clients to take medication as prescribed.
- c. Encourage clients to monitor pre-existing illnesses such as stroke, heart failure, angina / MI & other cardiac problems, hypertension, PVD, renal problems, cancer and/or high lipid levels and consult a physician / NP if changes occur.
- d. Support clients to stop smoking and discuss referral to a smoking cessation program. Refer for harm reduction / substance use management if available and the client consents.
- e. Based on client assessment, collaborate with a PT/ OT to assess and recommend the use of equipment and pressure redistribution devices and to develop a mobilization / activation plan if appropriate.
- f. Nutritional Care:
  - i. Consult with a dietitian, if available if the wound is not healing and/or the client has one or more of the following:
    - Nutritional risk factors such as weight loss, dehydration, obesity, poor intake, poor glycemic control, TPN / tube feed.
    - Abnormal pre albumin values in non-acute clients with chronic wounds.

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- The client has a pressure sore and Braden Scale nutrition subscale score 2 or less out of 4.
  - ii. Maximize the client's nutritional status through adequate protein and calorie intake <sup>7</sup> unless contraindicated.
  - iii. Reassess the need for protein supplements and additional fluids as the client's condition changes.
  - iv. Encourage 1500 – 2000 ml of fluid daily or 30 ml or more / kg of body weight. <sup>8</sup> Offer fluids q 2h for adult clients with dehydration, fever, vomiting, profuse sweating, diarrhea or heavily draining wounds, unless contraindicated, e.g. organ failure.
  - v. Refer to the appropriate professional if the client has difficulty swallowing or poor dentition.
  - vi. Document the % of food and fluid and record any issues with diet tolerance or acceptance.
3. Pain Relief
- a. If the client has wound pain and/or treatment-related pain, organize care to coordinate with analgesic administration allowing sufficient time for the analgesic to take effect.
  - b. 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.
  - c. Refer to a physician / NP to determine the need for topical analgesics (e.g. morphine) or anaesthetics (e.g. EMLA <sup>9</sup>, lidocaine) if wound pain is not well controlled. Consult with a pharmacist regarding topical morphine dosage as guidelines are not available in standard drug information resources such as the CPS or LexiComp.
  - d. Use appropriate medication to control neuropathic pain, if present.
  - e. Encourage clients to request a "time-out" during painful procedures.
  - f. Use dressings that are less likely to cause pain and trauma on removal (non-adherent dressings), or dressings that require less frequent changes.
  - g. Reduce wound pain by keeping the wound bed covered and moist if consistent with the goal of care.
  - h. Encourage repositioning and pressure redistribution as a means to reduce pain.
  - i. Reassess pain at regular intervals and note any increase in severity.
4. General Skin Care
- a. Cleanse skin gently with a pH balanced, non-sensitizing skin cleanser and moisturize the skin with lotions or creams. Do not apply moisturizer in skin folds and between the toes. Avoid moisturizers with allergens such as perfume, lanolin, preservatives, emulsifiers and stabilizers.
  - b. Avoid hot water, excessive scrubbing and friction. Use a soft cleaning cloth and pat the skin dry.
  - c. Inspect the skin for any new or additional skin damage each time the client is turned or repositioned.
  - d. Avoid massaging over bony prominences.

## Wound Care Management

1. Reassess the wound at every dressing change and do a full wound assessment weekly or as required by agency policy and the status of the wound. Change the client's care plan based on the findings of the wound assessment.
2. A wound clinician and / or physician / NP must be notified if the wound does not show signs of healing 3 weeks after initiating treatment or if the wound deteriorates.
3. Goals of Wound Treatment:
  - a. Goal of Care: To Heal the Wound Using Moist Wound Healing
    - i. Debride dead tissue in a timely fashion using an appropriate debridement method.
    - ii. Once the wound bed is debrided, minimize dressing changes to maintain wound temperature and protect against infection while maintaining moisture balance.
    - iii. Cleanse an open wound bed using an appropriate cleansing method.
    - iv. Ensure moisture balance within the wound to stimulate granulation tissue and epithelialization.

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<sup>7</sup> Clients with chronic wounds should receive 35 kcal / kg of energy dense foods per day including 1.5 g of protein / kg.<sup>26</sup> Assess renal function if increased protein intake is indicated.

<sup>8</sup> Assess for renal or liver dysfunction and heart failure if increased fluid intake is indicated.

<sup>9</sup> Note that EMLA is only recommended for treatment of venous leg ulcers.

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- v. Loosely fill undermining, sinuses and tunnels to ensure that healing occurs from the base of the wound.
  - vi. Maintain an open wound edge to support epithelialization and prevent wound edges from rolling.
  - vii. Monitor for and treat signs and symptoms of infection.
  - viii. Protect the peri-wound skin.
  - ix. Promote client comfort and treat pain.
- b. Goal of Care: To Maintain the Wound Using Moist Wound Healing
- i. Use moist wound healing unless contraindicated.
  - ii. Cleanse the wound bed with an appropriate cleansing method unless contraindicated.
  - iii. Ensure moisture balance within the wound unless contraindicated.
  - iv. Monitor for and treat signs and symptoms of infection.
  - v. Minimize dressing changes to maintain wound temperature and protect against infection.
  - vi. Loosely fill undermining, sinuses or tunnels to ensure that healing occurs from the base of the wound.
  - vii. Maintain an open wound edge if possible to support epithelialization and prevent wound edges from rolling.
  - viii. Protect the peri-wound skin.
  - ix. Promote client comfort and treat pain.
- c. Goal of Care: To Heal the Wound Using Dry Wound Healing
- i. If dry, stable eschar develops, do not remove the eschar and keep the wound dry.
  - ii. Apply an antiseptic/cover dressing to dry wounds if recommended by a wound clinician or physician / NP.
  - iii. If the eschar becomes soft and boggy, refer to a wound clinician or physician / NP. Cleansing and debridement may be done to reduce bacterial burden or reduce odour if recommended by a wound clinician or physician / NP.
  - iv. Monitor for and treat signs and symptoms of infection.
  - v. Promote client comfort and treat pain.
  - vi. Protect the peri-wound skin.
- d. Goal of Care: To Monitor and Manage the Non Healable Wound
- i. Monitor for deterioration in the wound bed, e.g. a Kennedy Terminal ulcer, a fungating malignant wound or dry gangrene that becomes wet.
  - ii. If dry stable eschar develops, do not debride the eschar and keep the wound dry. Apply an antiseptic to dry wounds if recommended by a wound clinician or physician / NP.
  - iii. If eschar becomes soft or boggy, refer to a wound clinician or physician / NP.
  - iv. Monitor for and treat signs and symptoms of infection.
  - v. Promote client comfort and treat pain.
  - vi. Cleansing and debridement may be done to reduce bacterial burden or reduce odour in non-healing moist wounds if recommended by a wound clinician or physician / NP.
  - vii. Protect the peri-wound skin.
4. Cleansing Wounds: (Link to [Wound Cleansing Procedure](#))
- a. When cleansing the wound, use personal protective equipment to protect from back-splash.
  - b. Choose the appropriate aseptic technique (sterile, no-touch or clean) based on the clinical condition of the client, the etiology of the wound, the invasiveness of the dressing procedure, the goal of care and agency policy.
  - c. The choice of cleansing method and type of wound cleansing solution is based on wound characteristics such as the presence of undermining, sinuses, tunnels, necrotic slough, and localized wound infection.
  - d. Sterile normal saline or sterile water are the preferred and usual solutions for wound cleansing. A non-cytotoxic antiseptic cleansing solution may be used for wound cleansing if needed.
  - e. For wounds in which the local bacterial burden is of greater concern than healing, antiseptic solutions such as povidone iodine or chlorhexidene may be used for cleansing based on the recommendation of a wound clinician or physician / NP. Many antiseptic solutions are cytotoxic and will delay wound healing so should only be used until the S&S of bioburden or local wound infection are resolved.
  - f. The following two cleansing methods deliver 8 – 15 psi of pressure which is enough pressure to remove necrotic tissue, slough, bacteria and debris without damaging granulation tissue:

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- A squeezable 30 – 100 ml sterile normal saline container designated for wound cleansing and held 10-15 cm (4-6 inches) from the wound.
  - OR
  - A 30 – 35 ml syringe with a wound irrigation tip catheter or an 18 - 19 gauge device and held 10-15 cm (4-6 inches) from the wound.
- g. Do not cleanse wounds that are covered with dry, stable eschar.
- h. **Undermining, sinuses and tunnels can only be irrigated when there is a known endpoint.**
- i. **Do not irrigate undermining, sinuses and tunnels which extend beyond 15cm (6 inches) unless directed by a physician / NP.** The length of a cotton-tipped applicator or metal probe is 15cm.
- j. Use of potable tap water for wound cleansing is acceptable but should be based on agency guidelines or direction from a wound clinician.
- k. Showering may be appropriate in some situations and is preferable to tub bathing. However the decision to shower or bath should be based on agency guidelines and/or direction from a wound clinician.

#### 5. Debriding Wounds:

Wound debridement is indicated for healable wounds when necrotic tissue and/or slough is present and should be initiated in a timely fashion. The choice of debridement technique(s) is dependent upon the clinical condition of the client, the type /amount of necrotic tissue present in the wound, signs & symptoms of infection if present, goal of care and the clinical setting.

- a. Autolytic Debridement - Utilizes the body's enzymes to soften and break down devitalized tissue.
- i. Debridement is facilitated with the addition of moisture, e.g. a hydrogel, and the use occlusive or semi-occlusive moisture retentive dressings to keep the wound moist.
  - ii. Debridement may be further facilitated by scoring eschar.<sup>10</sup>
  - iii. Autolytic debridement with occlusive dressings is contraindicated for infected wounds.
  - iv. Dressings that support autolytic debridement should not be left in place for longer than 3 days so that the progression of wound debridement and any onset of infection can be closely monitored.
- b. Enzymatic Debridement - Utilizes a naturally occurring enzyme, collagenase, which degrades necrotic tissue when applied to the wound surface.
- i. Debridement may be facilitated by scoring eschar.<sup>10</sup>
  - ii. Enzyme use can cause excessive exudate and irritation to peri-wound skin.
  - iii. A moist wound environment must be maintained when using collagenase.
  - iv. A physician / NP order is required for collagenase.
- c. Mechanical Debridement - Physically removes debris 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 can damage healthy tissue when removed.
  - ii. Irrigation is considered mechanical debridement when it is done with a 30 – 35 mL syringe and an irrigation tip catheter or an 18 - 19 gauge device.
  - iii. For some wounds showering may be appropriate but the decision should be based on agency guidelines and direction from a wound clinician.
  - iv. Wipe the wound surface with wet or dry gauze to remove loosely-adherent slough.
- d. Biological debridement – Therapeutic use of sterile, live, medical grade maggots (fly larvae) for debriding moist necrotic tissue and slough. (Link to [Maggot Debridement Therapy DST](#))
- i. Is very selective removing only devitalized tissue.
  - ii. Can be used with infected wounds and wounds with biofilm.
  - iii. Is a restricted nursing activity; requires the completion of additional education and that nurses follow an established guideline when carrying out this treatment.

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<sup>10</sup> Registered nurses must successfully complete additional education before scoring eschar with a sharp instrument. Agency / health authority policy and standards must be in place to support this practice.

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- e. Conservative Sharp <sup>10</sup> Wound Debridement – Removes devitalized tissue and/or biofilm using a sterile scalpel, scissors or curette to cut down to the level of viable tissue. Less invasive than surgical debridement, causes no or minimal pain, may cause minimal bleeding. (Link to [CSWD DST](#))
    - i. Must be done by a registered nurse, wound clinician or a physician / NP competent to carry out CSWD and within agency policy.
    - ii. Is a restricted nursing activity, requires the completion of additional education and related clinical practice before performing conservative sharp wound debridement. Nurses must also follow an established guideline when carrying out this treatment.
    - iii. Need to consider the clinical setting in which the CSWD procedure is to be done to ensure that there are resources available to manage any negative outcome that may arise.
  - f. Surgical Debridement - done by a surgeon in the operating room; debridement is done below the level of non-viable tissue, causes pain and bleeding.
6. Strategies to Prevent and Treat Wound Infection<sup>11</sup> (Link to Wound Infection DST):
- a. Adhere rigidly to hand washing protocols before and after dressing changes.
  - b. Aseptic technique is used to limit the transfer of microorganisms from one person to another by minimizing the microbe count and preventing cross contamination. The technique can be either sterile, no-touch or clean and is chosen based upon the:
    - i. clinical condition of the client
    - ii. etiology of the wound
    - iii. location of the wound
    - iv. invasiveness of the procedure
    - v. goal of care
    - vi. agency policy
  - c. Clients who may require sterile or no-touch technique include, but are not limited to, immune compromised clients, clients taking systemic corticosteroids or cancer medications, wounds with exposed bone or tendon, clients with burns, wounds at high risk for infection (arterial and diabetic wounds) and clients receiving CSWD.
  - d. Debride non-viable tissue in a timely fashion using a debridement method that is appropriate for the client condition, the wound and clinical setting.
  - e. Non-sensitizing broad-spectrum antimicrobial dressings are used to treat a localized wound infection, significant bio-burden or may be used for wounds that are not healing despite appropriate cleansing, debriding and moisture balance management. Antimicrobial treatment needs to be reassessed after 2 weeks of use with discontinuation of the treatment once the infection has resolved, bio-burden is controlled or the wound shows evidence of healing.
  - f. Normal saline or sterile water containers must be used by only one client and must be dated discarded within 24 hours of being opened if solution is left over.
  - g. Dressing supplies must be single client use only.
  - h. Use the smallest size of dressing that fits into or covers the wound.
  - i. Take only the dressing supplies needed for the dressing change to the bedside or into the home - any supplies taken to the bedside or home cannot be returned to the dressing supply room/shelf and must be discarded.
  - j. For any acute care unit, residential facility or clinic area, client specific supplies must be labeled with the client's name and kept together (e.g. in a labelled paper bag) to ensure easy, quick access to the supplies and to avoid cross-contamination.
  - k. Supplies kept at the home must be kept secure from children or household pets.

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- I. Saving Dressing Pieces <sup>11</sup>
  - When *sterile technique* is required for dressing changes, dressings must be sterile; saved dressings cannot be used.
  - When *no-touch technique* is used for dressing changes, dressings must be either sterile or appropriately saved dressing pieces.
  - If the dressing is larger than required to complete one dressing change, the unused piece(s) of dressing may be saved using the following process:
    - i. In preparation for the dressing change, open the sterile package and place the dressing material onto the sterile dressing tray.
    - ii. Use sterile forceps and sterile scissors to cut a piece of the dressing that fits into or covers the wound.
    - iii. Use sterile forceps to place the remaining dressing piece into a new C&S container or a new re-sealable plastic food storage bag. e.g. Zip-Lok bags. Each dressing needs its own container / storage bag.
    - iv. Seal the container or bag correctly and label the container or bag with the client's name, the date and the name of the dressing.
    - v. Note that once a sterile C & S container is opened to the air it is no longer considered sterile.
    - vi. If using a dressing piece that has been saved:
      - In preparation for the dressing change, use sterile forceps to remove a dressing piece from the container or bag and place the dressing material onto the sterile dressing tray.
      - Use sterile forceps and sterile scissors to cut a piece of the dressing that fits into or covers the wound.
      - Use sterile forceps to place the remaining dressing piece back into the container or bag which has been labeled with the client's name, date and the name of the dressing.
    - vii. After saving dressings for 2 weeks, discard the container or bag and any remaining dressing pieces.
    - viii. If saving another dressing piece, place it in a new C & S container or re-sealable plastic food storage bag using the process described above.
  - When *clean technique* is used for dressing changes, dressings must be clean or must be appropriately saved dressing pieces. Any unused dressings may be saved using the same procedure as for no-touch aseptic technique dressing changes but with the use of clean instruments.
7. Notify a wound clinician or physician / NP if:
  - a. 3 or more signs and symptoms of infection are present unless it is a diabetic wound then one or more symptoms of infection should be discussed with the wound clinician or physician / NP,
  - b. The C & S results are abnormal
  - c. The wound probes to bone if this is a new finding.
  - d. The wound does not show any signs of healing within 3 weeks of initiating appropriate treatment.
8. Strategies to Manage Biofilm:

Under the direction of a physician / NP or wound clinician, the treatment strategy for wounds with biofilm is to<sup>12</sup> 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.

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<sup>11</sup> A literature review did not find any existing guidelines regarding how to appropriately save dressing pieces nor was literature found to refute this practice. An expert consensus process was used to develop this practice for British Columbia. These infection control strategies have been reviewed and approved by the British Columbia Provincial Infection Control Network Management Office.

<sup>12</sup> Registered nurses must successfully complete additional education before scoring eschar with a sharp instrument. Agency / health authority policy and standards must be in place to support this practice

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9. Wound Packing (Link to [Wound Packing Procedure](#)):
  - a. The purpose of packing a wound is to:
    - i. Loosely fill any dead space (cavity, undermining or sinus tract/tunnel) to facilitate the wound 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.
    - iv. Assist with preventing the wound edge from rolling inward.
  - b. For any cavity, undermining, sinus tract or tunnel with a depth of greater than 1cm, document the number of packing pieces removed and number of packing pieces inserted into the wound.
  - c. When packing a dead space it is important to use only one piece of packing whenever possible to avoid a piece of packing being left in the wound. Packing left in the wound can lead to infection and impaired wound healing.
10. Moisture Balance:
  - a. Choose a packing material and cover dressing which keep the wound bed moist but not wet and retain exudate while keeping the peri wound skin dry.
  - b. If adding moisture to the wound bed, such as applying a gel, monitor its effectiveness and discontinue use when additional moisture is no longer required.
  - c. If exudate increases, assess and treat the cause and change to a more absorptive wound filler or cover dressing or increase the frequency of dressing changes.
  - d. Use wicking material or moisture transfer dressings for macerated or open areas in skin folds.
11. Management of hyper-granulation tissue:

Hyper granulation tissue is the result of too much moisture, critical colonization or a local wound infection, friction or movement on the wound surface or the presence of a foreign body, e.g. a suture

  - a. Collaborate with the physician / NP or wound clinician if the client has hyper granulation tissue.
  - b. Treat the underlying cause as well as addressing the excess tissue.
  - c. Treatments such as topical steroid cream (prescription required) and absorptive foam dressings have proven somewhat effective in reducing hyper granulation tissue.
  - d. Silver Nitrate may be used to remove the hyper granulation tissue if other treatments are not effective. It is usually used once daily for 3 – 5 days.
12. Wound Edge Management:
  - a. Maintain an open wound edge to support epithelialization and prevent wound edges from rolling by properly packing the wound
  - b. Ensure that the wound heals as quickly as possible as the longer the wound is open, the more likely that the wound edge will roll.
  - c. 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
13. Peri Wound Skin:
  - a. Keep the peri wound skin clean, dry and intact and apply skin barriers, protectants or moisture barriers as needed to protect the peri wound skin.
  - b. If peri wound excoriation or maceration is present due to excessive exudate, change to a more absorptive dressing, increase the frequency of dressing changes or apply a skin barrier around the wound, if necessary.
  - c. Skin irritation, rash, erythema, scaling and/or maceration may indicate a contact or allergic dermatitis or infection, especially a fungal infection. If this occurs, consult with a wound clinician or physician / NP.

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#### 14. Care for a Closed Wound

Ensure that the closed wound is protected for an extended period of time; the length of time depends upon the presence of risk factors as well as the type and underlying cause(s) of the original wound.

- a. Cleanse the skin gently with a pH balanced, non-sensitizing skin cleanser and apply a moisturizer to the closed area. Avoid moisturizers with allergens such as perfume, lanolin, preservatives, emulsifiers and stabilizers.
- b. Avoid hot water and excessive rubbing or friction over the closed area. Use a soft cloth and pat the skin dry.
- c. Do not reposition the client on an area that is recently closed.
- d. Inspect the area frequently for any new skin breakdown.
- e. Teach the client/client's caregivers strategies to prevent a recurrence of the wound, e.g. the need to wear compression / support stockings for clients with venous insufficiency, clients with closed diabetic ulcers do not walk barefoot, have regular follow-up to monitor glucose levels and the use of off-loading foot devices if required.
- f. Teach the client and/or client's caregivers strategies to prevent a recurrence of the wound.

#### Client Education and Resources

1. Teach the client and/or client's caregivers the following factors that affect wound healing:
  - a. Education concerning relevant disease processes.
  - b. How chronic disease affects the healing process and the importance of adhering to the treatment plan.
  - c. Measures to maintain clean well moisturized skin and avoid all chemical and mechanical traumas to the lower extremities.
  - d. The benefits of smoking cessation and attending a smoking cessation program, if the client is willing.
  - e. Strategies for improving nutrition, especially increasing protein and fluid intake and weight reduction, unless contraindicated.
  - f. Strategies for managing pain during and between dressing changes.
  - g. Signs of complications including wound deterioration, infection, and increased pain and the need to liaise with a health professional when these occur.
  - h. The need for ongoing follow-up with a health care provider at regular intervals.
  - i. Wound healability and the different goals and treatment for maintenance and non-healable wounds if necessary.
  - j. Providing pressure redistribution for heels, toes, and other bony prominences as necessary.
  - k. Care of a closed wound.
2. If the client and/or client's caregivers are able to participate in the actual care of the wound, teach them:
  - a. Signs and symptoms of wound infection and strategies to prevent infection, such as frequent hand washing.
  - b. Wound cleansing and dressing techniques.
  - c. Need for moisture balance, healing wound edges and healthy peri wound skin.
  - d. Appropriate aseptic technique when changing the dressing.
  - e. Reportable changes in the wound.
  - f. 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 client's caregivers about the roles of the interprofessional members on the wound care team.
4. Provide written materials that support or reinforce client teaching.

#### Discharge Planning

1. If discharge is anticipated, discharge planning should be initiated during the initial client encounter and support timely discharge and optimal client independence.
2. If the client's care is being transferred across sectors (acute care, community care or residential care), ensure that the receiving site / facility is provided with a care plan that outlines the current client care and wound management strategies.

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## **Client / Client's Caregivers Outcomes**

### **Intended Outcomes**

1. Intended Outcomes for Healable Wounds
  - a. The wound heals.
  - b. The client and client's caregivers understand their role in preventing further tissue damage and incorporate recommended activities and interventions to treat risk factors, prevent infection, and support wound healing into their daily activities.
2. Intended Outcomes for Maintenance Wounds
  - a. The wound is stable.
  - b. The level of pain or discomfort in the wound is acceptable to the client and/or the client's client's caregivers.
  - c. Wound exudate is controlled and there is no odour evident from the wound.
  - d. The wound is free from infection.
  - e. The wound does not prevent the client from engaging in routines and activities that are normal for them.
  - f. The wound is re-categorized as a healable wound if client's participation or the status of risk factors changes and/or resources, equipment and supplies become available.
3. Intended Outcomes for Non-Healable Wounds
  - a. The level of pain or discomfort in the wound is acceptable to the client and/or the client's caregivers.
  - b. The level of generalized pain is acceptable to the client and/or the client's caregivers.
  - c. Wound exudate is controlled and there is no odour evident from the wound.
  - d. The wound is free from infection.
  - e. Care needs are met and the client indicates that they are comfortable.
  - f. The wound does not prevent the client from engaging in routines and activities that are normal for them; however other health concerns may limit activities.

### **Unintended Outcomes**

1. Unintended Outcomes for Healable Wounds
  - a. The wound does not heal.
  - b. The level of pain or discomfort in the wound is not acceptable to the client.
  - c. The wound shows signs of infection and/or deteriorates.
  - d. The client and client's caregivers do not understand and/or act on their role in preventing further tissue damage and do not incorporate recommended activities and interventions to treat risk factors prevent infection, or support wound healing into their daily activities.
2. Unintended Outcomes for Maintenance Wounds
  - a. The wound deteriorates.
  - b. The level of pain or discomfort in the wound is not acceptable to the client.
  - c. Wound exudate is not controlled and/or wound odour is present.
  - d. The wound is infected.
  - e. Care needs are not met and the client indicates that they are uncomfortable.
  - f. Because of the wound the client is not able to engage in routines and activities that are normal for them.
3. Unintended Outcomes for Non-Healable Wounds
  - a. The level of pain or discomfort in the wound is not acceptable to the client.
  - b. The level of generalized pain is not acceptable to the client.
  - c. Wound exudate is not controlled and/or wound odour is present.
  - d. The wound is infected.
  - e. Care needs are not met and the client indicates that they are uncomfortable.
  - f. Because of the wound the client is not able to engage in routines and activities that are normal for them.

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## Documentation

1. Document initial and ongoing assessment as per agency guidelines (Link to Wound Assessment and Treatment Flow sheet).
2. Document care plans, clinical outcomes and care plan revisions as per agency guidelines.

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### **Document Creation/Review**

The strategies for the prevention and treatment of infection which are laid out on page 11 have been reviewed and approved by the British Columbia Provincial Infection Control Network Management Office for use within the province of British Columbia.

<b>Created By</b>	British Columbia Provincial Nursing Skin and Wound Committee in collaboration with the Wound Clinicians from across all Health Authorities
<b>Publication Date</b>	September 2014
<b>Revision Date(s)</b>	December 2014, June 2015
<b>Review Date (s)</b>	September 2017

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