

# Lower Limb Lymphedema

This BPR Brief is an abridged version of the **Best Practice Recommendations for the Prevention and Management of Wounds Related to Lower Limb Lymphedema**. In alignment with a global health-care perspective, Wounds Canada is committed to provide support to patients to help them adapt to and self-manage their condition in the face of social, physical and emotional challenges. This document uses the Wound Prevention and Management Cycle (WPMC) (Figure 1) as the basis for clinical decision making. For clinicians, this document is meant as a cue for treatment; it provides non-inclusive examples listed below each recommendation. For policy makers, it highlights (in ***bold italics***) actions and policies that support best practice.

Wounds Canada follows a population health strategy for wound care that enables us to address the entire range of individual and collective factors that determine health, including:

- Better health: health of the general population improved; behavioral, social, economic and environmental determinants addressed; preventative care rewarded
- Better health care: patient-centred, reliable, safe, evidence-based treatment; care managers co-ordinate total health-care delivery; evidence-based treatment with outcome tracking
- Better value: costs and cost improvements monitored; readmissions to hospital reduced; early interventions to reduce per patient cost implemented; unnecessary or duplicate procedures eliminated; information management technologies utilized

For more information on content, levels of evidence or tools related to a particular recommendation, click on the links provided.

We strongly recommend that before using this BPR Brief the user read the full best practice recommendation (BPR) document. To obtain a copy of the full document, go to: <https://www.woundscanada.ca/news/752-bpr-new>.

## Introduction

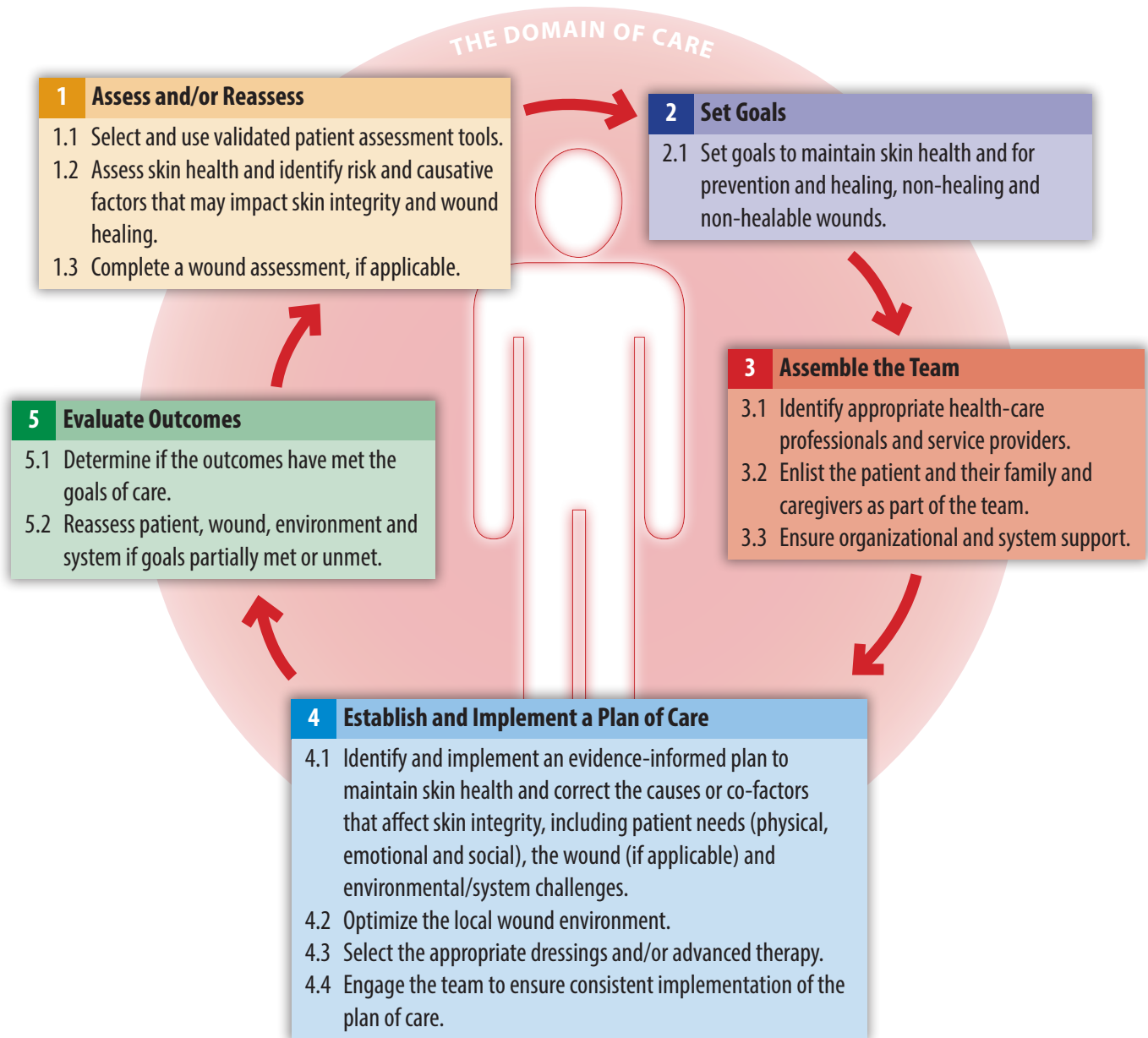
Lymphedema, often termed a hidden disease, is generally under-assessed and under-appreciated by health-care providers.

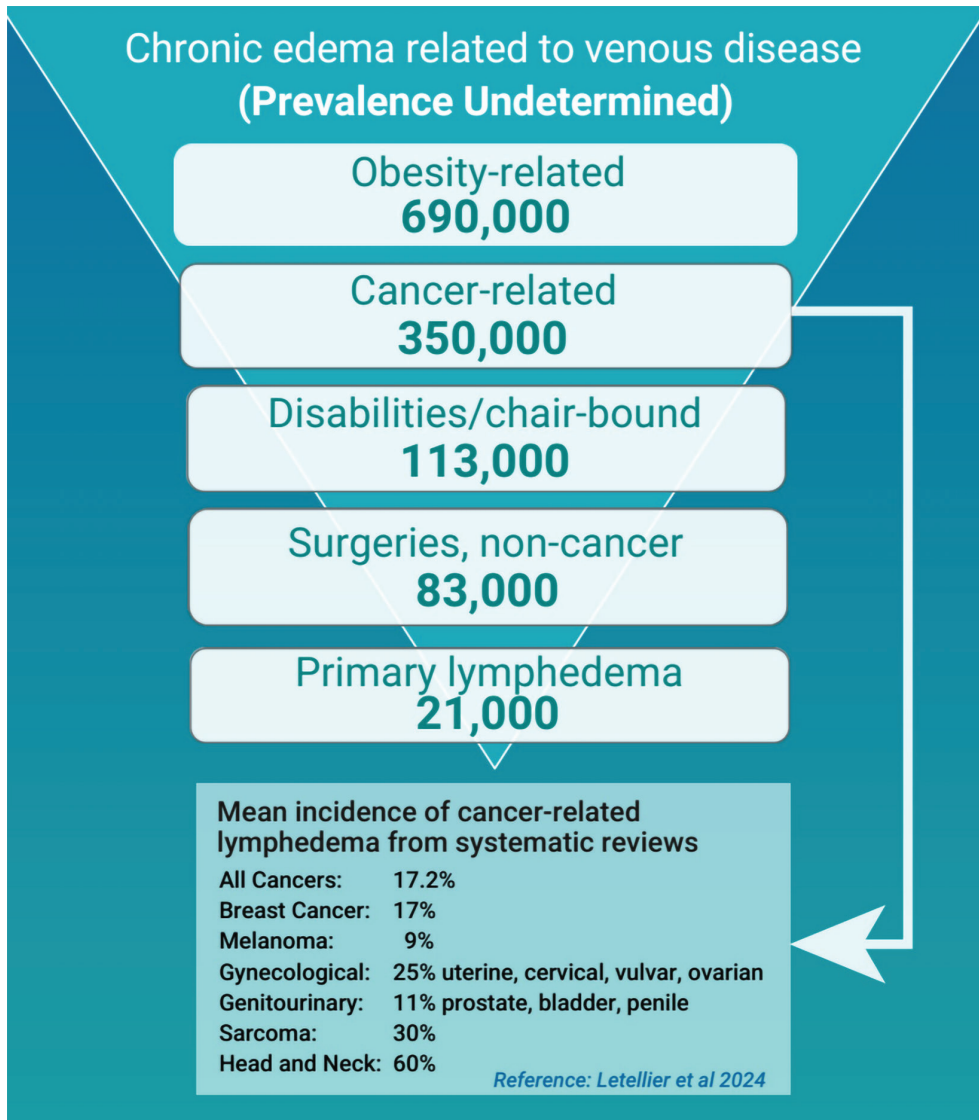
Edema that persists for more than three months and is minimally responsive to limb elevation and/or diuretics is defined as chronic edema. All chronic edema involves lymphatic dysfunction and is appropriately classified as lymphedema (LE).

Lymphedema affects more than 200 million people worldwide. The prevalence of LE in Canada is approximately 1.25 million (based on 41.5 million population), but the condition is underdiagnosed and undertreated. LE is associated with obesity, the rates of which are increasing in Canada. Because of these factors it is important that patients receive timely assessment, diagnosis and referrals for activation of treatment, with an important focus on skin health and the prevention and management of wounds related to LE. This is crucial, as wound care is a costly concern to the health-care system and more research is needed to fully appreciate the impact of LE on this issue.

**Disclaimer:** This document provides a brief clinical enabler for the content provided in the relevant chapter(s) of *Best Practice Recommendations for Skin Health and Wound Management 2025*. It is not intended to provide comprehensive information on the given topic(s). For more complete information on specific best practice recommendations, refer to the full publication at: <https://www.woundscanada.ca/news/752-bpr-new>

**Figure 1:** Wound Prevention and Management Cycle (WPMC)



**Figure 2:** Lymphedema and Chronic Edema Potential Prevalence, Canada 2024


## What is Lymphedema?

Lymphedema, whether congenital or secondary, is a serious, debilitating and progressive condition that develops when protein-rich fluid accumulates because the ability of the lymphatic system is inadequate to transport the excessive interstitial fluid. The fluid accumulation is most commonly seen in the extremities. The condition may range from mild to serious and affect patients of all ages, impacting quality of life, employment/employability, mobility and social and emotional wellness. Individuals who develop LE live with chronic, progressive swelling, skin changes, risk of infection, emotional distress and pain. Therefore, a holistic approach to lifelong care is required, including multiple referrals and reports from an interprofessional team whose members may represent lymphology, rheumatology, dermatology, endocrinology (diabetes mellitus), orthopedics and internal medicine (renal, cardiac, respiratory, bariatric) to determine causality.

Early diagnosis of LE is critical, as the disease is progressive. In the past, chronic leg edema (over three months) was not identified as LE. Recently, international experts have determined that though the pathology of chronic edema and LE may differ, the disorder is to be considered similar, as the overload or impairment of the lymphatics is the constant factor.

For the complete version of Best Practice Recommendations for Lower Limb Lymphedema, visit [here](#).

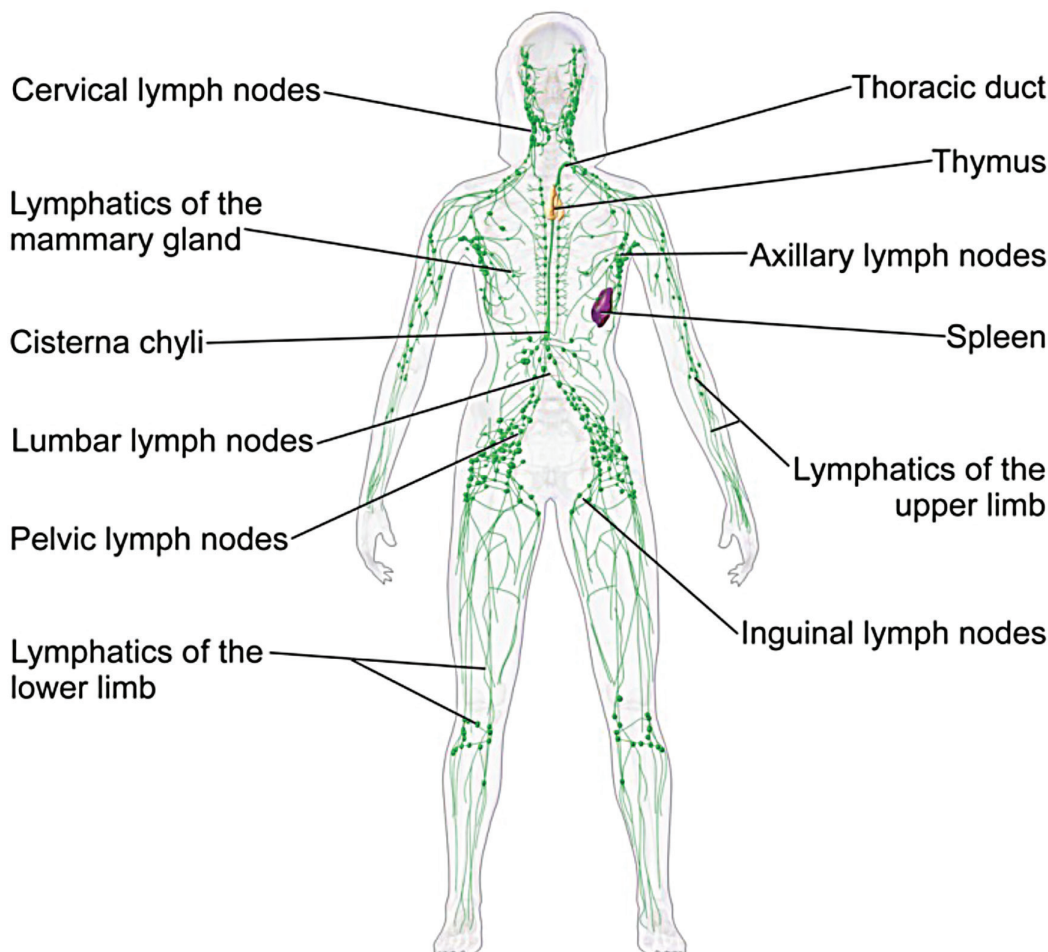
Patients diagnosed with lower limb LE often live with other co-occurring diseases/disorders such as obesity. To understand the state of LE in Canada, Wang and Keast (2016) reviewed 326 LE patients and found an average of 7.3 comorbid conditions that were potentially related to the development of chronic edema; hence the term complex lower extremity edema. Of importance is that they reported that 45% of patients were found to be morbidly obese.

Other causes of lower extremity LE include phlebo-lymphedema, most commonly known as chronic venous insufficiency (CVI) (41.8%), cancer-related lymphedema (33.9%), primary lymphedema (12.5%) and lipedema with secondary LE (11.8%).

## Pathophysiology

Understanding the pathophysiology of LE is important for successful assessment and management of the disease. It is important to consider the lymphatics, arteries and veins together. The lymphatics are responsible to, “mobilize all excess tissue fluid...have an immune function and a key role in fat metabolism. Lymphatics absorb fat from the digestive system and transport it as chyle to the circulatory system. It is known that LE and fat metabolism are linked”.

**Figure 3:** The Lymphatic System



## Lymphedema and the Development of Wounds

Slow- and non-healing wounds associated with LE are more likely to be identified in the lower extremity than upper limbs (most upper limb LE is related to breast cancer treatment). The higher intravascular hydrostatic pressure related to gravitational forces, chronic dependency and failed calf-muscle pump action in the lower limb result in higher filtration rates. This then leads to accumulation of tissue fluid, overwhelms the lymphatic capacity and results in subsequent inflammatory lymphatic dysfunction.

### 1 Assess and/or Reassess

- 1.1 Select and use validated patient assessment tools.
- 1.2 Assess skin health and identify risk and causative factors that may impact skin integrity and wound healing.
- 1.3 Complete a wound assessment, if applicable.

Assessment must occur to determine the causes and factors that may impact skin integrity and wound healing. Patient assessment include overall health status: skin status (and wound status, if applicable); environmental and system factors. If, after the WPMC has been completed, goals of care have not been fully met, reassessment must take place, followed by the rest of the recommendations in the WPMC. **Assessment tools need to be available and in use in all care settings, supported by staff education and policy.**

#### 1.1 Select and use validated patient assessment tools

Currently, there are no specific validated assessment tools for identifying LE risk factors that may affect intact skin; therefore clinicians should use general skin and wound assessment tools. Circumferential limb measurements are used to monitor progress in reducing chronic edema. The most common method is to measure with a tape measure at the ankle, knee and at a defined distance in centimeters above and below the knee. The points used depend on the areas of the limb that are most edematous.

**Health-related quality of life** tools must be completed. For a full description of lymphedema-related quality of life tools and further information, see [https://rees-france.com/wp-content/uploads/2022/05/Health\\_related\\_Quality\\_of\\_Life\\_Measurement\\_Tools.pdf](https://rees-france.com/wp-content/uploads/2022/05/Health_related_Quality_of_Life_Measurement_Tools.pdf).

#### 1.2 Assess skin health and identify risk and causative factors that may impact skin integrity and wound healing

Given the complex nature of LE there are many risk factors that impact the health of the patient that clinicians should consider while conducting the holistic patient assessment.

##### 1.2.1 Patient: Physical, emotional and lifestyle

Lower limb LE requires early diagnosis to support goal setting, care planning and the implementation of preventative strategies that include patient education focused on risk factors. A comprehensive physical and lower limb assessment should be completed and communicated to the team members.

For steps on completing a lower limb assessment see [Chapter 12: Best Practice Recommendations for the Prevention and Management of Venous Leg Ulcers](#).

Independent risk factors are identified through assessment and impact of risk factors. Assessment includes:

- Health history
- Medications (prescribed, over the counter, other)
- Social history
- Employment

Examination (height, weight, BP, joint mobility, gait, ankle-brachial assessment, limb assessment (skin), nail and foot and wound assessment, compression therapy, laboratory findings, and pain assessment.

### 1.2.2 Environmental: Socio-economic, care setting and potential for self-management

Health-care professionals must have knowledge about the environmental factors that can impact the skin health of a person living with LE. These factors include the ability for self-care, socio-economic conditions (employment type, income and benefits to fund bandaging system or compression garment design), living situation and environmental factors. The understanding of self-management specific to LE is growing, but more research is needed to focus on patient-centred outcomes and the impact of clinicians and systems. The key challenge with self-care approaches is how much the patient and the care partner can manage without it leading to emotional, physical and financial burden overload.

### 1.2.3 Systems: Health-care support and communication

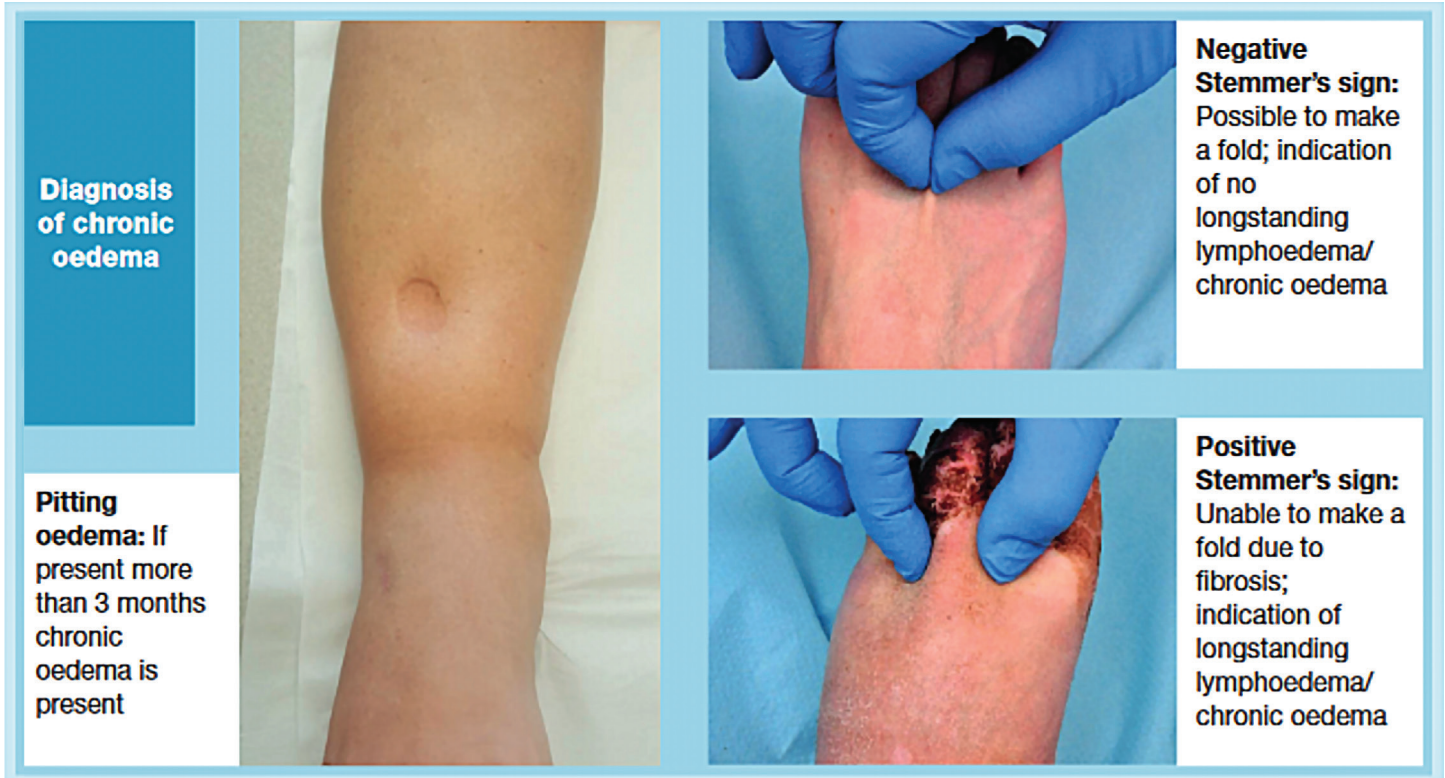
Health ministries and health-care professionals are responsible for addressing the prevalence of LE, its association with multiple chronic illness and the burden to the health-care system. Yet not all provinces/territories capture the diagnosis consistently using the International Statistical Classification of Diseases and Related Health Problems (ICD codes); some provinces/territories use different billing codes or have no billing codes for LE (assessment and management). As a result, data for research may not be fully available, and prevalence and incidence rates may be significantly underreported.

## 1.3 Complete a skin and wound assessment, if applicable

Complete a baseline skin/wound assessment as part of the comprehensive lower limb assessment.

**Skin Assessment:** Fife et al. identified skin disorders related to LE

- Directly caused by LE:
  - LE-related inflammatory processes leading to disfigurement of the associated limb or affected limb, and/or
  - Lymphorrhea – lymphatic fluid that drains directly through the skin that leads to tissue maceration and breakdown
- Indirectly related to LE:
  - Pressure ulceration from the weight of the limb(s)
  - Venous leg ulcers with a mixed venous/lymphatic origin, such as venous stasis
- Associated with the diseases causing LE, such as cancer
- Associated with LE treatment, such as poorly wrapped bandaging and ill-fitting compression garments and/or devices.

**Figure 4:** Diagnosis of Chronic Edema/Lymphedema

**Lymphedema Classification:** Lymphedema can be classified in several ways, with the goal of identifying the disease progression and severity. In this BPR brief we discuss the ISL staging system.

**Figure 5:** Staging of Lymphedema

## Wound Assessment

When completing a comprehensive wound assessment it is important to know the underlying LE causes and factors and know the other co-morbidities with which the patient has been diagnosed. To accurately assess all wounds, plan assessment when compression bandaging and garments are being applied as part of the patient's routine. Document wound(s) using validated tools to promote clear communication among team members. Monthly photography assists with the documentation of the full scope of the lower limb LE and associated wound issues.

Determine if the wound is healing or non-healing, healable or unhealable.

**A healing wound** is progressing through the normal stages of healing on an appropriate timeline.

**A wound is considered healable** if the LE-related cellulitis of the lower limb is localized and has sufficient vascular supply, underlying causes such as infection can be corrected and overall skin health and compression therapy can be optimized.

**A wound is considered to be non-healing** if the cellulitis is extensive, healing has stalled and the wound has healing potential, but various factors—such as smoking, high body weight and/or uncontrolled edema—are compromising skin health and wound healing. The patient may not tolerate the compression therapy or compression bandaging or devices may not be available to, or affordable for, the patient.

**A wound is considered non-healable** when it has no ability to heal due to untreatable causes such as terminal disease, significant peripheral arterial disease, smoking, obesity (morbid) that cannot be treated surgically, end stage malignant disease (such as extensive, inoperable tumours) or end-of-life status. If the wound is deemed to be non-healable, goals should be set that reflect management strategies for activities that prevent infection, protect the fragile periwound and other skin to prevent further skin breakdown and provide comfort for the patient.

For more information on wound assessment tools see Chapter 4: Best Practice Recommendations for the Prevention and Management of Wounds: An Overview. [HYPERLINK](#)

## 2 Set Goals

### 2.1 Set goals to maintain skin health and for prevention and healing, non-healing and non-healable wounds.

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Prior to, or in the presence of, diagnosed LE, the primary goal for the integrated team is to promote skin health, prevent the progression of LE and support patient engagement in compression therapy, medical management of underlying co-morbid diseases, physical exercise, weight and medication management and mental health. Though LE is not fully preventable, progression can be slowed.

Holistic goal setting with patients who have LE must involve the integrated team and be based on consistent and effective communication. Goals must be developed according to the SMART principle in col-

laboration with the patient, family and/or care partner, and adjusted as needs change over time. For more information on SMART goal setting, please see [Chapter 4: Best Practice Recommendations for the Prevention and Management of Wounds: An Overview](#).

### 2.1.2 Identify quality-of-life and symptom-control goals

Quality-of-life and symptom-control goal setting requires that the integrated team set realistic goals around smoking cessation, appropriate garment use, medication management, ADLs such as exercise and physical activity and the impact of skin changes and CDT on the patient's daily life.

## 3 Assemble the Team

- 3.1 Identify appropriate health-care professionals and service providers.
- 3.2 Enlist the patient and their family and caregivers as part of the team.
- 3.3 Ensure organizational and system support.

### 3.1 Identify appropriate health-care professionals and service providers

Health-care providers working with patients and their caregivers need to be trained in LE assessment and management. When caring for patients living with LE, clinicians need to understand anatomy and physiology, pathophysiology, multi-organ systems (skin, cardiac, renal, respiratory), mental health, mobility and exercise and collaborative care.

Ideally, clinicians would all be in a specialized centre, but in reality patients will be assessed by individual clinicians and specialists using in-person, online, web-based and tele-medicine approaches. Through use of technology and strong communication skills, clinicians specialized in LE can create a community of practice in which the patient and care partner are the centre.

### 3.2. Enlist the patient and their family and care partners as part of the team

Proactive skin health should be a priority for patients living with lower limb LE. For patients who develop skin complications and wounds, healing is often a complex process because of related underlying co-morbidities. Providing early encouragement and education to patients and their care partners enhances their engagement and understanding of how they can participate effectively in the LE care process. It's important to note that some patients who have had a delay in diagnosis may be frustrated when clinicians try to engage them in efforts to improve their quality of life through education and resources.

### 3.3 Ensure organizational and system support

Successful LE programs are patient-centred and include an integrated team of clinical practice leaders, educators, researchers, policy makers and administrators at a local, regional, provincial/territorial and national level. Organization and system support is required to ensure patients with LE to receive co-ordinated transition of care through community and health-care agencies. This level of collaboration and co-operation is essential as patients' needs will change as their LE progresses and as they live with other co-morbidities.13

Patients with LE require relevant home and community care services focused on improving and maintaining their quality of life,<sup>42</sup> along with adapting and modifying their work and engagement in life.

Organizations must support the education of staff so they obtain and maintain the required knowledge and skills to be effective members of the lymphedema care team. It is essential that LE health-care provider education includes a needs assessment to identify knowledge, skill and attitude gaps. Education should address the identified short and long-term gaps and be provided using the principles of adult learning.

The Canadian Lymphedema Framework lists several private schools that provide LE education and training that meet the Lymphology Association of North America requirements. See <https://www.canadalymph.ca/health-professionals/schools/> for more information

## 4 Establish and Implement a Plan of Care

- 4.1 Identify and implement an evidence-informed plan to maintain skin health and correct the causes or co-factors that affect skin integrity, including patient needs (physical, emotional and social), the wound (if applicable) and environmental/system challenges.
- 4.2 Optimize the local wound environment.
- 4.3 Select the appropriate dressings and/or advanced therapy.
- 4.4 Engage the team to ensure consistent implementation of the plan of care.

### 4.1 Identify and implement an evidence-informed plan to maintain skin health and correct the causes or cofactors that affect skin integrity, including individual needs (physical, emotional and social), the wound (if applicable) and environmental/system challenges

Standard prevention and treatment of LE involves patient-centred Complete Decongestive Therapy (CDT) with the overarching principles of promoting and supporting patient engagement in daily activities. The patient and care partner should receive skin health education related to handwashing and meticulous skin care to prevent skin breakdown, as well as information on the anatomy and physiology of the skin and other relevant areas of the body, management and wearing of individualized compression garments, proper footwear, exercises and management of wounds. They should also receive mental health and well-being support.

Based on a comprehensive assessment, care approaches begin with phase 1. Treatments may include:

- Meticulous skin care using pH-balanced soaps and unscented emollients (moisturizers)
- Routine nail care
- Education focused on using, managing and daily washing of garments
- Specific light manual massage – manual lymphatic drainage (MLD) with a therapist or taught to the patient (termed self-MLD)

- Limb elevation, range of motion and calf-muscle- and ankle-pumping exercises
- Deep-breathing exercises
- Compression therapy typically applied with multilayer wrapping (short-stretch) and hook-and-loop devices, taught by a trained therapist.

For more information on short short-stretch compression bandaging see [Appendix D: Parkwood Wound Clinic Protocol for Application of Short-Stretch Compression Bandages](#).

Phase 2 treatments, may include:

- Continuing phase 1 activities and optimizing education
- Compression therapy: low-stretch elastic stocking or sleeves and reusable, adjustable or fastened devices may be used once taught by a trained therapist.
- It is important to note that compression garments or massage therapy alone may not be effective. These approaches require further research.

Wounds Canada: Care at Home Series provides additional information for the prevention and care of wounds at home. <https://www.woundscanada.ca/patient-or-caregiver/resources/care-at-home-series>

## Skin Care

Patients or their care partners will be doing most of the basic skin care at home, so they need to be confident about their knowledge and skills related to hand hygiene, meticulous leg skin care, lotion application (medicated, non-medicated), identifying new skin changes, completing nail and foot care and managing compression garments, including daily washing of compression (circular and flat) garments, resetting the elastic and returning the garment to its original shape.

Patients wearing reusable (hook and loop) systems need to know the 'under stocking' requires daily washing for cleanliness.

Many patients with LE stage 2 or 3 frequently have deep skin tissue folds in the lower extremity and may have loss of the normal space between their toes. Therefore, care must be taken to clean skin folds daily with a mild pH-balanced cleanser, and ensure folds are carefully dried to prevent skin breakdown. Daily inspection of these folds is necessary to prevent local and deep tissue infections as a result of disruption to the normal skin barrier function. Patients may need mirrors and personal assistance to conduct their daily lower limb inspection.

Monthly photography of skin is encouraged to monitor for changes. Care partners can assume some of this responsibility but should not be the sole provider due to partner fatigue and burnout.

Skin-related prevention strategies must be regularly reassessed to ensure they remain appropriate.

Wounds Canada: Caring for Your Swollen Legs at Home is an excellent patient resource that is part of the Care at Home Series: <https://www.woundscanada.ca/patient-or-caregiver/resources/care-at-home-series>. It can be used as a teaching tool and left with patients and care partners to refer to when needed.

More patient information can be found at The Canadian Lymphedema Framework: Hints and Tips <https://www.canadalymph.ca/hints-and-tips/> and Skin Care available <https://www.canadalymph.ca/skin-care/>.

## Manual Lymphatic Drainage

Manual lymphatic drainage (MLD), also called lymphatic drainage massage, is a gentle massage done to stimulate the lymphatic vessels and to relieve or reduce the swelling in the limb. This can be done by a trained therapist or the patient or care partner with training.

### Exercise

Exercise programs should be part of a long-term commitment for a patient living with LE. The programs should be relevant to the patient's underlying co-morbidities and stage of LE and should engage care partners and family members, as appropriate. Exercise programs should be individualized by a physical therapist and may be unsupervised or supervised, depending on the patient's health status and co-morbidities.

## Compression Therapy

Prompt application of compression therapy is the cornerstone of LE treatment and lifelong edema management. It is essential that the clinician obtain an ankle-brachial pressure index (APBI) prior to application of compression therapy to the lower limb(s). In cases where obtaining an APBI is challenging, vascular studies should be considered in collaboration with the team and patient.

After a holistic assessment, and if vascular status permits, discuss compression therapy with the patient as one of the essential components for the treatment and management of lymphedema. If the patient agrees, compression therapy can be initiated.

**Table 1:** Compression Garment Design

Type	Properties
<b>Circular knit garment</b>	<ul style="list-style-type: none"> <li>Ready to wear (stocking, arm sleeves)</li> <li>Manufactured in a cylindrical form</li> <li>Supplied with compression gradients of 15–20 mmHg, 20–30 mmHg and 30–40 mmHg in standardized sizes for average-shaped limbs</li> <li>Due to their elastic nature, pressure variations under circular knit garments are minimal with movement</li> </ul>
<b>Flat knit garment</b>	<ul style="list-style-type: none"> <li>Custom measured and designed to fit the patient's specific anatomical extremity dimensions</li> <li>Elastic, and the knit design provides significantly higher resistance to stretch, providing more containment of edema under the garment</li> <li>Options for compression levels for flat knit garments are similar to circular knit; however, because the garment is custom engineered specifically to accommodate the size and shape of the limb, there is a more predictable pressure distribution. The stiffer construction results in slightly larger pressure variations with movement</li> <li>Flat knit garments are typically easier to apply as they are form fitting and specific to the patient</li> </ul>
<b>Inelastic adjustable wraps (hook-and-loop technology)</b>	<ul style="list-style-type: none"> <li>Designed to provide patients with adjustable compression levels along the length of the leg</li> <li>The adjustable design, often with hook-and-loop inelastic adjustable bindings, allows for easier application of the garment by the patient or care partner and permits adjustments throughout the day as needed</li> <li>These compression devices provide the stiffest construction, producing larger pressure variations with movement. Inelastic adjustable wraps can be worn during the day and nighttime hours</li> </ul>
<b>Nighttime garments</b>	<ul style="list-style-type: none"> <li>Designed for use when the patient is supine or sleeping</li> <li>Garments are designed to provide containment of the edema with lower compression levels during sleep</li> <li>They are specifically engineered with textured fabrics to soften fibrotic tissue</li> </ul>

Source: Hettrick H, Ehmann S, McKeown B, Bender D, Blebea J. Selecting appropriate compression for lymphedema patients: American Vein and Lymphatic Society position statement. *Phlebology*. 2023 Mar;38(2):115-8.

### Key Points

- Compression therapy needs to be designed specifically for each patient.
- The team must be aware that compression is essential for managing LE in the long term.
- Compression therapy should be assessed for, prescribed and applied by the patient, care partner, knowledgeable clinician or certified LE therapist.
- Education and training with the patient and/or care partner must be relevant and repeated to re-inforce the proper use of compression therapy.
- Education for the patient must include identified risks and complications and to whom the patient and care partner should communicate any changes.

**Compression Bandaging:** The disposable compression bandage is commonly employed during the initial phase of LE management. Its primary objective is to decrease edema to ensure an optimal fit of compression garments for long-term maintenance. Inelastic disposable systems should be administered by trained health-care professionals.

**Adjustable Compression Garments/Wraps:** Adjustable or modifiable garments/wraps are also available to help reduce edema. As the volume of the limb reduces throughout the day, the garment can be modified and readjusted to provide a better fit and comfort, bringing the patient closer to a permanently fitted garment.

For more information about adjustable compression wraps see the Canadian Society for Vascular Surgery resource Adjustable Compression Wraps: Applications & Benefits [https://canadianvascular.ca/resources/Documents/Sponsor-Showcase/MOHFocus\\_Wraps.pdf](https://canadianvascular.ca/resources/Documents/Sponsor-Showcase/MOHFocus_Wraps.pdf)

**Self-bandaging by Patients:** Self-bandaging with compression bandages, adjustable wraps or garments may be done by some patients and their care partners after they have been taught how to safely wrap by a trained team member. Patients need to be taught the signs and symptoms of an infection and not to wrap until they have been assessed by a health-care provider. Self-bandaging supports the patient's independence, enhances their self-management abilities, reduces the number of therapist visits and generally increases their knowledge about LE treatment and management.

Teaching a patient to self-bandage takes preparation and time, and the provider must use a teaching technique most appropriate for the person. The University Health Network provides an example of a visual and written teaching tool: How to Self-Bandage Your Legs and Feet to Reduce Lymphedema (Swelling). [https://www.uhn.ca/PatientsFamilies/Health\\_Information/Health\\_Topics/Documents/How\\_to\\_Self-bandage\\_legs\\_feet\\_to\\_Reduce\\_Lymphedema.pdf](https://www.uhn.ca/PatientsFamilies/Health_Information/Health_Topics/Documents/How_to_Self-bandage_legs_feet_to_Reduce_Lymphedema.pdf)

**Compression Garments:** A standard guideline for selecting LE compression garments includes having the affected limb measured and fitted by a professional garment fitter when the limb is in a decongested (baseline) state. There is no straightforward answer when it comes to choosing a compression garment for LE management. Various options are available in the consumer market, including circular knit, firmer circular knit, flat knit, adjustable wraps, night garments and decongestive garments.

**Key Points about Compression:** Meticulous skin care, daily exercises and consistent application of compression garments are more important than choosing a garment with high pressure and stiffness.

**Daily Care of Compression Garments:** Proper care includes washing by hand, hanging to dry, folding and storage of LE compression garments daily. Daily washing helps return the elastic in the garment to its original shape and may increase the life of the garment. The Canadian Lymphedema Framework outlines key teaching points for the handwashing, drying, storing and replacement of garments at <https://www.canadalymph.ca/hints-and-tips/>. They also discuss how to protect the garments in warm weather and when travelling.

The best compression garment is the one that **CONTROLS THE EDEMA** and that **THE PATIENT WILL WEAR** daily.

**Table 2:** Summary of Key Components of a Care Plan for Patients with Leg Wounds and LE

Component	Discussion
<b>Manage underlying conditions</b>	<ul style="list-style-type: none"> <li>Volume overload conditions such as congestive heart failure require management and may require diuretics; otherwise, diuretics do NOT help to reduce edema</li> <li>Manage glycemic control in persons with diabetes mellitus</li> <li>Consider referral to vascular surgery in arterial or venous insufficiency; ligation of veins may increase wound healing and reduce risk of recurrence in eligible patients with venous leg ulcers (VLU)<sup>112</sup> - low threshold for referral in peripheral arterial disease (PAD)</li> </ul>
<b>Compression therapy</b>	<ul style="list-style-type: none"> <li>Vascular status permits compression therapy and is the key intervention to reduce edema, improve the skin condition, and stimulate wound healing; in general, modified compression can be used up to the point of critical ischemia, in trained hands<sup>1</sup></li> <li>Risks of compression therapy primarily includes skin irritation, discomfort and pain – severe adverse events are rarely seen if compression is applied correctly, but use caution in severe cardiac heart failure (risk of decompensation), severe neuropathy and ischemia (risk of pressure injuries and/or compromised arterial function)</li> <li>Modified/reduced compression in ABPI 0.5–0.8 – bandaging usually contraindicated <math>\leq 0.5</math> (critical ischemia). Multi-component bandage and hosiery systems are more effective than single (for VLU)<sup>116</sup></li> <li>Garments are essential to prevent new edema formation and wounds; life-long treatment usually necessary; patient encouragement and education; renewal of garments necessary due to wear</li> </ul>
<b>Other edema management</b>	<ul style="list-style-type: none"> <li>Edema-related drugs: consider change of medication (risk-benefit)</li> <li>Intermittent pneumatic compression can supplement compression bandaging in selected cases</li> </ul>
<b>Wound care</b>	<ul style="list-style-type: none"> <li>Debridement</li> <li>Removal of non-viable tissue/slough at every dressing change where possible by clinicians with the skill and appropriate scope of practice can help prevention of overwhelming bioburden and biofilm</li> <li>Therapeutic cleansing at every dressing change with appropriate solutions (tap water, saline, antiseptics, depending on the care setting, home, community, rehabilitation)</li> </ul>
<b>Microbial management</b>	<ul style="list-style-type: none"> <li>Control of bioburden usually satisfactory with debridement and irrigation</li> <li>In high bacterial colonization or wound infection, local dressings/products are added containing antiseptics (e.g. silver, cadexomer iodine, PHMB, vinegar); antibiotics appropriate only in presence of cellulitis or wound infection that cannot be controlled by local antiseptics; treatment supported by cultures and antibiotic resistance</li> </ul>

*cont'd...*

<b>Exudate control</b>	<ul style="list-style-type: none"> <li>▪ Main reduction of exudate production is through compression—treat infection if this is the reason for excessive exudate</li> <li>▪ Manage exudate through appropriate choice of dressings and frequency of dressing changes, usually from once weekly to daily</li> </ul>
<b>Skin care</b>	<ul style="list-style-type: none"> <li>▪ Proactive hand hygiene</li> <li>▪ Prevention of broken skin and development of cellulitis</li> <li>▪ Use of pH balanced soaps, cleaning and drying between toes and in all crevices to prevent fissures/ mycosis that can lead to cellulitis</li> <li>▪ Gentle emollients to restore skin barrier function; if the skin is dry ointments are preferably used, otherwise a cream—carbamid or salicylic acid products can be used in hyperkeratosis</li> <li>▪ Control excessive inflammation/dermatitis (e.g., by topical corticosteroids, zinc or tar); steroids to be applied before usage of emollients</li> <li>▪ Barrier films to protect periwound skin from exudate</li> <li>▪ Diabetics and patients with neuropathy are encouraged to frequently inspect skin at pressure points from footwear, bandaging, garments, especially between toes.</li> </ul>
<b>Promote exercise/ mobility</b>	<ul style="list-style-type: none"> <li>▪ Physiotherapy consult may help to maximize calf muscle pump activity; otherwise, pamphlets and discussion of appropriate exercises can be provided</li> <li>▪ Support donning and doffing of day and nighttime compression</li> </ul>
<b>Promote lifestyle change/ choices</b>	<ul style="list-style-type: none"> <li>▪ Smoking cessation program</li> <li>▪ Diabetes mellitus management</li> <li>▪ Control substance use (e.g., alcohol)</li> <li>▪ Adherence encouragement with compression, mobilization, exercise, weight control, nutrition, and offloading footwear</li> <li>▪ Weight loss, especially in obesity-induced LE</li> <li>▪ Sexual health</li> </ul>
<b>Pain management</b>	<ul style="list-style-type: none"> <li>▪ Nociceptive and neuropathic pain important to distinguish from each other to initiate proper treatment (See Table 2: Medications)</li> </ul>
<b>Offloading pressure</b>	<ul style="list-style-type: none"> <li>▪ Proper offloading footwear mandatory for diabetic foot ulcers, and pressure injuries—encouragement, and education are important</li> <li>▪ Empowerment strategies</li> </ul>
<b>Psychological and spiritual impact</b>	<ul style="list-style-type: none"> <li>▪ Psychosocial and spiritual care and referrals made in collaboration with the patient</li> </ul>

*Adapted with permission from Dr. D. H. Keast.*

## 4.2 Optimize the local wound environment

Local skin health and wound management strategies need to be part of the plan of care and fit within the context of the overall healability of the identified skin issue or wound. To optimize the local skin and/or wound environment, clinicians must consider periwound skin, wound cleansing and debridement, management of bacterial burden and moisture control to support prevention and healing goals. See the Wounds Canada: Care at Home Series on Wound Management <https://www.woundscanada.ca/patient-or-caregiver/resources/care-at-home-series>.

### 4.2.1 Cleansing

Skin care can be particularly challenging in LE due to the presence of edema and altered limb/foot shapes, creases and contours. Patients with LE are at risk of infections such as cellulitis, which can exacerbate lymphatic dysfunction and lead to greater edema, sepsis and increased mortality. Therefore, it is important to daily cleanse and moisturize (unscented, non-allergic) the skin of the affected areas, or more often, depending on the plan of care.

Skin care regimes should be updated regularly depending on the skin condition(s) and when treatments (creams, ointments) need to be applied. Skin care should be done before donning garments and the skin checked upon removal of garments.

Areas with new onset of pain should be examined for evidence of deep fissures and assessed clinically for the possibility of infection.

### 4.2.2 Debriding

**Discussion:** Debridement serves to remove microbes, foreign bodies, debris and non-viable tissue from a wound to promote wound closure. As with wound cleansing, the appropriate method of debridement should be determined based on the patient's needs and vascular status. This includes consideration of the periwound condition, wound, the environment, available resources and the scope of practice of the health-care clinician completing the debridement.

For more information on wound debridement please see Chapter 4: Best Practice Recommendations for the Prevention and Management of Wounds: An Overview.

The Wounds Canada Skin and Wound Clean-up Product Picker is a useful tool to help clinicians choose the most appropriate form of wound debridement. Product Picker: Skin and Wound Clean-Up.

### 4.2.3 Managing bacterial balance

Patients living with LE are at specific risk of soft tissue infections, which may include erysipelas, lymphangitis or cellulitis in the affected areas. The stagnation of lymph limits bacterial clearance and may impair host immunity to bacteria due to limited lymphatic flow. Although these three entities (erysipelas, lymphangitis, cellulitis) have some clinical differences, they are treated similarly with directed antibiotics against usual skin bacteria of *Staphylococcus aureus* (including MRSA) and *Streptococcus* species (e.g., *S. pyogenes*). Soft tissue infections most commonly affect the limbs, but in some cases may occur in other areas affected by LE (e.g., genitals, groin area). In those cases, other bacteria may need to be considered and will guide treatment decisions.

### 4.2.4 Managing moisture balance

Managing moisture on the skin and in a wound is an important aspect of care. Lymphatic fluid can drain directly onto the skin through microscopic skin defects known as lymphorrhea.<sup>110</sup> Lymphorrhea drainage will collect in skin folds, especially if deep and in gravity-dependent areas, such as feet and toes, leading to skin irritation and excoriation. This results in moisture-associated skin damage (MASD). For more information on MASD see Chapter 5: Best Practice Recommendations for the Prevention and Management of Moisture-Associated Skin Damage.

## 4.3 Select the appropriate dressings and/or advanced therapy

Advancements in technology and innovation are rapidly evolving within the wound care sector. When choosing suitable dressings for LE-related wound care, it is crucial to ensure that the wound contact layer is compatible with the compression therapy being used and that the secondary dressing has the capacity to absorb and retain significant volumes of lymphorrhea to preserve periwound skin integrity.

For the complete version of Best Practice Recommendations for Lower Limb Lymphedema, visit [here](#).

#### 4.4 Engage the team to ensure consistent implementation of the plan of care

An individual who has been diagnosed with LE is living with a progressive condition that will require their entire team, including the patient themselves and their care partners, to be engaged in the plan of care. Trust, communication and collaboration among team members are essential for ensuring the success of any care plan. The team will need to encourage the patient to participate in management of underlying conditions, compression therapy, skin care, weight management, physical activity and other self-care activities while supporting their mental health throughout their lifelong journey with the LE.

## 5 Evaluate Outcomes

- 5.1 Determine if the outcomes have met the goals of care.
- 5.2 Reassess patient, wound, environment and system if goals partially met or unmet.

#### 5.1 Determine if the outcomes have met the goals of care

Clinicians need to determine if the skin health, limb volume, skin thickness, compression therapy and wound goals have been met, using general and specific validated tools accompanied by patient/care partners and team communications. Where possible, practitioners should aim to co-develop and document goals of care with the patient (and/or caregiver or family member) early in the patient-health-care-professional encounter.

It is important to remember that continued support of the patient with long-term compression therapy and psychosocial, physical activity and relevant therapies, proactive skin care and self-management strategies must take place and needs to be part of the determination of outcomes of the goals that have been set.

#### 5.2 Reassess patient, wound, environment and system if goals partially met or unmet

If the LE goals and response to the current therapies have been partially met or unmet, the team needs to return to Step 1 to reassess. The specific activities will depend on the skin status, wound factors and the impact on the patient's ability to manage daily activities (employment, social and home). Re-assessment should include a holistic review that includes reviewing underlying disease processes. Further assessment may include repeating diagnostic tests and laboratory tests relevant to the patient's co-morbidities, arterial/vascular assessment and psychosocial assessment. The latter may include the patient and/or care partner, as burnout may be occurring.

### 5.2.1 Determine if the outcomes have met the care goals of care

Evaluation of patient outcomes should take into consideration factors originally set in patient goals. Goals may need change over time based on management of LE, environmental factors, access to bandaging and compression therapies and overall health status (e.g., mobility, employment). Frequent reassessment of outcomes and their intersection with patient goals of care is recommended to develop a longitudinal understanding of the patient's care context and trajectory.

### 5.2 Reassess patient, wound, environment and system if goals are partially met or unmet

Consider several factors when reassessing the patient, wound, environment and system. Identify whether acute physical management goals have been met through thorough reassessment of limb volume (tape measurements) and related measures using validated tools. Also assess lymphorrhagia, wound exudate, allergic reaction/sensitivity to dressings, skin integrity and levels of wound comfort.

### 5.3 Ensure sustainability to support prevention and reduce risk of recurrence

Early discharge planning communications and integrated team collaboration are key in building a sustainable maintenance plan to reduce the risk of recurrence. A detailed discharge or transition in care (setting or unit) plan should be co-designed (with the initial plan of care) to accommodate the patient's unique physical, financial, social and accessibility needs. Ensure community-based care plans and referrals for follow-up have been established prior to discharge to promote smooth transitions in care and prevent patients from returning to hospital.

## Conclusion

Outcome evaluation is a stepwise process that engages the patient and care team across several aspects of the health continuum. Health-care professionals must be mindful of the many tools that can be used in the assessment of LE and corresponding wounds, while tailoring care to the unique needs and goals of the patients they encounter. Research is needed to develop assessment tools that integrate aspects of both lymphatic health and wound care in order to optimize the wellbeing of patients living with complex, combined presentation of lymphedema and wounds.





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