This resource binder was developed as part of a quality improvement initiative led by the Department of Health and Wellness Continuing Care branch in partnership with the Nova Scotia Health Authority Provincial Wound Prevention and Management Program. This binder is a compilation of best practice recommendations for the prevention and management of pressure injuries. The purpose of this resource is to support continuity of care, enhance knowledge, and build capacity to address pressure injury prevention and management in long-term care facilities.

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Best Practice
Recommendation Guide
Foundations of Best Practice for Skin and Wound Management

BEST PRACTICE RECOMMENDATIONS FOR THE Prevention and Management of Pressure Injuries

Linda Norton OT Reg(ONT) MScCH PhD Candidate
Nancy Parslow RN MCIsc-(WH) Wound Healing CETN(C)
Debra Johnston MN RN CETN(C)
Chester Ho MD
Afsaneh Afalavi MSc MD FRCPC
Mary Mark RN MHS MCIsc(WH) GNC(C) CETN(C)
Deirdre O’Sullivan-Drombolis BScPT MCIsc (Wound Healing)
Sheila Moffat RN BN CRN(C) IIWCC
The best practice recommendation articles are special publications of Wound Care Canada. Together they form the Foundations of Best Practice for Skin and Wound Management, an online resource available for free download from the Wounds Canada website (woundscanada.ca).

These 2017 updates build on the work of previous author teams and incorporate the latest research and expert opinion.

We would like to thank everyone involved in the production of past and present versions of these articles for their hard work, diligence and rigour in researching, writing and producing these valuable resources.

Executive Editor: Sue Rosenthal
Project Editor: Heather L. Orsted
Editorial Assistant: Katie Bassett
Copy Editor: Jessica Rezunyk

Art Direction and Layout: Robert Ketchen
Photo Researcher: Joanne Crone

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woundscanada.ca
info@woundscanada.ca

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Foundations of Best Practice for Skin and Wound Management

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Mary Mark RN MHS MCISC(WH) GNC(C) CETN(C)
Deirdre O’Sullivan-Drombolis BScPT MCISC (Wound Healing)
Sheila Moffat RN BN CRN(C) IIWCC
Introduction
Introduction

The prevention and management of pressure injuries continues to be a concern in the Canadian health-care system. In a 2003 study funded by the Canadian Association of Wound Care (Wounds Canada), the overall prevalence of pressure ulcers across all health-care settings was 26%, with approximately 70% of these wounds considered preventable. According to published literature, clinical practice and expert opinion, nearly all pressure ulcers can be prevented. Prevention, including best practices and use of appropriate equipment, is of paramount importance and must be the focus of care for all patients and across all care settings.

Despite the focus on prevention to date, pressure injury incidence rates have not significantly decreased in Canada when compared with other countries around the world, including the US. An integrated approach focused on prevention is required across all areas of the health-care system to make a significant difference in incidence rates. For optimal effectiveness, interdisciplinary teams need to be integrated to include the person at risk of or with a pressure injury (as the first team member) along with their families and departments such as purchasing and housekeeping.

Pressure injuries are expensive. The lowest cost for treating a deep-tissue injury or Stage 1 or 2 wound is $2,450 per month, while an uncomplicated Stage 3 or 4 is $3,616 per month. Pressure injuries complicated by osteomyelitis cost $12,648 per month to treat. The equipment and interventions required to prevent pressure injuries are less expensive than the cost of treatment. The number of pressure injuries in a setting can be multiplied by the appropriate monthly cost per stage to determine the total cost of treatment per month in a setting. Explicitly identifying this cost may help with the advocacy for pressure injury prevention programs and equipment.

In one study the cost of treatment for individuals over 65 who were admitted to hospital with a pressure injury was compared with individuals over 65 who acquired a pressure injury while in the hospital. Costs to treat pressure injuries that were present prior to admission ranged from $11,000 for a Category/Stage 3 pressure injury to $18,500 for a Category/Stage 4 pressure injury. Hospital-acquired pressure injury...
treatment costs ranged from $44,000 for Category/Stage 2 to $90,000 for Category/Stage 4. Where pressure injuries were the primary reason for admission to the hospital, the mean cost of hospitalization was $23,922 ± $54,367 and ranged between $1,247 and $597,363.

Although pressure injury prevention has had increased attention in recent years, Vanderwee et al. found that “only 10.8% of the patients at risk received fully adequate prevention in bed and while sitting.” At the same time, “more than 70% of the patients not at risk received (some) pressure ulcer prevention while lying or sitting.” Overall, the authors suggest “the biggest improvement can be gained in prevention interventions while sitting and the prevention specific for heels.” This study points to the importance of assessing individual patients to ensure pressure management resources are used appropriately to prevent pressure injuries.

The recommendations that are included in this paper are based on the best available evidence and are intended to support the clinician and integrated team in planning and developing best practices in the prevention and management of pressure injuries (see “Best Practice Recommendations for the Prevention and Management of Wounds” for a discussion of the evidence). The interprofessional team of authors engaged in synchronous and asynchronous collaboration using a variety of online tools. This collaborative process fostered rich discussion of the literature and its applicability to practice at the bedside. The depth of these discussions is reflected throughout this paper.

The Wound Prevention and Management Cycle

This paper offers a practical, easy-to-follow guide incorporating the best available evidence that outlines a process, or series of consecutive steps, that supports patient-centred care. This process, called the Wound Prevention and Management Cycle (see Figure 1) guides the clinician through a logical and systematic method for developing a customized plan for the prevention and management of wounds from the initial assessment to a sustainable plan targeting self-management for the patient.

“Pressure Ulcer” or “Pressure Injury”?

In May 2016, the National Pressure Ulcer Advisory Panel updated the term pressure ulcer to pressure injury. This update was done to clarify that both Category/Stage 1 and Deep Pressure Injuries refer to intact skin. The definitions of the categories of pressure injuries were changed slightly by the revision. In this document, the term pressure injury is considered synonymous with pressure ulcer and is used throughout the document except when directly quoting previously published literature.

Stage or Category?

The EPUAP classifies pressure injuries in categories while the NPUAP classifies pressure injuries in stages. The terms category and stage are used interchangeably when discussing pressure injuries.
The recommendations in this document are based on the best available evidence and are intended to support the clinician, the patient, his/her family and the health-care team in planning and delivering the best clinical practice. Two foundational papers supplement this document with additional evidence-informed information and rec-
ommendations that are general to all wound types: “Skin: Anatomy, Physiology and Wound Healing,”14 and “Best Practice Recommendations for the Prevention and Management of Wounds.”10

There are three guiding principles within the best practice recommendation papers (BPRs) that support effective prevention and management of skin breakdown:

1. the use of the Wound Prevention and Management Cycle regardless of the specifics to prevent and manage skin breakdown
2. the constant, accurate and multidirectional flow of information within the team and across care settings
3. the patient as the core of all decision making

Quick Reference Guide

The quick reference guide (QRG) (see Table 1) provides the recommendations associated with the five steps in the Wound Prevention and Management Cycle (see Figure 1). These recommendations are discussed with the supporting evidence.

Table 1: Wound Prevention and Management Quick Reference Guide

<table>
<thead>
<tr>
<th>Step</th>
<th>Recommendation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Assess and/or Reassess</td>
<td>1.1 Select and use validated patient assessment tools.</td>
<td>Ia – IV</td>
</tr>
<tr>
<td></td>
<td>1.2 Identify risk and causative factors that may impact skin integrity and wound healing.</td>
<td>Ia – IV</td>
</tr>
<tr>
<td></td>
<td>1.2.1 Patient: Physical, emotional and lifestyle</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>1.2.2 Environmental: Socio-economic, care setting, potential for self-management</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>1.2.3 Systems: Health-care support and communication</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>1.3 Complete a wound assessment, if applicable.</td>
<td>Ia – IV</td>
</tr>
<tr>
<td>2 Set Goals</td>
<td>2.1 Set goals for prevention, healing, non-healing and non-healable wounds.</td>
<td>Ia – IV</td>
</tr>
<tr>
<td></td>
<td>2.1.1 Identify goals based on prevention or healability of wounds.</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>2.1.2 Identify quality-of-life and symptom-control goals.</td>
<td>\</td>
</tr>
<tr>
<td>3 Assemble the Team</td>
<td>3.1 Identify appropriate health-care professionals and service providers.</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>3.2 Enlist the patient and their family and caregivers as part of the team.</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>3.3 Ensure organizational and system support.</td>
<td>IV</td>
</tr>
<tr>
<td>4 Establish and Implement a Plan of Care</td>
<td>4.1 Identify and implement an evidence-informed plan to 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.</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>4.2 Optimize the local wound environment aided through</td>
<td>Ia – IV</td>
</tr>
<tr>
<td></td>
<td>4.2.1 Cleansing</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>4.2.2 Debriding</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>4.2.3 Managing bacterial balance</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>4.2.4 Managing moisture balance</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>4.3 Select the appropriate dressings and/or advanced therapy.</td>
<td>\</td>
</tr>
<tr>
<td></td>
<td>4.4 Engage the team to ensure consistent implementation of the plan of care.</td>
<td>Ia – IV</td>
</tr>
<tr>
<td>5 Evaluate Outcomes</td>
<td>5.1 Determine if the outcomes have met the goals of care.</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>5.2 Reassess patient, wound, environment and system if goals are partially met or unmet.</td>
<td>Ib – IV</td>
</tr>
<tr>
<td></td>
<td>5.3 Ensure sustainability to support prevention and reduce risk of recurrence.</td>
<td>IV</td>
</tr>
</tbody>
</table>
Each recommendation above is supported by the level of evidence employed by Registered Nurses’ Association of Ontario (RNAO) guideline development panels (see Table 2). For more detailed information refer to the designated references.

**Table 2: Levels of Evidence**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>Evidence obtained from meta-analysis or systematic review of randomized controlled trials.</td>
</tr>
<tr>
<td>Ib</td>
<td>Evidence obtained from at least one randomized controlled trial.</td>
</tr>
<tr>
<td>IIa</td>
<td>Evidence obtained from at least one well-designed controlled study without randomization.</td>
</tr>
<tr>
<td>IIb</td>
<td>Evidence obtained from at least one other type of well-designed quasi-experimental study.</td>
</tr>
<tr>
<td>III</td>
<td>Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.</td>
</tr>
<tr>
<td>IV</td>
<td>Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.</td>
</tr>
</tbody>
</table>

*Used with kind permission from the Registered Nurses’ Association of Ontario.*

**Key reference documents include:**

- Association for the Advancement of Wound Care Pressure Ulcer Guideline; 2010.
Step 1: Assess and/or Reassess
Step 1: Assess and/or Reassess

**Recommendations**

1.1 Select and use validated patient assessment tools.

**Discussion:** The use of pressure injury prevention recommendations based on a risk assessment has demonstrated effectiveness in reducing the incidence of pressure injuries. Expert opinion clearly supports the use of validated pressure injury risk assessment tools (e.g., Norton, Braden, Waterlow, Gosnell, SCIPUS) but controversy exists over which tool is best suited to a particular care setting. In any case, expert opinion recommends the consistent use of a specific validated tool and the development of care plans based on the subscale scores that identify factors that put the person at risk for pressure injury development. As well as the extrinsic risk factors that are addressed by the risk assessment tools, clinical judgment is required to assess for intrinsic risk factors that include physical, psychosocial and medical conditions. Factors such as neurological deficits, advanced age, hydration status, peripheral vascular disease and level of consciousness must also be taken into account.

Other assessment tools may be required based on the needs of the person with a pressure injury, such as those with spinal cord injury, in critical care or in perioperative areas. No matter what assessment tool or scale is chosen, the same measurement should be used for subsequent assessments for ongoing comparison.

**Nutritional screening:** Nutritionally compromised patients can be assessed using a validated nutritional screening tool such as the Mini-Nutritional Assessment – Short Form, the Canadian Nutrition Screening Tool, the Malnutrition Universal Screening Tool or the Malnutrition Screening Tool.21

**Pain assessment:** Pain scales provide a systematic approach for assessing and addressing the factors that are causing or exacerbating wound-related pain (such as ischemic damage due to unrelieved pressure, shear and friction). There is no one pain scale deemed universal and useful for all individuals; however, changes in pain levels may indicate a need to reassess the choice and timing of analgesics and/or other interventions used in pain management.18,24

**Quality-of-life assessment:** Pressure injuries that are non-healing or slow to heal may have a significant impact on the patient’s quality of life. Use of a validated quality-of-life (QoL) assessment tool may be beneficial to identify potential barriers and patient lifestyle issues that may interfere with positive participation in the plan of care.18

1.2 Identify risk and causative factors that may impact skin integrity and wound healing.

**Discussion:** Assessment is the foundation for providing the correct treatment.

1.2.1 Patient: Physical, emotional and lifestyle

**Discussion:** Clinicians must complete a comprehensive patient history to determine general health status, comorbidities and risk factors that may lead to pressure injury formation or that may affect the healing of existing wounds. To facilitate consistent implementation of strategies for pressure injuries, patient levels of risk and additional risk factors must be communicated with all team members. Strategies to communi-
**Pressure** is defined as “the force per unit area exerted perpendicular to the plane of interest.”

**Shear** is defined as “the force per unit area exerted parallel to the plane of interest.”

From a clinical perspective, friction tends to hold the skin in place, enabling the shearing of the bony prominence against the inside of the skin.

**Physical Assessment**

**Pressure and shear injury:** Clinicians must assess for potential sources of pressure and shear injury by evaluating the patient’s posture, activities, mobility, lifestyle and current support surfaces such as sleeping and sitting surfaces.

Pressure is recognized as the main factor in the development of pressure injuries, with pressure three to five times higher internally near a bony prominence. The role of shear force is equally as important to understand. Shear can be described as the deformation of tissue by two oppositely directed parallel forces, such as what happens with patients slipping down in bed. Figure 2 demonstrates how pressure alone also contributes to shear strain in the tissue as the tissue deforms around the shape of the bony prominence. The addition of shear forces doubles the impact of pressure.

**Figure 2:** Tissue Distortion Due to Pressure

An assessment to determine the forces occurring on all sleeping and sitting surfaces and during all transitions (e.g., transfers, sitting up in bed) will identify the priority areas for intervention.

**Friction injuries** are often misdiagnosed as pressure injuries. An analysis of the literature by Brienza identified that friction contributes to shear strain in deeper tissues, which is identified as a factor in the development of a pressure injury. Tissue damage from friction is related to excessive cell deformation and not ischemic pressure injury in the superficial layers of the skin. Therefore friction alone is not a direct cause of a pressure injury. Friction is identified as a “risk factor that may contribute to, or exacerbate pressure injury development due to the shear it creates.” Thus shear has been identified as a “primary causative factor” contributing to pressure injury development and friction has been eliminated from the current NPUAP definition of pressure injury.
Nutrition screening using a validated tool for the appropriate clinical setting should be undertaken for all individuals with pressure injuries to identify those at risk for poor healing due to nutritional problems. Lack of optimal nutrition and hydration status may interfere with treatment effectiveness for people with pressure injuries.

In addition to using validated nutritional screening tools, it is important to review blood work for signs of compromised nutritional status. A comprehensive assessment utilized to screen participants with Category/Stage 2, 3 and 4 pressure ulcers in a randomized controlled trial by Houghton et al. identified a decreased healing potential when the number of abnormal blood values increased and a higher rate of non-healing over a six-month period for those with two or more abnormal blood values (even mildly abnormal). This study highlighted the value of blood analysis as an effective tool to assist in the identification of nutrition-related barriers that negatively impact pressure injury healing.

Determining the level of hemoglobin and conducting vascular studies in relevant cases can be beneficial. The presence of low hemoglobin and the presence of more than one wound can be risk factors for delayed wound healing. Having two or more low hematological values is also thought to be indicative of delayed wound healing.

Table 3: Blood Screening for Nutritional Barriers to Wound Healing

<table>
<thead>
<tr>
<th>Suggested blood screen to identify nutrition-related barriers to pressure injury healing</th>
<th>Screening for</th>
<th>Normal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete blood count (CBC)</td>
<td>Hemoglobin(g/L)</td>
<td>123 – 174</td>
</tr>
<tr>
<td>Iron status screening: ferritin, serum iron, % saturation, TIBC (total iron binding capacity): (assess for iron deficiency anemia)</td>
<td>Ferritin: (µg/L)</td>
<td>41 – 300</td>
</tr>
<tr>
<td></td>
<td>Serum iron: Fe (µmol/L)</td>
<td>11 – 32</td>
</tr>
<tr>
<td></td>
<td>Sat %</td>
<td>0.20 – 0.65</td>
</tr>
<tr>
<td></td>
<td>TIBC (µmol/L)</td>
<td>45 – 82</td>
</tr>
<tr>
<td>CRP, ESR: (inflammation/infection – anemia of chronic disease)</td>
<td>CRP (mg/L)</td>
<td>&lt; 0.8</td>
</tr>
<tr>
<td></td>
<td>ESR (mm/hour)</td>
<td>&lt; 6 ≤ 10</td>
</tr>
<tr>
<td>Prealbumin/albumin: severity of illness/injury and risk for malnutrition</td>
<td>Prealbumin (mg/L)</td>
<td>180 – 450</td>
</tr>
<tr>
<td></td>
<td>Albumin (g/L)</td>
<td>35 – 50</td>
</tr>
<tr>
<td>BUN, creatinine: assess for dehydration and kidney function</td>
<td>BUN (mmol/L)</td>
<td>2.5 – 8.0</td>
</tr>
<tr>
<td></td>
<td>Creatinine (µmol/L)</td>
<td>50 – 120</td>
</tr>
<tr>
<td>Fasting blood glucose (FBG) and glycosylated hemoglobin (HgbA1C): assess for hyperglycemia/diabetes</td>
<td>FBG (mmol/L)</td>
<td>3.3 – 5.8 (39)</td>
</tr>
<tr>
<td></td>
<td>HgbA1C</td>
<td>4 – 6 %</td>
</tr>
<tr>
<td>Thyroid function: assess for hypothyroidism</td>
<td>TSH (mU/L)</td>
<td>0.4 – 5.00</td>
</tr>
</tbody>
</table>

Incontinence-associated dermatitis (IAD) and pressure injuries may co-exist, and therefore a thorough assessment is essential to differentiate the etiology of a pressure injury, IAD or other skin conditions, thus enabling appropriate management strategies. In 2015 a Global Expert IAD Panel used the following descriptor to differentiate IAD from pressure injuries: “IAD is a ‘top down’ injury, i.e., damage is initiated on the surface of the skin, while pressure ulcers are believed to be ‘bottom up’ injuries, where
damage is initiated by changes within soft tissue."37 It is important that clinicians “determine the type of fecal or urinary incontinence based on symptoms and history; consider onset, duration, aggravating and relieving factors.”38

Skin assessment relies on clinical observation and visual inspection as described in the following table.

**Table 4: Differential Diagnosis of Pressure Injury and IAD**37

<table>
<thead>
<tr>
<th>Location</th>
<th>Pressure Injuries (Category/Stage 1)</th>
<th>Pressure Injuries (Category/Stage 2)</th>
<th>Incontinence-associated Dermatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Over bony prominence or sites exposed to external pressure and shear, or associated with a medical device</td>
<td>Over bony prominence or sites exposed to external pressure and shear, or associated with a medical device</td>
<td>May be localized to the perineum, perigenital areas or generalized to include buttocks; gluteal fold; medial and posterior aspects of upper thighs; lower back; may extend over bony prominence</td>
</tr>
<tr>
<td>History</td>
<td>Exposure to pressure, shear, immobility</td>
<td>Exposure to pressure, shear, immobility</td>
<td>Urinary and/or fecal incontinence</td>
</tr>
<tr>
<td>Pain (for those with intact sensation)</td>
<td>Burning, itching, warmth</td>
<td>Burning, pain</td>
<td>Burning, itching, tingling, pain</td>
</tr>
<tr>
<td>Odour</td>
<td>None</td>
<td>Unlikely</td>
<td>Fecal or urine</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Intact skin with distinct area of non-blanchable erythema</td>
<td>Shallow open area with distinct edges or margins</td>
<td>Area is diffuse with poorly defined edges with superficial, partial-thickness skin loss or may be intact skin with blanchable or non-blanchable, blotchy erythema</td>
</tr>
<tr>
<td>Periwound skin</td>
<td>Intact</td>
<td>Intact</td>
<td>Irritated, red</td>
</tr>
<tr>
<td>Infection</td>
<td>Rare</td>
<td>Rare, although secondary soft tissue infection may be present</td>
<td>Secondary superficial skin infection such as candidiasis may be present</td>
</tr>
<tr>
<td>Improvement</td>
<td>Pressure redistribution</td>
<td>Pressure redistribution</td>
<td>Control/containment of incontinence, effective skin protection</td>
</tr>
</tbody>
</table>

**Surgical considerations:** If surgery is being considered for closure of a pressure injury, a pre-operative assessment should be conducted, including management of underlying medical conditions, optimizing nutritional and hydration status, smoking cessation, bowel regulation, management of spasticity/contractures and presence of or management of infection.39 The patient’s ability to adhere to the post-operative medical requirements and rehabilitation processes must be assessed before surgery is offered. These include, but are not limited to: post-operative protocols for pressure redistribution and progressive seating, as well as readiness for tertiary prevention of pressure injuries.
Emotional Assessment

Pressure injuries negatively affect quality of life (QOL). Effects on QOL differ between partial-thickness and full-thickness tissue injuries. A psychological and QOL assessment should be conducted to assess the impact of the pressure injury on the QOL for the patient and their family/caregivers. This assessment will assist in determining their goals, along with their ability and determination to participate in the plan of care. If a pressure injury is deemed healable, commitment of the person with a pressure injury and caregivers is crucial in achieving successful outcomes in a timely, resource-efficient manner. As with all parameters of a complete assessment it will ultimately guide the plan of care.

Assessment needs to identify if the patient has multiple unmodifiable factors such as achieving a balance between the need for total offloading (bed-rest) and social, physical and psychological needs, recognizing that bed-rest can cause psychological and physical harm and social isolation.

Lifestyle: The importance of the lifestyle choices the person with a pressure injury makes regarding pressure injury prevention and management practices cannot be overstated. Clark et al. summarize the impact of lifestyle choices on pressure ulcer risk: “Every person sculpts a unique existence that reflects an interconnected network of psychological traits, goals, values, preferred activities, environmental opportunities and challenges, habits, routines, and personal health practices. Embedded in the context of his or her daily activities and concerns, each individual has a distinctive pattern of pressure ulcer risk.”

Lifestyle factors should be considered when identifying risk for the development of pressure injuries. Jackson et al. have identified six factors that influence the development of pressure injuries in people with spinal cord injuries. These factors include perpetual danger (of developing a pressure injury), change or disruption of routine, decay of prevention behaviours, lifestyle risk ratio, individualization, simultaneous
An assessment of daily activities, life goals, habits and routines, in addition to the devices and care available, is required to identify the person’s pattern of pressure injury risk. A thorough assessment enables the health-care provider to work with the person with the pressure injury to identify realistic ways to reduce the risk of further pressure injuries.

**Risk Assessment for Special Populations**

Assessment of certain categories of patients requires that the clinician be aware of and assess for specific factors that may increase risk for skin breakdown or affect healing of pressure injuries.

**Risk for the elderly and vulnerable:** Advancing age has been identified as a predictor of pressure-related injuries due to the gradual decline of general nutritional and mental status, decreased mobility, sensory perception deficits, incontinence and the changing characteristics of the skin such as decreased elasticity.

In nursing home residents with non-blanchable erythema, pressure injury risk is increased for those with hypotension, contractures or a history of cerebral vascular accident, while those with urinary incontinence have a decreased risk of developing a pressure injury, perhaps in relation to the increased movement and positioning while care is being provided. Being aware of the increased risks can assist clinicians to target high-risk individuals for prevention programs.
**Risk for the patient with a spinal cord injury:** Due to the lifelong risk of developing a pressure injury, patients with a spinal cord injury require frequent expert assessment from an integrated team to prevent and manage pressure injuries.

**Risk for the patient in critical care:** Pressure injury incidence and prevalence rates remain higher in critical care areas due to the numbers of severely compromised patients.

**Risk for pediatric populations:** Various pediatric risk assessment tools exist. However, due to the variation of pressure injury risk factors within the wide range of the pediatric population—from neonates to infants and children—a valid PI risk assessment tool with validated cut-off points is still not available.49 Further adding to this risk assessment complexity is the child’s communication level, developmental status and ability to properly differentiate pressure from other sensory perceptions of medical devices. According to Schluer et al., “in line with clinical expertise in the field of PU development in children, it is more reliable to focus on different risk populations, such as children hospitalized in a PICU, and also to assess equipment-related factors contributing to the development of PUs.”49

While the presence of medical devices is a specific risk factor in all age groups, limited activity, mobility and skin sensitivity are additional risk factors for this patient population. A comprehensive assessment should therefore include a pressure injury risk assessment and a head-to-toe skin assessment, including areas under splints, braces, traction boots, tracheostomy plates and arm boards.50
**Risk for bariatric populations:** Although the precise relationship between obesity and pressure injury development is unclear, maceration, inflammation and tissue/skin necrosis are reported in large and deep skin folds in severely obese patients. Literature reports that both increased tissue weight and fragile vascular and lymphatic frameworks subject the skin and tissues to ensuing complications.40

It can be challenging to assess skin and visualize all bony prominences. Skin areas under the pannus such as the hips, pubis, trunk and thighs require assessment, as the weight of the pannus can precipitate pressure injuries. Pressure injuries need to be differentiated from intertriginous dermatitis.47

**Risk for surgical patients:** Surgical patients have an especially high risk of developing intra-operative pressure injuries due to the prolonged pressure from immobility during the intra-operative and immediate post-operative periods. Additional risk factors may include: duration of time patient was immobilized before surgery, length of surgery, hypotensive episodes during surgery, low core temperature during surgery and reduced mobility on day one post-operatively.

**Risk for patients at end of life:** In many terminally ill patients, multiple factors and co-morbid conditions increase their risk for the development of pressure injuries and need to be identified.51

1.2.2 Environment: Socio-economic, care setting, potential for self-management

**Discussion:** People who are at risk for or who have a pressure injury often have other co-morbidities, including disabilities such as mobility impairments. People with disabilities are often underemployed in Canada when compared with Canadians without a disability. Fewer than half of people aged 25 to 64 with a disability are employed.52 Furthermore, over 12% of people with disabilities have been refused a job because of their disability, with that figure rising to 33% for those with a severe or very severe disability.52 People with disabilities who are employed tend to earn less than their non-disabled co-workers.52 The underemployment of people with disabilities has a direct impact on treatment plans, as they may not have the resources to pay for additional equipment or care.

Care is shifting away from institutions to the community, with over two million Canadians with disabilities receiving care at home. Most people (88%) receive at least some care from family and friends, while only 12% rely on professional services alone. For those receiving some care from family and friends, 70% have more than one person helping them.53 Given these statistics, assessing the risk for pressure injuries and implementing appropriate treatment plans present unique challenges. Self-management, sometimes through the ability to direct others, becomes critically important. People at risk for pressure injuries or who have pressure injuries need to be able to identify and manage their own risks related to pressure injuries, as well as implement treatment plans.

1.2.3 Systems: Health-care support and communication

**Discussion:** A systematic review by Sullivan identified key recommendations for in-facility health-care delivery to prevent hospital-acquired pressure injuries.54 Findings suggested that the “integration and implementation of multi-component core initiatives (bundles) for pressure ulcer prevention improved processes of care and reduced pressure ulcer rates in acute and long-term care settings.”54 Also identified were “key components of successful implementation, including: a focus on accounta-
bility with continued measurement of performance, simplification and standardization of pressure ulcer-specific interventions and consistency in staff training related to documentation, involvement of multidisciplinary teams and leadership, identification of designated skin champions with staff having autonomy for interventions, ongoing staff education, and sustained focused audits with feedback and recognition of front line staff successes.”54 In addition, recommendations for performance measurement to sustain improvements included embedding quarterly prevalence and incidence studies using validated collection tools into “assessments of risk/quality and professional practice, and continually monitoring all hospital-acquired pressure ulcers.”54

A review of the literature by the RNAO identified that the review of patient records did not provide valid and reliable data about pressure injuries and often under-predicted prevalence rates. It recommended that more attention be focused on the quality of documentation of the data to enable the reliable use of the electronic patient record for data collection in the future.7 Additional quality indicators such as the “Required Organizational Practices” identified by national accreditation organizations were also recommended as a method to monitor outcomes.7

The Pressure Ulcer Awareness and Prevention Program (PUAP), a continuous quality improvement (CQI) program implemented in Canadian institutions, demonstrated a reduction rate up to 57% (prevalence) and 71% (incidence).55
According to Bales et al., program sustainability requires assessment to determine if there is support through strong leadership, involvement of staff in decision-making and a desire to foster interdisciplinary relationships.56

1.3 Complete a wound assessment, if applicable.

Discussion: The RNAO recommends “a comprehensive head-to-toe skin assessment be carried out with all clients at admission, and daily thereafter for those identified at risk for skin breakdown. Particular attention should be paid to vulnerable areas, especially over bony prominences and skin adjacent to external devices.”16

The frequency of a comprehensive skin assessment after initial assessment depends on policies of the care setting. A thorough examination of bony prominences, folds, perineal and perigenital area, and under medical devices is recommended. Evaluation tools and approaches for skin damage such as high-resolution ultrasound57 and measuring subepidermal moisture58 have been developed—and there are studies in progress—but currently there is not enough evidence to recommend implementation into clinical practice.59

Health-care providers should assess and determine the category/stage of the pressure injury according to the 2016 NPUAP revised staging definitions.11 The categories Unclassified/Unstageable and Deep Tissue Injury should continue to be used. Categorizing pressure injuries from 2 to 4 is preferred to the use of the terms staging or grading, which tends to indicate a hierarchical progression,7,60 which is not always the case. Accurate categorization of pressure injuries is essential for treatment planning, data collection and financial reimbursement.51,62 The NPUAP recommends that pressure injuries be categorized/staged according to the depth of original injury and not be categorized/staged in reverse as healing occurs. That is, a pressure injury that was originally identified as a Category/Stage 4 would be classified as a healing Category/Stage 4 pressure injury as healing progresses.51 Visual inspection to identify/classify pressure injuries in darkly pigmented skin is a challenge and is often inaccurate, requiring assessment for differences in skin temperature, colour, consistency and pain.20,60,64 Wounds that are not pressure injuries should not be classified using NPUAP criteria. It is essential to differentiate pressure injuries from various other wound etiologies such as arterial ulcers, neuropathic ulcers, skin tears and incontinence-associated dermatitis.51
Pressure injuries need to be assessed on admission to the care setting and at least weekly thereafter.\textsuperscript{20,60,65,66} The MEASURE (measure, exudate, appearance, suffering, undermining, re-evaluate, edge) mnemonic\textsuperscript{67} captures many of the key parameters essential for pressure injury assessment.\textsuperscript{40,68} Validated and reliable assessment tools that can detect progress toward healing and provide valuable information to direct treatment decisions should be used.\textsuperscript{20,60,69–71}

Such tools include the Pressure Ulcer Scale for Healing (PUSH)\textsuperscript{72} and the Bates-Jensen Wound Assessment Tool (BWAT).\textsuperscript{26} Although the BWAT demonstrated excellent reliability when used by nurses with special training in wound assessment and has undergone some testing that identified that the total BWAT score may be useful in predicting outcomes, more research is required to determine its predictive validity.\textsuperscript{73} The revised Photographic Wound Assessment Tool (PWAT)\textsuperscript{26} is a valid and reliable tool to assess chronic wounds of various etiologies using digital images, but it has not been tested to determine if it is responsive to changes in wound status over time.\textsuperscript{74} If available, serial photography using a standardized technique and/or reliable validated electronic data collection devices can also provide valuable information to assist with wound assessment.\textsuperscript{60}

Although there are several wound assessment tools available, none of the 10 tools reviewed by Pillen et al. were found to be valid in all required criteria (validity, reliability and sensitivity).\textsuperscript{75} The Pressure Ulcer Scale for Healing (PUSH) and Pressure Sore Status Tool (PSST), also known as the Bates-Jensen Wound Assessment Tool (BWAT), showed the strongest scores for responsiveness.

Assessment tools specific to special populations, such as those with spinal cord injuries, have been developed to ensure population-specific information is considered. Thomason et al. introduced the Spinal Cord Impairment Pressure Ulcer Monitoring Tool (SCI-PUMT) to improve the outcomes of assessment and treatment of pressure injuries in patients with spinal cord injuries or disorders.\textsuperscript{76} One validated tool presently used to measure healing with spinal-cord-injured patients is the Photographic Wound Assessment Tool (PWAT), which shows reliability and validity with other measures of healing.\textsuperscript{77}

Khoo and Jansen performed a literature search on types of wound measurement techniques between 2000 and 2014.\textsuperscript{78} A comparison of measurement techniques (ruler, digital planimetry, acetate tracings/contact planimetry, as well as laser and structured light devices) revealed digital planimetry provided the best precision and reliability over ruler and acetate tracings. The use of laser and structured light requires more study. Institutional resources must be considered when introducing an organizational standard for practice.

The clinician must be able to identify when bacterial damage is occurring and differentiate between superficial, spreading and deep infection or abnormal persistent inflammation in order to create a plan of care that will provide the appropriate treatment. Accurate identification of the microbial load and causative organisms within the wound is best achieved by tissue biopsy or by the Levine quantitative swab technique.\textsuperscript{18}

A bone biopsy is recommended to diagnose osteomyelitis if there is clinical suspicion of osteomyelitis.
Step 2: Set Goals
Step 2: Set Goals

Recommendations

2.1 Set goals for prevention, healing, non-healing and non-healable wounds.

Discussion: Pressure injury prevention should be considered a patient safety goal. Because of the increased acuity of elderly patients admitted and decreased lengths of stay in the hospital, 15% of elderly patients will develop pressure injuries within the first week of hospitalization. For those admitted to long-term care, pressure injuries are most likely to develop within the first four weeks.\textsuperscript{79} The mortality rates associated with pressure injuries are as high as 60% for older persons with pressure injuries within one year of hospital discharge.\textsuperscript{80,81}

2.1.1 Identify goals based on prevention or healability of wounds.

Discussion: Treatment goals must reflect prevention and/or the overall healing ability of the wound. In order to assist clinicians in setting realistic goals, wounds can be classified as healing, non-healing or non-healable.

The efficacy endpoint of a pressure injury may be classified as complete healing or surrogate endpoints and both must be considered when the team sets goals and develops a plan of care to meet the goals. It is important to be cognizant of surrogate endpoints to measure outcomes of the pressure injuries management plan. Surrogate
markers are the endpoints that occur early in the course of treatment and are predictive of healing. Decrease in wound size and alleviation of smell, discharge and pain are examples of endpoints that are critical for the person with a pressure injury and caregiver. To have consistent and quantifiable goals and objectives, the endpoints should be measurable, repeatable and specific, with interrater reliability.82

Once a person has developed a pressure injury, healability will depend on the ability of the team to modify both the intrinsic and extrinsic factors. A goal of wound closure may not be realistic when factors that impair wound healing are present, such as poor perfusion, malnutrition, malignancies, unmanageable co-morbidities and/or lack of adherence to the plan of care.20,60 Preventing or healing a pressure injury may be improbable, and these wounds may be classified as non-healing or non-healable.40,68

**Table 5:** Intrinsic and Extrinsic Factors that Affect Pressure Injuries16

<table>
<thead>
<tr>
<th>Extrinsic (External) Risk Factors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hygiene</td>
<td></td>
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<tr>
<td>Living conditions</td>
<td></td>
</tr>
<tr>
<td>Medications</td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td></td>
</tr>
<tr>
<td>Friction</td>
<td></td>
</tr>
<tr>
<td>Shear</td>
<td></td>
</tr>
<tr>
<td>Clothing/garments</td>
<td></td>
</tr>
<tr>
<td>Moisture</td>
<td></td>
</tr>
<tr>
<td>Transfer type/quality</td>
<td></td>
</tr>
<tr>
<td>Transfer slings</td>
<td></td>
</tr>
<tr>
<td>Restraint use</td>
<td></td>
</tr>
<tr>
<td>Support surfaces</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Intrinsic (Internal) Risk Factors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritional status (malnutrition and dehydration)</td>
<td></td>
</tr>
<tr>
<td>Reduced mobility/immobility</td>
<td></td>
</tr>
<tr>
<td>Involuntary movements</td>
<td></td>
</tr>
<tr>
<td>Posture/contractures</td>
<td></td>
</tr>
<tr>
<td>Neurological/sensory impairment</td>
<td></td>
</tr>
<tr>
<td>Incontinence (urinary and fecal)</td>
<td></td>
</tr>
<tr>
<td>Extremes of age</td>
<td></td>
</tr>
<tr>
<td>Level of consciousness</td>
<td></td>
</tr>
<tr>
<td>Acute illness</td>
<td></td>
</tr>
<tr>
<td>History of previous pressure damage</td>
<td></td>
</tr>
<tr>
<td>Vascular disease</td>
<td></td>
</tr>
<tr>
<td>Severe, chronic or terminal illness</td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
</tr>
</tbody>
</table>
It is important to determine the adequacy of blood supply to support healing, especially for ulcers on the lower extremities.\textsuperscript{40,68} When contributing factors cannot be corrected or there is an absence of adequate blood supply, a wound can be non-healable.

Wound closure may also be unrealistic for patients who are terminally ill. Skin Changes at Life's End (SCALE)\textsuperscript{83} may develop, so alleviating pain, reducing smell and managing exudate should be primary goals of the plan of care.\textsuperscript{40}

\textbf{2.1.2 Identify quality-of-life and symptom-control goals.}

\textbf{Discussion:} Goals need to be established to enhance the patient’s quality of life regardless of the healability of pressure injuries.\textsuperscript{40} Such goals may be primary ones or surrogate endpoints to improve quality of life.

Comfort is the principal consideration in supportive care and therefore may supersede prevention protocols and wound treatments for actively dying patients and for those who have conditions that cause them to have a single position of comfort.
Step 3: Assemble the Team
Step 3: Assemble the Team

Recommendations

3.1 Identify appropriate health-care professionals and service providers.

Discussion: The etiology of pressure injuries is complex and multifactorial, and as a result requires an integrated team to address the many underlying impairments and contributing factors. Each team member brings a unique body of knowledge but also needs to have a foundational understanding of pressure injuries, except, perhaps, the patient and their family. Team member knowledge can be assessed through tools such as the Pieper Pressure Ulcer Knowledge Test (PPUKT).\textsuperscript{18}

The team process requires that all team members work together, not independently of one another, to create a customized plan of care. The comprehensive patient assessment and goal-setting stages will help identify who should be part of the team. Table 6 lists some of the potential members and what they bring to the team.

Table 6: Team Members and their Knowledge and Skills\textsuperscript{18}

<table>
<thead>
<tr>
<th>Team Members</th>
<th>Knowledge and Skill to Address Impairments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinician with advanced wound care training</td>
<td>Optimized care planning for management of pressure injuries</td>
</tr>
<tr>
<td>Chiropodist/podiatrist</td>
<td>Specialized care of pressure injuries in the foot; pressure offloading; some surgical procedures to eliminate or minimize pressure points on the foot</td>
</tr>
<tr>
<td>Diabetes educator</td>
<td>Ongoing education for the management of diabetes to optimize glucose control and enhance healing potential</td>
</tr>
<tr>
<td>Enterostomal therapy nurse</td>
<td>Advanced education regarding risk assessment and management of pressure injuries</td>
</tr>
<tr>
<td>Infection disease practitioner</td>
<td>Addressing of unresponsive, recalcitrant, or recurrent infection such as osteomyelitis</td>
</tr>
<tr>
<td>Nurse practitioner</td>
<td>Primary health care provider; can prescribe medications, order tests, provide referrals</td>
</tr>
<tr>
<td>Occupational therapist</td>
<td>Pressure redistribution, activities of daily living assessments, cognitive assessments and interventions, psychosocial assessment, support/counselling, expertise in assessment of pressure redistribution surfaces, including wheelchair seating prescription, shear prevention and management</td>
</tr>
<tr>
<td>Pedorthist/orthotist</td>
<td>Pressure offloading for foot and lower extremity pressure injuries as well as bracing for other areas of the body</td>
</tr>
<tr>
<td>Personal support worker</td>
<td>Day-to-day personal care of patient; early recognition of Category/Stage 1 pressure injury</td>
</tr>
</tbody>
</table>

cont’d.
<table>
<thead>
<tr>
<th>Team Members</th>
<th>Knowledge and Skill to Address Impairments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person with pressure injuries and family/friends</td>
<td>Experts in their everyday lifestyle, needs and ability to participate in plan of care</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Medication; can optimize management of comorbidities, pain, infection; reconciliation/information/teaching, monitoring for interactions</td>
</tr>
<tr>
<td>Physiatrist</td>
<td>Care of persons with SCI; work with rehabilitation personnel</td>
</tr>
<tr>
<td>Physical therapist</td>
<td>Pressure redistribution, mobility, safe exercise and reconditioning, adjunctive therapies, wheelchair seating and positioning, shear prevention and management</td>
</tr>
<tr>
<td>Physician</td>
<td>Can prescribe medications, order tests, provide referrals, oversee plan of care</td>
</tr>
<tr>
<td>Psychologist</td>
<td>Assessment and treatment of mental health issues, coping strategies, quality-of-life issues impacting adherence to the plan of care</td>
</tr>
<tr>
<td>Registered dietitian</td>
<td>Assessment and management of nutritional status to ensure optimal nutrition to maintain skin integrity and facilitate healing</td>
</tr>
<tr>
<td>RN/RPN</td>
<td>Assessment and management of pressure injuries, dressing changes, administering medication, health teaching and monitoring</td>
</tr>
<tr>
<td>Social worker</td>
<td>Psychosocial, spiritual care, psychosocial assessment/social supports (housing, devices, financial resources, etc.) and disposition planning</td>
</tr>
<tr>
<td>Speech and language pathologist</td>
<td>Swallowing and communication assessment and recommendations to optimize nutritional intake and quality of life</td>
</tr>
<tr>
<td>Spiritual care</td>
<td>Support and counselling for those with slow-to-heal, non-healing and non-healable wounds</td>
</tr>
<tr>
<td>Surgeon</td>
<td>Surgical intervention, debridement, flap closure for deep or slow-healing pressure injuries, vascular interventions to improve perfusion to lower limb pressure injuries</td>
</tr>
</tbody>
</table>

3.2 Enlist the patient and their family and caregivers as part of the team.

Discussion: The success of a plan of care for the prevention and treatment of pressure injuries hinges on the collaboration of the person with a pressure injury, their support system and communication among the team of professionals involved in the development of the plan of care. In order to be effective team members, the person with the pressure injury and their support system must have the motivation, capacity, ability and commitment to act, as well as the personal ability to interact effectively with each other.84
3.3 Ensure organizational and system support.

**Discussion:** Health-care organizations need to make available financial and human resources, including relevant consultants and team members as well as time and support for frontline nursing staff and appropriate access to equipment such as moisturizers, skin barriers and therapeutic devices to ensure pressure injury programs are successful. Policies and procedures regarding pressure injury prevention and management also need to be developed, implemented and evaluated regularly.

Organizations need to support appropriate education for staff so they may obtain adequate skills and knowledge to effectively manage the multiple complex issues related to pressure injuries. A needs assessment should be undertaken to identify knowledge gaps and ensure that educational sessions are tailored to meet those needs. Educational sessions need to utilize principles of adult learning, relate to clinical practice and reinforce strategies to sustain knowledge.
Step 4: Establish and Implement a Plan of Care
Step 4: Establish and Implement a Plan of Care

Recommendations

4.1 Identify and implement an evidence-informed plan to 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.

Discussion: It is important to establish an interdisciplinary, collaborative, patient-centred treatment plan utilizing an evidence-informed approach that is aligned with the overall goals of care.

A systematic review by Reddy et al. on pressure injury prevention identified that the priority in the prevention of pressure injuries was to identify and address underlying causative and contributing factors rather than focus on local wound care, as she found that the differences between specific treatment strategies were minimal. Focus should be on forces associated with immobility such as shear, friction, temperature and moisture management to effectively reduce the risks of pressure injury development.

Managing Pressure, Friction and Shear

Managing pressure, friction and shear forces is important in any pressure injury prevention and management plan. The optimal management of these forces requires an integrated team skilled in the management of pressure, friction and shear within the context of the person’s goals and lifestyle. When considering the treatment plan, the focus should be on maintaining mobility while reducing these forces. Treatment expectations may need to be adjusted in the presence of multiple unmodifiable factors such as achieving a balance between the need for total offloading (bed rest) and social, physical and psychological needs.

Utilization of the five As of self-management—(1) assess, (2) advise, (3) agree, (4) assist and (5) arrange—may be a useful technique to assist in the facilitation of “effective collaboration between health-care professionals and persons and their primary caregiver(s) in self-management education.”

All patient care facilities across the continuum of care must be able to access the appropriate equipment to meet specific patient needs. Helpful equipment may include repositioning sheets, a trapeze bar, support surfaces in bed, a fitted wheelchair with a pressure management cushion and other equipment designed to reduce pressure, friction and shear. Regardless of the support surface used, it is important that care providers are knowledgeable regarding the use, maintenance and operation of these devices.

Positioning: For patients with a pressure injury on the buttocks and/or trochanter, mobilization should be a priority. At a minimum, sitting should be encouraged where pressure on the ulcer can be managed to promote mobility and the minimization of bed rest. Bed rest has known complications such as anorexia.

Patients as Partners in Care

There has been a recent shift toward utilizing chronic disease patient self-management principles in the healing of chronic wounds. Engaging patients in carefully prescribed strengthening and conditioning programs by rehabilitation professionals can be safe and very empowering for patients and their families. The mental and physical benefits of exercise are many, including improved mood, sleep patterns, appetite, strength and endurance. These positive effects lead to improved functional status.
decreased executive functioning, de-conditioning and potential pulmonary emboli. There are no randomized controlled trials (RCTs) that indicate that bed rest is effective in the treatment of pressure injuries. Confining patients to bed often results in the person positioning the head of the bed at greater than 30 degrees for important activities such as eating, sponge bathing and visiting with family. Managing pressure, friction and shear throughout activities of daily life likely results in an improved quality of life for the person with a pressure injury and decreases the risk that a pressure injury could develop in fragile tissues.

Factors influencing shear force in bed include body type (slender individuals tend to have the highest shear force at the coccyx and sacrum), whether or not the knee is raised (raising the knees tends to decrease shear) and whether or not the position of the person with a pressure injury (bending points) in a supine position matches those of the bed.

Repositioning should also be considered for all those at risk of pressure injury development. Personalized repositioning protocols should be based on the patient’s tissue tolerance, level of mobility, medical condition, treatment objectives and the existing support surface.

The use of a pressure-redistributing support surface does not eliminate the need for repositioning. Patient positioning and repositioning should be carefully assessed by a physical and occupational therapist. Several positions, such as semi-Fowler with the head of the bed at greater than 30 degrees and sitting in recline, significantly increase the forces of friction and shear experienced by the patient. Elevating the patient’s knees in bed prior to bringing the head of the bed up, utilizing tilt rather than recline and ensuring that the patient’s feet are supported while sitting can help to decrease these forces. Frequent repositioning is important to relieve pressure on bony prominences but must be done in a manner that minimizes friction and shear by utilizing lifting sheets and positioning wedges. It is also very important that everyone involved in the patient’s care is made aware of the patient’s risk of tissue injury in order to ensure that safe transfers and adequate safe positioning and repositioning occur.

Transfers in particular should be assessed both at the beginning and end of the day when fatigue may impact the quality of the transfer. There are several tools available to aid in transfers and positioning, including transfer boards, trapezes and slider sheets, all of which help to reduce the forces of pressure, friction and shear. These tools, however, need to be used properly and by trained staff. Improved functional status translates into improved transfers, positioning and bed mobility. These skills are vital for the prevention and treatment of pressure injuries because poorly execut-
ed positioning, transfers or shifts in bed can result in increased tissue injury due to friction and shear. Transfer techniques should therefore be assessed by physical and occupational therapists for all people with pressure injuries and those at risk for developing pressure injuries.

Minimizing head-of-bed elevation and use of turning sheets for repositioning are also recommended. If the patient has received surgical intervention, mobility should be increased gradually from 30-minute sitting intervals to sitting as tolerated over four to eight weeks, according to the surgeon’s recommendations and the condition of the skin. OT/PT involvement is beneficial to ensure that the individual is positioned on a pressure-redistributing cushion when sitting in a chair.

The management of heels needs to be considered independently of the support surface. A systematic review by Junkin and Gray found that pressure redistribution surfaces vary in their ability to prevent heel pressure injuries, but there was insufficient evidence to determine which surfaces were optimal. A support surface tool has been developed based on the available evidence to assist clinicians to select the most appropriate support surface based on the person with a pressure injury’s risk for developing pressure injuries and their level of mobility. Evidence suggests that the use of a wedge-shaped cushion to suspend the heels off the bed is more effective in reducing the incidence of pressure ulcers than the use of a standard pillow. Evidence also suggests that a well-designed heel ulcer prevention program can reduce the incidence of pressure injuries in an acute orthopedic environment.

The effects of friction and shear are enhanced in the presence of moisture, and moisture from incontinence can be a risk factor for pressure injury development. An individualized bowel and bladder program for patients with incontinence should be established, including offering a bedpan or urinal in conjunction with turning schedules.

As with all wound types, the clinician must establish effective pain management strategies to optimize comfort, especially prior to movement and positioning.

Positioning patients for the prevention and management of pressure injuries can be very challenging. The following positioning tips will assist the clinician in preventing or managing pressure injuries.

- Follow a positioning schedule. Position every two to four hours while in bed; weight shift every 15 minutes when sitting.
- Avoid positioning the person with a pressure injury on bony prominences or on existing pressure injuries.
- Limit head of bed elevation greater than 30 degrees if medical condition permits.
- Use pillows or wedges to assist with proper positioning and body alignment. Do not use donut-type devices. Utilize assistive devices (such as bed rails, transfer boards, trapeze bars) to increase the patient’s independence and safety with repositioning and transfers.
- Develop a modified sitting schedule based on equipment availability (with tilt/recline functionality), quality-of-life goals and evidence of wound healing.
- Ask an occupational therapist or physical therapist for patient-specific transfer techniques to minimize shearing effects and maintain the patient’s independence.
- Inform the patient, family and caregivers about the positioning schedule and proper transferring and weight-shifting techniques.

- Ask an occupational therapist to assess the wheelchair and cushion for at-risk patients and for patients with known pressure injuries on the ischial tuberosities, coccyx or sacral area. Ensure feet are supported.

- Check your sling! Some types of slings are designed to be left under patients, while others are to be removed after transfer.

**Managing Moisture of Intact Skin**

The management of moisture of intact skin can be applied to all patient populations (see Table 7).

**Table 7: Managing Moisture of Intact Skin**

<table>
<thead>
<tr>
<th>Dry skin</th>
<th>Moisture-associated skin damage (MASD)</th>
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| - Dry skin is a significant and independent risk factor for pressure injury development.60  
- Skin emollients or non-sensitizing fragrance-free and alcohol-free moisturizers (e.g., urea, glycerin, alpha hydroxyl acids and lactic acid) are recommended to maintain supple hydrated skin and reduce the risk of skin damage. | - MASD is inflammation and erosion associated with skin exposure to mucus and/or saliva, ostomy effluent, perspiration, urine, stool or wound drainage. Erosion is attributable to moisture in the presence of various co-factors such as chemical irritants, mechanical forces and micro-organisms.  
Principles of prevention and treatment of MASD:  
- Implementation of an interventional skin care program that removes irritants from the skin, extends the natural barrier function of the skin and protects skin from future contact with irritants is recommended.  
- Control or diversion of the moisture source is essential.  
- Utilization of moisture-wicking products or devices that move moisture away from at-risk or compromised skin is essential for preventing secondary cutaneous infection.101 |

*cont’d.*
### Fecal and urinary incontinence

Peri-care is paramount in maintaining skin integrity.

- Skin requires cleansing after each fecal incontinence episode because briefs can trap fecal output against the skin and accelerate skin breakdown.
- Soft wipes or sprays are recommended to minimize friction that may occur during peri-care.
- Application of topical barrier products to protect skin from moisture is recommended. Excessive application of such products may interfere with the absorptive capacity of the incontinence brief.
- The co-efficient of friction for wet fabric on skin is more than double that for dry fabric; therefore, the risk for skin breakdown is increased when wet products are in contact with the skin.
- Parslow et al. suggest, “briefs are not recommended for long-term fecal incontinence management because of the risk of incontinence associated dermatitis (IAD).” For patients identified with IAD, the use of barrier products containing humectants (urea, glycerin, alpha hydroxyl acids and lactic acid) should be avoided since these products retain moisture in the skin and IAD causes the skin to already be overly hydrated.
- Ratliff et al. suggest, “indwelling catheters and fecal management systems may be warranted for brief periods if urine and liquid stool contribute to skin breakdown.” Vigilant monitoring for signs of pressure injury is recommended with the use of incontinence products and devices as they may contribute to increased pressure. Monitoring for pressure injury must be a consideration in care planning and implementation.
- Incontinence should not be managed by limitations in fluid and food intake. Monitoring of fluid intake is recommended to prevent dehydration, especially if vomiting, diarrhea, heavily draining wounds, excessive perspiration and other forms of insensible fluid losses occur.
- Consultation with an advanced practice nurse and the team is recommended for management of persistent moisture-related skin irritation.

### Heavy wound exudate

- Use of products or devices capable of containing/wicking exudate to maintain dry periwound skin and prevent maceration is recommended.
- Use of protective barrier sprays, creams, ointments or solid barrier sheets is recommended to protect periwound skin from heavy wound exudate.
- Wound drains should be assessed frequently to ensure that drainage tubes are not leaking, kinked or blocked.

### Skin microclimate

- Consideration of therapeutic support surfaces such as mattresses and chair cushions is important to ensure optimal microclimate of the skin.
- Incontinence briefs and pads should be compatible with the support surface, and layers of linen minimized or eliminated to ensure optimal microclimate for the skin.
- Chair cushions and covers should also be assessed for heat dissipation. Cushions and covers that permit air exchange to minimize temperature and moisture at the buttock interface are recommended.
Specific Information for Care of Special Populations

Care for the elderly and vulnerable: Pressure injury prevention and treatment plans should be developed with consideration of the person’s values and goals as well as their cognitive status to promote adherence.18,47

Care should include the use of barrier products to protect skin from excessive moisture, protection from medical devices, use of atraumatic wound dressings and the establishment of an individualized continence program. Repositioning (manual handling as well as equipment) and therapeutic support surfaces should address pressure redistribution and reduction of shearing forces.

Care for the patient with a spinal cord injury: Because of the patient’s immobility and decreased sensation, the use of seating surfaces, transfer devices and mattress support surfaces are paramount to aid with pressure redistribution.77

Care for the patient in critical care: Support surfaces and repositioning are crucial for this vulnerable, largely immobile, patient population. Support surfaces should be selected based on the patient’s need for microclimate control, shear reduction, pressure redistribution, turn, assist and percussion.47

Patients who cannot be turned for medical reasons should also be evaluated for a therapeutic support surface. According to the NPUAP, “In some instances individuals cannot be safely repositioned due to temporary oral-pharyngeal airway, spinal instability or the risk of fatality due to hemodynamic status. Indications of an individual being too hemodynamically unstable for repositioning include being actively fluid resuscitated to maintain systemic blood pressure, active hemorrhaging, life-threatening arrhythmia, or changes in hemodynamic parameters that do not stabilize with ten minutes of repositioning.”47 Regular repositioning should be implemented as the patient stabilizes.47
Repositioning schedules that employ slow, gradual turns should be initiated for each patient with consideration of their current oxygenation and hemodynamic tolerance to position change. For patients who cannot tolerate major changes in body position, small frequent shifts in body position are beneficial to promote reperfusion.\textsuperscript{47} Patients should be positioned off pressure injuries as much as possible. The lateral rotation support surface function is not recommended for patients with existing pressure injuries. If the lateral rotation feature of the support bed needs to be used, the patient should be secured with bolster pads to prevent sacral shear.\textsuperscript{47} Heels should be floated off the bed surface to reduce pressure injury development. Knees should be slightly flexed to prevent popliteal vein obstruction and avoid pressure over the Achilles tendon.\textsuperscript{47}

**Care for pediatric populations:** The presence of medical devices requires interventions to prevent and address pressure under splints, braces, traction boots, tracheostomy plates and arm boards.\textsuperscript{50}

Schluer et al. found increased pressure injuries under blood pressure cuffs, transcutaneous oxygen pressure probes, nasal prongs, CPAP masks and plaster casts.\textsuperscript{49}

Individualized pressure injury interventions should be based on the needs of the pediatric patient. Other medical devices such as orthotics, wheelchairs and wheelchair cushions should be frequently reassessed in growing children.

**Care for bariatric populations:** Due to the increased difficulty obese patients may have with moving, it is important for organizations to have bariatric management strategies to safely optimize manual handling techniques. Friction and shear injuries are increased, as patients often drag their heels and sacrum during transfers. Patients and all other team members should have access to equipment (such as beds, chairs and commodes) with the appropriate size and weight specifications to accommodate the patient’s girth.\textsuperscript{47}
All skin folds and surfaces should be assessed and addressed regularly, as pressure injuries may also develop over areas of high adipose tissue concentration such as across the buttocks and between skin folds.\textsuperscript{47}

**Care for patients during peri-operative stage:** While specific patient positioning is crucial for access and exposure to the surgical site, special attention is required when positioning the patient on the operating table to protect pressure points during surgery,\textsuperscript{103,104} redistribute pressure and minimize the effects of shearing as much as possible. High specification reactive or alternating pressure support surfaces are recommended for patients identified as being at risk. Protection of accessible bony prominences and heel elevation with protection of the Achilles tendon are also recommended.\textsuperscript{47}

**Care for patients at end of life:** While palliative care focuses on symptom management and comfort measures, the prevention of pressure injuries is an important aspect of care. However, during the time of active dying, the patient’s wishes for pain control and comfort may outweigh the desire for pressure injury prevention.\textsuperscript{47}

Other comfort measures may include skin emollients to maintain adequate skin moisture and prevent dryness. Pre-medicating the person with a pressure injury prior to repositioning, respecting the patient’s choices in turning schedules and utilizing a support surface may be beneficial. Hydration goals should be compatible with the patient’s condition and wishes.\textsuperscript{105}

Wound care for existing pressure injuries should focus on reduction of pain, minimizing odour, managing exudate and other symptoms that may impact quality of life.\textsuperscript{47}

The patient’s choices regarding turning should be respected and include whether they have a “position of comfort” after an explanation of the rationale for turning. The family and caregivers should be made aware of the goals and plan of care. Social work and spiritual care are important resources to consider for this population.

Management options for wounds that are non-healable because of factors such as an inability to effectively offload sitting pressures for a person with a Category/Stage 4 ischial pressure injury due to restricted finances should focus on the promotion of quality-of-life improvements such as comfort and management of wound symptoms as identified by the patient.

**Special Considerations**

**Medical device-related pressure injuries:** The NPUAP states, “Medical device-related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure injury generally conforms to the pattern or shape of the device.”\textsuperscript{13}

Routine skin inspection should include areas beneath medical devices for edema and potential skin breakdown if not medically contraindicated. Device-related injuries should be categorized/staged according to the degree of tissue injury. All staff members should be educated on the correct size of device to be used and proper positioning and placement of the device based on location, presence of existing pressure injuries and patient’s mobility status. High-risk areas such as the nasal bridge should be cushioned with protective dressings.\textsuperscript{106}

**Mucosal membrane pressure injuries:** The NPUAP states, “Mucosal membrane pressure injuries are located on mucous membranes with a history of a medical device in
use at the location of the injury. Due to the anatomy of the tissue these injuries cannot be staged.\textsuperscript{13}

Mucosal inspection should occur in conjunction with skin assessment and areas of compromised mucosa documented for health-care team awareness and continued monitoring. All staff members should be educated about appropriate anchoring techniques according to anatomical location to prevent friction from movement, shearing and pressure.

**Pain:** Pain is often considered one of the most problematic aspects of wound management, and pharmacotherapy continues to be the mainstay of pain management.\textsuperscript{107} Appropriate agents should be selected based on severity and specific types of pain according to the World Health Organization’s analgesic ladder.\textsuperscript{108} Some evidence suggests that topical agents (ibuprofen,\textsuperscript{109} morphine\textsuperscript{107} or dressings) play a role in alleviating wound-related pain.\textsuperscript{110}

**Surgical management of pressure injuries:** Surgical intervention represents an option to close recurrent, multiple or non-healing Category/Stage 3 and 4 chronic pressure injuries provided it is consistent with the goals of care.\textsuperscript{39} The decision-making process should be done in collaboration with the person with a pressure injury and the wound care team. Potential risks and benefits must be discussed within the team to ensure that the patient’s expectations and condition are understood and optimized prior to surgery. Psychosocial factors that may impact surgical wound healing and the patient’s willingness/ability to participate in all post-operative activities must also be considered and addressed prior to surgery.\textsuperscript{60}

The focus of post-operative flap care should be protecting the blood supply to the incisions from pressure and tension through the use of advanced pressure redistribution techniques. These techniques might include the use of a therapeutic support surface capable of reducing shear and pressure and controlling the microclimate over the operative site.

The recurrence rates for pressure injuries treated with plastic surgery have been reported to be high (13 – 31\%) in studies by Kierney et al.\textsuperscript{111} and Schryvers et al.\textsuperscript{112} However, a more recent review by Sameem et al. showed lower recurrence rates.\textsuperscript{113} Currently, the literature does not provide an RCT on the subject and therefore the effectiveness of surgery for the treatment of chronic pressure injuries is unclear.\textsuperscript{114}
4.2 Optimize the local wound environment.

4.2.1 Cleansing
Discussion: Optimizing local wound healing is multifaceted. Expert opinion recommends that:

- Pressure injuries and surrounding skin be cleansed\textsuperscript{115} using solutions with low toxicity such as saline, water\textsuperscript{40,68} or acetic acid (0.5\%–1.0\%).
- Tap water should not be used for wound cleansing for immune-compromised individuals.
- Irrigation of wounds should be avoided when you cannot see where the solution is going or cannot retrieve/aspirate the irrigation solution.\textsuperscript{40,68}
- Cleansing solutions containing surfactants and/or antimicrobials can be effective in critically colonized or infected wounds.\textsuperscript{20,60}

4.2.2 Debriding
Discussion: Debridement of healable pressure injuries continues to be recommended. The appropriate method of debridement needs to be determined based on the patient, the wound, the environment, the scope of practice of the person conducting the debridement and the resources available for the various debridement methods (e.g., autolytic, mechanical, enzymatic, biological, sharp/surgical).\textsuperscript{40,68} Surgical debridement is recommended in the presence of advancing cellulitis, crepitus, fluctuance and/or sepsis from wound-related infection and considered with the presence of undermining, tunnelling or extensive necrosis.\textsuperscript{60} It is recommended that dry, stable eschar on ischemic limbs not be debrided.\textsuperscript{60} For non-healable wounds, only conservative debridement should be performed.

4.2.3 Managing bacterial balance
Discussion: Bacterial balance is essential for wound healing. Vowden and Cooper state that wound deterioration or failure to progress toward healing is an indicator of potential wound infection when other potential causes have been managed.\textsuperscript{116} Therefore, the rate of healing in conjunction with subtle or overt signs of infection can help to guide intervention decisions.\textsuperscript{117}

Standard medical practice for osteomyelitis also includes a prolonged course of antibiotics of at least a six-week duration. If surgical intervention is planned the infected bone should be resected prior to surgical closure.\textsuperscript{118}

4.2.4 Managing moisture balance
Discussion: Moisture balance within the wound base can be achieved through dressing selection. Dressings should be selected according to the amount of available moisture within the wound bed and the cause of any excess of wound drainage. An increase in wound exudate may be the result of recurrent trauma, unmanaged co-morbidities such as congestive heart failure or wound infection. These co-morbidities should be addressed.

4.3 Select the appropriate dressing and/or advanced therapy.
Discussion: A systematic review by Clark et al. studied the evidence regarding the use of prophylactic dressings for the prevention of pressure injury. They report that “Several cohort studies, weak RCTs and case series all suggested that the introduction
of a dressing as part of pressure ulcer prevention may assist to reduce pressure ulcer incidence associated with medical devices especially in immobile intensive care unit patients.”\textsuperscript{119} Silicone dressings, film and foam dressings have been studied for their use as a preventative measure to protect bony prominences for those at risk of pressure injury. Clarke et al. commented on dressings for wound healing by stating they “did not identify clinical evidence that one dressing type was more effective than other dressings.”\textsuperscript{119} One RCT was identified that suggested that dressings can be of use for preventing wounds. This study found that the “placement of a soft silicone foam dressing over the sacrum significantly reduced the incidence of pressure ulcers compared to similar patients who received preventive care but no dressing.”\textsuperscript{119}

Dressings/devices should be selected to contain wound exudate and maintain exudate off periwound skin with slight moisture at wound base.\textsuperscript{120} It is also important to choose products that will prevent trauma or injury to fragile/friable tissue—including the periwound area—such as those that are silicone based or non-adherent.\textsuperscript{68}

Emerging evidence suggests that a dressing with a slippery backing placed over areas at risk for pressure injury development may help to reduce friction and shear and lower the incidence of pressure injuries.\textsuperscript{121}

Dressing considerations for non-healable wounds may include the use of products that reduce moisture and bacteria, are atraumatic to reduce painful removal and contribute to conservative debridement. The use of advanced active therapies is often contraindicated when goals are not related to healing.\textsuperscript{40,68}

There are various categories of antimicrobial dressings, including antiseptics and products containing silver, honey, slow-release iodine and polyhexamethylene biguanide (PHMB). Topical antimicrobial dressings are to be discontinued once critical colonization has been corrected or if a beneficial effect is not evident after two to four weeks of use.\textsuperscript{40,68} Topical dressings exist to reduce matrix metalloproteinases (MMPs) and can be used in combination with topical antimicrobials or systemic anti-inflammatories/antimicrobials.\textsuperscript{40,68}

**Advanced Therapies and Devices:**

Advanced therapy options are available to promote healing.\textsuperscript{68}

A person with a chronic pressure injury may be a candidate for advanced therapies. These are therapies that support, enhance or replace traditional therapies. Their level of evidence varies depending on the modality.\textsuperscript{36} An extensive review of the scientific literature was conducted for randomized controlled trials, multi-centre trials and meta-analyses that examined the effectiveness of various modalities on healing (wound closure) of chronic pressure injuries. New modalities and elements of discussion are included in this recommendation and are summarized in Table 8.
| **Electrical stimulation therapy (EST) (Level of Evidence: Ia)**[^122] | EST has been demonstrated to be effective in enhancing the healing of recalcitrant Category/Stage 2, 3 and 4 pressure injuries[^60]. There are 12 randomized controlled studies involving the study of a total of 404 subjects. No new trials were identified for this update. Ten of the 12 studies report that EST accelerated wound healing compared with subjects in the control group. The results of these clinical trials are to be combined in a meta-analysis[^123]. Preliminary findings demonstrated a significant increase in closure rates of pressure injuries of EST compared with controls[^124]. |
| **Platelet-derived growth factor (PDGF-BB) (Level of Evidence: IIa)** | The clinical evidence on platelet-derived growth factor (PDGF) suggests that PDGF-BB may improve healing of pressure injuries. However, the evidence is not sufficient to recommend this treatment for routine use[^60]. In the past, three trials (RCTs) examined the impact of using PDGF on pressure injuries. Only one reported a significant increase in wound healing rate for chronic pressure injuries treated with PDGF-BB[^125]. |
| **Electromagnetic therapy (EMT) (Level of Evidence: IV)** | EMT could be considered a treatment for recalcitrant Category/Stage 2, 3 and 4 pressure injuries. The literature reports two randomized controlled trials (RCTs), involving 60 participants. Both trials compared the use of EMT with sham EMT, although one of the trials included a third arm in which only standard wound care was applied. The results of this review provided no strong evidence of benefit in using EMT as an adjunctive modality to treat chronic pressure injuries[^123]. |
| **Negative pressure wound therapy (NPWT) (Level of Evidence: IV for NPWT as an adjunctive modality in the treatment of chronic wounds; III as a pre-surgical procedure)** | The evidence for the use of negative pressure wound therapy with pressure injuries is not sufficient to recommend its use. In three studies, the wound improvement was similar with NPWT when compared with standard care[^122]. NPWT may be considered in the preparation of pressure injuries prior to surgical closure, with the aim of reducing the wound surface area and to stimulate wound bed vascularization, but no RCTs have been published to support this application. As found in the Cochrane Review published in 2008 and reviewed in 2011, there are now seven trials (RCTs) that report the effects of NPWT on chronic wounds but only one on patients with chronic pressure injuries[^127]. At present, there is no meta-analysis published on the effects of NPWT on chronic pressure injuries specifically. |

[^122]: [Link](#)
[^123]: [Link](#)
[^124]: [Link](#)
[^125]: [Link](#)
[^127]: [Link](#)

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<table>
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<tr>
<th>5. Ultraviolet light C (UVC) (Level of Evidence: Ib)</th>
<th>One small RCT (n = 16) demonstrated that UVC combined with standard wound care generated a greater effect on wound healing of chronic pressure injuries\textsuperscript{128} than standard wound care alone; however, no evidence exists to clarify whether UVC or ultrasound, used alone, exerts any beneficial effect.\textsuperscript{129} One study reported a significant reduction in semi-quantitative swab results following a single treatment with UVC.\textsuperscript{130} If one of the goals of care is to reduce bacterial burden in clean but critically colonized Category/Stage 3 and 4 pressure injuries, UVC may be considered but should not be used instead of other products, dressings or therapies to reduce bacterial burden.\textsuperscript{50}</th>
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<tr>
<td>6. Warming therapy (Level of Evidence: Ib)</td>
<td>Two RCTs support the use of the warming therapy or noncontact normothermic wound therapy (NNWT) in the treatment of chronic pressure injuries. Subjects received three treatments daily during which the dressing was warmed for one hour. The results of the two trials are similar and report an increased healing rate for the warming therapy group.\textsuperscript{131,132}</td>
</tr>
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<td>7. Laser (Level of Evidence: IV)</td>
<td>Two trials (RCTs) on the use of laser as an adjunctive therapy in the treatment of chronic pressure injuries reported no difference between laser therapy and standard wound care, which presents a contradiction to what may be believed in clinical practice.\textsuperscript{122,128,133}</td>
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<td>8. Topical oxygen therapy (TOT) (Level of Evidence: III)</td>
<td>Only one research study has been completed on the subject and it included only three patients.\textsuperscript{134} Results showed a positive effect on the healing rate, but more research is needed to confirm that TOT is a useful adjunctive modality in the treatment of chronic pressure injuries.</td>
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<td>9. Ultrasound therapy (Level of Evidence: IV)</td>
<td>Three RCTs involving 146 subjects have been published on the use of ultrasound therapy in the treatment of chronic pressure injuries. Results showed no significant difference in healing rates between the ultrasound treated and the control group.\textsuperscript{122,135}</td>
</tr>
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<td>10. Hyperbaric oxygen therapy (Level of Evidence: IV)</td>
<td>Hyperbaric oxygen therapy is considered useful for ischemic wounds, but there is a lack of data concerning the correlation of this modality and the treatment of chronic pressure injuries. No RCTs on the subject have been found.\textsuperscript{136}</td>
</tr>
<tr>
<td>11. Skin equivalents (Level of Evidence: IV)</td>
<td>The literature review did not find a single published RCT exploring the effect or benefit of skin equivalents on chronic pressure injuries. There is insufficient scientific evidence to support their use at this time.\textsuperscript{20}</td>
</tr>
<tr>
<td>12. Proteases modulating (Level of Evidence: IV)</td>
<td>The literature review did not find a single published RCT exploring the effect or benefit of protease modulating products on chronic pressure injuries.</td>
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4.4 Engage the team to ensure consistent implementation of the plan of care.

Discussion: Instruction needs to be directed to all levels of care providers, including the person with a pressure injury, family and caregivers, to maintain the plan of care. Education on the prevention and management of pressure injuries should be designed to incorporate the principles of age-specific learning and the level of information required. The mode of delivery must be flexible to accommodate the needs of the learner. To maximize retention of information and to facilitate translation into practice, information needs to be presented at a level that is appropriate for the target audience.

Patients and caregivers: Collaboration among the person with a pressure injury and the rest of the team in the development and implementation of the plan of care is essential.

Persons at risk for pressure injury development and those with an existing pressure injury and their caregivers require information regarding the causes and risk factors for pressure injuries as well as their risk for re-injury and ulcer recurrence. Both formal and informal educational methods are beneficial, including the use of standardized patient-education materials on pressure injuries (pamphlets/packages/modules) as well as individualized demonstration and review of prevention/management techniques.

Patients and caregivers need to know how to conduct a daily skin inspection (examination), how to use pressure management techniques (such as weight shifts, correct positioning, offloading) and must be aware of the importance of adequate nutrition and hydration. Patients should also be encouraged to reposition themselves. Education should also include information regarding appropriate use of therapeutic surfaces, the roles of various health professionals, strategies to manage pain and discomfort, expected outcomes and duration of treatment, if known.

Health-care professionals: Comprehensive educational programs need to be developed for health-care professionals, with implementation across the continuum of care to ensure accurate, consistent and uniform assessment as well as documentation of the extent of tissue damage and the role of the interdisciplinary team.

These programs should outline the roles of health-care professionals in the prevention of pressure injuries, including skin inspection for signs of pressure injuries, skin care regimens, pressure management, reduction of friction and shear injuries, positioning
and transfer techniques\(^3\) and monitoring for poor nutritional status.\(^2\) Critical analysis of current practice and outcomes, formation of an interdisciplinary team, development of simple prevention protocols, selection of therapeutic pressure redistribution surfaces and mandatory staff training\(^3\) have all been identified as essential for program success.

Detailed components of education for health-care professionals include instruction on how to achieve accurate and reliable risk assessments by incorporating clinical judgment of risk factors, and how to conduct comprehensive skin assessments, including special assessment techniques for unblanchable erythema, especially for those with darker skin tones.\(^6\) The importance of documentation of all risk and skin assessments and the necessity for ongoing assessment to detect early signs of pressure damage are described as essential in ensuring accurate communication within the integrated team, providing evidence that care planning is appropriate and is serving as a benchmark for monitoring progress.\(^6\)

Magnan and Maklebust identified a relationship between scores on Braden subscales and nurses’ selection of commonly used best-practice interventions for pressure injuries prevention.\(^13\) Data analysis provided evidence that accurate risk assessment promoted increased attention to preventative measures, thereby reinforcing the importance of staff education programs focused on both accuracy of pressure injury risk assessment and aggressive preventative interventions.\(^13\)

Educational programs also need to include strategies to differentiate pressure injuries from other types of wounds and the appropriate use of a classification system, including the appearance of different tissue types. Training regarding repositioning strategies and the use and maintenance of pressure management devices are essential for all those involved in the prevention and care of pressure injuries, including the person at risk of or with a pressure injury.\(^3\,6\)

Prevention programs should be structured, organized, comprehensive, sustainable and be updated on a regular basis to incorporate new evidence and technologies.\(^7\) Integrating a process for continuous program evaluation into the planning process is essential.\(^7\)

The creation of pressure injury prevention teams, use of champions to assist with local implementation of pressure injury prevention programs, establishment of goals for pressure injury reduction and maintenance of data on identification, prevention and outcomes assists facilities with the evaluation of their nursing practice based on nurse-sensitive indicators.\(^7\) Identification of facility-wide barriers, including failure to consistently differentiate community-acquired versus hospital-acquired pressure injuries, is also important for the creation of successful programs.\(^14\)

Additional quality improvement strategies to facilitate culture change include skin-care-unit-based council meetings and activities, lectures, newsletters, informal one-on-one bedside clinical instruction, networking opportunities, positive feedback and re-instruction.\(^7\)

Technology-assisted education, including web-based training modules and resources, has been identified as an effective method to improve knowledge and the abilities of health-care professionals in pressure injury risk assessment and pressure injury identification and staging.\(^14\)
Step 5: Evaluate Outcomes
Step 5: Evaluate Outcomes

Recommendations

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

Discussion: Through the use of validated tools, the clinician can determine if the goals of the prevention or treatment plan have been met. Prevention of pressure injuries is the ultimate goal; however, if wounds occur, signs of progress toward healing should be evident for most wounds within two weeks of treatment.20,60,65,142,143

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

Discussion: Goals of care such as wound closure, quality-of-life issues and symptom control may not occur until all of the underlying causes have been optimized. It is important to return to the assessment and recommendations and re-evaluate, and potentially revise, the treatment plan to address gaps and areas for modification.

Reassess the patient, wound and environment:

Validated and reliable tools that have been tested for responsiveness are essential to assist the wound team evaluate wound healing and other wound-related goals. If wound closure is expected, goals should be based on the patient’s condition and ability to heal. If there is no evidence of progress toward healing within two weeks, reassessment of the wound, plan of care and patient is required.60

Although rare, chronic pressure injuries that are not healing as expected can become malignant and form a Marjolin’s ulcer. A biopsy of the wound during reassessment can reveal this.

Reassess the system:

A root cause analysis (RCA) process, as recommended by the NPUAP, provides a systematic process to assist a facility to “gain insight into the development of a pressure ulcer through a review of the timeline of events. The RCA is not intended for the analysis of all facility-acquired pressure injuries but as a review of the development of a Category/Stage 3, Category/Stage 4 or DTI.”144 Such a review can help to identify why a PI developed and what strategies, including improvement to the facility’s skin management program, can be implemented to prevent further pressure injuries. The NPUAP emphasizes that an RCA “is not intended as a punitive function but rather as a learning and growth opportunity for facility staff” and that the information uncovered can be useful to create strategies for risk management.144

The NPUAP also recommends that quality councils track trends using event forms such as the RCA to identify and investigate facility-acquired pressure injuries.145 These trends can then be compared with similar facilities to assist with benchmarking.

Soban et al.146 identified five essential components of pressure injury prevention toolkits found in the Veterans Health association (VHA) handbook147 and the Agency for Healthcare Research and Quality (AHRQ) toolkit for PI prevention.148 These components include policy, committee/team, wound specialist/team, monitoring performance and staff education. Evaluation of these components on a regular basis is crucial to ensure pressure injury prevention program success and show improvement over time.
**Evaluation of prevention equipment and supplies:** Equipment used by patients/clients needs to be maintained and re-evaluated regularly. Most equipment manuals will provide information on preventative maintenance requirements as well as the life expectancy of the equipment. The appropriateness of a well-maintained piece of equipment for a specific client also needs regular evaluation. Ideally, this evaluation should occur annually.

Evaluation of supplies should also occur regularly. Cost effectiveness, rather than straight cost, should be considered in conjunction with patient satisfaction and care provider satisfaction.

**Evaluation of policy/programs:** The RNAO has made the following recommendation for the evaluation of policies and programs: “Organizations must lead and provide the resources to integrate pressure injury management best practices into standard and interprofessional clinical practice, with continuous evaluation of outcomes.”\(^{18}\) The provision of “organizational support including identification of barriers to implementation, decision support tools, a communication mechanism and standardized metrics were identified as key to the successful implementation of pressure injury best practices.”\(^{18}\) Collaboration with the integrated team to support best practices and identify resources was also highlighted as an important component of quality management of pressure injuries.

Staff-to-patient ratios have also been identified as having an impact on pressure injury occurrence. A systematic review by Backhaus et al. found that the availability of more staff resulted in a decrease in pressure injury development.\(^{149}\) Similarly, a study by Lui et al. identified that hospital-acquired pressure injuries “significantly increased when the patient-to-nurse ratios exceeded 7:1,” demonstrating an association between a higher incidence of pressure injuries and high patient-to-nurse ratios, as well as the number of overtime hours worked.\(^{18,150}\)

Prevalence and incidence studies using validated collection tools and focused audits have been identified as useful methods to monitor performance, interventions and outcomes, as well as embedding prevalence of pressure injury studies into assessment of risk/quality and professional practice.\(^{62}\) Quality indicators such as those identified by national accreditation organizations should also be used to monitor outcomes.\(^{7}\)

Review of patient records has not presented valid and reliable data about pressure injuries and often under-predicts prevalence rates. It is recommended that more attention be focused on the quality of documentation of the data to enable the reliable use of the electronic patient record for data collection in the future.\(^{7}\)

**Evaluation of committee and teams:** Quality reviews assist with the assessment of teams and culture. Sullivan identified key recommendations to prevent hospital-acquired pressure injuries with a “focus on accountability, continued measurement of performance, staff autonomy with interventions, consistency in staff training relating to documentation and recognition of front-line staff success.”\(^{54}\)

According to Bales et al., sustainability requires an environmental assessment to determine the existence of strong leadership, involvement of staff in decision-making and a desire of the team to develop and foster relationships.\(^{56}\)

Hospitals with a wound care specialist staff resource had a high association of successful performance monitoring, staff education and lower pressure injury rates. Further
studies are needed to investigate the relationship between key operational components to prevent pressure injuries and the influence of a wound-care specialist.\textsuperscript{146}

Staffing should also be considered when evaluating a pressure injury program. Trinkoff et al. noted that higher turnover of CNA staff was linked to higher rates of pressure injuries.\textsuperscript{151}

**Culture:** Successful pressure injury prevention programs require assessments of communication and routines. Niederhauser et al. recommend evaluating routine care and communication strategies to improve programs.\textsuperscript{152} Evaluating practices and bundling common care activities can successfully assist caregivers with prevention activities when added to routine practices already built into their day.

The Attitude towards Pressure ulcer Prevention instrument (APuP) may help to illuminate some of the barriers to prevention. This instrument has been designed to measure five factors:\textsuperscript{153}

1. Attitude toward personal competency to prevent pressure ulcers
2. Attitude toward the priority of pressure ulcer prevention
3. Attitude toward the impact of pressure ulcers
4. Attitude toward responsibility in pressure ulcer prevention
5. Attitude toward confidence in the effectiveness of prevention

With appropriate, multifaceted education, adherence to guidelines increases.\textsuperscript{154} Paquay et al. also found that while almost all recommended prevention strategies were implemented, repositioning in bed and in the armchair decreased significantly, likely because the nurses mistakenly believed the pressure management materials in place were sufficient and therefore repositioning was unnecessary.\textsuperscript{154} Knowledge of pressure injuries and pressure injury prevention is not enough—the attitudes of nurses toward pressure injuries are significantly correlated with the implementation of prevention activities.\textsuperscript{154}

**Evaluation of education programs and the health-care team:** Interdisciplinary education should be standardized and reviewed for application of knowledge.\textsuperscript{18} The RNAO recommends pre- and post-assessment of knowledge related to pressure injury prevention. Assessments of knowledge transfer to practice should be assessed through audits and case study exercises. Recommendations related to frequency or timing of post evaluations is lacking in the literature. The RNAO recommends post-test assessment of knowledge, attitudes and skill to reinforce previous learning.\textsuperscript{18}

The Pieper Pressure Ulcer Knowledge Test (PPUKT) is a valid and reliable tool to assess knowledge of pressure injury prevention and management and has been in use since 1995.\textsuperscript{155} In 2014, Pieper and Zulkowski added improvements to their test and renamed it the Pieper/Zulkowski...
Pressure Ulcer Knowledge Test (PZ-PUKT), however this has not been tested for validity and reliability.156

5.3 **Ensure sustainability to support prevention and reduce risk of recurrence.**

**Discussion:** Sustainability of an individualized pressure injury prevention protocol or maintenance of a healed pressure injury is dependent on access to appropriate equipment and services, collaboration among the person with or at risk for a pressure injury, their caregivers, service providers and the interprofessional team of health-care professionals. Ongoing evaluation as well as clear, effective communication regarding the plan and follow-up is required by all involved across the continuum of care.

At the system and institutional levels, successful sustainability of pressure injury prevention programs was described by Bales and Padwojski as dependent on strong leadership and management skills to identify prevention as a key priority within organizations, involvement of staff in decision-making and interdisciplinary participation to ensure optimal outcomes.56,158 In addition, a systematic review by Sullivan et al. identified that measures of performance such as conducting quarterly prevalence studies and continually monitoring all hospital-acquired pressure injuries were key components to sustaining improvements.54 Prompt identification of pressure injuries that fail to progress to sustained closure is essential for reassessment and evaluation of the treatment plan to ensure that all potential underlying causative and contributing factors are optimized. As well, a rapid response to Category/Stage 1
injuries, including pressure management strategies, will provide a sustainable, cost-effective model to support improved outcomes.

An example of a successful and sustainable pressure injury prevention program is the previously mentioned PUAP program, which demonstrated a pressure injury reduction rate up to 57% (prevalence) and 71% (incidence).55

Conclusion

Prevention of pressure injuries is of paramount importance. Despite a focus on prevention to date, pressure injury incidence rates have not significantly decreased. An integrated approach focused on prevention is required across all areas of the healthcare system to make a significant difference in incidence rates. For optimal acceptance and effectiveness, integrated teams need to include other departments such as purchasing and housekeeping as well as stakeholders such as the patient and families. Collaboration and communication across all departments and sectors of care are vital to ensure that outcomes are patient-centred and optimal for the prevention and management of pressure injuries.

Immediate implementation of pressure management strategies have been shown to be effective when a Category/Stage 1 pressure injury is identified, yet our systems may not be set up to support this rapid response even though it is important that systems be structured to facilitate it. It is also important to return to the basics of prevention: look at all surfaces upon which the person at risk for or with a pressure injury sits or lies as well as transfer techniques during all points of care, such as in acute care, operating and interventional room tables, emergency room stretchers, ambulatory departments, rehabilitation settings, community and long-term care. Focusing on treating the potential causes of pressure injuries is paramount, while at the same time remembering that not all pressure injuries are preventable.

In all cases of injury prevention or management, customized plans of care should be implemented.

The use of metrics to monitor clinical outcomes is essential to drive culture and practice changes that may be necessary to prevent and manage pressure injuries. Identification of facility barriers and implementation of strategies to resolve these issues are imperative to support the changes required.

Pressure injury prevention and management have now been recognized as measures of quality by Accreditation Canada in both long-term care and hospitals, and nationally hospital pressure injury rates are being reported, with facilities being named.

It is time to ensure that pressure injury prevention becomes a critical component of all aspects of safe patient care.

Prevention is key!
References
References


3. Sibbald RG, Queen D. Demonstration project for community patients with lower leg and foot ulcers: A collaborative project of the University of Toronto, Women's College Hospital, Registered Nurse's Association of Ontario, Toronto CCAC and Peel CCAC. Wound Care Canada. 2007;5(1):supplement.


42. Langemo, DK. Quality of life and pressure ulcers: What is the impact? Wounds. 2005;17(1).


47. National Pressure Ulcer Advisory Panel (NPUAP), European Pressure Ulcer Advisory Panel (EPUAP) and Pan Pacific Pressure Injury Alliance (PPPIA). Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. 2014.


104. Cherry C. Best practices for preventing hospital acquired pressure injuries in surgical patients. AORN J. 2011;29(1).


Reference Policies and Procedures

These documents are not for direct replication but reference for building a Pressure Injury Prevention Policy for your facility
STANDARDS TO BE MAINTAINED

When people enter long term care, the Northwood inter-professional team assess and document the condition of the residents’ skin integrity. The team will regularly assess the condition of residents’ skin, risk of skin integrity issues and document the results of the assessment. A change in medical condition and/or significant time away from Northwood facilities triggers reassessment of skin integrity and increase the risk of skin integrity issues. Northwood provides best practice preventative care to prevent skin integrity issues and best practice treatment of existing skin integrity issues. Under the direction of the wound resource team, Northwood continues to improve care and develop procedures to minimize the occurrence and duration of skin integrity issues.
DEFINITIONS

Braden Scale Risk Assessment Tool.

The Braden Scale for Predicting Pressure Ulcer Risk, is a tool that was developed in 1987 by Barbara Braden and Nancy Bergstrom. The purpose of the scale is to help health professionals, especially nurses, assess a patient's risk of developing an injury. The Braden Scale is a scale made up of six subscales which measure elements of risk that contribute to both higher intensity and duration of pressure, or lower tissue tolerance for pressure. These are: sensory perception, moisture, activity, mobility, nutrition, friction, and shear. Each item is scored between 1 and 4, with each score accompanied by a descriptor. The lower the score, the greater the risk.

Pressure Injury:
A pressure injury is localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

Stage 1 Pressure Injury: Non-blanchable erythema of intact skin
Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.

Stage 2 Pressure Injury: Partial-thickness skin loss with exposed dermis
Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive related skin injury (MARSII), or traumatic wounds (skin tears, burns, abrasions).

Stage 3 Pressure Injury: Full-thickness skin loss
Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.
Stage 4 Pressure Injury: Full-thickness skin and tissue loss
Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.

Unstageable Pressure Injury: Obscured full-thickness skin and tissue loss
Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e. dry, adherent, intact without erythema or fluctuance) on the heel or ischemic limb should not be softened or removed.

Deep Tissue Pressure Injury: Persistent non-blanchable deep red, maroon or purple discoloration
Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full thickness pressure injury (Unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions.

EQUIPMENT
How2Trak (Electronic Wound Care Documentation System)
Pointclickcare (PCC)
Braden Scale risk assessment tool for predicting pressure ulcers on PCC
Wound and skin care Referral on PCC
Skin Observation tool on PCC
NUAP Pressure Ulcer Staging Guide
Northwood Wound care manual, staging poster
CAWC/RNAO Binder

METHOD:
RN/LPN:
1. Complete the Braden Scale to document all residents at risk of developing pressure within the first 72 hours of a new admission or 24 hours of a resident that has been readmitted, then every two weeks for four weeks following the admission and then quarterly.
2. Complete the Braden Risk Assessment tool when there are changes in the residents’ health status including a transfer to a higher level of care.

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3. Perform a skin assessment on all residents within the first 8 hours of admission or first 2 hours of readmission. This is to be documented on PCC under skin observation tool.

4. Perform a skin assessment within the first 2 hours upon return from hospital or if the resident has spent over 24 hours in the emergency department and document on Point Click Care under skin integrity.

5. Implement intervention guidelines for Braden Scale for all residents scoring at risk and documented intervention on Point Click Care in the resident progress notes.

6. Complete a plan of care for all residents identified at high risk and very high risk developing pressure injury (i.e. Braden score of 12 or less). Document on point click care under CAP MDs 2.0 library focus Pressure Ulcer.

7. Stage every pressure injury using the National Pressure Ulcer Advisory Panel (NPUAP) staging system (Appendix A).

8. Report facility acquired pressure injury (FAPI) Stage 2, 3, Stage 4, Unstageable and Deep Tissue Pressure Injury (DTPI) in Point Click Care, Risk Management as a New pressure injury.

9. Provide residents, family members and caregivers with education and prevention strategies on pressure injury risk factors. Taking into consideration their scope of practice and employment, all health care team members are required to maintain their competency for best practice in pressure injury prevention.

Wound Care Team:

10. Audit and complete yearly prevalence/incident reports to monitor/measure the success of the pressure injury prevention program.

KEY POINTS:

1. **Skin Assessment** (RN/LPN Responsibilities) - Perform skin assessment on all residents on first 8 hours of admission and first 2 hours of readmission. This is to be documented on PCC under skin observation tool

2. CCA performs a skin assessment at least once every shift, and reports changes to nurse and charge and the CCA documents changes on point click care

3. **Risk Assessment** (RN/LPN Responsibilities). If the Braden scale scores high to very high risk (12 or less) an individualized care plan is required to be developed in point click care PCC under care plan with interventions put in place for CCA ADL.

4. **Education** - Residents, family members and caregivers are provided with education on risk factors and prevention strategies related to their care.
5. **Documentation** - All Wound assessment, interventions and outcomes will be documented in How2trak each time a dressing is changed. Any complications to normal wound healing are documented in Point Click care, e.g. infection.

6. **Facility acquired pressure injury (FAPI)** Stage 2, Stage 3, Stage 4, Unstageable and Deep Tissue Pressure Injury (DTPI) will be reported in point click care, under risk management.

7. **Quality/Reporting** - Facility acquired pressure injury (FAPI) Stage 2-4, Unstageable and Deep Tissue Injury (DTI) will be reported using the facility-specific reporting system. Note: Preexisting pressure injury progressing to an advanced stage (i.e. Stage 3, Stage 4, and Unstageable) must also be reported through same process; house/floor audits will be performed quarterly (every 3 months) to assess pressure ulcer prevention activities.

8. **Residents at risk for pressure injuries** are identified on admission; readmission and changes in medical status. All residents are to be monitored regularly, with interventions implemented to prevent pressure ulcer development. Referrals to allied health team members based on low subscales on the Braden Scale or as needed.

**QUALITY MONITOR**

Audit and complete yearly prevalence/incident reports to monitor/measure the success of the pressure injury prevention program.

**EDUCATION**

The inter-professional team are provided with skin integrity, pressure ulcer prevention, wound care products and documentation on hire and as needed.

**REVISION HISTORY**

Original – 01/09/2012
Revised – 04/18/2017
Revised – 01/15/2018
## APPENDICES

### PRESSURE INJURY AND STAGES

A pressure injury is localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense pressure, prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

<table>
<thead>
<tr>
<th>DEFINITION</th>
<th>SCHEMATIC DRAWING</th>
<th>EXAMPLE</th>
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<tbody>
<tr>
<td><strong>STAGE 1 PRESSURE INJURY</strong></td>
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<tr>
<td>Non-blanchable erythema of intact skin</td>
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<td><strong>STAGE 2 PRESSURE INJURY</strong></td>
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<td>Partial-thickness skin loss with exposed dermis</td>
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<td>Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive related skin injury (MARSi), or traumatic wounds (skin tears, burns, abrasions).</td>
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<td><strong>STAGE 3 PRESSURE INJURY</strong></td>
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<td>Full-thickness skin loss</td>
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<tr>
<td>Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epiderme (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.</td>
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<tr>
<td><strong>STAGE 4 PRESSURE INJURY</strong></td>
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<tr>
<td>Full-thickness loss of skin and tissue</td>
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<table>
<thead>
<tr>
<th>Definition</th>
<th>Schematic Drawing</th>
<th>Example</th>
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<tbody>
<tr>
<td><strong>Unstageable Pressure Injury</strong>&lt;br&gt;Obscured full-thickness skin and tissue loss&lt;br&gt;Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e., dry, adherent, intact without erythema or fluctuance) on an ischemic limb or the heel(s) should not be softened or removed.</td>
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<td><img src="image" alt="Example" /></td>
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<td><strong>Deep Tissue Pressure Injury</strong>&lt;br&gt;Persistent non-blanchable deep red, maroon or purple discoloration&lt;br&gt;Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, purple discoloration, or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full thickness pressure injury (Unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions.</td>
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<td><strong>Mucosal Membrane Pressure Injury</strong>&lt;br&gt;Mucosal membrane pressure injury is found on mucous membranes with a history of a medical device in use at the location of the injury. These ulcers cannot be staged.</td>
<td><img src="image" alt="Schematic Drawing" /></td>
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## Pressure Injury Prevention Repositioning Schedule

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<tr>
<th>Date</th>
<th>Time</th>
<th>Right Side</th>
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<th>Skin inspection observations</th>
<th>Staff Signature</th>
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## Braden Scale Implementation Guide

**Check off when implemented.**

<table>
<thead>
<tr>
<th>If residents score 15-18</th>
<th>Manage Moisture</th>
</tr>
</thead>
</table>

- Keep positioned off bony prominences
- Reposition every 2 hours using either a full turn or small shift of position
- Protect Heel and Elbows using long sleeves
- Elevate Heels off bed at all times even with therapeutic support surface. Support the knees to avoid hyperextension when heels are elevated
- Use pillows to avoid contact between bony prominences such as knees and ankles when side lying in bed
- Inspect skin when repositioning, toileting & assisting with
- Moisturize skin 2-3 times a day
- Ensure that bed linens beneath the resident are smooth and unwrinkled
- Remove slings while in chair/wheelchair
- Ensure the bed is flat when moving the resident up in bed
- Do not use multiple layers of bedding or padding, especially `soaker pads`
- Develop and document individualized care plan
- Consult OT for Braden Sensory subscales of 3 or less
- Consult OT for Braden Mobility or Activity subscales of 3 or less

**Manage Moisture**

- Consult wound care nurse for Braden Moisture subscales of 3 or less
- Use absorbent incontinence products that work and hold moisture
- Offer bedpan/urinal and glass of water in conjunction with turning schedules
- Offer toilet as necessary to maintain continence or check for incontinence every 2-4 hours
- Use a moisture barrier to protect skin from urine, feces, and perspiration
- Do not “double pad”; if the resident voids large amounts use a more absorbent product, change the continence brief more frequently or use a condom catheter for males
- Gently cleanse skin folds and perineal area after each incontinence episode with a no-rinse pH balanced skin cleanser and pat dry when finished; do not rub the skin
- Use dimethicone to reduce skin irritation breakdown
- Avoid allergens such as perfume, lanolin preservatives and alcohol
- Avoid hot water, use mild cleansing agent (pH balanced) and avoid excessive rubbing, rather pat skin dry
- Avoid the use of powders and talc to reduce moisture
- Protect sacral or perineal wounds from feces and infected urine, use a local collector bag, condom catheter or indwelling catheter if appropriate for the resident until the incontinence problem has been addressed

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**BRADEN SCALE IMPLEMENTATION GUIDE**

If resident score is 13-14
**Considered Moderate risk initiate intervention from 15-18**
**Plus Implement following intervention**

- Avoid positioning the person on a pressure ulcer or reddened area, if this is not possible then limit the time to less than one hour and assess for further damage
- If the person has an ulcer on a sitting surface, reduce sitting time to two-35 minute sessions per day
- For residents using therapeutic surfaces, check to ensure the support surface is functioning properly, i.e., Roho cushion
- Elevate the heels off the surface of the bed in collaboration with an occupational or physical therapist to determine the most appropriate heel off-loading device
- Implement an individualized turning schedule
- Elevate HOB no more than 30 degrees raised the knee gatch 10 – 20 degrees before the HOB is raised. Ensure the resident’s hip bones are aligned 10 cm above the point where the bed flexes
- Use form wedges for 30 degree Lateral positioning
- Pressure reduction support surface

Manage Nutrition
- Consult Dietician for Braden Nutrition subscale score that score 2 or less
- Increase protein intake
- Increase calorie intake to spare proteins
- Maximize the resident’s nutritional status through adequate protein and calorie intake, especially with Stage 3 and 4 ulcers, if compatible with goals of care

If resident score is 10-12
**Considered High risk initiate 15-18 and 13-14**
**Plus Implement following intervention**

- Supplement with small shifts in position
- If the resident is chair bound or sits for long periods, use a therapeutic support surface on the chair and consider limiting chair sitting to 1-2 hour intervals
- Hourly Reposition chair bound residents who cannot move themselves
- When sitting, ensure resident’s feet are supported directly on the floor, on a foot stool or a foot rest so that the hips and knees are at 90 degrees to prevent sliding down in the bed

Manage Friction & Shear
- Consult OT for Braden Shear and Friction subscale that equals 2 or less
- Elevate HOB no more than 30 degrees
- Use transfer sheets lift sheet to move resident
- For lateral transfers, use sliding boards, roll boards or transfer sheets to minimize shearing

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### BRADEN SCALE IMPLEMENTATION GUIDE

**If resident score is 9 or below**
- Considered High risk initiate from 15-18, 13-14 and 10-12
- Plus Implement following interventions

<table>
<thead>
<tr>
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<th>All of the above</th>
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<tbody>
<tr>
<td></td>
<td>Establish a written resident specific 24-hour repositioning schedule that establishes every 1-2 hourly turns depending on the resident risk status and irrespective of the resident’s therapeutic support surface</td>
</tr>
<tr>
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<td>High-risk individuals with poor tissue tolerance may require small shifts in position between turns</td>
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<tr>
<td></td>
<td>Use pressure-relieving surface if resident has intractable pain OR</td>
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<td></td>
<td>Severe pain exacerbated by turning</td>
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</table>

**Other general care Issues**
- Do NOT use rolled blankets, towels, pillow cases, incontinence pads to elevate heel
- Maintain good hydration
- Avoid drying the skin
- Avoid positioning the resident on a pressure ulcer or reddened area; if this is not possible then limit the time to less than 1 hour and assess for further damage

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**Guidelines for use of Braden Risk Assessment tool:**

**Admission:**
- Braden Scale is to be completed the first 72 hours of a new admission
- 24 hours of a readmission
- Then every two weeks for four weeks, then quarterly.

**Braden Scale should be completed when resident returns from hospital; is reclassified to a higher level of care; changes in resident’s condition.**
REFERENCES


Nova Scotia health Authority, Pressure Ulcer Procedure June 2016

Prevention Plus, LLC permission to use Braden scale April 2017


The National Pressure Ulcer Advisory Panel; NPUAP Pressure Injury Stages retrieved Jan 2017


NS Department of Health and Wellness Long Term Care Program Requirements: Nursing Homes & Residential Care Facilities, Section 6.4 2015
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POLICY

1. The assessment and documentation of all patients' risk of developing pressure injury are to be performed by an RN/LPN using the Braden Scale Risk Assessment Tool for adults and Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk (under age 5 years) within the first 24 hours of being admitted.

2. The assessment of skin must be performed for each patient on admission, every shift, and when there is a significant change in patient's status.

3. Every pressure injury will be staged using the National Pressure Ulcer Advisory Panel (NPUAP) staging system (Appendix A).

4. All patients identified at risk of developing pressure injury (i.e. Braden score of 18 or less) will have a plan of care implemented.

5. Patients, family members and caregivers will be provided with education and prevention strategies on pressure injury risk factors.

6. Taking into consideration their scope of practice and employment, all health care team members are required to maintain their competency for best practice in pressure injury prevention.

7. Facility acquired pressure injury (FAPI) Stage 3, Stage 4, Unstageable and Deep Tissue Pressure Injury (DTPI) will be reported using the facility-specific reporting system (e.g. Safety Improvement and Management System (SIMS)). Note: Preexisting pressure injury progressing to an advanced stage (i.e. Stage 3, Stage 4, Unstageable) will be reported.

8. Written informed consent will be obtained in writing and documented in the patient chart prior to a photograph being taken of any wound.

9. The success of the pressure injury prevention program will be measured by NSHA quarterly audits and yearly prevalence/incidence study.

GUIDING PRINCIPLES AND VALUES

Pressure Injury (Ulcer) Prevention is a Required Organizational Practice (ROP) within the Accreditation Canada Standards. This policy supports compliance with the Accreditation Standards. This information is based on the Required Organizational Practice (ROP) Handbook 2017.

PROTOCOLS

1. Skin Assessment (RN/LPN Responsibilities)

   1.1 Perform skin assessment on all patients on admission and at least once every shift, and document according to facility standards. Refer to current Perry and Potter for details of skin assessment.
2. **Risk Assessment** (RN/LPN Responsibilities)

2.1 Assess all admitted patients, within 24 hrs, for their level of risk for skin breakdown using:

2.1.1 the Braden Scale for Predicting Pressure Ulcer Risk for adults.

2.1.2 the Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk for age less than 5 years.

2.2 Braden scales are scored according to physical assessment, interview and chart review.

2.3 Patients will be reassessed on transfer to the nursing unit, and whenever their condition changes.

2.4 Perform routine Braden or Braden Q Scale assessments as follows:

<table>
<thead>
<tr>
<th>Location</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Emergency Department</td>
<td>Within 24 hour of admission, and Daily</td>
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<tr>
<td>Critical Care (ICU/ IMCU) units</td>
<td>Daily</td>
</tr>
<tr>
<td>Acute Care units</td>
<td>Daily</td>
</tr>
<tr>
<td>Subacute Care units</td>
<td>Weekly (e.g. Restorative Care)</td>
</tr>
<tr>
<td>Long Term Care/Nursing Home Unit within NSHA</td>
<td>Weekly x 4 and then Monthly</td>
</tr>
<tr>
<td>Geriatric long stay</td>
<td>Weekly x 4 and then monthly</td>
</tr>
<tr>
<td>Identified high risk patients in Mental Health and Addictions</td>
<td>Weekly x 4 and then monthly</td>
</tr>
</tbody>
</table>

**EXCLUSIONS:**

- Maternal/Labor and Delivery/Operating Room
- Neonatal Intensive Care Unit (NICU)
- Patient visits less than 24 hours

3. **Interventions/ Plan of Care based on Braden Scale/Braden Q**

3.1 An individualized care plan must be developed for the patient.
3.2 The subscales of the Braden or Braden Q Scale should be used to identify appropriate interventions to prevent skin breakdown (standardized plans of care are available on NSHA facility websites).

<table>
<thead>
<tr>
<th>If Braden Score 18 or Braden Q Score 16 the RN/LPN must:</th>
</tr>
</thead>
<tbody>
<tr>
<td>● have an individualized patient plan of care</td>
</tr>
<tr>
<td>● have interventions to address identified Braden subscale areas of risk (e.g. sensory perception, moisture, etc)</td>
</tr>
<tr>
<td>● develop a turning schedule</td>
</tr>
<tr>
<td>● assess for Heel Off Loading (<a href="#">Appendix B</a>)</td>
</tr>
<tr>
<td>● assess for Therapeutic Support Surface (<a href="#">Appendix C</a>)</td>
</tr>
<tr>
<td>● assess for Chair Support Surfaces (<a href="#">Appendix D</a>)</td>
</tr>
<tr>
<td>● assess for device related injury (bedpan, braces, etc)</td>
</tr>
<tr>
<td>● collaborate with the health care team to promote patient goals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If Braden Score 14 or less the RN/LPN must:</th>
</tr>
</thead>
<tbody>
<tr>
<td>● perform above activities and</td>
</tr>
<tr>
<td>● place a pressure ulcer icon sticker on plan of care</td>
</tr>
<tr>
<td>● revise interventions as necessary</td>
</tr>
</tbody>
</table>

Braden Q- for subscale Tissue Perfusion and Oxygenation patient must be:

- monitored for oxygen saturation OR
- serum hemoglobin and serum pH OR
- capillary refill

For extremely compromised: Hypotensive (mean arterial pressure (MAP) of less than 50mmHg; less than 40 in a newborn) OR the patient does not physiologically tolerate position changes.

4. **Patient Education**

4.1 Patients, family members and caregivers are provided with education on risk factors and prevention strategies related to their care.

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4.2 Provide patient and family with pamphlet on pressure ulcer prevention.

5. **Documentation**

5.1 Document the assessment, interventions and outcomes in the patient’s health care record.

6. **Quality/Reporting**

Facility acquired pressure injury (FAPI) Stage 3, Stage 4, Unstageable and Deep Tissue Injury (DTI) will be reported using the facility-specific reporting system. Note: Preexisting pressure injury progressing to an advanced stage (i.e. Stage 3, Stage 4, Unstageable) must also be reported.

6.1 Unit audits will be performed quarterly (every 3 months) to assess pressure ulcer prevention activities.

6.2 Prevalence and Incidence will be performed on a yearly basis for NSHA.

**REFERENCES**


Braden, B. (2012). The Braden Scale for Predicting Pressure Sore Risk: Reflections after 25 Years. * Advances in Skin and Wound Care.* p. 61


Braden, B.; Bergstrom, N. (2004) Permission to Use Braden Scale in CDHA; Prevention Plus Omaha, NE. (obtained for NSHA)


Curley, M.A.Q., Razmus, I.S., Roberts, K.E., Wypij, D. Predicting Pressure Ulcer Risk in Pediatric Patients: The Braden Q Scale. *Nursing Research.* 52(1):22-33,
January/February 2003. [http://www.marthaaqcurley.com/braden-q.html](http://www.marthaaqcurley.com/braden-q.html) (Permission for NSHA to use Braden Q Jan 26, 3016)


National Pressure Ulcer Advisory Panel (NPUAP) website. [www.npuap.org](http://www.npuap.org); Accessed April 22, 2016.


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[http://www.bradenscale.com](http://www.bradenscale.com)

**RELATED DOCUMENTS**

**Policies**

CC 02-009 Care Team Assistant Skills

CDHA CC 55-045 Skin and Wound Assessment

SWH 800.1045 1 Pressure Ulcer Management

**Forms**

See forms for each Zone at present

- Braden Scale
- Braden Q Scale
- PrinA1513 (Dal Print) Pressure Ulcer Prevention Sticker
- PrinA1514 (Dal Print) Pressure Ulcer Prevention bedside Poster (5” x 5”)

**Brochures**

- Central Zone: Pressure ulcer (bed sore) prevention (print # WE85-1582 Dal printing)
- South Shore: Pressure Ulcer Pamphlet

**Appendices**

- Appendix A - NPUAP Pressure Injury Stages (2016)
- Appendix B - Heel Offloading Algorithm
- Appendix C - Therapeutic Surface Support
- Appendix D – Chair Support Services

[Click here to get to the LIBRARY for more resources](#)

**Replacing the Following District Health Authority/Version History**

***

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OP3PO150710
APPENDIX A National Pressure Ulcer Advisory Panel (NPUAP)
Pressure Injury Stages©

Pressure Injury Definition:
A pressure injury is localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

<table>
<thead>
<tr>
<th>STAGE PICTURE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| ![Stage 1 Picture](image1.png) | **Stage 1 Pressure Injury: Non-blanchable Erythema of Intact Skin**  
Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury. |
| ![Stage 2 Picture](image2.png) | **Stage 2 Pressure Injury: Partial-thickness Skin Loss with Exposed Dermis**  
Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive related skin injury (MARSII), or traumatic wounds (skin tears, burns, abrasions). |
**Stage 3 Pressure Injury: Full-thickness Skin Loss**

Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.

---

**Stage 4 Pressure Injury: Full-thickness Skin and Tissue Loss**

Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.

---

**Unstageable Pressure Injury: Obscured Full-thickness Skin and Tissue Loss**

Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e. dry, adherent, intact without erythema or fluctuance) on an ischemic limb or the heel(s) should not be removed.
### Deep Tissue Pressure Injury (DTPI): Persistent non-blanchable deep red, maroon or purple discoloration

Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full-thickness pressure injury (Unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions.

It is recommended that reverse staging of pressure ulcers NOT be used to describe the healing process of a wound as this does not accurately reflect what is physiologically occurring in the ulcer (NPUAP, 2000). NPUAP 2016© [www.npuap.org](http://www.npuap.org)
APPENDIX B Heel Offloading

Assessing the Patient who is at Risk for Heel Pressure Injury (Complete Braden Scale)

Do the following:
- Frequent position changes
- Early mobilization
- Assess skin integrity every shift

Braden 19-23

Establish if patient is appropriate for heel device:
1. Visible signs of pressure?
   And/or
2. Have ONE of the risk factors for pressure

- Apply and monitor off-loading device
- Perform skin check q2h once device applied
- Refer to appropriate team members
- Consider therapeutic surface

RISK FACTORS:
- Braden-Mobility ≤ 2 and Activity ≤ 2
- Fractured hip or lower extremity fracture
- Ischemia of the lower limb
- Remaining lower limb amputee
- Peripheral neuropathy-Diabetes mellitus
- Leg Spasms/inadequately controlled pain
- Mental confusion
- Skin grafts to the lower leg or foot
- Paralysis of the lower leg or foot
- Unconscious
- Slings and springs
- Bucks Traction

Braden 18 or less

Pressure Ulcer Prevention Basic Strategies:
- Reposition every 2 hours (even when on a therapeutic surface)
- Elevate/float heels off the surface of the bed
- Use pillows lengthwise
- Assess skin integrity every shift for red areas

Is Patient Ambulatory?
2 person assist will be considered “NOT AMBULATORY”

Yes

CONTINUED VISIBLE SIGNS OF PRESSURE?
(blanchable and/or non-blanchable redness)

No

Return to Pressure Injury Prevention Strategies

- Apply and monitor off-loading device
- Perform skin check q2h once device applied

If continues skin breakdown, consider consult:
- Occupational Therapy
- Orthotics & Prosthetics

No

Yes
APPENDIX C Therapeutic Surface Support

BRADEN SCORE 18 or less AND / OR CLINICAL SIGNS OF PRESSURE (BLANCHABLE OR NON-BLANCHABLE REDNESS)

NO

- Use a standard hospital foam mattress (consider weight limit of mattress)
- Implement basic prevention strategies for skin breakdown:
  - head to toe skin assessment daily
  - head of bed below 30°
  - turn q2hours
  - off-load heels

YES

Develops signs of pressure (blanchable or non-blanchable redness)

Assess patient for additional concerns contributing to potential or actual skin breakdown:
- mattress unable to support weight (bottoming out)
- edema
- pressure points (i.e. coccyx, heels)
- poor nutrition and dehydration
- moisture (incontinence or excessive sweating or wound drainage)
- friction/shear
- head of bed greater than 30° over long periods of time (COPD, tube feeds, ventilation, TV, etc)
- pain (uncontrolled)
- limited options for repositioning (i.e. broken hip)

YES

- Increase prevention strategies regarding additional concerns identified above.
- Monitor skin integrity qshift
- Consult OT/PT to address mobility, activity and/or surface support challenges

CONTINUED VISIBLE SIGNS OF PRESSURE? (blanchable or non-blanchable redness)

Consider a therapeutic surface for patient/resident

Pressure Redistribution
- Therapeutic pressure redistribution mattress
- Provide appropriate mattress for patients for weight

Pressure Redistribution, Moisture, Friction, and/or Shear
- Air mattress
- Low air loss mattress or overlay
- GOR-TEX cover sheet
- Microclimate

Pressure redistribution, pulmonary, and/or circulatory
- Low air loss mattress
- Percussion/pulsation
- Rotation
- Alternating pressure

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**APPENDIX D: Chair Support Surfaces**

Regardless of the materials used no cushion relieves pressure from all aspects of the seated surface, so frequent (q 15min) repositioning is required.

Incontinence and incontinence briefs should be considered when choosing a cushion.

<table>
<thead>
<tr>
<th>Support Surface</th>
<th>Characteristic</th>
<th>Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foam Cushion (Solid)</td>
<td>Provides some pressure redistribution, depending on types of foam used and contours of the cushion. Patient still requires repositioning q15 min-1h</td>
<td>Condition of foam must be checked for deterioration. The more contoured the cushion, the more critical the patient’s placement is while sitting needs to be to prevent skin breakdown.</td>
</tr>
<tr>
<td>Gel Cushion (Semi-solid)</td>
<td>Redistributions pressure by allowing the pelvis to immerse into the gel. May be used with clients with problems with friction and shear. Patient still requires repositioning q15 min- q1h</td>
<td>Some gel cushions require the gel to be redistributed or kneaded every time before the patient sits on it. For cushions with thick gel sliding can be a problem.</td>
</tr>
<tr>
<td>Air-filled Cushion (Fluid)</td>
<td>Redistributions pressure by allowing the pelvis to immerse into the air cells. Patient still requires repositioning q 15 min- q1h</td>
<td>Under inflation or over inflation render the cushion ineffective. The cushion requires daily monitoring to ensure proper inflation (check for bottoming out). The cushion can be recalibrated when inappropriate air pressure is discovered. If a puncture in the cushion is found, repairs are in order.</td>
</tr>
</tbody>
</table>

Bottoming out (see definition in Learning Module) should be tested on air-filled cushions to ensure the air is supporting the patient and does not need to be replaced.

To establish recommended sitting time perform skin assessment when patients return to bed.
District Health Authority/IWK Policies Being Replaced

AVH Preventing Heel Pressure Ulcers and Plantar Flexion in the Non-ambulatory Patient Protocol
CEHHA 311-060 Pressure Ulcer Guidelines
CBDHA N-16-50 Pressure Ulcer Prevention and Braden Scale
CHA DW-012.034 Pressure Ulcer Prevention
GASHA 1-525 Pressure Ulcer Prevention & Management
SSH-NU-100-921 Pressure Ulcer Prevention in Long Term Care
SSH-NU-100-921.1 Pressure Ulcer Prediction, Prevention and Treatment Pathway
SWH 800.1044,1 Pressure Ulcer Prevention

Version History
(To Be Completed by the Policy Office)

<table>
<thead>
<tr>
<th>Major Revisions (e.g. Standard 4 year review)</th>
<th>Minor Revisions (e.g. spelling correction, wording changes, etc.)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2017-12-12 Title changed to Pressure Injury (Ulcer) Prevention</td>
</tr>
<tr>
<td></td>
<td>2018-07-18 Title changed to Pressure Injury Prevention</td>
</tr>
</tbody>
</table>

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OP3PO150710
Risk Assessment and Interventions
### Sensory Perception

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Completely Limited</td>
</tr>
<tr>
<td>2</td>
<td>Very Limited</td>
</tr>
<tr>
<td>3</td>
<td>Slightly Limited</td>
</tr>
<tr>
<td>4</td>
<td>No Impairment</td>
</tr>
</tbody>
</table>

### Moisture

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constantly Moist</td>
</tr>
<tr>
<td>2</td>
<td>Very Moist</td>
</tr>
<tr>
<td>3</td>
<td>Occasionally Moist</td>
</tr>
<tr>
<td>4</td>
<td>Rarely Moist</td>
</tr>
</tbody>
</table>

### Activity

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bedfast</td>
</tr>
<tr>
<td>2</td>
<td>Chairfast</td>
</tr>
<tr>
<td>3</td>
<td>Walks Occasionally</td>
</tr>
<tr>
<td>4</td>
<td>Walks Frequently</td>
</tr>
</tbody>
</table>

### Mobility

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Completely Immobile</td>
</tr>
<tr>
<td>2</td>
<td>Very Limited</td>
</tr>
<tr>
<td>3</td>
<td>Slightly Limited</td>
</tr>
<tr>
<td>4</td>
<td>No Limitation</td>
</tr>
</tbody>
</table>

### Nutrition

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Poor</td>
</tr>
<tr>
<td>2</td>
<td>Probably Inadequate</td>
</tr>
<tr>
<td>3</td>
<td>Adequate</td>
</tr>
<tr>
<td>4</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

### Friction & Shear

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Problem</td>
</tr>
<tr>
<td>2</td>
<td>Potential Problem</td>
</tr>
<tr>
<td>3</td>
<td>No Apparent Problem</td>
</tr>
</tbody>
</table>

---

BRADEN SCALE FOR PREDICTING PRESSURE SORE RISK

**Patient’s Name ______________________________________ Evaluator’s Name __________________ Date of Assessment ________**

<table>
<thead>
<tr>
<th>SENSORY PERCEPTION</th>
<th>MOISTURE</th>
<th>ACTIVITY</th>
<th>MOBILITY</th>
<th>NUTRITION</th>
<th>FRICION &amp; SHEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory Perception</td>
<td>Moisture</td>
<td>Activity</td>
<td>Mobility</td>
<td>Nutrition</td>
<td>Friction &amp; Shear</td>
</tr>
</tbody>
</table>

---

© Copyright Barbara Braden and Nancy Bergstrom, 1988  All rights reserved  
Total Score 87
Braden Scale for Predicting Pressure Sore©

<table>
<thead>
<tr>
<th>Level of Risk Scoring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>At Risk</td>
<td>15–18</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td>13–14</td>
</tr>
</tbody>
</table>

At Risk and Moderate Risk Levels: If other major risk factors are present: 75–years or older, fever, poor dietary intake of protein, diastolic pressure below 60, an existing pressure injury, hemodynamic instability advance to the next level of risk

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk:</td>
<td>10–12</td>
</tr>
<tr>
<td>Very High Risk:</td>
<td>9 or less</td>
</tr>
</tbody>
</table>

Frequency of Risk Assessment

1. New admission to facility within 24–hours
2. Re-admission to facility from hospital, or other facility within 24–hours
3. Every week for four–weeks
4. Then quarterly
**Pressure Injury Prevention Points**

**RISK ASSESSMENT**

1. Consider bedfast and chairfast individuals to be at risk for development of pressure injury.
2. Use a structured risk assessment, such as the Braden Scale, to identify individuals at risk for pressure injury as soon as possible (but within 8 hours after admission).
3. Refine the assessment by including these additional risk factors:
   - Fragile skin
   - Existing pressure injury of any stage, including those ulcers that have healed or are closed
   - Impairments in blood flow to the extremities from vascular disease, diabetes or tobacco use
   - Pain in areas of the body exposed to pressure
4. Repeat the risk assessment at regular intervals and with any change in condition. Base the frequency of regular assessments on acuity levels:
   - Acute care . . . . . . . Every shift
   - Long term care . . . Weekly for 4 weeks, then quarterly
   - Home care . . . . . . . At every nurse visit
5. Develop a plan of care based on the areas of risk, rather than on the total risk assessment score. For example, if the risk stems from immobility, address turning, repositioning, and the support surface. If the risk is from malnutrition, address those problems.

**SKIN CARE**

1. Inspect all of the skin upon admission as soon as possible (but within 8 hours).
2. Inspect the skin at least daily for signs of pressure injury, especially nonblanchable erythema.
3. Assess pressure points, such as the sacrum, coccyx, buttocks, heels, ischium, trochanters, elbows and beneath medical devices.
4. When inspecting darkly pigmented skin, look for changes in skin tone, skin temperature and tissue consistency compared to adjacent skin. Moistening the skin assists in identifying changes in color.
5. Cleanse the skin promptly after episodes of incontinence.
6. Use skin cleansers that are pH balanced for the skin.
7. Use skin moisturizers daily on dry skin.
8. Avoid positioning an individual on an area of erythema or pressure injury.

**NUTRITION**

1. Consider hospitalized individuals to be at risk for under nutrition and malnutrition from their illness or being NPO for diagnostic testing.
2. Use a valid and reliable screening tool to determine risk of malnutrition, such as the Mini Nutritional Assessment.
3. Refer all individuals at risk for pressure injury from malnutrition to a registered dietitian/nutritionist.
4. Assist the individual at mealtimes to increase oral intake.
5. Encourage all individuals at risk for pressure injury to consume adequate fluids and a balanced diet.
6. Assess weight changes over time.
7. Assess the adequacy of oral, enteral and parenteral intake.
8. Provide nutritional supplements between meals and with oral medications, unless contraindicated.

**REPOSITIONING AND MOBILIZATION**

1. Turn and reposition all individuals at risk for pressure injury, unless contraindicated due to medical condition or medical treatments.
2. Choose a frequency for turning based on the support surface in use, the tolerance of skin for pressure and the individual’s preferences.
3. Consider lengthening the turning schedule during the night to allow for uninterrupted sleep.
4. Turn the individual into a 30-degree side lying position, and use your hand to determine if the sacrum is off the bed.
5. Avoid positioning the individual on body areas with pressure injury.
6. Ensure that the heels are free from the bed.
7. Consider the level of immobility, exposure to shear, skin moisture, perfusion, body size and weight of the individual when choosing a support surface.
8. Continue to reposition an individual when placed on any support surface.
9. Use a breathable incontinence pad when using microclimate management surfaces.
10. Use a pressure redistributing chair cushion for individuals sitting in chairs or wheelchairs.
11. Reposition weak or immobile individuals in chairs hourly.
12. If the individual cannot be moved or is positioned with the head of the bed elevated over 30°, place a polyurethane foam dressing on the sacrum.
13. Use heel offloading devices or polyurethane foam dressings on individuals at high-risk for heel ulcers.
14. Place thin foam or breathable dressings under medical devices.

**EDUCATION**

1. Teach the individual and family about risk for pressure injury
2. Engage individual and family in risk reduction interventions
# Braden Scale Implementation Guide

**Check off when implemented.**

<table>
<thead>
<tr>
<th>If residents score 15-18 Considered Low risk implement following interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep positioned off bony prominences</td>
</tr>
<tr>
<td>Reposition every 2 hours using either a full turn or small shift of position</td>
</tr>
<tr>
<td>Protect Heel and Elbows using long sleeves</td>
</tr>
<tr>
<td>Elevate Heels off bed at all times even with</td>
</tr>
<tr>
<td>therapeutic support surface. Support the</td>
</tr>
<tr>
<td>knees to avoid hyperextension when heels are</td>
</tr>
<tr>
<td>elevated</td>
</tr>
<tr>
<td>Use pillows to avoid contact between bony</td>
</tr>
<tr>
<td>prominences such as knees and ankles when</td>
</tr>
<tr>
<td>side lying in bed</td>
</tr>
<tr>
<td>Inspect skin when repositioning, toileting &amp;</td>
</tr>
<tr>
<td>assisting with</td>
</tr>
<tr>
<td>Moisturize skin 2-3 times a day</td>
</tr>
<tr>
<td>Ensure that bed linens beneath the resident are</td>
</tr>
<tr>
<td>smooth and unwrinkled</td>
</tr>
<tr>
<td>Remove slings while in chair/wheelchair</td>
</tr>
<tr>
<td>Ensure the bed is flat when moving the</td>
</tr>
<tr>
<td>resident up in bed</td>
</tr>
<tr>
<td>Do not use multiple layers of bedding or padding,</td>
</tr>
<tr>
<td>especially 'soaker pads'</td>
</tr>
<tr>
<td>Develop and document individualized care plan</td>
</tr>
<tr>
<td>Consult OT for Braden Sensory subscales of 3 or less</td>
</tr>
<tr>
<td>Consult OT for Braden Mobility or Activity</td>
</tr>
<tr>
<td>subscales of 3 or less</td>
</tr>
</tbody>
</table>

**Manage Moisture**

- Consult wound care nurse for Braden Moisture subscales of 3 or less
- Use absorbent incontinence products that work and hold moisture
- Offer bedpan/urinal and glass of water in conjunction with turning schedules
- Offer toilet as necessary to maintain continence or check for incontinence every 2-4 hours
- Use a moisture barrier to protect skin from urine, feces, and perspiration
- Do not "double pad"; if the resident voids large amounts use a more absorbent product, change the continence brief more frequently or use a condom catheter for males
- Gently cleanse skin folds and perineal area after each incontinence episode with a no-rinse pH balanced skin cleanser and pat dry when finished; do not rub the skin
- Use dimethicone to reduce skin irritation breakdown
- Avoid allergens such as perfume, lanolin preservatives and alcohol
- Avoid hot water, use mild cleansing agent (pH balanced) and avoid excessive rubbing, rather pat skin dry
- Avoid the use of powders and talc to reduce moisture
- Protect sacral or perineal wounds from feces and infected urine, use a fecal collector bag, condom catheter or indwelling catheter if appropriate for the resident until the incontinence problem has been addressed
## BRADEN SCALE IMPLEMENTATION GUIDE

### If resident score is 13-14

Considered Moderate risk initiate intervention from 15-18

**Plus Implement following intervention**

<table>
<thead>
<tr>
<th>Action</th>
<th>Manage Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Avoid positioning the person on a pressure ulcer or reddened area, if this is not possible then limit the time to less than one hour and assess for further damage</td>
<td>□ Consult Dietician for Braden Nutrition subscale score that score 2 or less</td>
</tr>
<tr>
<td>□ If the person has an ulcer on a sitting surface, reduce sitting time to two-45 minute sessions per day</td>
<td>□ Increase protein intake</td>
</tr>
<tr>
<td>□ For residents using therapeutic surfaces, check to ensure the support surface is functioning properly, i.e., Roho cushion</td>
<td>□ Increase calorie intake to spare proteins</td>
</tr>
<tr>
<td>□ Elevate the heels off the surface of the bed in collaboration with an occupational or physical therapist to determine the most appropriate heel off-loading device</td>
<td>□ Maximize the resident’s nutritional status through adequate protein and calorie intake, especially with Stage 3 and 4 ulcers, if compatible with goals of care</td>
</tr>
<tr>
<td>□ Implement an individualized turning schedule</td>
<td></td>
</tr>
<tr>
<td>□ Elevate HOB no more than 30 degrees raised the knee gatch 10 – 20 degrees before the HOB is raised. Ensure the resident’s hip bones are aligned 10 cm above the point where the bed flexes</td>
<td></td>
</tr>
<tr>
<td>□ Use form wedges for 30 degree Lateral positioning</td>
<td></td>
</tr>
<tr>
<td>□ Pressure reduction support surface</td>
<td></td>
</tr>
</tbody>
</table>

### If resident score is 10-12

Considered High risk initiate 15-18 and 13-14

**Plus Implement following intervention**

<table>
<thead>
<tr>
<th>Action</th>
<th>Manage Friction &amp; Shear</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Supplement with small shifts in position</td>
<td>□ Consult OT for Braden Shear and Friction subscale that equals 2 or less</td>
</tr>
<tr>
<td>□ If the resident is chair bound or sits for long periods, use a therapeutic support surface on the chair and consider limiting chair sitting to 1-2 hour intervals</td>
<td>□ Elevate HOB no more than 30 degrees</td>
</tr>
<tr>
<td>□ Hourly Reposition chair bound residents who cannot move themselves</td>
<td>□ Use transfer sheets lift sheet to move resident</td>
</tr>
<tr>
<td>□ When sitting, ensure resident’s feet are supported directly on the floor, on a foot stool or a foot rest so that the hips and knees are at 90 degrees to prevent sliding down in the bed</td>
<td>□ For lateral transfers, use sliding boards, roll boards or transfer sheets to minimize shearing</td>
</tr>
</tbody>
</table>

3300 2017 04 03
**BRADEN SCALE IMPLEMENTATION GUIDE**

<table>
<thead>
<tr>
<th>If resident score is 9 or below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considered High risk initiate from 15-18, 13-14 and 10-12</td>
</tr>
<tr>
<td>Plus Implement following interventions</td>
</tr>
</tbody>
</table>

- All of the above
- Establish a written resident specific 24-hour repositioning schedule that establishes every 1-2 hourly turns depending on the resident risk status and irrespective of the resident’s therapeutic support surface
- High-risk individuals with poor tissue tolerance may require small shifts in position between turns
- Use pressure-relieving surface if resident has intractable pain
- Severe pain exacerbated by turning

**Other general care Issues**

- Do NOT use rolled blankets, towels, pillow cases, incontinent pads to elevate heel
- Maintain good hydration
- Avoid drying the skin
- Avoid positioning the resident on a pressure ulcer or reddened area; if this is not possible then limit the time to less than 1 hour and assess for further damage

Guidelines for use of Braden Risk Assessment tool:

**Admission:**

Braden Scale is to be completed the first 72 hours of a new admission
24 hours of a readmission
Then every two weeks for four weeks, then quarterly.

Braden Scale should be completed when resident returns from hospital; is reclassified to a higher level of care; changes in resident’s condition.
## Basic Skin Care and Prevention of Pressure Ulcers

<table>
<thead>
<tr>
<th>Sensory</th>
<th>Protect skin from damage of pressure, trauma or burns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Turn patient every 2 hours or more frequently to prevent skin breakdown</td>
</tr>
<tr>
<td></td>
<td>□ Head to toe assessment of skin for non-blanchable redness every shift (minimum standard)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moisture/Dryness</th>
<th>Address cause of incontinence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Keep skin clean and free of acidic urine/feces</td>
</tr>
<tr>
<td></td>
<td>□ Use absorbent pads or incontinence brief to wick moisture away from skin</td>
</tr>
<tr>
<td></td>
<td>□ Establish a bowel/bladder routine (i.e.- offer bedpan or urinal during q2 turns to promote continence, coordinate bowel movements on scheduled days, etc)</td>
</tr>
<tr>
<td></td>
<td>□ Use no rinse skin cleansers with barrier to decrease skin irritation</td>
</tr>
<tr>
<td></td>
<td>□ Use barrier cream to protect skin from irritation</td>
</tr>
<tr>
<td></td>
<td>□ If barrier cream is ineffective, use stronger creams with zinc and dimethicone to reduce skin irritation</td>
</tr>
<tr>
<td></td>
<td>□ Reduce wetness with airflow sheets or airflow mattress</td>
</tr>
<tr>
<td></td>
<td>□ For dry cracking skin use moisturizers to reduce cracking and breakdown (avoid allergens such as perfume, lanolin preservatives and alcohol)</td>
</tr>
<tr>
<td></td>
<td>□ Geriatric patients-Avoid hot water, use mild cleansing agent (pH balanced) and avoid excessive rubbing, rather pat skin dry</td>
</tr>
<tr>
<td></td>
<td>□ Use bowel management system to minimize skin breakdown from liquid stool in extreme circumstances</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Establish a written repositioning schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Consult OT for support surface, seating and prevention strategies</td>
</tr>
<tr>
<td></td>
<td>□ Consult PT for mobilization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Encourage patient to change position every 2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Reposition every 2 hours or more frequently if patient unable to perform</td>
</tr>
<tr>
<td></td>
<td>□ Protect heels from surface of bed</td>
</tr>
<tr>
<td></td>
<td>□ Utilize pillows and wedges to assist with turning and positioning</td>
</tr>
<tr>
<td></td>
<td>□ Consult OT for positioning and prevention strategies</td>
</tr>
<tr>
<td></td>
<td>□ Consult PT to address range of motion/positioning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nutrition/Hydration</th>
<th>Maintain hydration, encourage patient to drink fluids throughout shift (if indicated)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Promote adequate nutrition</td>
</tr>
<tr>
<td></td>
<td>□ Consult Dietitian for nutritional support</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Friction and Shear</th>
<th>Maintain head of bed position below 30 degrees when possible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Raise the foot of the bed 10-20 degrees to minimize shear and friction unless contraindicated</td>
</tr>
<tr>
<td></td>
<td>□ Do not massage over bony prominences</td>
</tr>
<tr>
<td></td>
<td>□ Use lift sheets/devices to ensure skin does not slide on sheets</td>
</tr>
<tr>
<td></td>
<td>□ Use trapeze to allow patients independence with mobility and decrease friction and shear to skin</td>
</tr>
<tr>
<td></td>
<td>□ Protect heels and elbows from friction using socks and long sleeves</td>
</tr>
<tr>
<td></td>
<td>□ Use sheets that reduce friction</td>
</tr>
<tr>
<td></td>
<td>□ Consult OT/PT for positioning and activity to reduce harm</td>
</tr>
</tbody>
</table>
Best Practices for Prevention of Medical Device-Related Pressure Injuries in Long Term Care

- Choose the correct size of medical device(s) to fit the individual
- Cushion and protect the skin with dressings in high-risk areas (e.g., nasal bridge)
- Inspect the skin in contact with device at least daily (if not medically contraindicated)
- Avoid placement of device(s) over sites of prior or existing pressure injury
- Educate staff on correct use of devices and prevention of skin breakdown
- Be aware of edema under device(s) and potential for skin breakdown
- Confirm that devices are not placed directly under an individual who is bedridden or immobile
Turning Clock
Pressure Injury Prevention 2018
Positioning Techniques in Long-Term Care

Self-Directed Learning Package for Health Care Providers

Supporting Implementation of the RNAO BPGs
Assessment and Management of Stage I to IV Pressure Ulcers and
Risk Assessment and Prevention of Pressure Ulcers
Acknowledgement

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- **Gordana Stankovic, PT, MscPt**, Willowdale Physiotherapy Clinic, Physiotherapy Consultant to Wellesley Central Place.
- A resident from Wellesley Central Place, who acted as a model for photography in this self-directed learning package.
- The RNAO *Risk Assessment and Prevention of Pressure Ulcers and Assessment and Management of Stage I – IV Pressure Ulcers* development panels, who developed the guidelines on which this resource is based.

Disclaimer

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The RNAO Nursing Best Practice Guidelines *Assessment and Prevention of Pressure Ulcers and Assessment and Management of Stage I – IV Pressure Ulcers* are available for download from the RNAO website at [http://www.rnao.org/bestpractices](http://www.rnao.org/bestpractices).
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<td>REFERENCES</td>
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INTRODUCTION TO THE SELF-DIRECTED LEARNING PACKAGE

Purpose of the Self-Directed Learning Package

This self-directed learning package incorporates the positioning recommendations from the RNAO best practice guidelines, Assessment and Prevention of Pressure Ulcers and Assessment and Management of Stage I – IV Pressure Ulcers. The purpose of this learning package is to assist health care providers in long-term care facilities to gain the knowledge and skill required to manage the unique challenges inherent in the positioning of residents with varying degrees of dependency.

The learner will gain knowledge to enable them to position a resident in good body alignment, taking into consideration typical scenarios that may occur in a long-term care setting.

The package will highlight the ways that correct and frequent positioning will contribute to the resident’s comfort and greatly assist in the prevention of pressure ulcers and contractures.

Educators may want to use sections of this package to incorporate into a teaching plan, and may also visit the RNAO website to view additional workshop materials related to skin and wound guidelines, available for free download.

Target Audience

This educational resource has been developed for nurses and other professionals in long-term care who are responsible for the ongoing supervision and education of the unregulated members of the health care team. It is recognized that in many cases it is the unregulated caregivers who provide at-the-bedside care to residents in long-term care homes.

View an educational workshop for RNs and RPNs on the Assessment and Management of Pressure Ulcers at www.rnao.org/bestpractice
INSTRUCTIONS FOR USING THE SELF-DIRECTED LEARNING PACKAGE

This self-directed learning package enables you to proceed through educational content at an independent pace. Each section of the package will take approximately 1-2 hours to complete, and may be put aside for breaks at any time.

1. At the outset of the Self-Directed Learning Package, you will be given the opportunity to complete a short Pre-Learning Knowledge Assessment. The purpose of this assessment is to allow you to evaluate your present knowledge of basic positioning techniques for long-term care residents.

2. Upon completion of the Pre-Learning Knowledge Assessment, proceed with one section of the Self-Directed Learning Package at a time, making sure to complete the following steps:
   a) Review the learning objectives.
   b) Read all the information in the section.
   c) Complete the review questions/case study at the end of the section.
   d) Compare with the section content or answer sheet at the back of the package and review content related to any incorrect answers.
   e) Review the section objectives again to confirm that you have gained knowledge and skill in this area.

   Repeat these steps as often as you feel necessary.
   Remember this is your learning and you are evaluating and increasing your knowledge.

3. Once you have completed the Learning Package:
   a) Take the opportunity to evaluate your new knowledge by completing a Post-Learning Knowledge Assessment.
   b) Continue to refer the learning package to reinforce the knowledge that you have gained.

GOOD LUCK!
Pre-Learning Knowledge Assessment

This questionnaire is meant to evaluate your existing knowledge of correct positioning. The assessment is made up of six questions. Answers to these questions can be found on page 36.

1. What is wrong with this picture?

Circle the six parts of the body that are not aligned correctly. Explain the impact this would have on the resident's well being.

1. ____________________________
   ____________________________
   ____________________________

2. ____________________________
   ____________________________
   ____________________________

3. ____________________________
   ____________________________
   ____________________________

4. ____________________________
   ____________________________
   ____________________________

5. ____________________________
   ____________________________
   ____________________________

6. ____________________________
   ____________________________
   ____________________________
2. The force called “pressure” is the result of:
   a) Congestion with redness of the skin
   b) Having bony prominences
   c) Weight of one object pressing down on another
   d) Lack of friction on moving

3. Prolonged pressure on the sacrum causes the skin and underlying tissue to:
   a) Become compact and flattened out
   b) Swell up and become larger
   c) Turn pale in color
   d) Receive too much oxygen and nutrients

4. The nurse should ensure that the position of the resident in bed is changed at least:
   a) Once every shift
   b) Every 2 hours
   c) Every hour
   d) Every half hour

5. All but one of the following are reasons for using aids in positioning the resident:
   a) To provide support of a body part
   b) To assist with ambulation
   c) To relieve pressure
   d) To maintain the body in good alignment

6. One organ of the body that is quickly affected by pressure from lying in a lateral position for a long period of time is:
   a) The kidney
   b) The stomach
   c) The brain
   d) The lung
SECTION I: POSITIONING

LEARNING OBJECTIVES

Upon completion of this section, learners will be able to:

1. Discuss the importance of positioning as it relates to the comfort of the resident and the prevention of pressure ulcers and contractures.
2. Describe the key principles of positioning.
3. Describe the steps to ensure a resident is maintained in correct body alignment at all times.
4. Provide support for various parts of the body with the use of aids such as pillows, towels, hand rolls, foot boards and trochanter rolls.

Note
Some of the words used in this section of the package may be new, unfamiliar or you may need a review. You may wish to turn to the Glossary in Appendix B before starting the section.

WHY IS POSITIONING IMPORTANT?

One of the basic procedures health care providers in long-term care facilities perform most frequently is that of changing the resident's position. Any position, after a period of time becomes uncomfortable and then painful. Whereas the independent person has the ability to assume a great variety of positions, the dependent person may be limited. The resident who is unable to move limbs freely to change positions or who is partially or totally dependant on the nursing staff because of injury or disease must be moved at regular intervals. Changing the dependant resident's position at least every 2 hours accomplishes four things:

- a) Contributes to the comfort of the resident;
- b) Relieves pressure on affected areas;
- c) Helps prevent formation of contractures or deformities; and
- d) Improves circulation.

It is important to remember the amount of support required for positioning depends on the individual resident. When creating a care plan and positioning schedule for the resident, the nurse must look at the individual needs of that resident.

Note
Alignment and correct positioning is only effective if the resident is comfortable and safe.

When positioning, it is important to look at the resident as an individual and take into consideration all factors of the resident’s care plan.
KEY PRINCIPLES OF POSITIONING

1. Resident must be positioned in correct body alignment at all times.
2. The resident’s body should be supported with positioning aids to maintain good alignment.
3. The position of the resident in bed must be changed at least every 2 hours.

**PRINCIPLE # 1**
*Resident must be positioned in correct body alignment at all times.*

The goal of good body alignment is to position the resident so that the movable segments of the body are aligned in such a way that there is no undue stress placed on the muscles or skeleton.

Good body alignment should be maintained from side to side (laterally) as well as front to back (anterior-posterior).

**Check Points of Good Body Alignment**

- Head up, eyes straight ahead
- Neck and back straight
- Arms relaxed at side
- Chest up and out
- Abdomen tucked in
- Knees slightly flexed
- Feet slightly apart, toes pointing forward

**Diagram #1**
*Good body alignment*
Diagram #2 Poor body alignment (anterior-posterior)

Poor body alignment can be seen in the above diagram.

1. The resident’s neck and chest is flexed so that chest expansion for breathing is reduced. This increases the risk of respiratory infections. The resident’s ability to swallow may also be affected.
2. The arms are curled on the chest causing strain to the shoulder muscles and flexion of the wrists.
3. There is no support in the lower back which can cause hyper-extension of the back. This hyper-extension can cause strain on the abdominal and back muscles.
4. Pressure on the coccyx increases the risk of pressure ulcers in this area of the body.
5. Muscle strain in the knees can occur as the knees are not supported.
6. The feet are hyper-extended. This may lead to problems with ambulation later due to foot drop.

When the resident is in the supine position (lying on the back) and there is poor body alignment (as can be seen in Diagram #2), muscle strain can easily occur. Common areas where muscle strain is felt when the resident is in the supine position are: neck, lower back, elbow, wrist, knee and foot.

Diagram #3 Points of muscle strain in supine position
Diagram #4 Poor body alignment (laterally)
Lying on arm, other arm not supported.

If the resident is lying on his/her side, care must be taken to ensure the resident is not lying on one arm and that the other arm is supported. The circulation will be impaired in the arm that is under the resident. In this diagram the other arm falling and lying unsupported behind the resident will cause strain to the shoulder joint. The upper leg is not supported which could result in an inward rotation of the hip joint.

The resident can be made more comfortable in bed by flexing (bending) the elbows, hips, and knees while the alignment of the rest of the body is maintained. Those parts that are flexed may need to be supported to keep them in good alignment as well.

Although the flexed position may be comfortable for the resident, the flexed body segment must be straightened after no more than 2 hours. A position of prolonged flexion may result in contractures. The joints of the upper and lower extremities are the most likely to be affected by contractures. Failure to prevent contractures contributes to even more immobility and pain.

Activity
Find a bed and lay flat with all of your extremities straight for 5-10 minutes and feel the points in your body that are uncomfortable. Now imagine how you would feel if you could not move and you were in the same position for 2 hours.

You may want to capture your thoughts from this activity in the space below, to reflect on the experience in the future.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
**Principle #1: Recap**

1. Four reasons for changing the position of the resident are:

   a) ________________________________  
   b) ________________________________

   c) ________________________________  
   d) ________________________________

2. If the feet in bed are not supported in good alignment, this can lead to ________________________________.

3. A position of prolonged flexion may result in ________________________________.

4. The goal of good alignment is not to put stress on the ________________________________ and ________________________________.
PRINCIPLE #2
The resident’s body should be supported with positioning aids to maintain good alignment.

It is important to remember that the amount of support required for positioning depends on the individual resident. When creating a care plan and positioning schedule for a resident, the nurse must look at the individual needs of that resident.

In a long-term care ‘home’, resources are often a challenge. As a result, it is important that the caregiver understands the concept of correct body alignment and correct positioning so he/she is able to think “outside the box”, be creative and utilize resources that are readily available.

Positioning Aids

<table>
<thead>
<tr>
<th>POSITIONING AID</th>
<th>RATIONALE</th>
</tr>
</thead>
</table>
| **Pillows**     | • Most commonly used to support various parts of the body.  
                  • They are soft and thus help to reduce pressure.  
                  • They are light, flexible and can be rolled, folded and tucked firmly under the body to maintain a position. |
| **Towels**      | • May be used to support the resident’s forearm and hand to prevent pulling strain on the shoulder and wrist muscles.  
                  • Towels are easy to obtain and can be folded for many purposes.  
                  • They can be easily washed to maintain good hygiene.  
                  Note: Towels should preferably be soft so as not to cause additional trauma to the skin. |
| **Face cloths** | • May be used to make hand rolls. Hand rolls are used for residents who are not able to move their hands. The hand roll should fit into the palm of the hand, with the thumb curved in a grasp position. A gauze strip looped around the hand can help keep the roll in position, if needed.  
                  • Hand rolls are used to prevent the fingers of the hand from being in a tight fist which could cause flexion contracture. This provides some extension for the fingers and keeps the hand in position to reduce skin breakdown.  
                  • Hand rolls made from face cloths can be easily washed to maintain good hygiene. The face cloths should be soft so as not to cause additional trauma to the skin. |
| **Trochanter Roll** | • Trochanter Rolls are sometimes used to prevent external rotation of the legs in supine position.  
                    See Appendix A for directions on how to make a trochanter roll. |
Principle #2: Recap

1. The resident’s body is maintained in good alignment by using ________________________.

2. Face cloths are often used to make ____________________________.

3. Trochanter rolls are sometimes used to prevent ____________________________ of the legs in supine position.

4. The purpose of the hand roll is
   a) To encourage exercise to the hands and fingers
   b) To keep the palm of the hand warm and dry
   c) To keep the fingers and thumb flexed
   d) To provide some extension to the fingers and keep the thumb in opposition
PRINCIPLE #3
The position of the resident in bed must be changed at least every two hours.

If the resident’s position is not changed at least every two hours, the individual will be at risk for pain from muscle discomfort, pressure ulcers, contractures and damage to superficial nerves and blood vessels.

Note
Little research exists to provide nurses with guidelines on optimal turning schedules. In the absence of strong evidence, RNAO’s BPG Risk Assessment and Prevention of Pressure Ulcers supports a written re-positioning schedule that is determined by the results of a skin assessment and the resident’s needs and not by a predetermined schedule.

It is not enough to just position the resident on a turning schedule and expect that the resident will stay in that position for the duration of the time. In between times, the resident should be checked to ensure proper alignment has been sustained.

Pressure on the Skin
Perhaps the most important of all the reasons for changing the position of the resident is to reduce pressure on the various body parts and to prevent the formation of pressure areas.

The longer the resident is in the same position the more pressure from the supporting surface is on the skin, blood vessels and underlying tissues. These structures are not rigid, so pressure causes them to flatten and become more compact. The end result, if the pressure continues is pressure ulcers.

Skin is most commonly affected in areas located over bony prominences (where there is less fat protecting the skin from the bone).

Areas of bony prominence include:
- Occiput
- Scapulae
- Shoulders
- Spine
- Elbows
- Greater trochanters
- Ischial tuberosities
- Knees
- Sacrum
- Coccyx
- Malleoli
- Heels

Pressure ulcers may develop in a period of a few hours in an elderly, undernourished and/or dehydrated resident.
Proper positioning is crucial in the prevention of pressure ulcers in the elderly resident.

With continuing pressure, the skin and muscle tissues are deprived of oxygen and essential nutrients. Tissue trauma can develop in matters of hours. Redness of the skin can occur in 30 minutes with sustained pressure. This redness can take about 36 hours to dissipate once the pressure is removed. Tissue ischemia begins within 2-6 hours, often the tissue does not return to normal and permanent damage is done (Lubisch, 2006).

Most often pressure ulcers are the result of not enough attention and care given to turning and positioning of the resident.

**Diagram #5 Pressure on blood vessel**

**Initial Contact:**
- muscle
- blood vessels
- skin

**Continued Pressure:**
- muscles
- skin
- blood vessels

DO NOT use a donut or ring type cushions! Such devices cause venous congestion and increase pressure to the area of concern (RNAO, 2005, Recommendation 3.8).

**Pressure on other organs of the body**

Although we can see the affect of pressure on the skin, other organs of the body can also be affected by the force of pressure. The lungs are extremely susceptible to pressure (especially when lying on the side). As the resident’s body remains in one position, the weight of the upper lung presses down on the lung beneath and makes it more dense and compact. This is compounded by the pressure of the supporting surface (bed) pushing down on the lung beneath. The result is that air is squeezed out of the alveoli. When the resident is lying still, he/she tends to take very shallow breaths and less air which means less oxygen. With less air to expand the lungs and the alveoli flattened, this becomes a breeding ground for infection. Pneumonia is a common complication of bed rest when the person is not repositioned on a regular basis.

**Diagram #6 Pressure on lungs.**

**Initial Contact:**
- lungs

**Continued Pressure:**
- lungs
Activity
Reflect back to the last time you sat on your hand or a limb and it caused it to go numb, and on relieving the pressure you had the feeling of “Pins and Needles.” Reflect how you would feel if you experienced that numbness but were not able to move to relieve the pressure.

You may want to capture your thoughts from this activity in the space below, to reflect on the experience in the future.

Principle #3: Recap

1. Prolonged pressure causes the skin, blood vessels and muscles to become ___________________________.

2. The effects of pressure on the lungs can lead to the complication of ___________________________.

3. Pressure areas most often develop over ___________________________, ___________________________.

4. Donuts and ‘ring type’ cushions can cause ___________________________ and ___________________________.

SECTION II: BASIC BODY POSITIONS AND VARIATIONS

LEARNING OBJECTIVES

Upon completion of this section, learners will be able to:

1. Demonstrate correct positioning of residents in supine position, including variations of the Fowler’s position.
2. Demonstrate correct positioning of residents in lateral position, including Sim’s position.
3. Demonstrate correct positioning of a resident in a chair.
4. Identify elements of poor positioning (in supine position and in a chair) and advise on support aids that will promote correct positioning.

In the last section, you learned about the three key principles of positioning. Keeping them in mind, the photos in the following section will demonstrate correct positioning for the basic positions in bed; supine, variations of supine, lateral, Sim’s and in a chair. Instructions will be given for each basic position.

When positioning a resident, it is assumed that caregivers will use the correct body mechanics when moving a resident. It should also be noted when positioning, the resident may have different needs from the resident in the photos. Conditions, such as osteoarthritis, swallowing difficulties, hearing, vision, respiratory problems, contractures etc. must all be considered when creating a care plan for the resident around correct positioning.

Note

Check the resident several times during the two hour period after positioning to ensure he or she is not experiencing pain, numbness or discomfort.
**Supine Position:** has many variations of degrees from flat to 60 degrees.

This position is used for short periods of time, for example a short rest. The head of the bed may be raised 15 degrees for added comfort.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place one pillow under the head and shoulders.</td>
<td>Hyperextension of the neck is prevented and alignment is maintained.</td>
<td>Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment.</td>
</tr>
<tr>
<td>2. One pillow is placed under the thigh to flex the knee slightly.</td>
<td>This decreases knee and hip extension and relaxes the lower back.</td>
<td></td>
</tr>
<tr>
<td>3. The heels are resting on the bed.</td>
<td>This can be tolerated for short periods of time without causing tissue damage.</td>
<td>Prolonged pressure on the heel is not recommended for periods over 30 minutes.</td>
</tr>
</tbody>
</table>
**Supine Position Variation:** pillow under the head - 2 pillows under the legs.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place one pillow under the head and shoulders.</td>
<td>Hyperextension of the neck is prevented and alignment is maintained.</td>
<td>Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment.</td>
</tr>
<tr>
<td>2. Two pillows are placed lengthwise starting at the ankles and continuing to the bottom of the buttocks.</td>
<td>This decreases knee and hip extension as well as relaxes the lower back.</td>
<td></td>
</tr>
<tr>
<td>3. The heels are off the bed - floated by using pillows.</td>
<td>The heel is a very small surface for weight distribution and at high risk for skin breakdown.</td>
<td>Pillows should not be placed directly under the heels but under the calf and knee, so that the heel is completely off the bed and the weight of the lower leg is distributed evenly across the pillow.</td>
</tr>
<tr>
<td>4. Arms are at the resident’s side (parallel) to the body and supported in good alignment with folded towels.</td>
<td></td>
<td>Arms may also be slightly flexed and placed on the chest if the resident prefers.</td>
</tr>
</tbody>
</table>
Supine Position Variation: Semi Fowler’s: head of the bed elevated 15 degrees. This position is often used for sleeping.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place one pillow under the head and shoulders.</td>
<td>Hyperextension of the neck is prevented and alignment is maintained.</td>
<td>Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment.</td>
</tr>
<tr>
<td>2. Raise the foot of the bed slightly.</td>
<td>This prevents the resident from sliding down the bed and causing shearing. The slight flexion of the knees when the foot of the bed is elevated slightly, gives more comfort by reducing strain on the abdominal muscle and lower back.</td>
<td>Shearing occurs when the skeleton and deep fascia slides downward with gravity, while the skin and upper fascia remains in the original position. Deep necrosis can occur when the shearing between the two layers of tissue leads to stretching, kinking and tearing of vessels in the subcutaneous tissues. Shearing most often occurs when individuals slide down, or are dragged up, a bed or chair.</td>
</tr>
</tbody>
</table>
**Supine Position Variation: Semi-Fowlers**: bed is raised 30 degrees.
Residents are often placed in this position for 30-60 minutes following feeding as it aids in digestion.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bed is elevated 30 degrees and one pillow is placed under the head and shoulders.</td>
<td>Hyperextension of the neck is prevented and alignment is maintained.</td>
<td>Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment.</td>
</tr>
<tr>
<td>2. Arms and wrists are supported on the bed parallel to the body.</td>
<td>The arms are supported in good alignment - slightly flexed to reduce strain on shoulder muscles.</td>
<td></td>
</tr>
<tr>
<td>3. Raise the foot of the bed slightly.</td>
<td>This prevents the resident from sliding down the bed and causing shearing. The slight flexion of the knees when the foot of the bed is elevated slightly, gives more comfort by reducing strain on the abdominal muscle and lower back.</td>
<td>Shearing occurs when the skeleton and deep fascia slides downward with gravity, while the skin and upper fascia remains in the original position. Deep necrosis can occur when the shearing between the two layers of tissue leads to stretching, kinking and tearing of vessels in the subcutaneous tissues. Shearing most often occurs when individuals slide down, or are dragged up, a bed or chair.</td>
</tr>
<tr>
<td>4. The heels are resting on the bed.</td>
<td>This can be tolerated for short periods of time without causing tissue damage.</td>
<td>Prolonged pressure on the heel is not recommended for periods over 30 minutes.</td>
</tr>
</tbody>
</table>
**Note**

Raising the head of the bed more than 30 degrees increases shearing forces over the lower back and coccyx. When a resident is at the top of the bed with the head elevated and begins to slide down towards the foot of the bed, a shear effect is created on the buttocks. As the resident slides, the deep tissues over the sacrum and coccyx are forced in one direction while the superficial tissues move in the opposite direction. Shear causes ischemia by compressing blood vessels and impeding the flow of blood.

**Discourage the resident in bed from sitting with head elevated more than 30 degrees** except for short periods of time (e.g. meal times, enteral feeds) (RNAO, 2005 – Recommendation 3.7).
Supine Position Variation: Fowler's: bed is raised approximately 45 degrees (up to 60 and 90 degrees) – semi-sitting position.

Fowler's position is the position of choice for residents who have difficulty breathing or experiencing heart problems. In this position, gravity pulls the diagram downward, allowing greater chest expansion and lung ventilation. It is not the position of choice if the resident is at risk for developing pressure ulcers (pressure on the coccyx).

<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place one pillow under the head and shoulders.</td>
<td>Hyperextension of the neck is prevented and alignment is maintained.</td>
<td>Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment.</td>
</tr>
<tr>
<td>2. Arms and wrists are supported on the bed parallel to the body or can be flexed and placed on the resident's lap.</td>
<td>Both positions prevent muscle strain on the shoulders.</td>
<td></td>
</tr>
<tr>
<td>3. One pillow is placed under the thigh to flex the knee slightly.</td>
<td>This decreases knee and hip extension and relaxes the lower back. Helps maintain a sitting position without sliding down the bed. Relieves some of the pressure on the heels.</td>
<td></td>
</tr>
</tbody>
</table>
4. Elevate bed slightly at
the feet.

<table>
<thead>
<tr>
<th>Avoids pressure on lower back and prevents resident from slipping down the bed which can cause shearing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shearing occurs when the skeleton and deep fascia slides downward with gravity, while the skin and upper fascia remains in the original position. Deep necrosis can occur when the shearing between the two layers of tissue leads to stretching, kinking and tearing of vessels in the subcutaneous tissues.</td>
</tr>
</tbody>
</table>

5. The heels are resting on the bed.
**You may notice that the feet are not supported in good alignment.**

<table>
<thead>
<tr>
<th>This can be tolerated for short periods of time without causing tissue damage. Prevents hyper-flexion of the feet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged pressure on the heel is not recommended for periods over 30 minutes. <strong>A foot board or other supporting device is advisable to keep the foot in good alignment and prevent foot drop.</strong></td>
</tr>
</tbody>
</table>

**Note**
The head of the bed should not be brought to the full upright position (90 degrees) for individuals who are unable to maintain their balance.
Lateral Position

The lateral position is a side-lying position. The person can lie on one side or the other. In the side lying position, the resident can be positioned with the upper trunk rotated forward or backward.

Turn the resident onto the side toward you. A 30 degree turn to either side is recommended (RNAO, 2005 – Recommendation 3.7).

When a resident is positioned forward, the pillow is positioned in front of the individual. The uppermost extremity is brought forward to rest on the pillow.

When a resident is rotated backward, the pillow is placed behind the patient (as in the photo).

The lateral positioning is good for resting and sleeping. This position helps relieve pressure on the sacrum and heels in residents who spend a great deal of time sitting and who are confined to bed in dorsal and Semi-Fowler’s positions.
<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
</table>
| 1. Place one pillow under the head and shoulders. | Hyperextension of the neck is prevented and alignment is maintained.  
If the head rests on the bed surface; weight is borne by lateral aspects of cranial and facial bones. | Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment. |
| 2. One pillow is placed under the upper arm, slightly flexed with wrist supported and comfortable on the pillow at the back (or across the abdomen). | Prevents internal rotation of the shoulder.  
Internal rotation of shoulder and arm can cause pressure on chest, restricting expansion during breathing. | |
| 3. A second pillow is placed lengthwise and tucked in at the back. The resident is encouraged to lean back into the pillow. | This supports alignment and maintains the position. | |
| 4. The resident’s lower arm is supported, slightly flexed with wrist supported and comfortable on a pillow in the front.  
Several towels have been folded and can be seen under the resident’s wrist.  
Please note: The resident in the photograph has arthritic deformities of the wrist. | Gives support and prevents internal rotation. | Make sure the resident is not lying on his/her arm. |
| 5. The lower limbs are outstretched with knees slightly flexed - upper leg slightly forward of the lower leg.  
The uppermost lower extremity is supported by a sufficient number of pillows to support the lower extremity in proper alignment with the trunk. | Minimum extension of the legs minimizes pressure on the trochanter to avoid excessive pull on the lower trunk.  
This also prevents pressure on the knees and ankles. | |
Lateral Position Variation: Sims’ Position

Sims’ position is a variation of the lateral position - usually a left side-lying position used for the administration of enemas and other procedures. This position may be used for resting if the resident finds it comfortable.

The resident is placed on the left side with the upper trunk forward.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Rationale</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place one pillow under the head and shoulders.</td>
<td>Hyperextension of the neck is prevented and alignment is maintained.</td>
<td>Older adults often suffer from kyphosis or have limited neck extension. The pillow helps support the neck in good alignment</td>
</tr>
<tr>
<td>2. The left shoulder is pulled forward and the upper body, head, neck and torso are aligned properly. The left wrist is supported with a rolled towel.</td>
<td>Promotes good circulation to the extremity. Prevents lateral flexion and fatigue of the sternocleidomastoid muscles and internal rotation/adduction of the shoulder.</td>
<td></td>
</tr>
<tr>
<td>3. A pillow is placed under the upper arm to place it in good alignment; arm should be flexed comfortably.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. A pillow is placed laterally under leg and thigh. The right leg is sharply flexed so that it does not rest on the lower leg. A pillow is positioned between the legs to maintain the position.</td>
<td>This ensures good alignment with the shoulders and hips. Maintains the position.</td>
<td></td>
</tr>
</tbody>
</table>
Positioning in a chair or wheelchair

The resident is seated in a chair that promotes good positioning.

Foot support is essential for maintaining a stable base of support. This resident’s feet are firmly on the floor. A foot stool could be used if the resident could not reach the floor.

**Chair/Wheelchair Position Checklist**

- Is the resident sitting in midline or are they slouched to one side?
- Are the resident's knees higher than the hips, causing increased pressure on the sacrum?
- Are the chair arms or foot rests causing pressure marks on the resident's skin?
- FEET FLAT 90°/90°/90°

- The knees (at a 90° angle with the hips) are slightly separated to provide relaxation and promote further alignment.
- Hips are positioned at midline of the chair seat with the pelvis stable.
- The back is supported forward in the chair so the back meets the hips at a 90° angle.
- The arms are flexed and supported by the arms on the chair.
- The head is positioned in midline of the body and is supported by the back of the chair.
- While sitting, the best posture to use is ‘feet flat and a 90°/90°/90° position’.

Reposition residents **hourly** if in a chair or wheelchair. If the resident is able, ask him/her to shift weight every 15 minutes (RNAO, 2005 – Recommendation 3.8).
Note
Refer to an Occupational Therapist or Physiotherapist for seating assessment and adaptations for special needs (RNAO, 2005 – Recommendation 3.8).

To increase the effectiveness of positioning, it is imperative that the resident be provided with a chair that is suitable for his/her needs. If an appropriate chair is used, the resident is likely to be more comfortable, and thus tolerate sitting for a longer period of time.

Check the resident often to make sure he or she is not experiencing pain, numbness or discomfort in this position.

Activity
Shearing can be illustrated by placing the index finger of one hand on the back of the other hand and pushing the skin towards the elbow without sliding the fingers across the skin surface.

If this activity was prolonged, what affect would this have on your hand and fingers.

You may want to capture your thoughts and reflections below.

SECTION II: RECAP

1. Match the following definitions to the basic positions of the resident in bed.

<table>
<thead>
<tr>
<th>Definitions</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Head elevated (15°), hips and knees flexed</td>
<td>___ Fowler’s</td>
</tr>
<tr>
<td>(b) Lying on one side with one leg resting on another</td>
<td>___ Semi Fowler’s</td>
</tr>
<tr>
<td>(c) Lying with face and feet upward</td>
<td>___ Lateral</td>
</tr>
<tr>
<td>(d) Lying with foot of bed slightly elevated and head raised (45°)</td>
<td>___ Supine</td>
</tr>
</tbody>
</table>

2. Posture or body alignment, affects cardiovascular, respiratory, and gastrointestinal function.
True_________ False_________

3. When a resident is in a chair or wheel chair the position should be changed every _________.

4. Circle the correct answer in the following statement:
A pillow placed between the knees of a resident lying on his side will increase/decrease the pressure on the knee joint and prevent the hip joint from turning inward/outward.
5. What is wrong with this Picture?


6. Complete the following tables using the principles of positioning.

**Supine Position**

<table>
<thead>
<tr>
<th>Unsupported position</th>
<th>Problem to be Prevented</th>
<th>Corrective Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head is flat on bed surface</td>
<td>Hyperextension of neck</td>
<td></td>
</tr>
<tr>
<td>Legs are externally rotated</td>
<td>External rotation of legs</td>
<td></td>
</tr>
<tr>
<td>Legs are extended</td>
<td>Hyperextension of knees</td>
<td></td>
</tr>
<tr>
<td>Feet assume planter flexion position</td>
<td>Plantar flexion (foot drop)</td>
<td></td>
</tr>
<tr>
<td>Heels on bed surface</td>
<td>Pressure on heels</td>
<td></td>
</tr>
</tbody>
</table>
### Fowler’s Position - 45 degrees

<table>
<thead>
<tr>
<th>Unsupported Position</th>
<th>Problem to Be Prevented</th>
<th>Corrective Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head rests on bed surface</td>
<td>Hyperextension or hyperflexion of neck</td>
<td></td>
</tr>
<tr>
<td>Arms fall at sides</td>
<td>Shoulder muscle strain, possible dislocation of shoulders, edema of hands and arms with flaccid paralysis, flexion contracture of the wrist</td>
<td></td>
</tr>
<tr>
<td>Legs lie flat and straight on lower bed surface</td>
<td>Hyperextension of knees</td>
<td></td>
</tr>
<tr>
<td>Legs are externally rotated</td>
<td>External rotation of hips</td>
<td></td>
</tr>
<tr>
<td>Heels rest on bed surface</td>
<td>Pressure on heels</td>
<td></td>
</tr>
<tr>
<td>Feet are in Plantar flexion</td>
<td>Plantar flexion of feet (foot drop)</td>
<td></td>
</tr>
</tbody>
</table>
Post-Learning Knowledge Assessment

This questionnaire is meant to test your knowledge of correct positioning following the completion of the learning package. The test is made up of 6 questions. Answers can be found on page 36.

1. What is wrong with this picture?

Circle the six parts of the body that are not aligned correctly. Explain the impact this would have on the resident’s well being.

1.)

2.)

3.)

4.)

5.)

6.)
2. The force called pressure is the result of:
   a) Congestion with redness of the skin
   b) Having bony prominences
   c) Weight of one object pressing down on another
   d) Lack of friction on moving

3. Prolonged pressure on the sacrum causes the skin and underlying tissue to:
   a) Become compact and flattened out
   b) Swell up and become larger
   c) Turn pale in color
   d) Receive too much oxygen and nutrients

4. The nurse should see that the position of the resident in bed be changed at least:
   a) Once every shift
   b) Every two hours
   c) Every hour
   d) Every half hour

5. All but one of the following are reasons for using aids in positioning the resident:
   a) To provide support of a body part
   b) To assist with ambulation
   c) To relieve pressure
   d) To maintain the body in good alignment

6. One organ of the body that is quickly affected by pressure from lying in a lateral position for a long period of time is:
   a) The kidney
   b) The stomach
   c) The brain
   d) The lung
To make a trochanter roll:

a. Fold in thirds.

b. Roll up.

c. Roll in place.

d. Place flap under patient.
APPENDIX B: GLOSSARY

ALVEOLI – air sacs in the lung.

BODY ALIGNMENT – refers to the relationship of the moveable segments of the body to one another. Good alignment is achieved when there is no undue stress placed on the muscles or skeleton.

CONTRACTURE – is the permanent contraction of a muscle due to spasms or paralysis that leads to ‘freezing’, or immobilization, of the affected joint(s).

FOOT DROP – is hyperextension of the foot with permanent contracture of the calf muscles and tendons.

LATERAL POSITION – side position.

SIMS’ POSITION (variation of lateral) – usually on the left side with the uppermost leg moderately flexed so that it does not rest on the lower leg.

PRESSURE – the force caused by the weight of one object in contact with another.

SHEARING – results from the sliding and displacement of two opposing forces. Shearing causes ischemia by compressing blood vessels and impeding the flow of blood. Shearing is more likely to affect deeper structures.

SUPINE POSITION – lying on the back with face upward; also referred to as a dorsal recumbent position.

FOWLER’S POSITION (variation of supine position) – head of bed elevated usually to an angle of between 45 to 60 degrees, but maybe as elevated as low as 15 degrees or as great as 90 degrees.
APPENDIX C: ANSWERS TO PRE AND POST ASSESSMENT AND RECAPS

WHAT IS WRONG WITH THIS PICTURE?

1. Circle the six parts of the body that are not aligned correctly. Explain the impact this would have on the resident’s well being.
   - The resident’s neck is flexed so that puts strain on the neck and shoulders. Chest expansion for breathing is reduced and this increases the risk of respiratory infections.
   - The arms are extended and not supported which can lead to strain of the joints, especially the shoulder, elbow and wrist.
   - There is no support in the lower back which can cause hyperextending of the back. This hyperextension can cause strain on the abdominal muscles and some compression in the large blood vessels in the torso.
   - Pressure on the coccyx increases the risk of pressure ulcers.
   - Muscle strain in the knees can occur as they are not supported.
   - The feet are hyper extended. This may lead to problems with ambulation later due to foot drop.

2. c)
3. a)
4. b)
5. b)
6. d)
**PRINCIPLE #1: RECAP**

1. a) comfort b) relieve pressure c) prevent contractures d) improve circulation  
2. Foot drop  
3. Contractures  
4. Muscles and skeleton  

**PRINCIPLE #2: RECAP**

1. Positioning aids  
2. Hand rolls  
3. External rotation  
4. d)  

**PRINCIPLE #3: RECAP**

1. Flattened/more compact  
2. Pneumonia  
3. Bony prominences  
4. venous congestion and increase  

**SECTION II: RECAP**

1. a) semi-Fowler’s b) lateral c) supine d) Fowler’s  
2. True  
3. Every hour  
4. (increase), (inward)  
5. not demonstrating 90º 90º 90º positioning
## 6. Supine Position

<table>
<thead>
<tr>
<th>Unsupported position</th>
<th>Problem to be Prevented</th>
<th>Corrective Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head is flat on bed surface</td>
<td>Hyperextension of neck.</td>
<td>Pillow of suitable thickness under head and shoulders, if necessary for alignment</td>
</tr>
<tr>
<td>Legs may be externally rotated</td>
<td>External rotation of legs</td>
<td>Roll or sandbag placed laterally to trochanter of femur</td>
</tr>
<tr>
<td>Legs are extended</td>
<td>Hyperextension of knees</td>
<td>Small pillow under thigh to flex knee slightly</td>
</tr>
<tr>
<td>Feet assume planter flexion Heels on bed surface</td>
<td>Plantar flexion (foot drop)</td>
<td>Footboard or rolled pillow to support feet in dorsal flexion</td>
</tr>
<tr>
<td>Heels on bed surface</td>
<td>Pressure on heels</td>
<td>Small pillow under ankles</td>
</tr>
</tbody>
</table>

### Fowler’s Position - 45 degrees

<table>
<thead>
<tr>
<th>Unsupported position</th>
<th>Problem to be Prevented</th>
<th>Corrective Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head rests on bed surface</td>
<td>Hyperextension or hyperflexion of neck</td>
<td>Pillows to support head, neck and upper back</td>
</tr>
<tr>
<td>Arms fall at sides</td>
<td>Shoulder muscle strain, possible dislocation of shoulders, edema of hands and arms with flaccid paralysis, flexion contracture of the wrist</td>
<td>Pillow under forearms to eliminated pull on shoulder and assist venous blood flow from hands and lower arms. <strong>Low Fowler’s 30 degree or 15 degree—Supported arm support is omitted in this instance</strong></td>
</tr>
<tr>
<td>Legs lie flat and straight on lower bed surface</td>
<td>Hyperextension of knees</td>
<td>Small pillow under thighs to flex knees</td>
</tr>
<tr>
<td>Legs are externally rotated</td>
<td>External rotation of hips</td>
<td>Trochanter roll lateral to femur</td>
</tr>
<tr>
<td>Heels rest on bed surface</td>
<td>Pressure on heels</td>
<td>Small pillow under ankle</td>
</tr>
<tr>
<td>Feet are in Planter flexion</td>
<td>Plantar flexion of feet (foot drop)</td>
<td>Footboard or rolled pillow to provide support for dorsal flexion</td>
</tr>
</tbody>
</table>
## APPENDIX D: REPOSITIONING SCHEDULE

<table>
<thead>
<tr>
<th>TIME</th>
<th>BED CARE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Night Shift</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23:30</td>
<td>Back – flat</td>
<td></td>
</tr>
<tr>
<td>01:30</td>
<td><strong>Left side – 30 ° degree turn</strong></td>
<td>* Avoid positioning directly on the trochanter</td>
</tr>
<tr>
<td>03:30</td>
<td><strong>Right side – 30 ° degree turn</strong></td>
<td>* Avoid positioning directly on the trochanter</td>
</tr>
<tr>
<td>05:30</td>
<td>Back - flat</td>
<td></td>
</tr>
<tr>
<td><strong>Day Shift</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30</td>
<td>Fowler’s position for breakfast – foot of bed slightly elevated</td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td>After breakfast – 30 ° upright back lying</td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Right side – 30 ° degree turn</strong></td>
<td>* Avoid positioning directly on the trochanter</td>
</tr>
<tr>
<td>12:00</td>
<td>Fowler’s position for lunch - foot of bed slightly elevated</td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td>After lunch – 30 ° upright back lying</td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td>Left side – 30 ° degree turn</td>
<td>* Avoid positioning directly on the trochanter</td>
</tr>
<tr>
<td><strong>Evening Shift</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td>Fowler’s position for dinner – foot of bed slightly elevated (knee gatch)</td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td>After dinner – 30° upright back lying</td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td><strong>Right side – 30 ° degree turn</strong></td>
<td>* Avoid positioning directly on the trochanter</td>
</tr>
<tr>
<td>21:30</td>
<td><strong>Left side – 30 ° degree turn</strong></td>
<td>* Avoid positioning directly on the trochanter</td>
</tr>
</tbody>
</table>

The Repositioning Schedule is used with permission from the Drs. Paul and John Rekai Centres, Toronto, Ontario.
BIBLIOGRAPHY


Pressure Injury Staging
Pressure Injury (PI): A pressure injury is localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

### Stage 1 Pressure Injury

| Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury. |

### Stage 2 Pressure Injury

| Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical |
| Stage 3 Pressure Injury | Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury. |
| Stage 4 Pressure Injury | Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury. |
| Unstagable Pressure Injury | Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e. dry, adherent, intact without erythema or fluctuance) on an ischemic limb or the heel(s) should not be removed. |
| Deep Tissue Injury Pressure Injury | Intact or non–intact skin with localized area of persistent non–blanchable deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone–muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full–thickness pressure injury (Unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions. |

**Medical Device Related Pressure Injury:** This describes an etiology. Medical device related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure injury generally conforms to the pattern or shape of the device. The injury should be staged using the staging system.  

**Mucosal Membrane Pressure Injury:** Mucosal membrane pressure injury is found on mucous membranes with a history of a medical device in use at the location of the injury. Due to the anatomy of the tissue these ulcers cannot be staged.  

**DO NOT Reverse Stage:** NPUAP pressure injury staging describes the depth of tissue damage due to pressure. It does not describe healing tissue. Do not reverse stage using NPUAP pressure injury staging.(i.e.– a Stage 4 pressure injury cannot become a Stage 3, Stage 2, and/or subsequently Stage 1. When a Stage 4 injury has healed it should be classified as a healed Stage 4 pressure injury.)
Why is this a Stage 1 Pressure Injury?

- The skin is not open or broken
- The area is pinkish/reddish color and does not change over time when pressure is removed
- When tested for blanching it will not blanch
Why is this a Stage 2 Pressure Injury?

- The skin is open
- It has **NO** slough in the wound bed
- It has pink granulated tissue
- It can be a serum filled blister that is intact or broken
Why is this a Stage 3 Pressure Injury?

• The skin is open
• The wound is caused by pressure
• The wound bed has slough or fatty tissue
• The dead tissue (*slough*) is not stopping you from seeing the bottom of the wound bed
Why is this a Stage 4 Pressure Injury?

• This injury is caused by pressure and/or shear
• This injury is down to bone, tendon or muscle
• The bone is visible or palpable
Why is this a Unstageable Pressure Injury?

• The dead tissue (slough or eshcar) is stopping you from seeing the base of the wound bed
• You cannot know the depth of the damage until the dead tissue is removed
Why is this a Deep Tissue Pressure Injury?

• The skin can be intact or broken
• The area is purple or maroon in color
• It can look like a deep bruise from constant pressure
• It can also look like a blood blister
Wound Assessment & Documentation
**Assessment**

**Determine cause of wound**
- Pressure, injury, diabetic, venous insufficiency, arterial insufficiency, trauma
- Verify correct wound etiology diagnosis

**Determine Healability**
- **Healable:** Patients have the physical capability to heal and the system can support optimal wound healing:
  - 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.
- **Maintenance:** Patient has the physical capabilities to heal but cannot due to client, wound and/or system factors that cannot be eliminated resulting in wound healing that is slow or stalled. 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 or underlying causes of the wound cannot be eliminated to promote healing in a timely fashion.
- **Non-healable:** Patient is unable to heal wound due to:
  - 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.

**Comprehensive Patient Assessment:**
- **Co-morbidities**
  - Conditions that increase risk of delayed or impaired healing
  - Diabetes—glucose control, neuropathy,
Cardiovascular or cardiopulmonary conditions (decrease perfusion to tissues) – CAD, COPD, PAD, hypertension

Conditions that affect sensation and mobility (CVA, spinal cord injury, MS)

◊ Medications
  o Steroids
  o Immunosuppressant
  o NSAIDS
  o Anticoagulants

◊ Nutrition
  o Optimal nutrition and hydration needed for healing
  o Overweight, underweight, inadequate oral intake
  o Perform nutritional assessment (e.g. Mini Nutritional Assessment or Canadian Nutritional Screening Tool)

◊ Lifestyle
  o Smoking
  o Substance use
  o Personal hygiene

◊ Moisture
  o Incontinence (urine or fecal)
  o Edema (causing “weepy” legs)
  o Exudating wounds
  o Excessive perspiration

◊ Allergies and sensitivities

Wound Assessment

◊ History of wound (current and past) – location, etiology, treatments
◊ Location
◊ Size and depth
◊ Undermining or tunneling
◊ Edges of wound
◊ Tissue type
  o Granulation
  o Non-viable (necrotic)
◊ Exudate (amount and consistency)
◊ Periwound skin
◊ Pain
◊ Signs & Symptoms of infection
◊ Use wound assessment tool (eg. BWAT)
Risk Factors for Developing a Wound Infection

- Individualize care plans to eliminate risk factors for developing a wound infection—optimize host factors and wound environment.
- Perform comprehensive wound assessments frequently for early detection of wound infection.
- Consider the use of topical antimicrobial product if resident had many risk factors for developing an infection.
- Practice good hand hygiene and use of personal protective equipment.

Table 2: Factors associated with increased risk of wound infection

(International Wound Infection Institute, 2016)
Recognizing Wound Infection

Local infection:

◊ Micro-organisms are moving deeper into wound proliferating at a rate that causes a host response and delays healing. Local infection is limited to one location, system or structure. Signs & symptoms of infection include subtle or overt signs of infection.

Spreading:

◊ Micro-organisms are proliferating at a rate that they invade the surrounding tissue around the wound. Signs and symptoms of infection spread to outside of wound border. Can invade deep tissue, fascia, muscle, organs or body cavities

Systemic:

◊ Micro-organisms spread through the body via the lymphatic or vascular system. Systemic inflammatory response--sepsis, and organ dysfunction occur

2 or more S&S are sufficient for a clinical diagnosis of potential wound infection

1 or more S&S are sufficient for in clients with diabetes or arterial insufficiency

If able to see or probe to bone assume osteomyelitis

(International Wound Infection Institute, 2016)
## Wound Base and Tissue Type

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epithelial</td>
<td>Translucent or white cell layer, migrate onto granulation tissue</td>
<td><img src="CAWC" alt="Image" /></td>
</tr>
<tr>
<td>Granulation</td>
<td>Pink/red “beefy” tissue, granular cells, moist. Necessary for healing</td>
<td><img src="CAWC" alt="Image" /></td>
</tr>
<tr>
<td>Slough/ necrotic tissue</td>
<td>Soft, moist dead tissue. White, yellow, brown, green. May be loose or adhered to wound bed</td>
<td><img src="CAWC" alt="Image" /></td>
</tr>
<tr>
<td>Eschar</td>
<td>Brown or black necrotic tissue. Texture: hard, soft or boggy. Can be adhered to wound bed or separated from edge</td>
<td><img src="CAWC" alt="Image" /></td>
</tr>
</tbody>
</table>
## Exposed Structure in Wound Bed

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone</td>
<td>White, yellow or grey</td>
</tr>
<tr>
<td></td>
<td>Hard to touch</td>
</tr>
<tr>
<td>Tendon/ Ligament</td>
<td>Dense bands of fibrous connective tissue. Shiny and white</td>
</tr>
</tbody>
</table>

![Bone Image](image)

![Tendon/Ligament Image](image)
# Exudate

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>No exudate</td>
</tr>
<tr>
<td>Small (scant)</td>
<td>Exudate fully controlled, non absorptive dressing may be used, wear time up to 7 days</td>
</tr>
<tr>
<td>Moderate</td>
<td>Exudate controlled, Absorptive dressing required, Wear time 2–3 days</td>
</tr>
<tr>
<td>Large (copious)</td>
<td>Exudate uncontrolled, Absorptive dressing required, Dressing overwhelmed &lt;1 day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consistency</th>
<th>Colour</th>
<th>Odour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serous</td>
<td>Thin watery</td>
<td>none</td>
</tr>
<tr>
<td>Serosanguinous</td>
<td>Thin watery</td>
<td>pink</td>
</tr>
<tr>
<td>Sanguineous</td>
<td>Active bleeding</td>
<td>Bright red</td>
</tr>
<tr>
<td>Sero–purulent</td>
<td>Thin watery</td>
<td>White, tan</td>
</tr>
<tr>
<td>Purulent</td>
<td>Thick translucent opaque</td>
<td>White, tan, greenish</td>
</tr>
</tbody>
</table>
## Edges

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advancing</td>
<td>Epidermal cells migrating across wound bed</td>
<td>CAWC</td>
</tr>
<tr>
<td>Attached</td>
<td>Edges attached but not advancing</td>
<td>NSHA</td>
</tr>
<tr>
<td>Rolled</td>
<td>Curled wound edge, thick</td>
<td>CAWC</td>
</tr>
<tr>
<td>Callus</td>
<td>Thick hyperkeratotic tissue around all or parts of wound edge</td>
<td>CAWC</td>
</tr>
<tr>
<td>Indistinct</td>
<td>Cannot distinguish wound boundaries from periwound skin</td>
<td>CAWC</td>
</tr>
</tbody>
</table>
Periwound Skin

- Assessment of the skin surrounding the wound is an important component of the wound assessment
- Assess for color
  - Redness (erythema)
  - Bruised (purple)
  - Hemosiderin staining (brown staining from long standing venous insufficiency)
- Assess for temperature
- Assess for maceration (moist, soft): typically white looking
- Assess for induration: firm or edematous skin
- Assess for further breakdown (tape injury, blisters, excoriation)
<table>
<thead>
<tr>
<th>Periwound Terminology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Erythema</strong></td>
<td>Redness surrounding the wound on the periwound skin</td>
</tr>
<tr>
<td><strong>Hemosiderin staining</strong></td>
<td>Brown discolouration due to chronic venous insufficiency</td>
</tr>
<tr>
<td><strong>Macerated</strong></td>
<td>Wet around wound, skin looks wet, and soft</td>
</tr>
<tr>
<td><strong>Indurated</strong></td>
<td>Swelling or edema around wound, firm to touch</td>
</tr>
</tbody>
</table>
**Undermining and Tunneling**

- **Undermining**: separation of the wound edge from deeper tissue
- **Tunneling**: channel extending beyond open wound bed
- Measure the degree of each incidence
- Document areas of undermining and tunneling using a clock face (12oclock is towards head of the patient)

Retrieved image from
BATES-JENSEN WOUND ASSESSMENT TOOL

Instructions for use

General Guidelines:

Fill out the attached rating sheet to assess a wound’s status after reading the definitions and methods of assessment described below. Evaluate once a week and whenever a change occurs in the wound. Rate according to each item by picking the response that best describes the wound and entering that score in the item score column for the appropriate date. When you have rated the wound on all items, determine the total score by adding together the 13-item scores. The HIGHER the total score, the more severe the wound status. Plot total score on the Wound Status Continuum to determine progress. If the wound has healed/resolved, score items 1, 2, 3 and 4 as =0.

Specific Instructions:

1. **Size**: Use ruler to measure the longest and widest aspect of the wound surface in centimeters; multiply length x width. Score as = 0 if wound healed/resolved.

2. **Depth**: Pick the depth, thickness, most appropriate to the wound using these additional descriptions, score as =0 if wound healed/resolved:
   - 1 = tissues damaged but no break in skin surface.
   - 2 = superficial, abrasion, blister or shallow crater. Even with, &/or elevated above skin surface (e.g., hyperplasia).
   - 3 = deep crater with or without undermining of adjacent tissue.
   - 4 = visualization of tissue layers not possible due to necrosis.
   - 5 = supporting structures include tendon, joint capsule.

3. **Edges**: Score as = 0 if wound healed/resolved. Use this guide:
   - Indistinct, diffuse = unable to clearly distinguish wound outline.
   - Attached = even or flush with wound base, no sides or walls present; flat.
   - Not attached = sides or walls are present; floor or base of wound is deeper than edge.
   - Rolled under, thickened = soft to firm and flexible to touch.
   - Hyperkeratosis = callous-like tissue formation around wound & at edges.
   - Fibrotic, scarred = hard, rigid to touch.

4. **Undermining**: Score as = 0 if wound healed/resolved. Assess by inserting a cotton tipped applicator under the wound edge; advance it as far as it will go without using undue force; raise the tip of the applicator so it may be seen or felt on the surface of the skin; mark the surface with a pen; measure the distance from the mark on the skin to the edge of the wound. Continue process around the wound. Then use a transparent metric measuring guide with concentric circles divided into 4 (25%) pie-shaped quadrants to help determine percent of wound involved.

5. **Necrotic Tissue Type**: Pick the type of necrotic tissue that is predominant in the wound according to color, consistency and adherence using this guide:
   - White/gray non-viable tissue = may appear prior to wound opening; skin surface is white or gray.
   - Non-adherent, yellow slough = thin, mucinous substance; scattered throughout wound bed; easily separated from wound tissue.
   - Loosely adherent, yellow slough = thick, stringy, clumps of debris; attached to wound tissue.
   - Adherent, soft, black eschar = soggy tissue; strongly attached to tissue in center or base of wound.
   - Firmly adherent, hard/black eschar = firm, crusty tissue; strongly attached to wound base and edges (like a hard scab).

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6. **Necrotic Tissue Amount**: Use a transparent metric measuring guide with concentric circles divided into 4 (25%) pie-shaped quadrants to help determine percent of wound involved.

7. **Exudate Type**: Some dressings interact with wound drainage to produce a gel or trap liquid. Before assessing exudate type, gently cleanse wound with normal saline or water. Pick the exudate type that is predominant in the wound according to color and consistency, using this guide:
   - Bloody = thin, bright red
   - Serosanguineous = thin, watery pale red to pink
   - Serous = thin, watery, clear
   - Purulent = thin or thick, opaque tan to yellow or green may have offensive odor

8. **Exudate Amount**: Use a transparent metric measuring guide with concentric circles divided into 4 (25%) pie-shaped quadrants to determine percent of dressing involved with exudate. Use this guide:
   - None = wound tissues dry.
   - Scant = wound tissues moist; no measurable exudate.
   - Small = wound tissues wet; moisture evenly distributed in wound; drainage involves ≤ 25% dressing.
   - Moderate = wound tissues saturated; drainage may or may not be evenly distributed in wound; drainage involves > 25% to ≤ 75% dressing.
   - Large = wound tissues bathed in fluid; drainage freely expressed; may or may not be evenly distributed in wound; drainage involves > 75% of dressing.

9. **Skin Color Surrounding Wound**: Assess tissues within 4cm of wound edge. Dark-skinned persons show the colors "bright red" and "dark red" as a deepening of normal ethnic skin color or a purple hue. As healing occurs in dark-skinned persons, the new skin is pink and may never darken.

10. **Peripheral Tissue Edema & Induration**: Assess tissues within 4cm of wound edge. Non-pitting edema appears as skin that is shiny and taut. Identify pitting edema by firmly pressing a finger down into the tissues and waiting for 5 seconds, on release of pressure, tissues fail to resume previous position and an indentation appears. Induration is abnormal firmness of tissues with margins. Assess by gently pinching the tissues. Induration results in an inability to pinch the tissues. Use a transparent metric measuring guide to determine how far edema or induration extends beyond wound.

11. **Granulation Tissue**: Granulation tissue is the growth of small blood vessels and connective tissue to fill in full thickness wounds. Tissue is healthy when bright, beefy red, shiny and granular with a velvety appearance. Poor vascular supply appears as pale pink or blanched to dull, dusky red color.

12. **Epithelialization**: Epithelialization is the process of epidermal resurfacing and appears as pink or red skin. In partial thickness wounds it can occur throughout the wound bed as well as from the wound edges. In full thickness wounds it occurs from the edges only. Use a transparent metric measuring guide with concentric circles divided into 4 (25%) pie-shaped quadrants to help determine percent of wound involved and to measure the distance the epithelial tissue extends into the wound.

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Complete the rating sheet to assess wound status. Evaluate each item by picking the response that best describes the wound and entering the score in the item score column for the appropriate date. If the wound has healed/resolved, score items 1,2,3, & 4 as =0.

**Location:** Anatomic site. Circle, identify right (R) or left (L) and use "X" to mark site on body diagrams:

- Sacrum & coccyx
- Trochanter
- Ischial tuberosity
- Buttock

Location:

- Sacrum & coccyx
- Trochanter
- Ischial tuberosity
- Buttock

**Shape:** Overall wound pattern; assess by observing perimeter and depth.

Circle and date appropriate pattern:

- Irregular
- Linear or elongated
- Round/oval
- Bowl/boat
- Square/rectangle
- Butterfly
- Other Shape

<table>
<thead>
<tr>
<th>Item</th>
<th>Assessment</th>
<th>Date Score</th>
<th>Date Score</th>
<th>Date Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Size*</td>
<td>0 = Healed, resolved wound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = Length x width &lt;4 sq cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = Length x width 4--&lt;16 sq cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = Length x width 16.1--&lt;36 sq cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 = Length x width 36.1--&lt;80 sq cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 = Length x width &gt;80 sq cm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 2. Depth*| 0 = Healed, resolved wound                                                  |            |            |            |
|          | 1 = Non-blanchable erythema on intact skin                                 |            |            |            |
|          | 2 = Partial thickness skin loss involving epidermis &/or dermis            |            |            |            |
|          | 3 = Full thickness skin loss involving damage or necrosis of               |            |            |            |
|          | subcutaneous tissue; may extend down to but not through underlying         |            |            |            |
|          | fascia; &/or mixed partial & full thickness &/or tissue layers obscured by |            |            |            |
|          | granulation tissue                                                        |            |            |            |
|          | 4 = Obscured by necrosis                                                  |            |            |            |
|          | 5 = Full thickness skin loss with extensive destruction, tissue necrosis or |            |            |            |
|          | damage to muscle, bone or supporting structures                           |            |            |            |

| 3. Edges*| 0 = Healed, resolved wound                                                  |            |            |            |
|          | 1 = Indistinct, diffuse, none clearly visible                              |            |            |            |
|          | 2 = Distinct, outline clearly visible, attached, even with wound base     |            |            |            |
|          | 3 = Well-defined, not attached to wound base                               |            |            |            |
|          | 4 = Well-defined, not attached to base, rolled under, thickened           |            |            |            |
|          | 5 = Well-defined, fibrotic, scarred or hyperkeratotic                      |            |            |            |

| 4. Under-mining* | 0 = Healed, resolved wound |            |            |            |
|                  | 1 = None present            |            |            |            |
|                  | 2 = Undermining < 2 cm in any area |            |            |            |
|                  | 3 = Undermining 2-4 cm involving < 50% wound margins |            |            |            |
|                  | 4 = Undermining 2-4 cm involving > 50% wound margins |            |            |            |
|                  | 5 = Undermining > 4 cm or Tunneling in any area |            |            |            |

| 5. Necrotic Tissue Type | 1 = None visible |            |            |            |
|                       | 2 = White/grey non-viable tissue &/or non-adherent yellow slough |            |            |            |
|                       | 3 = Loosely adherent yellow slough                                       |            |            |            |
|                       | 4 = Adherent, soft, black eschar                                          |            |            |            |
|                       | 5 = Firmly adherent, hard, black eschar                                   |            |            |            |

<p>| 6. Necrotic Tissue Amount | 1 = None visible |            |            |            |
|                         | 2 = &lt; 25% of wound bed covered                                           |            |            |            |
|                         | 3 = 25% to 50% of wound covered                                          |            |            |            |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Assessment</th>
<th>Date Score</th>
<th>Date Score</th>
<th>Date Score</th>
</tr>
</thead>
</table>
| 7. Exudate Type | 4 = > 50% and < 75% of wound covered  
5 = 75% to 100% of wound covered |            |            |            |
| 8. Exudate Amount | 1 = None  
2 = Bloody  
3 = Serosanguineous: thin, watery, pale red/pink  
4 = Serous: thin, watery, clear  
5 = Purulent: thin or thick, opaque, tan/yellow, with or without odor |            |            |            |
| 9. Skin Color Surrounding Wound | 1 = Pink or normal for ethnic group  
2 = Bright red &/or blanches to touch  
3 = White or grey pallor or hypopigmented  
4 = Dark red or purple &/or non-blanchable  
5 = Black or hyperpigmented |            |            |            |
| 10. Peripheral Tissue Edema | 1 = No swelling or edema  
2 = Non-pitting edema extends <4 cm around wound  
3 = Non-pitting edema extends >4 cm around wound  
4 = Pitting edema extends < 4 cm around wound  
5 = Crepitus and/or pitting edema extends >4 cm around wound |            |            |            |
| 11. Peripheral Tissue Induration | 1 = None present  
2 = Induration, < 2 cm around wound  
3 = Induration 2-4 cm extending < 50% around wound  
4 = Induration 2-4 cm extending > 50% around wound  
5 = Induration > 4 cm in any area around wound |            |            |            |
| 12. Granulation Tissue | 1 = Skin intact or partial thickness wound  
2 = Bright, beefy red; 75% to 100% of wound filled &/or tissue overgrowth  
3 = Bright, beefy red; < 75% & > 25% of wound filled  
4 = Pink, &/or dull, dusky red &/or fills ≤ 25% of wound  
5 = No granulation tissue present |            |            |            |
| 13. Epithelialization | 1 = 100% wound covered, surface intact  
2 = 75% to <100% wound covered &/or epithelial tissue extends >0.5cm into wound bed  
3 = 50% to <75% wound covered &/or epithelial tissue extends to <0.5cm into wound bed  
4 = 25% to < 50% wound covered  
5 = < 25% wound covered |            |            |            |

**TOTAL SCORE**

**SIGNATURE**

---

Plot the total score on the Wound Status Continuum by putting an "X" on the line and the date beneath the line. Plot multiple scores with their dates to see-at-a-glance regeneration or degeneration of the wound.

© 2001 Barbara Bates-Jensen
Identify patients who are at risk for malnutrition

Ask the patient the following questions*

- Have you lost weight in the past 6 months **WITHOUT TRYING** to lose this weight? If the patient reports a weight loss but gained it back, consider it as **NO** weight loss.
- Have you been eating less than usual **FOR MORE THAN A WEEK**?

**Two “YES” answers indicate nutrition risk†**

* If the patient is unable to answer the questions, a knowledgeable informant can be used to obtain the information. If the patient is uncertain regarding weight loss, ask if clothing is now fitting more loosely.

Patients at nutrition risk need an assessment to confirm malnutrition

Nutrition screening using a valid tool can generate a significant volume of requests for nutrition evaluation. Subjective Global Assessment (SGA) is a simple and efficient first-line assessment of nutritional status that can be used following a positive screening and to help prioritize cases.

If a patient is malnourished (SGA B or C), an in-depth nutrition assessment, along with treatment, is required by a registered dietitian.

**The Canadian Nutrition Screening Tool was rigorously validated and tested for reliability in Canadian hospitals. Non-expert raters completed the tool and it was compared to the SGA conducted by a dietitian or trained nutrition researcher.**

† If a patient is not at risk, rescreen within a week. Only consider weight change in the past week.

---

**Canadian Nutrition Screening Tool (CNST)**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Age:</th>
<th>Weight:</th>
<th>Room:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ask the patient the following questions**

- Have you lost weight in the past 6 months **WITHOUT TRYING** to lose this weight? If the patient reports a weight loss but gained it back, consider it as **NO** weight loss.
- Have you been eating less than usual **FOR MORE THAN A WEEK**?

**Two “YES” answers indicate nutrition risk†**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission</td>
<td>Rescreening</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
The Importance of Nutrition Screening

**Strategies to support adequate food intake**

- Position patients properly for eating
- Assist patients in opening packages and containers
- Avoid scheduling tests or examinations during meal times
- Consider in-between meal snacks and supplements to support intake
- Clarify why the patient is not eating and find solutions to overcome these problems
- Determine if the patient has pain, is depressed, anxious or in need of medication and social support

Flag patients who are eating 50% or less of their hospital meals

Obtain measured weight of patients using a portable, digital chair scale at their bedside. Weight should be measured at admission and at least weekly. Communicate discharge weight and nutritional status with the patient, family and formal service providers.
Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

### Screening

**A** Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
- 0 = severe decrease in food intake
- 1 = moderate decrease in food intake
- 2 = no decrease in food intake

**B** Weight loss during the last 3 months
- 0 = weight loss greater than 3 kg (6.6 lbs)
- 1 = does not know
- 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
- 3 = no weight loss

**C** Mobility
- 0 = bed or chair bound
- 1 = able to get out of bed / chair but does not go out
- 2 = goes out

**D** Has suffered psychological stress or acute disease in the past 3 months?
- 0 = yes
- 2 = no

**E** Neuropsychological problems
- 0 = severe dementia or depression
- 1 = mild dementia
- 2 = no psychological problems

**F1** Body Mass Index (BMI) (weight in kg) / (height in m)²
- 0 = BMI less than 19
- 1 = BMI 19 to less than 21
- 2 = BMI 21 to less than 23
- 3 = BMI 23 or greater

*IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2. DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.*

**F2** Calf circumference (CC) in cm
- 0 = CC less than 31
- 3 = CC 31 or greater

### Screening score

(max. 14 points)

- **12-14 points:** Normal nutritional status
- **8-11 points:** At risk of malnutrition
- **0-7 points:** Malnourished

---


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For more information: [www.mna-elderly.com](http://www.mna-elderly.com)
Wound Management
Treatment Planning

◊ Treat cause of wound (address and eliminate factor(s))

◊ Patient Centered concerns
  o Quality of life
  o Pain
  o Odour
  o Costs of treatment (if any for patient)
  o Patient preferences

◊ Interventions to optimize wound healing
  o Optimize co-morbidities when possible
    ▪ Diabetes– glucose control
    ▪ Cardiovascular conditions
  o Risk reduction
    ▪ Smoking
    ▪ Substance use
  o Nutrition
    ▪ Consider dietician consult
    ▪ Ensure adequate hydration and protein intake
    ▪ Dietician or physician to screen for appropriateness of initiating a MedPass Program
  o Pressure Redistribution
    ▪ Keep pressure off wound location
    ▪ Consider use support surface and offloading device
    ▪ OT consult
  o Pain relief
    ▪ Appropriate analgesic use
  o General Skin Care
    ▪ Use pH balance soap
    ▪ Moisturize with non–scented lotion
    ▪ Inspection of skin daily
    ▪ Thoroughly clean after episodes of incontinence and use barrier products to protect skin

◊ Local wound care: Heable wound
  o Cleanse wound with every dressing change
    ▪ Normal saline or antiseptic solution can be used
    ▪ Adequate force with cleansing
  o Debridement of non–viable tissue (Physicians to sharp debride)
• Necrotic tissue feeding ground for bacteria and micro-organisms
  • Sharp, autolytic or enzymatic
  o Managing moisture—“not too wet, not too dry, just the moisture of your eye”
    • Moist wound environment needed for wound healing (promotes decreased dehydration and cell death, autolytic debridement, angiogenesis, epithelialization) and decreases pain
    • Select dressing to support optimal moisture balance
      • Too dry: add moisture (hydrogel)
      • Just right: moisture retentive dressing (film, hydrocolloid, light foam)
      • Too wet: absorptive dressing (foam, hydrofiber, composite, alginate)
  o Manage infection (bioburden)
    • Assess for signs & symptoms of infection
    • Removal of non-viable tissue
    • Appropriate use of topical antimicrobials
    • Appropriate use of systemic antibiotic

◊ Local wound care non-healable or maintenance wound
  o If dry stable eschar present do not remove, keep dry and intact
    • Paint with antiseptic (solu-prep, or betadine)
  o Manage moisture
    • Keep dry, absorptive wound dressing to manage exudate
    • Do not add moisture unless for pain relieving measures
  o Manage and prevent infection
    • Monitoring for signs & symptoms of infection
    • Use of topical antimicrobials
    • Conservative debridement to decrease risk of infection

◊ Dressing Selection considerations:
  o Size—undermining and tunneling
  o Characteristics of wound
    • Tissue type
    • Odour
    • Exudate level
    • Signs & symptoms of infection
  o Patient concerns and preference
  o Manage moisture—add, retain or absorb
  o Manage infection—topical antimicrobials
  o Wear time—based on wound (exudate and infection), patient preference and product
Treatment of Wound Infection

Optimize Residents Healing Factors:

◊ Optimize management of co-morbidities
◊ Optimize nutrition and hydration status
◊ Minimize or eliminate risk factor for infection when possible
◊ Optimize wound environment
◊ Treat systemic symptoms– pain, fever

Contamination & Colonization

◊ Implementation of universal precautions– good hand–hygiene and use of appropriate personal protective equipment
◊ Aseptic dressing technique
◊ Wound cleansing with every dressing change
◊ Monitoring for wound infection– changes to size, pain scale, wound bed ect.

Local Infection

◊ Same as above, as well as:
◊ Notify MD or NP
◊ Removal of non–viable tissue– debridement (sharp, autolytic, enzymatic)
◊ Topical antimicrobials–silver, PHMB, iodine, gentian violet and methylene blue, medical grade honey
◊ Manage exudate from wound: use of absorptive dressing
◊ Monitor for spreading infection and systemic infection

Spreading Infection and systemic infection:

◊ Same as above, as well as:
◊ Notify MD or NP
◊ Appropriate antibiotic treatment
◊ Monitor for S&S of systemic infection: lethargy or general malaise, fever or chills, change in cognition or behavior, change in glucose levels (clients with DM), elevated heart rate and respirations
Pressure Injuries and Nutrition

Nutrition and hydration both play an important role in preserving skin and tissue viability and in repairing tissue and healing pressure ulcers. Malnutrition is associated with increased risk of Pressure Injuries (PI) Individuals who are at risk for Pressure Injuries whether or not they have a PI should have a comprehensive nutritionals assessment by a registered dietician. The registered dietician is an important interdisciplinary wound care team member. “A person with a Pressure Injury should have an individualized care plan based on his/her nutritional needs, feeding route and goals of care…” The care plan is to improve or maintain the individual’s nutritional status. Nutritional needs should be met by a healthy diet, however oral nutritional supplements with enhanced foods such as high protein and high calorie food fortifiers between meals can be used to meet nutrition needs.

Practice Pearls:

◊ Screen and assess the nutritional status of individuals at risk for or with Pressure Injuries.
◊ Collaborate with the RD and members of the interprofessional team to determine appropriate individualized nutritional interventions.
◊ Implement 2014 NPUAP/EPUAP/PPPIA nutrition guidelines according to the individual’s assessed needs.
◊ Encourage consumption of a balanced diet, which includes good sources of calories, protein, fluids, vitamins, and minerals.
◊ Provide enriched food and/or ONSs between meals, if appropriate and consistent with the individual’s plan of care.
◊ Consider nutrition support (EN or parenteral feeding) if oral intake is inadequate (must be compatible with individual’s goals).
◊ Offer palliative care based on the individual’s condition and wishes.
Medpass Program

What is the medpass program?

MedPass is a simple and flexible nutrition supplement program that can be added to your medication routine to provide extra nutrition at regular times throughout the day. Simply take 30–60 mL of a complete nutrition supplement, 4 times a day with your medications.

Who should be on the program?

You should receive the medpass program if you are unable to eat enough food to meet your needs. This is also true if current mealtime supplements, are interfering with the amount of food you are able to be eat.

The following is a list of conditions that medpass would be beneficial for:

- Weight Loss
- Low ideal body weight
- Low protein intake
- Healing wounds
- Cancer
- Poor overall food intake
- Heart failure
- Lung disease
- Infection
- Known malnutrition
- Stroke
- Poor supplement intake at meals or between meals
Avoidable Pressure Injury:

An avoidable pressure ulcer can develop when the provider did not do one or more of the following: evaluate the individual's clinical condition and pressure, ulcer risk factors; define and implement interventions consistent with individual needs, individual goals, and recognized standards of practice; monitor and evaluate the impact of the interventions; or revise the interventions as appropriate.

Unavoidable Pressure Injury:

An unavoidable pressure ulcer can develop even though the provider evaluated the individual's clinical condition and pressure ulcer risk factors; defined and implemented interventions consistent with individual needs, goals, and recognized standards of practice; monitored and evaluated the impact of the interventions; and revised the approaches as appropriate.

Unavoidable pressure ulcers may develop in patients who are hemodynamically unstable, terminally ill, have certain medical devices in place, and are non-adherent with artificial nutrition or repositioning.

Unavoidable pressure injuries: best practice interventions were implemented, monitored and revised as needed and a pressure injury still developed.

Product Reference Sheet
<table>
<thead>
<tr>
<th>FUNCTION OF PRODUCT</th>
<th>CATEGORY</th>
<th>PRODUCT NAME</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound Hydration</td>
<td>HYDROGEL</td>
<td>INTRASITE GEL</td>
<td>To add moisture in wounds with DRY necrotic tissue to enhance autolytic debridement. Do not use on heel ulcers with dry stable eschar</td>
</tr>
<tr>
<td>Moisture Retention</td>
<td>TRANSPARENT DRESSING</td>
<td>TEGADERM TRANSPARENT</td>
<td>For shallow healing wounds with small amount of exudate May cause trauma/injury to fragile skin</td>
</tr>
<tr>
<td>TRANSPARENT DRESSING</td>
<td>COMFEEL HYDROCOLLOID TRANSPARENT THIN AND PLUS</td>
<td></td>
<td>For shallow healing wounds with small amount of exudate May cause trauma/injury to fragile skin</td>
</tr>
<tr>
<td>Exudate Management</td>
<td>CALCIUM ALGINATE</td>
<td>NU - DERM</td>
<td>For wounds with moderate to large amounts of exudate For the management of localized minor bleeding in superficial wounds Packing wounds</td>
</tr>
<tr>
<td>FOAM WITH SILICONE</td>
<td>MEPILEX WITH BORDER AND WITHOUT BORDER AND LITE</td>
<td></td>
<td>For wounds with moderate to large amount of exudate For wounds with friable wound bed and/or fragile peri-wound skin For skin tears. Caution on diabetic feet</td>
</tr>
<tr>
<td>FOAM</td>
<td>TIELLE WITH OR WITHOUT BORDER, HEAL AND SACRAL</td>
<td></td>
<td>For wounds with moderate to large amount of exudate. Caution on diabetic feet</td>
</tr>
<tr>
<td>Antimicrobial</td>
<td>ANTIMICROBIAL SILVER ALGINATE EXUDATE MANAGEMENT</td>
<td>SILVERCEL NON-ADHERENT</td>
<td>Wounds with moderate to large amounts of exudate which show signs and symptoms (S&amp;S) of local wound infection or colonization</td>
</tr>
<tr>
<td>10% POVIDONE IODINE IMPREGNATED GAUZE</td>
<td>INADINE</td>
<td></td>
<td>For shallow wounds which show signs and symptoms (S&amp;S) of local wound infection or at risk of developing a local wound infection For maintenance/non-healing shallow wounds Last up to 3 days</td>
</tr>
<tr>
<td>ANTIMICROBIAL: SILVER CONTACT LAYER</td>
<td>RESTORE SILVER CONTACT LAYER</td>
<td></td>
<td>For fragile wounds with low to moderate exudate which shows signs and symptoms (S&amp;S) of local wound infection</td>
</tr>
<tr>
<td>FUNCTION OF PRODUCT</td>
<td>CATEGORY</td>
<td>PRODUCT NAME</td>
<td>INDICATION</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>Speciality Items</td>
<td>SUPERABSORBENT DRESSINGS</td>
<td>MEXTRA</td>
<td>For moderately to heavily exuding wounds</td>
</tr>
<tr>
<td></td>
<td>COVER DRESSING: COMPOSITE</td>
<td>MESORB</td>
<td>For moderate to heavily exuding wounds which require frequent dressing changes Can be used as a primary dressing or in combination with other wound products as a secondary dressing Not for Moist Wound Healing</td>
</tr>
<tr>
<td></td>
<td>COVER DRESSING: COMPOSITE</td>
<td>MEPORE PRO</td>
<td>To protect site from wound contamination Low exuding wounds Surgical incisions</td>
</tr>
<tr>
<td></td>
<td>ODOUR MANAGEMENT ACTIVATED CHARCOAL WITH SILVER</td>
<td>ACTISORB 220</td>
<td>For malodorous wounds resulting from infection, bacterial contamination and malignancy</td>
</tr>
<tr>
<td>Charcoal for odorous wounds</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Compression USE: For Venous Leg Ulcers ABI required before use | COMPRESSION THERAPY: TUBULAR CIRCUMFERENTIAL COMPRESSION | TUBIGRIP AND TUBIFAST | For mild compression therapy for the treatment of Venous insufficiency with or without ulcer(s) or Arterial/venous insufficiency with or without ulcer(s) or Lymphedema with or without ulcers(s) or Generalized edema ABI required before application |

Northwood
Product Function
**Product Functions**

**Wound Hydration**

Function: To donate moisture to a dry wound.  
Caution: Do not use if wound is moist or with dressing for exudate management

---

**INTRASITE GEL**

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Hydrogel: Amorphous Gel – WOUND HYDRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY POINTS</td>
<td>Water based amorphous gel</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>To add moisture in wounds with DRY necrotic tissue to enhance autolytic debridement</td>
</tr>
<tr>
<td>PRECAUTIONS</td>
<td>Do not use an absorptive cover dressing (Foam, alginate) with the gel as it will be absorbed into dressing</td>
</tr>
<tr>
<td></td>
<td>Do not add gel to moist wound, for DRY wounds only</td>
</tr>
<tr>
<td></td>
<td>Can cause wound maceration is use in a wound with drainage</td>
</tr>
<tr>
<td></td>
<td>Do not use on heel ulcer with dry stable eschar where healing is not the goal</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>Moist or heavily exudating wounds</td>
</tr>
<tr>
<td>FORMATS AND SIZES</td>
<td>7308 - 8GM</td>
</tr>
</tbody>
</table>

**APPLICATION DIRECTIONS**

- Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin. 
  - Reduces wound debris and allows for adhesion of dressing or tape.
- If required, apply skin barrier to peri-wound skin. 
  - Will help prevent peri-wound maceration.

**TO APPLY**

- Use the orange cap to snap the white tip off of the applipak’s nozzle. Discard the white tip. 
  - Product is single-patient use only. Discard after use.
- Use on dry wound, when wound starts exudating stop use of the gel 
  - Apply moisture retentive dressing on top of gel to keep area moist.

**TO REMOVE**

- Flush/irrigate wound with normal saline. Or wound cleanser 
  - Intrasite Gel is water soluble, non-adherent and easily removed without harming fragile tissue

---

Northwood

187
<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate. For necrotic wounds, do not leave dressings in place for longer than 2 days.</td>
<td>Reapply gel until eschar softens and drainage begins to come from the wound</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eschar begins to lift in preparation of the wound for sharp or autolytic debridement.</td>
<td>CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>

From Smith and Nephw product information and CLWk
### Exudate Management

**Function:** The products are used to manage moderate to heavy amounts of exudate, they should never be used with a gel.

#### NU-DERM

<table>
<thead>
<tr>
<th><strong>CLASSIFICATION</strong></th>
<th>Calcium Alginate – FOR EXUDATE MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KEY POINTS</strong></td>
<td>Made of - Sterile woven pad of high guluronic acid alginate and carboxymethylcellulose (CMC)</td>
</tr>
<tr>
<td><strong>INDICATIONS</strong></td>
<td>For wounds with moderate to large amounts of exudate</td>
</tr>
<tr>
<td></td>
<td>For the management of localized minor bleeding in superficial wounds</td>
</tr>
<tr>
<td><strong>PRECAUTIONS</strong></td>
<td>Not intended to control heavy bleeding</td>
</tr>
<tr>
<td><strong>CONTRAINdications</strong></td>
<td>Do not use for clients with known sensitivity to alginate.</td>
</tr>
<tr>
<td></td>
<td>Do not use on third degree burns or surgical implantations</td>
</tr>
<tr>
<td><strong>FORMATS AND SIZES</strong></td>
<td>AWD112 -2.5 X 30.5CM</td>
</tr>
<tr>
<td></td>
<td>AWD202- 5 X 5CM</td>
</tr>
<tr>
<td></td>
<td>AWD404 -10 x 10CM</td>
</tr>
</tbody>
</table>

#### APPLICATION DIRECTIONS

<table>
<thead>
<tr>
<th><strong>APPLICATION DIRECTIONS</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanse/irrigate wound with sterile normal saline or approved wound cleanser; dry peri-wound skin.</td>
<td>Reduces wound debris and allows for adhesion of dressing or tape.</td>
</tr>
<tr>
<td>If required, apply skin barrier to peri-wound skin</td>
<td>To protect the peri-wound skin from maceration and to improve the adhesion of the dressing or tape</td>
</tr>
</tbody>
</table>

#### TO APPLY

<table>
<thead>
<tr>
<th><strong>TO APPLY</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose appropriate size of dressing to fill space in wound.</td>
<td>Dressing should remain within the edges of the wound to prevent maceration.</td>
</tr>
<tr>
<td>Dressing may be cut to fit. It can also be folded to add addition layers for extra absorption</td>
<td>Over packing undermining or sinus tracts can lead to tissue necrosis. The tail will facilitate the removal of packing.</td>
</tr>
<tr>
<td>Apply appropriate cover dressing to maintain a moisture-balanced wound environment</td>
<td>The choice of cover dressing is dependent upon the amount of exudate expected</td>
</tr>
<tr>
<td>TO REMOVE</td>
<td>RATIONALE</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Dressing will have turned into a gel pad.</td>
<td>To avoid trauma to the wound bed. If alginate is adhered to wound, choose a different cover dressing to maintain a better moisture balance within the wound.</td>
</tr>
<tr>
<td>Gently remove the pad with forceps or with irrigation (using normal saline)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate. Dressing may be left in wound for up to 7 days.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exudate is managed with no peri-wound skin maceration. Localized minor bleeding is managed.</td>
</tr>
</tbody>
</table>
# Mepilex with and without Border

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Cover Dressing: Foam with Silicone - EXUDATE MANAGEMENT</th>
</tr>
</thead>
</table>
| KEY POINTS     | Highly comfortable foam dressing with silicone adhesive layer for atraumatic dressing removal  
Border dressing is waterproof |
| INDICATIONS    | For wounds with moderate to large amount of exudate  
Skin tears and for wounds with friable wound bed and/or fragile peri-wound skin  
May be used in conjunction with compression therapy |
| PRECAUTIONS    | Bordered dressing should not be cut, caution with use on diabetic foot |
| CONTRAINDICATIONS | Do not use if redness or sensitivity occur  
Do not use Mepilex with oxidizing agents such as hypochlorite solutions or hydrogen peroxide  
Do not use with skin sealants  
Do not use border dressing if resident has adhesive allergies – non border should be used |
| FORMATS AND SIZES | 295200 Mepilex Border 7.5 cm x 7.5 cm  
295800 Mepilex Border 10 cm x 20 cm  
295900 Mepilex Border 10 cm x 30 cm  
295000 Mepilex Border 12.5 cm x 12.5 cm  
295400 Mepilex Border 15 cm x 15 cm  
295600 Mepilex Border 15 cm x 20 cm  
282000 Mepilex Border Sacrum 16 x 20 cm  
282400 Mepilex Border Sacrum 22 cm x 25 cm  
495300 Mepilex Post OP Border 10 x 15 cm  
294300 Mepilex foam 15cmx 15cm  
294400 Mepilex foam 20cm x 20cm  
288100 Mepilex Non Border Heel 13cm x 20cm  
NON BORDER 294300 15 X 15CM  
NON BORDER 294400 -20 X 20CM |

## APPLICATION DIRECTIONS

| Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin. |

## RATIONALE

<p>| Reduces wound debris and allows for adhesion of dressing or tape. |</p>
<table>
<thead>
<tr>
<th><strong>TO APPLY</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose a dressing size that will ensure that the dressing extends at least 2cm beyond wound edge.</td>
<td>Incorrect sizing will adversely affect the dressing absorption functionality.</td>
</tr>
<tr>
<td>Non-bordered dressing may be cut to but must maintain at least 2cm beyond the wound edge.</td>
<td></td>
</tr>
<tr>
<td>The dressing may be notched to improve application over curves</td>
<td></td>
</tr>
<tr>
<td>Place the dressing directly over the center of the wound ensuring the white side is applied to the wound.</td>
<td>Needs to be in contact with the wound to be most effective</td>
</tr>
<tr>
<td>Apply directly on the wound as a primary dressing or in combination with another wound product as a secondary cover dressing</td>
<td></td>
</tr>
<tr>
<td>For non-bordered dressings tape edges securely</td>
<td>Do not cover with a transparent film as this will decrease the breathability of the dressing and increase the possibility of maceration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>FREQUENCY OF DRESSING CHANGES</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate. Change when exudate on back of dressing extends to within 2cm of the edge of the dressing. Can be left on up to 7 days</td>
<td>The absorbed exudate is clearly visible through the pink backing of the dressing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>EXPECTED OUTCOME</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exudate is managed with no peri-wound skin maceration</td>
<td>CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>
From Molnlycke product information and CLW
Antimicrobial

Function: These are broad spectrum that are to be used to reduce harmful levels of bacteria in a wound. They are to be used on wound at high risk of infection, stalled wounds or colonized wounds.

### INADINE

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Antimicrobial: 10% Povidone Iodine Impregnated Gauze</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY POINTS</td>
<td>Broad spectrum topical antimicrobial dressing effective even against MRSA. A non-adherent viscose sheet impregnated with a polyethylene glycol base containing 10% povidone-iodine; equivalent to 1% available iodine Povidone-iodine may be absorbed into the body through the wound.</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>For shallow wounds that show signs and symptoms (S&amp;S) of local wound infection or at risk of developing a local wound infection</td>
</tr>
<tr>
<td></td>
<td>For maintenance/non-healing shallow wounds</td>
</tr>
<tr>
<td>PRECAUTIONS</td>
<td>If used for a resident who is on Lithium, monitor Lithium blood work on a regular basis</td>
</tr>
<tr>
<td></td>
<td>Should be used with caution in clients with severely impaired renal function or past history of any thyroid disorder as they are more susceptible to alterations in thyroid metabolism</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>Do not use on clients with known iodine sensitivity or allergy</td>
</tr>
<tr>
<td></td>
<td>Do not use before or after the use of radio-iodine therapy (until permanent healing)</td>
</tr>
<tr>
<td></td>
<td>Do not use on pregnant or breast feeding women</td>
</tr>
<tr>
<td></td>
<td>Do not use in cases of Duhring’s herpetiform dermatitis (a rare skin disease)</td>
</tr>
<tr>
<td>FORMATS AND SIZES</td>
<td>P01481 5 X 5CM</td>
</tr>
</tbody>
</table>

### APPLICATION DIRECTIONS

<table>
<thead>
<tr>
<th>Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin.</th>
<th>Reduces wound debris and allows for adhesion of dressing or tape.</th>
</tr>
</thead>
<tbody>
<tr>
<td>If required, apply skin barrier to peri-wound skin.</td>
<td>To protect the peri-wound skin from maceration and to improve the adhesion of the dressing or tape.</td>
</tr>
<tr>
<td>TO APPLY</td>
<td>RATIONALE</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Inadine may be cut to wound size. Remove backing paper from both sides of product. Apply Inadine directly to the wound bed.</td>
<td>Do not apply Inadine to the wound with backing paper still attached.</td>
</tr>
<tr>
<td>Apply appropriate cover dressing to maintain a moisture-balanced wound environment.</td>
<td>The choice of cover dressing is depended upon the amount of exudate expected.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TO REMOVE</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove cover dressing, then carefully remove Inadine from wound bed. If there is difficulty removing the dressing then gently stretch the dressing at diagonally opposite corners.</td>
<td>To avoid trauma to the wound bed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate. Dressing can be used up to 7 days, often last only 3 days so the dressing will need to be checked.</td>
<td>Newly applied Should be changed</td>
</tr>
<tr>
<td>Fading of colour in the product indicates the loss of antimicrobial efficacy and indicates when the Inadine dressing should be changed.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs and symptoms of local wound infection are resolved within 2 weeks.</td>
<td>CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>

---

from Acelity product information and CLWK

Northwood
Exudate Management Antimicrobial

Function: These are broad spectrum that are to be used to reduce harmful levels of bacteria in a wound. They are to be used on wound at high risk of infection, stalled wound or colonized wounds, and manage moderate to highly exudating wounds

### SILVERCEL

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Antimicrobial: Silver Alginate – EXUDATE MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY POINTS</td>
<td>This product is a combination of silver, alginate and carboxymethyl cellulose sandwiched between non-adherent film layers to help prevent sticking to wounds or shedding fibres</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>Broad spectrum topical antimicrobial dressing Wounds with moderate to large amounts of exudate that show signs and symptoms (S&amp;S) of local wound infection</td>
</tr>
<tr>
<td>PRECAUTIONS</td>
<td>Avoid putting electrodes or conductive gels in contact with silver products</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>Do not use for clients with known sensitivity or allergy to silver, alginates or ethylene methylacrylate (EMA) Do not use in conjunction with surgical implantations Do not use pregnant or lactating women due to absence of specific information Do not use silver products in combination with oil-based products such as petroleum or paraffin Do not use silver products when client is undergoing MRI examination or during radiation therapy (dressing can be replaced after MRI or radiation treatment is completed)</td>
</tr>
<tr>
<td>FORMATS AND SIZES</td>
<td>CAD230Silvercel Adherent Alginate Rope 2.5 cm x 30.5 cm CAD020Silvercel Adherent Alginate 10 cm x 20 cm CAD011Silvercel Adherent Alginate 11 cm x 11 cm</td>
</tr>
</tbody>
</table>

### APPLICATION DIRECTIONS

<table>
<thead>
<tr>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin.</td>
</tr>
<tr>
<td>If required, apply skin barrier to peri-wound skin.</td>
</tr>
<tr>
<td>TO APPLY</td>
</tr>
<tr>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Apply dry. Cut the sheet dressing to the size of the wound; lightly layer to fill a cavity space.</td>
</tr>
<tr>
<td>For packing: lightly pack one piece (where possible) of ribbon into cavity, undermining or sinus tract. Leave a tail of the ribbon (2.5 cm) so that it can easily be seen and removed.</td>
</tr>
<tr>
<td>Apply appropriate cover dressing to maintain a moisture-balanced wound environment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TO REMOVE</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gently remove the dressing with forceps or flush with normal saline if needed</td>
<td>If the dressing adheres to the wound bed, reassess whether there is enough exudate to warrant continued use this dressing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate.</td>
<td>Silvercel remains effective up to 7 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs and symptoms of local wound infection are resolved within 2 weeks.</td>
<td>CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>

From Acelity product information and CLWK
Cover Dressing

Function: These products are not used for moist wound healing.

<table>
<thead>
<tr>
<th><strong>MESORB</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASSIFICATION</strong></td>
<td>Cover Dressing: Composite</td>
</tr>
</tbody>
</table>
| **KEY POINTS** | Highly absorbent core  
Fluid repellent backing which also covers the sides to prevent side leakage  
Breathable |
| **INDICATIONS** | For moderate to heavily exuding wounds which require frequent dressing changes  
Can be used as a primary dressing or in combination with other wound products as a secondary dressing |
| **PRECAUTIONS** | N/A |
| **CONTRAINDICATIONS** | Do not use on untreated clinically-infected wounds |
| **FORMATS AND SIZES** | 677001 Mesorb 10 cm x 13 cm  
677201 Mesorb 10 cm x 15 cm  
677601 Mesorb 15 cm x 20 cm  
677801 Mesorb 23 cm x 30 cm |

**APPLICATION DIRECTIONS** | **RATIONALE**
--- | ---
Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin. | Reduces wound debris and allows for adhesion of dressing or tape. |
If required, apply skin barrier to peri-wound skin. | Will help prevent peri-wound maceration. |

**TO APPLY** | **RATIONALE**
--- | ---
Apply Mesorb to the wound with at least 2-4 cm overlap on the peri-wound skin. Do not cut the dressing. | Facilitates absorption of exudate at the edges of the wound |
May be used as a primary dressing or in combination with other wound product as a secondary cover dressing. Secure in place with tape or fixation device |
<table>
<thead>
<tr>
<th>TO REMOVE</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gently remove tape from peri-wound skin</td>
<td>To minimize trauma to the peri-wound skin.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exudate is managed with no peri-wound skin maceration</td>
<td>CONTACT CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>

From Molnlycke product information and CLWK
<table>
<thead>
<tr>
<th><strong>CLASSIFICATION</strong></th>
<th><strong>Cover Dressing: Composite – NOT MOIST WOUND HEALING</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KEY POINTS</strong></td>
<td>Low adherent pad keeps wound clean reduces the risk of wound contamination Water proof film</td>
</tr>
<tr>
<td><strong>INDICATIONS</strong></td>
<td>To protect a site from wound contamination Low exudating wounds Surgical incisions</td>
</tr>
<tr>
<td><strong>PRECAUTIONS</strong></td>
<td>Do not use on exudating wounds Do not use under compression. Use carefully over joints so it does not impair the flexibility of joints</td>
</tr>
<tr>
<td><strong>CONTRAINDICATIONS</strong></td>
<td>Residents who are sensitive to acrylic adhesives or individuals with very fragile skin</td>
</tr>
<tr>
<td><strong>FORMATS AND SIZES</strong></td>
<td>670800-Mepore 6 x 7cm 670920 Mepore 9 x 10cm 671000 Mepore 9 x 15cm 670120 Mepore 9 x 20cm 671200 Mepore 9 x 25cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>APPLICATION DIRECTIONS</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin.</td>
<td>Reduces wound debris and allows for adhesion of dressing or tape.</td>
</tr>
<tr>
<td>If required, apply skin barrier to peri-wound skin.</td>
<td>Will help prevent peri-wound maceration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>APPLICATION DIRECTIONS TO APPLY</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply Mesorb to the wound with at least 2-4 cm overlap on the peri-wound skin. Do not cut the dressing. Do not stretch dressing</td>
<td>Facilitates absorption of exudate at the edges of the wound.</td>
</tr>
<tr>
<td>Secure in place with tape or fixation device.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>APPLICATION DIRECTIONS TO REMOVE</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gently remove tape from peri-wound skin.</td>
<td>To minimize trauma to the peri-wound skin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>FREQUENCY OF DRESSING CHANGES</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will depend upon the amount of exudate.</td>
<td></td>
</tr>
<tr>
<td><strong>EXPECTED OUTCOME</strong></td>
<td><strong>RATIONALE</strong></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Exudate is managed with no peri-wound skin maceration</td>
<td>CONTACT CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>

From Molnlycke product information and CLWK
Charcoal Dressing

Function: This product is for malodorous wounds.

### ACTISORB 220

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Odour Management: Activated Charcoal with silver</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KEY POINTS</strong></td>
<td>Dressing contains activated charcoal dressing impregnated with silver which is encased in a nylon sleeve. The activated charcoal traps the bacteria which the silver kills and then absorbs the bacteria’s toxins which decreases the odour.</td>
</tr>
<tr>
<td><strong>INDICATIONS</strong></td>
<td>For malodorous wounds resulting from infection, bacterial contamination and malignancy</td>
</tr>
<tr>
<td><strong>PRECAUTIONS</strong></td>
<td>Ensure the etiology of the odour has been established</td>
</tr>
<tr>
<td><strong>CONTRAINDICATIONS</strong></td>
<td>Do no use on clients with known sensitivity or allergy to silver or charcoal. Do not cut dressing.</td>
</tr>
<tr>
<td><strong>FORMATS AND SIZES</strong></td>
<td>MAS105 10.5 X 10.5CM</td>
</tr>
</tbody>
</table>

### APPLICATION DIRECTIONS

<table>
<thead>
<tr>
<th></th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPLICATION DIRECTIONS</strong></td>
<td></td>
</tr>
<tr>
<td>Cleanse/irrigate wound with sterile normal saline or agency approved wound cleanser; dry peri-wound skin.</td>
<td>Reduces wound debris and allows for adhesion of dressing or tape.</td>
</tr>
<tr>
<td>If required, apply skin barrier to peri-wound skin.</td>
<td>To protect the peri-wound skin from maceration and to improve the adhesion of the dressing or tape.</td>
</tr>
</tbody>
</table>

### TO APPLY

<table>
<thead>
<tr>
<th></th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TO APPLY</strong></td>
<td></td>
</tr>
<tr>
<td>Chose the appropriate size of dressing. Actisorb should cover the entire size of the wound.</td>
<td>If the dressing is too small in comparison to the wound it will not perform optimally.</td>
</tr>
<tr>
<td>Do not cut the Actisorb dressing; edges must be sealed. Apply dry.</td>
<td>If cut, particles of activated charcoal may get into the wound and cause discoloration</td>
</tr>
<tr>
<td>Apply appropriate cover dressing to maintain a moisture-balanced wound environment.</td>
<td>The choice of cover dressing depends upon the amount of exudate expected</td>
</tr>
</tbody>
</table>

### TO REMOVE

<table>
<thead>
<tr>
<th></th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TO REMOVE</strong></td>
<td></td>
</tr>
</tbody>
</table>

Northwood
Gently remove Actisorb with forceps, if dressing adheres to the wound bed, soak with normal saline.
If the dressing is adhering to the wound bed, apply Actisorb over a non-adherent contact layer.

<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change when dressing no longer manages the odour. Actisorb can be left on for up to 7 days, however, for heavily exudating wounds it may need to be changed more frequently.</td>
<td>Actisorb is effective either wet or dry.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound odour is managed.</td>
<td>CONTACT PHYSICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>

From Acelity product information and CLW
**Compression**

Function: To provide low compression.

### CLASSIFICATION

**Compression Therapy: Tubular Circumferential Compression**

### KEY POINTS

- For Compression Therapy
- Vascular studies or ABIs are required prior to application of any compression
- A physician/NP order is required to apply a compression stocking
- Only health care professionals who have successfully completed additional education for compression therapy may apply compression wraps
- Latex based multi-purpose tubular stocking providing 10-15mmHg of compression
- Use a double layer of stocking unless directed differently by Wound Clinician/Physician/NP
- Single patient use only; product can be reused/washed for up to 6 months

### INDICATIONS

- May be used for support of sprains, strains, soft tissue injury, post-burn scarring (specific instruction for these uses are not included in this guide)
- For clients who require mild compression therapy for the treatment of:
  - Venous insufficiency with or without ulcer(s) or
  - Arterial/venous insufficiency with or without ulcer(s) or
  - Lymphedema with or without ulcers(s) or Generalized edema

### PRECAUTIONS

- Product contains latex
- Very thin legs and boney prominences are susceptible to excessive pressure and tissue damage
- Do not leave stocking pulled down or slouched around ankle as this can produces a tourniquet effect

### CONTRAINDICATIONS

- Do not use for clients with allergies to latex
- Do not use in the presence of uncontrolled heart failure
- Do not use in the presence of an uncontrolled lower limb skin or wound infection
### FORMATS AND SIZES

<table>
<thead>
<tr>
<th>Stocking size</th>
<th>Calf size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size B</td>
<td>13 – 16 cm</td>
</tr>
<tr>
<td>Size C</td>
<td>16 – 20 cm</td>
</tr>
<tr>
<td>Size D</td>
<td>20 – 24 cm</td>
</tr>
<tr>
<td>Size E</td>
<td>24 – 28 cm</td>
</tr>
<tr>
<td>Size F</td>
<td>28 – 36 cm</td>
</tr>
<tr>
<td>Size G</td>
<td>36 – 46 cm</td>
</tr>
<tr>
<td>Size J</td>
<td>46 – 110 cm</td>
</tr>
</tbody>
</table>

### APPLICATION DIRECTIONS

**Prior to the client mobilizing and with the client supine, measure the widest part of the calf. Select the size of bandage based on the calf measurement and as per manufacturer’s recommendation.**

This gives a base-line measurement of the edema, as well as what size of tubular support bandage to use.

**To determine the length of stocking needed:**

- measure from the base of the toes to 1-2 cm below the knee following the contours of the leg double this measurement (as per order/direction) add 2-3cm for the overlap

**Apply/re-apply stocking in the early morning, if possible. Wash or shower leg(s) with warm water. Moisturize intact skin**

**Allow moisturizer to absorb and dry before wrapping. Measure the ankle circumference 10 cm from the bottom of the heel; measure the calf circumference 30 cm from the bottom of the heel**

Edema should be minimal in the morning

To remove dead skin and resolve/prevent dry skin.

This measurement gives a base-line assessment/re-assessment of the client’s edema.

**Apply an appropriate cover dressing if wound present**
<table>
<thead>
<tr>
<th>TO APPLY</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply the stocking starting from the base of the toes and pull up towards the knee; stopping 4cm below the knee.</td>
<td>Compression begins from the toes, through the calf to below the knees.</td>
</tr>
<tr>
<td>Double the stocking back over limb ensuring that the toes are exposed and that the second layer of stocking is 2-3cm higher up the limb than the first layer.</td>
<td>Doubling the stocking will provide 10-15 mmHg of pressure.</td>
</tr>
<tr>
<td>Ensure the top layer is at least two finger widths below the back of the knee. Smooth stocking to ensure no wrinkles of creases are present.</td>
<td>Finishing the bandage 2-3 cm below the knee will prevent a tourniquet effect from occurring.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TO REMOVE</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The stocking should be removed at night when the client is supine. Remove the stocking by pulling over the foot like a pair of socks. Do not leave stocking pulled down or slouched around ankles.</td>
<td>Stocking left pulled down or slouched around ankles may cause a tourniquet effect.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FREQUENCY OF DRESSING CHANGES</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change the stocking if it is soiled, lost its shape or is slipping.</td>
<td>Reassess the wound’s cover dressing if wound exudate seeps through to stocking.</td>
</tr>
<tr>
<td>Reduction of edema will result in the stocking slipping. Re-measure the calf and select another size of stocking.</td>
<td>Washing will help to reset the elasticity of the stocking. Replace stocking when it has lost its elasticity.</td>
</tr>
<tr>
<td>The stocking can be hand washed in cold water and hung to dry. Client may need two sets of stockings to allow the alternate stocking to dry after washing.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPECTED OUTCOME</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurable improvement in the ankle and calf measurements within 1 week.</td>
<td>CONTACT WOUND CLINICIAN IF NOT HEALING</td>
</tr>
</tbody>
</table>
## Sizing Guide

<table>
<thead>
<tr>
<th>Size</th>
<th>Low pressure circumference</th>
<th>Medium pressure circumference</th>
<th>High pressure circumference</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
<td>10-12.5 cm/3.9-4.9 in</td>
<td>12.5-15 cm/4.9-5.9 in</td>
</tr>
<tr>
<td>B</td>
<td>10-12.5 cm/3.9-4.9 in</td>
<td>12.5-15 cm/4.9-5.9 in</td>
<td>15-24.5 cm/5.9-9.6 in</td>
</tr>
<tr>
<td>C</td>
<td>13.5-15 cm/5.3-5.9 in</td>
<td>15-24.5 cm/5.9-9.6 in</td>
<td>24.5-35.5 cm/9.6-14 in</td>
</tr>
<tr>
<td>D</td>
<td>15-24.5 cm/5.9-9.6 in</td>
<td>24.5-35.5 cm/9.6-14 in</td>
<td>35.5-45 cm/14-17.7 in</td>
</tr>
<tr>
<td>E</td>
<td>24.5-35.5 cm/9.6-14 in</td>
<td>35.5-45 cm/14-17.7 in</td>
<td>45-50.4 cm/17.7-19.8 in</td>
</tr>
<tr>
<td>F</td>
<td>35.5-45 cm/14-17.7 in</td>
<td>45-50.4 cm/17.7-19.8 in</td>
<td>50.4-60.7 cm/19.8-23.9 in</td>
</tr>
<tr>
<td>G</td>
<td>45-50.4 cm/17.7-19.8 in</td>
<td>50.4-60.7 cm/19.8-23.9 in</td>
<td>60.7-70.3 cm/23.9-27.7 in</td>
</tr>
<tr>
<td>J</td>
<td>60.7-70.3 cm/23.9-27.7 in</td>
<td>70.3-75.5 cm/27.7-29.7 in</td>
<td>-</td>
</tr>
<tr>
<td>K</td>
<td>70.3-75.5 cm/27.7-29.7 in</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Low pressure = 5-10 mmHg  Medium pressure = 10-20 mmHg  High pressure = 20-30 mmHg
Skin Changes at End of Life (SCALE)
Skin Changes at End of Life

What it is:

- Skin is the largest organ of the body and like all organs can start to breakdown at the end of life due to physiological changes that occur during the dying process:
  - Changes causing decreased blood flow and oxygenation can occur at the tissue, cellular or molecular level which cause reduced availability of oxygen and the body’s ability to utilize vital nutrients and other factors required to sustain normal skin function.
- Skin changes at life’s end are a reflection of compromised skin: reduced soft tissue perfusion, decreased tolerance to external insults, and impaired removal of metabolic wastes, and can occur despite optimal care being provided.
- Can occur days or weeks prior to end of life.

Risk factors signs and symptoms associated with SCALE

- Weakness and progressive limitation of mobility.
- Suboptimal nutrition including loss of appetite, weight loss, wasting, low serum albumin/pre-albumin, and low hemoglobin as well as dehydration.
- Diminished tissue perfusion, impaired skin oxygenation, decreased local skin temperature, mottled discoloration, and skin necrosis.
- Loss of skin integrity from any of a number of factors including equipment or devices, incontinence, chemical irritants, chronic exposure to body fluids, skin tears, pressure, shear, friction, and infections.
- Impaired immune function.

Interventions:

- Total skin assessment to be completed regularly, close monitoring over bony–prominences.
- Consultation with a qualified health care professional is recommended for any skin changes associated with increased pain, signs of infection, skin breakdown.
- Plan of care should reflect patient centered concerns and preferences (pain, ADLs).
- Care plan should include interventions for prevention of worsening skin breakdown, patient preferences and providing comfort and care.
Abstract

An expert panel was established to formulate a consensus statement on Skin Changes At Life’s End (SCALE). The panel consists of 18 internationally recognized key opinion leaders including clinicians, caregivers, medical researchers, legal experts, academicians, a medical writer and leaders of professional organizations. The inaugural forum was held on April 4-6, 2008 in Chicago, IL, and was made possible by an unrestricted educational grant from Gaymar Industries, Inc. The panel discussed the nature of SCALE, including the proposed concepts of the Kennedy Terminal Ulcer (KTU) and skin failure along with other end of life skin changes. The final consensus document and statements were edited and reviewed by the panel after the meeting. The document and statements were initially externally reviewed by 49 international distinguished reviewers. A modified Delphi process was used to determine the final statements and 51 international distinguished reviewers reached consensus on the final statements.

The skin is the body’s largest organ and like any other organ is subject to a loss of integrity. It has an increased risk for injury due to both internal and external insults. The panel concluded that: our current comprehension of skin changes that can occur at life’s end is limited; that SCALE process is insidious and difficult to prospectively determine; additional research and expert consensus is necessary; and contrary to popular myth, not all pressure ulcers are avoidable.

Specific areas requiring research and consensus include: 1) the identification of critical etiological and pathophysiological factors involved in SCALE, 2) clinical and diagnostic criteria for describing conditions identified with SCALE, and 3) recommendations for evidence-informed pathways of care.

The statements from this consensus document are designed to facilitate the implementation of knowledge-transfer-into-practice techniques for quality patient outcomes. This implementation process should include interprofessional teams (clinicians, lay people and policy makers) concerned with the care of individuals at life’s end to adequately address the medical, social, legal, and financial ramifications of SCALE.

The content of this document is based on the results of a two-day round table discussion held on April 4-6, 2008 in Chicago, IL, and was made possible by an unrestricted educational grant from Gaymar Industries, Inc. Additional input was received from an international panels of 49 and 51 distinguished reviewers using a modified Delphi Method process. The information contained herein does not necessarily represent the opinions of all panel members, distinguished reviewers, or Gaymar Industries, Inc.

Disclaimer: The content of this document is intended for general information purposes and is not intended to be a substitute for medical or legal advice. Do not rely on information in this article in place of medical or legal advice.

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SCALE Expert Panel Members

Co-Chairpersons
R. Gary Sibbald, BSc, MD, FRCPC (Med, Derm), MACP, FAAD, MEd, FAPWCA University of Toronto, Toronto, Canada, gary.sibbald@utoronto.ca

Diane L. Krasner, PhD, RN, CWCN, CWS, BCLNC, FAAN, Wound & Skin Care Consultant, York, PA, USA, dlkrasner@aol.com **Corresponding Author: 212 East Market Street, York, PA 17403 USA**

Medical Writer
James Lutz, MS, CCRA, Lutz Consulting, LLC, Medical Writing Services, Buellton, CA, USA, jlutzmail@aol.com

Panel Facilitator
Cynthia Sylvia, MSc, MA, RN, CWOCN, Gaymar Industries, Inc., Orchard Park, NY, USA, csylvia@gaymar.com

Additional Panel Members
Oscar Alvarez, PhD, CCT, FAPWCA, Center for Curative and Palliative Wound Care, Calvary Hospital, Bronx, NY, USA, oalvarez@calvaryhospital.org

Elizabeth A. Ayello, PhD, RN, ACNS-BC, ETN, FAPWCA, FAAN, Excelsior College School of Nursing, USA, elizabeth@ayello.com

Sharon Baranoski, MSN, RN, CWOCN, APN, DAPWCA, FAAN, Wound Care Dynamics, Inc., Shorewood, IL, USA, nrsebear@aol.com

William J. Ennis, DO, MBA, FACOS, University of Illinois, Palos Heights, IL, USA, w.ennis@comcast.net

Nancy Ann Faller, RN, MSN, PhD, ETN, CS, Carlisle, PA, USA, nafaller@aol.com

Jane Hall, Medical Malpractice Defense Attorney, Huie, Fernambucq & Stewart, LLP, Birmingham, AL, USA, jgh@hfsllp.com

Rick E. Hall, BA, RN, CWCN, Helping Hands Wound Care, Wichita, KS, USA, mnurse66@yahoo.com

Karen Lou Kennedy-Evans, RN, CS, FNP, KL Kennedy, LLC, Tucson, AZ, USA, ktulcer@aol.com

Diane Langemo, PhD, RN, FAAN, Langemo & Assoc, Grand Forks, ND, USA, dianelangemo@aol.com

Joy Schank, RN, MSN, ANP, CWOCN, Schank Companies, Himrod, NY, USA, joyschank@yahoo.com

Thomas P. Stewart, PhD, Gaymar Industries, Inc., Orchard Park, NY & S.U.N.Y. at Buffalo, USA, tstewart@gaymar.com

Nancy A. Stotts, RN, CNS, EdD, FAAN, University of California, San Francisco, San Francisco, CA, USA, nancy.stotts@nursing.ucsf.edu

David R. Thomas, MD, FACP, AGSF, GSAF, CMD, St. Louis University, St. Louis, MO, USA, thomasdr@slu.edu

Dot Weir, RN, CWON, CWS, Osceola Regional Medical Center, Kissimmee, FL, USA, dorothy.weir@hcahealthcare.com
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Background for Skin Changes At Life’s End (SCALE)

Organ dysfunction is a familiar concept in the health sciences, and can occur at any time but most often occurs at life’s end, during an acute critical illness or with severe trauma. Body organs particularly the heart and kidneys undergo progressive limitation of function as a normal process related to aging and the end of life. End of life is defined as a phase of life when a person is living with an illness that will often worsen and eventually cause death. This time period is not limited to the short period of time when the person is moribund.\(^1\) It is well accepted that during the end stages of life, any of a number of vital body systems (e.g. the renal, hepatic, cardiac, pulmonary, or nervous systems) can be compromised to varying degrees and will eventually totally cease functioning. The process of organ compromise can have devastating effects, resulting in injury or interference with functioning of other organ systems that may contribute to further deterioration and eventual death.

We propose that the skin, the largest organ of the body, is no different, and also can become dysfunctional with varying degrees of resultant compromise. The skin is essentially a window into the health of the body, and if read correctly, can provide a great deal of insight into what is happening inside the body. Skin compromise, including changes related to decreased cutaneous perfusion and localized hypoxia (blood supply and local tissue factors) can occur at the tissue, cellular, or molecular level. The end result is a reduced availability of oxygen and the body’s ability to utilize vital nutrients and other factors required to sustain normal skin function. When this compromised state occurs, the manifestations are termed, Skin Changes At Life’s End (SCALE). It should be noted that the acronym SCALE is a mnemonic used to describe a group of clinical phenomena, and should not be confused with a risk assessment tool. The term applies to all individuals across the continuum of care settings.

Skin organ compromise at life’s end is not a new concept in the literature. The first clinical description in modern medical literature appeared in 1989 with the Kennedy Terminal Ulcer (KTU).\(^2\) Kennedy described the KTU as a specific subgroup of pressure ulcers that some individuals develop as they are dying. They are usually shaped like a pear, butterfly, or horseshoe, and are located predominantly on the coccyx or sacrum (but have been reported in other anatomical areas). The ulcers are a variety of colors including red, yellow or black, are sudden in onset, typically deteriorate rapidly, and usually indicate that death is imminent.\(^2\) This initial report was based on retrospective chart reviews of individuals with pressure ulcers. It sparked further inquiry into how long these individuals within the facility lived after occurrence of a pressure ulcer. Just over half (55.7%) died within six weeks of discovery of their pressure ulcer(s). The observations were further supported by Hanson and colleagues (1991), who reported that 62.5% of pressure ulcers in hospice patients occurred in the 2 weeks prior to death.\(^3\) Further evidence for the existence of the KTU is mostly observational in nature, but is consistent with the premise that skin function can become compromised at life’s end.

It is noteworthy that while Kennedy independently described the KTU in 1989, a similar condition was actually first described much earlier in the French medical literature by Jean-Martin Charcot (1825-1893).\(^4, 5\) In a medical textbook written in 1877, Charcot described a specific type of ulcer that is butterfly in shape and occurring over the sacrum. Patients that developed these ulcers usually died shortly thereafter, hence he termed the ulcer Decubitus Ominosus. However, Charcot attributed the ulcers to being neuropathic rather than pressure in origin. Charcot’s writings of Decubitus Ominosus...
were all but forgotten in the medical literature until recently with renewed interest in skin organ compromise.\textsuperscript{4} The fact that two experts in the field of chronic wounds independently reported the same clinical phenomenon, with very similar descriptions, 112 years apart, lends credence to the possible existence of terminal pressure ulcers as a result of end-of-life skin organ compromise.

Also of historical interest is the original work of Dr. Alois Alzheimer in Germany. He was on call in 1901 when a 51 year old woman, Frau August D, was admitted to his asylum for the insane in Frankfort. Dr. Alzheimer followed this patient, studied her symptoms and presented her case to his colleagues as what came to be known as Alzheimer’s Disease. When Frau Auguste D. died on April 8, 1906, her medical record listed the cause of death as “septicemia due to decubitus.”\textsuperscript{6} Alzheimer noted, “at the end, she was confined to bed in a fetal position, was incontinent and in spite of all the care and attention given to her, she suffered from decubitus.” So, here we have the first identified patient with Alzheimer’s Disease having developed immobility and two pressure ulcers with end stage Alzheimer’s. In our modern times, end stage Alzheimer’s Disease has become an all-too-frequent scenario with multiple complications including SCALE.

In 2003, Langemo proposed a working definition of skin failure; that it is a result of hypoperfusion, creating an extreme inflammatory reaction concomitant with severe dysfunction or failure of multiple organ systems.\textsuperscript{7} Three years later, Langemo and Brown (2006) conducted a comprehensive review of the literature on the concept of skin failure that focused largely on pressure ulcer development.\textsuperscript{8} They presented a discussion of changes in the skin that can occur with aging, the development of pressure ulcers, multiorgan failure, and “skin failure” (both acute and chronic as well as end of life).\textsuperscript{9,15} In the early 1990’s two publications by Parish & Witkowski had presented logical arguments about the mechanism of pressure ulcer occurrence at the end of life, suggesting that they may not be preventable in those individuals with multiple organ failure.\textsuperscript{11,16} Although the term skin failure has been introduced, it is not currently a widely accepted term in the dermatological or the wound literature.

Despite the limited scientific literature, there is consensus from the narrative literature that some pressure ulcers may be unavoidable including those that are manifestations of SCALE. We propose that at the end of life, failure of the homeostatic mechanisms that support the skin can occur, resulting in a diminished reserve to handle insults such as minimal pressure. Therefore, contrary to popular myth, not all pressure ulcers are avoidable.\textsuperscript{17,18} Many members of the SCALE Panel acknowledge the need for systematic study of the phenomenon.

Goals and Objectives of the SCALE Panel

The overall goal of the SCALE Expert Panel was to initiate stakeholder discussion of skin changes at the end of life, a phenomenon that we have termed SCALE. An objective was to examine the concept of unavoidable pressure ulcers that can occur as a result of SCALE. While reaching consensus on the various aspects of this topic is an important outcome, this endeavor will require a more rigorous scientific investigative approach that was beyond the scope of this ground breaking meeting. The purpose of this initial meeting was to generate a series of statements that will serve as a platform for future consensus discussions. The objective of this document is to present these panel statements, disseminate them for public discussion, and to further the development of the body of scientific knowledge on this important topic.

Methodology

A modified three phase Delphi Method approach was used to reach consensus on the 10 statements reported in this document. The Delphi Method relies on expert panel input to reach consensus on a topic of interest.\textsuperscript{19} Our approach consisted of three separate phases of consensus building involving an international group of 69 noted experts in the field.
of wound care.

**Phase 1:** A panel of 18 experts in the field of wound care with expertise in wound and skin care convened in a round table format on April 4-6, 2008 in Chicago, IL, USA. Audio proceedings and written notes from this round table discussion were used to generate a Preliminary Consensus Document (PCD). This PCD was returned to the original panel for review and was modified as necessary to reach panel consensus.

**Phase 2:** The PCD was presented and distributed at numerous international conferences seeking public comment from September 2008 through June 2009. The document was published, and also available for public download from the web site of the panel sponsor (Gaymar Industries, Inc.). The PCD was further reviewed by a selected international panel of 49 Distinguished Reviewers with noted expertise in wound care and palliative medicine.

**Phase 3:** Written input received from the panel of Distinguished Reviewers and from the various public presentations was used to generate A Final Consensus Document (FCD). This FCD was then returned to the original 18-member Expert Panel and a 52-member Distinguished Reviewer Panel for voting on each of the 10 statements for consensus. A quorum of 80% that strongly agree or somewhat agree with each statement was used as a pre-determined threshold for having achieved consensus on each of the statements. Fifty two individuals voted on the final consensus process.

In addition to the PCD and FCD documents, an annotated bibliography of literature pertinent to SCALE was generated and is available for download from the web site of the panel sponsor (Gaymar Industries, Inc.).

**Panel Statements**

As a result of the two-day panel discussion and subsequent panel revisions, and with input from 69 noted wound care experts in a modified Delphi Method approach, the following 10 statements are proposed by the SCALE Expert Panel:

**Statement 1**

Physiologic changes that occur as a result of the dying process (days to weeks) may affect the skin and soft tissues and may manifest as observable (objective) changes in skin color, turgor, or integrity, or as subjective symptoms such as localized pain. These changes can be unavoidable and may occur with the application of appropriate interventions that meet or exceed the standard of care.

When the dying process compromises the homeostatic mechanisms of the body, a number of vital organs may become compromised. The body may react by shunting blood away from the skin to these vital organs, resulting in decreased skin and soft tissue perfusion and a reduction of the normal cutaneous metabolic processes. Minor insults can lead to major complications such as skin hemorrhage, gangrene, infection, skin tears and pressure ulcers that may be markers of SCALE. See Statement 6 for further discussion.

**Statement 2**

The plan of care and patient response should be clearly documented and reflected in the entire medical record. Charting by exception is an appropriate method of documentation.

The record should document the patient’s clinical condition including co-morbidities, pressure ulcer risk factors, significant changes, and clinical interventions that are consistent with the patient’s wishes and recognized guidelines for care. Facility policies and guidelines for record keeping should be followed and facilities should update these policies and guidelines as appropriate. The impact of the interventions should be assessed and revised as appropriate. This documentation may take many forms. Specific approaches to documentation of care should be consistent with professional, legal, and regulatory guidelines, and may involve narrative documentation, the use of flow sheets, or other documentation systems/tools.
If a patient is to be treated as palliative, it should be stated in the medical record, ideally with a reference to a family/caregiver meeting, and that consensus was reached. If specific palliative scales such as the Palliative Performance Scale, or other palliative tools were utilized, they should be included in the medical record. Palliative care must be patient-centered, with skin and wound care being only a part of the total plan of care.

It is not reasonable to expect that the medical record will be an all-inclusive account of the individual’s care. Charting by exception is an appropriate method of documentation. This form of documentation should allow the recording of unusual findings and pertinent patient risk factors. Some methods of clinical documentation are antiquated in light of today’s complexity of patient care and rapidly changing interprofessional healthcare environment; many current documentation systems need to be revised and streamlined.

Statement 3

Patient centered concerns should be addressed including pain and activities of daily living.

A comprehensive, individualized plan of care should not only address the patient’s skin changes and co-morbidities, but any patient concerns that impact quality of life including psychological and emotional issues. Research suggests that for wound patients, health-related quality of life is especially impacted by pain, change in body image, odors and mobility issues. It is not uncommon for these factors to have an effect on aspects of daily living, nutrition, mobility, psychological factors, sleep patterns and socialization. Addressing these patient-centered concerns optimizes activities of daily living and enhance a patient’s dignity.

Statement 4

Skin changes at life’s end are a reflection of compromised skin (reduced soft tissue perfusion, decreased tolerance to external insults, and impaired removal of metabolic wastes).

When a patient experiences SCALE, tolerance to external insults (such as pressure) decreases to such an extent that it may become clinically and logistically impossible to prevent skin breakdown and the possible invasion of the skin by microorganisms. Compromised immune response may also play an important role, especially with advanced cancer patients and with the administration of corticosteroids and other immunosuppressant agents.

Skin changes may develop at life’s end despite optimal care, as it may be impossible to protect the skin from environmental insults in its compromised state. These changes are often related to other cofactors including aging, co-existing diseases and drug adverse events. SCALE, by definition occurs at life’s end, but skin compromise may not be limited to end of life situations; it may also occur with acute or chronic illnesses, and in the context of multiple organ failure that is not limited to the end of life. However, these situations are beyond the scope of this panel’s goals and objectives.
Statement 5

Expectations around the patient’s end of life goals and concerns should be communicated among the members of the interprofessional team and the patient’s circle of care. The discussion should include the potential for SCALE including other skin changes, skin breakdown and pressure ulcers.

It is important that the provider(s) communicate and document goals of care, interventions, and outcomes related to specific interventions (See Statement 2). The patient’s circle of care includes the members of the patient unit including family, significant others, caregivers, and other healthcare professionals that may be external to the current interprofessional team. Communication with the interprofessional team and the patient’s circle of care should be documented. The education plan should include realistic expectations surrounding end of life issues with input from the patient if possible. Communication of what to expect during end of life is important and this should include changes in skin integrity.

Being mindful of local protected health information disclosure regulations (e.g. USA: HIPAA, 1996), the patient’s circle of care needs to be aware that an individual at the end of life may develop skin breakdown, even when care is appropriate. They need to understand that skin function may be compromised to a point where there is diminished reserve to tolerate even minimal pressure or external insult. Educating the patient’s circle of care up front may help reduce the chances of shock and emotional reactions if end of life skin conditions occur.

This education includes information that as one nears end of life, mobility decreases. The individual frequently has a “position of comfort” that the patient may choose to maintain, resulting in a greater potential for skin breakdown. Some patients elect to continue to lie on the pressure ulcer, stating it is the most comfortable position for them. Respecting the coherent patient’s wishes is important.

With the recognition that these skin conditions are sometimes a normal part of the dying process, there is less potential for assigning blame, and a greater understanding that skin organ compromise may be an unavoidable part of the dying process.

The patient’s circle of care includes the members of the patient unit including family, significant others, caregivers, and other healthcare professionals that may be external to the current interprofessional team.

Discussions regarding specific trade-offs in skin care should be documented in the medical record. For example, patients may develop pressure ulcers when they cannot be (or do not want to be) turned due to pain or the existence of other medical conditions. Pressure ulcers may also occur in states of critical hypoperfusion due to underlying physical factors such as severe anemia, hypoxia, hypotension, peripheral arterial disease, or severe malnutrition. Care decisions must be made with the total goals of the patient in mind, and may be dependent on the setting of care, trajectory of the illness, and priorities for the patient and family. Comfort may be the overriding and acceptable goal, even though it may be in conflict with best skin care practice.

In summary, the patient and family should have a greater understanding that skin organ compromise may be an unavoidable part of the dying process.

Statement 6

Risk factors, symptoms and signs associated with SCALE have not been fully elucidated, but may include:

- Weakness and progressive limitation of mobility.
- Suboptimal nutrition including loss of appetite, weight loss, cachexia and wasting, low serum albumin/pre-albumin, and low hemoglobin as well as dehydration.
• **Diminished tissue perfusion, impaired skin oxygenation, decreased local skin temperature, mottled discoloration, and skin necrosis.**

• **Loss of skin integrity from any of a number of factors including equipment or devices, incontinence, chemical irritants, chronic exposure to body fluids, skin tears, pressure, shear, friction, and infections.**

• **Impaired immune function.**

Diminished tissue perfusion is the most significant risk factors for SCALE and generally occurs in areas of the body with end arteries, such as the fingers, toes, ears, and nose. These areas may exhibit early signs of vascular compromise and ultimate collapse, such as dusky erythema, mottled discoloration, local cooling, and eventually infarcts and gangrene.

As the body faces a critical illness or disease state, a normal protective function may be to shunt a larger percentage of cardiac output from the skin to more vital internal organs, thus averting immediate death. Chronic shunting of blood to the vital organs may also occur as a result of limited fluid intake over a long period of time. Most of the skin has collateral vascular supply but distal locations such as the fingers, toes, ears and nose have a single vascular route and are more susceptible to a critical decrease in tissue oxygenation due to vasoconstriction. Furthermore, the ability to tolerate pressure is limited in poorly perfused body areas.

Additional literature reviews and clinical research are needed to more thoroughly comprehend and document all of the potential risk factors associated with SCALE and their clinical manifestations.

**Statement 7**

A total skin assessment should be performed regularly and document all areas of concern consistent with the wishes and condition of the patient. Pay special attention to bony prominences and skin areas with underlying cartilage. Areas of special concern include the sacrum, coccyx, ischial tuberosities, trochanters, scapulae, occiput, heels, digits, nose and ears. Describe the skin or wound abnormality exactly as assessed.

It is important to assess the whole body because there may be signs that relate to skin compromise. Table 1 provides a limited list of dermatologic terms that may be useful when describing areas of concern. Table 2 provides descriptive terms for lesions based on characteristics and size.

**Statement 8**

Consultation with a qualified health care professional is recommended for any skin changes associated with increased pain, signs of infection, skin breakdown (when the goal may be healing), and whenever the patient’s circle of care expresses a significant concern.

There are very definite descriptive terms for skin changes that can be used to facilitate communication between health care professionals (see Statement 7). Until more is known about SCALE, subjective symptoms need to be reported and objective skin changes described. This will allow for identification and characterization of potential end of life skin changes.

An accurate diagnosis can lead to decisions about the area of concern and whether it is related to end of life care and/or other factors. The diagnosis will help determine appropriate treatment and establish realistic outcomes for skin changes. For pressure ulcers, it is important to determine if the ulcer may be (i) healable within an individual’s life expectancy, (ii) maintained, or (iii) non-healable or palliative.17 The treatment plan will depend on an accurate diagnosis, the individual’s life expectancy and wishes, family members’ expectations, institutional policies,

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**For pressure ulcers, it is important to determine if the ulcer may be (i) healable within an individual’s life expectancy, (ii) maintained, or (iii) non-healable or palliative.**
and the availability of an interprofessional team to optimize care.\textsuperscript{31} Remember that patient status can change and appropriate reassessments with determination of likely outcomes may be necessary.

It is important to remember that a maintenance or non-healable wound classification does not necessarily equate with withholding treatment. For example, the patient may benefit with improved quality of life from surgical debridement and/or the use of advanced support surfaces.

Table 1: Useful dermatologic terms for describing areas of concern. Additional terms can be found in the Glossary included at end of this document.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td><strong>Bruise</strong></td>
<td>An injury producing a hematoma or diffuse extravasation of blood without rupture of the skin.\textsuperscript{29} Often presents as a reddish, purple, black discoloration of the skin.</td>
</tr>
<tr>
<td><strong>Crust</strong></td>
<td>A hard outer layer or covering; cutaneous crusts are often formed by dried serum, pus or blood on the surface of a ruptured blister or pustule.\textsuperscript{29}</td>
</tr>
<tr>
<td><strong>Erosion (denudation)</strong></td>
<td>A loss of surface skin with an epidermal base.</td>
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<tr>
<td><strong>Eschar</strong></td>
<td>Thick adherent, necrotic tissue that is typically dry and brown, black or gray in color.</td>
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<tr>
<td><strong>Fissure</strong></td>
<td>A thin linear loss of skin with a dermal or deeper base.</td>
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<tr>
<td><strong>Hematoma</strong></td>
<td>A collection of blood in the soft tissues.</td>
</tr>
<tr>
<td><strong>Lesion</strong></td>
<td>Any change in the skin that may be a normal or abnormal variant including a wound or injury.\textsuperscript{29} It encompasses everything from macular lesions (color changes without elevation or depression of the skin) through total skin breakdown.</td>
</tr>
<tr>
<td><strong>Mottling of skin due to vascular stasis</strong></td>
<td>An area of skin composed of macular lesions of varying shades or colors over the smaller or medium sized blood vessels.\textsuperscript{29}</td>
</tr>
<tr>
<td><strong>Scale</strong></td>
<td>Surface keratin that may be thick or thin, resembling a fish scale, cast off (desquamating) from the skin.\textsuperscript{29}</td>
</tr>
<tr>
<td><strong>Skin Tear</strong></td>
<td>A traumatic wound occurring principally on the extremities of older adults as a result of friction alone or with shearing and frictional forces, that separate the epidermis from the dermis (partial-thickness wound) or which separate both the epidermis and the dermis from the underlying structures (full-thickness wound).\textsuperscript{10}</td>
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<tr>
<td><strong>Slough</strong></td>
<td>Yellow, green, tan, or white putrefied debris often partly separated from the surface of the wound bed.\textsuperscript{29}</td>
</tr>
<tr>
<td><strong>Ulcer</strong></td>
<td>A loss of surface skin with a dermal or deeper base.</td>
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\textbf{Statement 9}

\textit{The probable skin change etiology and goals of care should be determined. Consider the 5 Ps for determining appropriate intervention strategies:}

- \textbf{Prevention}
- \textbf{Prescription (may heal with appropriate treatment)}
- \textbf{Preservation (maintenance without deterioration)}
- \textbf{Palliation (provide comfort and care)}
- \textbf{Preference (patient desires)}

Prevention is important for well being, enhanced quality of life, potential reimbursement, and to avoid unplanned medical consequences for end of life care. The skin becomes fragile when stressed with...
decreased oxygen availability associated with the end of life. The plan of care needs to address excessive pressure, friction, shear, moisture, suboptimal nutrition, and immobilization.

Prescription refers to the interventions for a treatable lesion. Even with the stress of dying, some lesions are healable after appropriate treatment. Interventions must be aimed at treating the cause and at patient centered concerns (pain, quality of life), before addressing the components of local wound care as consistent with the patient’s goals and wishes.

Preservation refers to situations where the opportunity for wound healing or improvement is limited, so maintenance of the wound in its present clinical state is the desired outcome. A maintenance wound may have the potential to heal, but there may be other overriding medical factors that could direct the interprofessional team to maintain the status quo. For example there may be limited access to care, or the patient may simply refuse treatment.

Palliation refers to those situations in which the goal of treatment is comfort and care, not healing. A palliative or non-healable wound may deteriorate due to a general decline in the health of the patient as part of the dying process, or due to hypoperfusion associated with non-correctable critical ischemia. In some situations, palliative wounds may also benefit from some treatment interventions such as surgical debridement or support surfaces, even when the goal is not to heal the wound.

Preference includes taking into account the preferences of the patient and the patient’s circle of care.

The 5P enabler can be used in combination with the SOAPIE mnemonic to help explain the process of translating this recommendation into practice (Figure 1). Realistic outcomes can be derived from appropriate SOAPIE processes with the 5 skin Ps becoming the guide to the realistic outcomes for each individual.

**S = Subjective skin & wound assessment:** The person at the end of life needs to be assessed by history, including an assessment of the risk for developing a skin change or pressure ulcer (Braden Scale or other valid and reliable risk assessment scale).36

**O = Objective observation of skin & wound:** A physical exam should identify and document skin changes that may be associated with the end of life or other etiologies including any existing pressure ulcers.

**A = Assess and document etiology:** An assessment should then be made of the general condition of the patient and a care plan.

**P = Plan of care:** A care plan should be developed that includes a decision on skin care considering the 5P’s as outlined in the Figure 1. This plan of care should also consider input and wishes from the patient and the patient’s circle of care.

**I = Implement appropriate plan of care:** For successful implementation, the plan of care must be matched with the healthcare system resources (availability of equipment and personnel) along with appropriate education and feedback from the patient’s circle of care and as consistent with the patient’s goals and wishes.

**E = Evaluate and educate all stakeholders:** The interprofessional team also needs to facilitate appropriate education, management, and periodic reevaluation of the care plan as the patient’s health status changes.

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**Table 2: Dermatological descriptions of lesions based on characteristics and size.**

<table>
<thead>
<tr>
<th>Lesion Characteristics</th>
<th>Lesion Size</th>
<th>&quot;&lt;1 cm&quot;</th>
<th>&quot;&gt;1 cm&quot;</th>
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<tr>
<td>Flat</td>
<td>Macule</td>
<td>Patch</td>
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<tr>
<td>Elevated</td>
<td>Papule</td>
<td>Plaque</td>
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<tr>
<td>Blister</td>
<td>Vesicle</td>
<td>Bulla</td>
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**Statement 10**

*Patients and concerned individuals should be educated regarding SCALE and the plan of care.*

Education needs to be directed not only to the patient but also the patient’s circle of care. Within the confines allowed by local protected health information regulations (e.g. HIPAA, 1996, USA), the patient’s circle of care needs to be included in decision making processes regarding goals of care and the communication of the meaning and method of accomplishing those decisions. Collaboration and communication should be ongoing with designated representatives from the patient’s circle of care and the clinical team connecting at regular intervals. Documentation of decision making, educational efforts, and the patient’s circle of care perspective is recommended. If adherence to the plan of care cannot be achieved, this should be documented in the medical record (including the reasons), and alternative plans proposed if available and feasible.

Education also extends beyond the patient’s circle of care, to other involved healthcare professionals, healthcare administrators, policy makers, and to the payers. Healthcare professionals need to facilitate communication and collaboration across care settings and disciplines; organizations need to prepare staff to identify and manage SCALE. Ongoing discussions with key stakeholders will additionally provide a stimulus for additional evidence based research and education regarding all aspects of SCALE.

**Healthcare professionals need to facilitate communication and collaboration across care settings and disciplines; organizations need to prepare staff to identify and manage SCALE.**
Recommendations for Future Research

Conduct and disseminate through publications and presentations:

- A thorough review of the literature concerning all aspects of SCALE.
- Research to identify the mechanisms for the proposed decreased hypoperfusion and oxygenation of the skin and soft tissues involved with SCALE and resulting outcomes.
- Research to determine the mechanisms for the proposed, tissue, cellular, and molecular dysfunctions that occur during SCALE.
- Research that helps to clarify and distinguish skin and soft tissue damage associated with SCALE from pressure ulcers and other skin disorders not associated with skin organ compromise or the end of life.
- Research into predictive tools for the onset and measurement of SCALE and the timing of life’s end (possibly adaptive use of the Palliative Performance Scale (http://palliative.info/resource_material/PPSv2.pdf)
- Qualitative research to explore the impact of SCALE on the patient, the patient’s circle of care, and professional caregivers with regard to healthcare-related quality of life.
- Development of a database of patients (with histories) suspected of exhibiting SCALE to analyze them retrospectively for skin and soft tissue changes and risk factors that occurred just prior to death. Isolate the skin changes and risk factors involved and determine how important each individual variable is to the occurrence of SCALE.
- Research cataloging patients who do not exhibit SCALE to identify factors that may help prevent the occurrence of SCALE.
- Develop a registry of Kennedy Terminal Ulcers to better categorize this phenomenon, including location, clinical description, patient and ulcer outcomes, and the presence of other end of life skin changes including lesions in other locations.
- Both prospective and retrospective prevalence research of individuals suspected of exhibiting SCALE, particularly among hospice patients.
- Research on specific medical and physiologic conditions that may contribute to SCALE. These include but may not be limited to malignancy, hypotension and hemodynamic instability, administration of potent vasoconstrictors, peripheral arterial and vascular disease, hypoxia, malnutrition, and severe anemia.

Conclusions

SCALE Panel members are in agreement that there are observable changes in the skin at the end of life. Our current understanding of this complex phenomenon is limited and the panel concludes that additional research is necessary to assess the etiology of SCALE, to clinically describe and diagnose the related skin changes, and to recommend appropriate pathways of care. The panel recommends that clinicians, laypeople, and policy makers need to be better educated in the medical, social, legal and financial ramifications of SCALE.

Health care organizations need to ensure the provision of resources that enable health care professionals to identify and care for SCALE while maintaining the dignity of the patient, family and circle of care to the end of life.
Glossary of Terms

**Arterial Ulcer:** An ulcer that occurs almost exclusively in the distal lower extremity due to inadequate perfusion/ischemia.\(^{37}\)

**Avoidable (pressure ulcer):** The resident (individual) developed a pressure ulcer and the facility did not do one or more of the following: evaluate the resident’s clinical condition and pressure ulcer risk factors; define and implement interventions that are consistent with resident needs, resident goals, and recognized standards of practice; monitor and evaluate the impact of the interventions; or revise the interventions as appropriate (CMS definition).\(^{38}\)

**Charting by Exception (CBE):** Charting by exception is premised on an assumption that the patient has manifested a normal response to all interventions unless an abnormal response is charted.\(^{39}\) This type of charting is often performed with flow sheets that are based on preestablished guidelines, protocols, and procedures that identify and document the standard patient management and care delivery. Clinicians need to make additional documentation when the patient’s condition deviates from the standard or what’s expected.\(^{40}\)

**Crust:** A hard outer layer or covering; cutaneous crusts are often formed by dried serum, pus or blood (one or more components may co-exist) on the surface of a ruptured blister or pustule.\(^{29}\)

**Decubitus Ominous:** Medical term first used by Jean-Martin Charcot in the 19th century to signify a sacral ulcer that presages death.

**Denudation:** See erosion.

**Diabetic Ulcer:** A wound occurring most often in the feet of people with diabetes due most commonly to neuropathy and/or peripheral vascular disease.\(^{41}\)

**End of Life:** End of life is defined as a phase of life when a person is living with an illness that will worsen and eventually cause death. It is not limited to the short period of time when the person is moribund.\(^{1}\)

**Erosion:** A loss of surface skin with an epidermal base.

**Fissure:** A thin linear loss of skin with a dermal or deeper base.

**Healable (wound):** A wound occurring on an individual whose body can support the phases of wound healing within the individuals expected lifetime.

**Healed (wound):** A wound that has attained closure of the epidermal surface. A recently closed wound may only have 20% tensile strength of skin that has never been wounded and may be susceptible to recurrent ulceration.

**Kennedy Terminal Ulcer:** A pressure ulcer that some individuals develop as they are dying. It is usually shaped like a pear, butterfly, or horseshoe, usually on the coccyx or sacrum (but has been reported on other anatomical areas), has colors of red, yellow or black, is sudden in onset, and usually is associated with imminent death.\(^{2, 42-49}\)

**Lesion:** Any change in the skin that may be a normal or abnormal variant including a wound
or injury. It encompasses everything from macular lesions (color changes without elevation or depression of the skin) through total skin breakdown.

**Maintenance (wound):** An attempt to keep an ulcer from deteriorating by providing good wound care. The wound may not heal due to patient choice or a lack of the health care system to provide optimal resources to promote healing.

**Non-healable (wound):** A wound that often deteriorates and occurs on an individual whose body cannot support the phases of wound healing within the individual's expected lifetime. There may be inadequate vascular supply to support healing or the cause of the wound cannot be corrected.

**Palliative skin care:** Providing comfort and support for the body's cutaneous surface (part of the practice of palliative medicine) is not a time-confined but rather a goal-oriented and patient-centered care delivery model. Palliative wound care is the evolving body of knowledge and skills that take a holistic approach to relieving suffering and improving quality of life for patients (individuals) and families living with chronic wounds, whether the wound is healable, can be maintained or may deteriorate.

**Patient circle of care:** This is not a legal term, but rather a social term that includes all of the stakeholders in the patient's health and well being. The term includes, but is not limited to, the patient, a legal guardian or responsible party, a spouse or significant other, interested friends or family members, caregivers, and any other individual(s) who may have an interest in the patient's care and well being.

**Pressure Ulcer:** A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction. A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated.

**Scale (skin):** Surface keratin that may be thick or thin, resembling a fish scale, cast off (desquamating) from the skin.

**SCALE:** The acronym for Skin Changes at Life's End.

**Skin breakdown:** An interruption in the integrity of the skin surface leading to defect in the epidermal covering with an epidermal, dermal or deeper base.

**Skin compromise:** A state in which skin’s protective function is at risk of breaking down.

**Skin failure:** An acute episode where the skin and subcutaneous tissues die (become necrotic) due to hypoperfusion that occurs concurrent with severe dysfunction or failure of other organ systems.

**Skin tear:** A traumatic wound occurring principally on the extremities of older adults as a result of friction alone or with shearing and frictional forces that separate the epidermis from the dermis (partial-thickness wound) or a deeper split that separates both the epidermis and the dermis from the underlying structures (full-thickness wound).

**Stakeholders:** An individual, facility, or organization with an interest in Skin Changes at Life's End (SCALE).

**Stage I Pressure Ulcer:** Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.

**Stage II Pressure Ulcer:** Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.

**Stage III Pressure Ulcer:** Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.

**Stage IV Pressure Ulcer:** Full thickness tissue loss.
with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.51

**Suspected Deep Tissue Injury:** Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.51

**Terminal tissue trauma:** Damage to the integumentary system that has occurred at the end of life.

**Ulcer:** A loss of surface skin with a dermal or deeper base.

**Unavoidable (pressure ulcer):** The resident developed a pressure ulcer even though the facility had evaluated the resident’s clinical condition and pressure ulcer risk factors; defined and implemented interventions that are consistent with resident needs, goals, and recognized standards of practice; monitored and evaluated the impact of the interventions; and revised the approaches as appropriate (CMS definition).38

**Unstageable Pressure Ulcer:** Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed.51

**Venous Ulcer:** A ulceration that occurs on the lower limb secondary to underlying venous disease; formerly called stasis ulcers.52

References


40. Smith LM. How to chart by exception. Nursing 2002 (SEPT).


### List of Distinguished Reviewers

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The SCALE Annotated Bibliography and future updates to the SCALE Consensus Statement will be posted at: www.gaymar.com > Clinical Support and Education > SCALE Consensus Documents.

Corresponding Author:
Dr. Diane L. Krasner
212 East Market Street
York, PA 17403 USA
dlkrasner@aol.com
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