Learning Module:

Pressure Ulcer Prevention & Management

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Adapted from CBDHA.
PURPOSE

According to the Nursing Policy 1-525, Pressure Ulcer Prevention and Management, risk assessment is a recommended step in preventing pressure ulcer development. The Braden Scale Risk Assessment is to be done on each adult admission and repeated on all patients as per policy. The purpose of this learning package is to improve assessment skills and promote the early implementation of interventions to manage skin integrity.

Please also review:


LEARNING OBJECTIVES

On completion of this package, the learner will:

- Define pressure ulcer, shear and friction
- Identify risk factors associated with pressure ulcer development
- Perform a skin assessment
- Know the Braden Scale for predicting pressure ulcer risk
- Identify interventions to prevent pressure ulcers
- Be familiar with the forms used to document

DEFINITIONS

Backstaging: The staging of pressure ulcers occurs only in one direction. If a wound deteriorates, staging numbers will increase and will reflect the most severe stage. Improvement or healing of a wound is determined by objective data (i.e. wound measurements, etc) not by adjustments in the stage. The stage will remain at the maximum number. For example, once a stage IV, always a stage IV. It may be a healing stage IV or a closed stage IV but always stage IV.

Friction: Mechanical forces exerted when two surfaces move across each other resulting in the removal of superficial layers of skin. The areas on the body most susceptible are the heels and elbows.

Pressure (Interface): The force between the patient and the sitting or lying surface. Pressure ulcers are associated with high interface pressure especially over a bony prominence. (Norton et. Al, 2007.) External pressure over the tissues causes compression and distortion of the underlying structures. If the pressure is higher than the capillary closing pressure occlusion of the blood vessels, decreased tissue perfusion and tissue death may result. (RNAO, 2005)

Pressure Reducing Surface: A surface that reduces the interface pressure between the body surface and the resting surface. It does not consistently maintain pressure below capillary closing pressure. (RNAO, 2005) Common examples include gel pads, off loading boots and chair cushions.

Pressure Relieving Surface: A surface that consistently reduces the interface pressure
between the body surface and resting surface below capillary closing pressure. A common example would include an airflow surface.

**Pressure ulcer:** A pressure ulcer is any localized injury caused by unrelieved pressure or pressure in combination with friction and/or shear that results in damage of skin and underlying tissue. They usually occur over bony prominences such as the sacrum, heels and hips and are graded according to the amount of tissue damage. Pressure ulcers are the only wounds that are staged. They cannot be back staged.

**Shear:** Deep tissue damage and necrosis that occurs as a result of a mechanical force that impedes blood flow to the skin. When tissue is pulled it leads to stretching, kinking and tearing of the vessels at the subcutaneous level. The resulting disruption of the local blood supply produces ischemia. Most shear injuries occur when patients slide down or are pulled up in a bed or chair. The areas on the body most susceptible are the sacrum and coccyx.

**Tunneling:** Wounds which have channels that extend from the wound bed into and through subcutaneous tissue or muscle (Barnes, 2009).

**Undermining:** Extension of a wound under wound margins caused by tissue destruction

### THEORY

#### Stages of Pressure Ulcers

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Tissue Injury:</td>
<td>Purple or maroon localized area of discolored <em>intact skin</em> or blood filled blister due to damage of underlying soft tissue from pressure and/or shear. Deep Tissue Injury may be difficult to detect in individuals with dark skin tones and can spiral quickly to a worsening stage.</td>
</tr>
<tr>
<td>Stage I:</td>
<td><em>Intact skin</em> with a localized area of non-blanchable redness usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from surrounding area.</td>
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<tr>
<td>Stage II:</td>
<td>Partial thickness loss of dermis presenting as a shallow open ulcer with a red or pink wound bed, without slough. Stage II pressure ulcers may also present as an intact or open/ruptured serum filled blister.</td>
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<tr>
<td>Stage III:</td>
<td>Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle is not exposed. Slough may be present but does not obscure the depth of tissue loss. Stage III pressure ulcers may include undermining and tunneling.</td>
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<tr>
<td>Stage IV:</td>
<td>Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Stage IV pressure ulcers often include undermining and tunneling.</td>
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<tr>
<td>Stage X (Unstagable):</td>
<td>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. The evaluator is unable to determine the depth of the wound due to slough or eschar tissue obscuring the base of the wound thus unstagable.</td>
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Complications Related to Bedrest

*Bedrest* should be a treatment option exercised only after its efficacy is clearly established. Physical complications of bedrest include: joint contractures, muscle atrophy, osteoporosis, pathological fractures, urinary tract infections, decreased cardiac reserve, resting and post exercise tachycardia, orthostatic hypotension, pulmonary embolism, deep vein thrombosis, pneumonia, anorexia, constipation and bowel impaction. Psychological complications include: depression, learned helplessness and decreased executive functioning (Norton et. al. 2007).

### Risk factors associated with Pressure Ulcer Development

**Paralysis or immobilization:** Patient is unable to turn or reposition independently to relieve pressure.

**Sensory loss** (*e.g.* hemiplegia, spinal cord injury, diabetic neuropathy): When sensory loss is present, the patient feels no discomfort from pressure and does not independently change position.

**Circulatory disorders** (*e.g.* diabetes mellitus, peripheral vascular disease): Disorders that reduce perfusion of skin's tissue layers.

**Fever:** Increases metabolic demands of tissues. Accompanying diaphoresis leaves skin moist.

**Anemia:** Decreased hemoglobin reduces oxygen-carrying capacity of blood and amount of oxygen available to tissues.

**Malnutrition:** Inadequate nutrition can lead to weight loss, muscle atrophy, and reduced tissue mass. Severe protein deficiency makes tissue more susceptible to breakdown. Poor protein, vitamin, mineral and caloric intake limits wound healing capabilities.

**Incontinence:** Skin becomes exposed to moist environment containing bacteria. Moisture causes skin maceration. Incontinence of both urine and feces will result in increased skin irritation and breakdown. Fecal enzymes attack the skin and are more active as the pH increases. The interaction between urine and feces produces ammonia leading to increased damaging enzymatic activity. (Narzako, 2007, Berg, Buckingham & Stewart, 1986).

**Heavy sedation and anesthesia:** Patient is not mentally alert and does not turn or change position independently. Sedation can also alter sensory perception.

**Age:** There is a loss of dermal thickness in the older adult impairing the ability to distribute pressure.

**Dehydration:** Results in decreased skin elasticity and turgor.

**Edema:** Edematous tissues are less tolerant of pressure, friction and shear.

**Existing pressure ulcers:** Limits surfaces available for position changes, placing available tissues at increased risk.

**History of pressure ulcer/wounds:** Skin only regains about 80% of its original tensile strength following wound healing. This area is more susceptible to the development of a pressure ulcer. It is important to know the location and severity of any previous skin damage or wounds.

**Other Factors to Consider:** Diastolic Blood Pressure below 60 which results in decreased tissue perfusion.
Performing a Skin Assessment

Inspect skin and bony prominences at least daily. Assess condition of patient’s skin over regions of pressure. Body weight against bony prominences places skin at risk for breakdown. Particular areas of concern include:

- Ear
- Occiput
- Shoulder
- Scapula
- Elbow
- Trochanter
- Sacrum
- Ischial Tuberosity
- Coccyx
- Knee
- Malleolus
- Heel

See Perry and Potter 7th edition Figure 18-1 page 485 for pressure concerns specific to chair bound patients.

Any skin changes should be documented, including a description of skin changes and any interventions implemented. Look for:

1. **Skin changes:** Any of the following changes may indicate that tissue was under pressure.
   - Color change-redness in light-tone skin; purplish or bluish in darkly pigmented skin
   - Tissue consistency -firm or boggy feel
   - Unusual sensations of pain, itch etc.

2. ** Blanching**
   
   If an area of redness blanches (lightens in color) when the nurse applies pressure, this indicates that the tissue, although reddened, is not ischemic. Tissue that does not blanch when palpated indicates that there is ischemic injury (Stage 1).

3. **Pallor and mottling**
   
   Persistent hypoxia/poor tissue oxygenation can result in skin color changes including pallor and/or mottling and may be a physiological response to the effects of pressure.

4. **Absence of superficial skin layers**
   
   Assess underlying cause to determine if it is a pressure area versus a traumatic injury (i.e. skin tear, puncture, etc). If the absence of superficial skin layers is due to pressure, the pressure ulcer is Stage II or greater.

5. **Skin temperature**
   
   Palpation of differences in temperature between reddened area and adjacent skin, either coolness or warmth, may be an initial indicator of ischemia.

**Cultural Considerations Related to Skin Assessment:**

Patients with darkly pigmented skin cannot be assessed for pressure ulcer risk by examining only skin color. Follow these recommended guidelines:

**Assess Localized Skin Color Changes**

Any of the following may appear:

- Skin color changes are different from usual skin tone.
• Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.
• Color is darker than surrounding skin - purplish, bluish, eggplant.

Importance of lighting for skin assessment:
• Use natural or halogen light
• Avoid fluorescent lamps, which can give the skin a bluish tone.
• Avoid wearing tinted lenses when assessing skin color.

Tissue Consistency
• Assess for edema, swelling.
• Assess for firm or boggy feel.

Sensation
• Assess for pain or changes in skin sensation such as itching.

Skin Temperature
• Initially skin in the area of pressure ulcer may feel warmer than surrounding skin.
• Subsequently skin may feel cooler than surrounding skin.
• Feel areas of skin that are not involved in or around a pressure point to serve as a point of temperature reference.

Braden Scale Risk Assessment

The Braden Risk Assessment takes into account 6 areas of risk, and assigns a score to each. (Keast et al, 2006).

**SENSORY PERCEPTION - Ability to respond meaningfully to pressure-related discomfort**

1. **Completely Limited**: Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation OR limited ability to feel pain over most of body.
2. **Very Limited**: Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness OR has a sensory impairment which limits the ability to feel pain or discomfort over ½ of body.
3. **Slightly Limited**: Responds to verbal commands, but cannot always communicate discomfort or the need to be turned OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.
4. **No Impairment**: Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.

**MOISTURE - Degree to which skin is exposed to moisture**

1. **Constantly Moist**: Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.
2. **Very Moist**: Skin is often, but not always moist. Linen must be changed at least once a shift.
3. **Occasionally Moist**: Skin is occasionally moist, requiring an extra linen change approximately once a day.
4. **Rarely Moist**: Skin is usually dry; linen only requires changing at routine intervals.
ACTIVITY - Degree of physical activity

1. **Bedfast**: Confined to bed.
2. **Chairfast**: Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.
3. **Walks Occasionally**: Walks occasionally during day but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.
4. **Walks Frequently**: Walks outside room at least twice a day and inside room at least once every two hours during walking hours.

MOBILITY - Ability to change and control body position

1. **Completely Immobile**: Does not make even slight changes in body or extremity position without assistance.
2. **Very Limited**: Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.
3. **Slightly Limited**: Makes frequent though slight changes in body or extremity position independently.
4. **No Limitation**: Makes major and frequent changes in position without assistance.

NUTRITION

1. **Very Poor**: Never eats a complete meal. Rarely eats more than ½ of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement OR is NPO and/or maintained on clear liquids or IV’s for more than 5 days.
2. **Probably Inadequate**: Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement OR receives less than optimum amount of liquid diet or tube feeding.
3. **Adequate**: Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products per day). Occasionally will refuse a meal, but will usually take a supplement when offered OR is on a tube feeding or TPN regimen which probably meets most of nutritional needs.
4. **Excellent**: Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.

FRICTION & SHEAR

1. **Problem**: Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures or agitation leads to almost constant friction.
2. **Potential Problem**: Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.
3. **No Apparent Problem**: Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair.
Pressure Ulcer Prevention Interventions

General Prevention Recommendations

- Inspect skin daily and document findings.
- Individualize bathing frequency; avoid hot water, irritating cleaning agents and excessive friction.
- Use moisturizers on dry skin. Minimize factors leading to dry skin such as low humidity and cold air.
- Do not use sheepskins. The use of sheepskin increases moisture and this moisture remains close to the skin.
- Do not massage skin over bony prominences.
- Keep the head of bed at lowest height possible (less than 30 degrees when medically appropriate).

Prevention Recommendations dealing with Moisture

- Control incontinence by establishing bowel/ bladder schedule. Toilet every 2 hours.
- Offer a bedpan or urinal coinciding with turning schedule.
- When incontinence cannot be controlled, cleanse skin at time of soiling with mild soap, use a topical moisture barrier and select incontinence products that are absorbent and provide a quick drying surface to the skin.

Prevention Recommendations dealing with Patients who are Bedfast, Chair fast or who have Problems with Mobility

- Turn and position at risk patients q2h or more frequently if indicated.
- Use pillows or other devices to keep bony prominences from direct contact with each other.
- Raise heels of at risk patients off the bed. Do not use donut-type devices.
- Use a 30 degree lateral side lying position. Do not place patient directly on trochanter.
- Limit the amount of time head of bed is higher than 30 degrees when medically appropriate.
- Use lifting devices to move patients during transfers and position changes.
- Use pressure-reducing devices for at risk patients.
- Encourage chair fast patients to reposition themselves every hour if unable to do so then reposition chair fast patients every hour.
- Limit time in chair to 2 hours or less per sitting or as per individualized activity plan.
- Consult physiotherapist and occupational therapist
- Encourage mobilization as much as possible
- Encourage active range of motion exercises
- Perform passive range of motion exercises if patient unable to do active range of motion exercises.

Prevention Interventions dealing with Inadequate Nutrition

- Encourage adequate caloric intake.
- Encourage fluid intake of 1500 mls per day unless contraindicated. Offer a glass of water coinciding with turning schedule.
- Monitor for signs of dehydration (dry skin, dry mucous membranes)
- Consult dietician to assess need for dietary supplements, increasing protein and calorie intake.
Prevention Interventions dealing with Friction and Shears

- Use proper positioning, transferring and turning techniques to minimize skin injury due to friction and shear forces.
- Use a lift sheet or mechanical lift to move patient.
- Protect high-risk areas such as elbows, heels, sacrum and back of head from friction injury.
- Do not elevate the head of bed more than 30 degrees if medically appropriate.
- Have the patient use a trapeze to lift self up in bed if able.
- Use only paper tape on fragile skin.

DOCUMENTATION

Document assessments/findings in Meditech on the “Skin Risk Assessment” screen.

Document interventions in Meditech on the “Skin Risk Management-Document Interventions” screen.
SELF TEST

1. Pressure ulcers usually occur over bony prominences such as the sacrum, heels and hips and are graded according to the amount of tissue damage.
   True or False

2. Incontinence is a risk factor associated with pressure ulcer development.
   True or False

3. Clients with darkly pigmented skin can be assessed for pressure ulcer risk by examining only skin color.
   True or False

4. Using the Braden Scale Risk Assessment a score of 9 or below indicates low risk for developing a pressure ulcer.
   True or False

5. It’s OK to massage skin over bony prominences.
   True or False

6. The Braden Scale Risk Assessment is to be done on each admission and repeated on all patients in ACUTE CARE every Monday, Wednesday and Friday, or if the patient’s condition changes.
   True or False.

7. Included in a patient’s care plan should be a bathing schedule that reflects skin care needs.
   True or False.

8. Which one of the following nursing care orders should the nurse question as being inappropriate in the plan of care for an 82-year-old incontinent female, when preventing the development of pressure ulcers is an important goal?
   a. Turn and position the client every 2 hours.
   b. Monitor the client’s serum albumin level.
   c. Use a ‘donut’ device on the chair when client is sitting.
   d. Implement a toileting schedule to treat her urinary incontinence.

9. Which of the following are risk factors associated with pressure ulcer development?
   a. dehydration
   b. malnutrition
   c. heavy sedation
   d. immobility
   e. all of the above

10. ____________ is the mechanical forces exerted when skin is dragged across a coarse surface such as bed linens.

11. The head of the bed should not be elevated more than ______ degrees.

12. Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often includes undermining and tunneling. This describes a stage _____ pressure ulcer.
Self test Answers
1. True
2. True
3. False
4. False
5. False
6. True
7. True
8. c
9. e
10. Friction
11. 30
12. IV
REFERENCES


Crumbley, D.R., Kane, M.A. (2010). Development of an Evidence-Based Pressure Ulcer Program at the National Naval Medical Center: Nurses’ Role in Risk Factor Assessment, Prevention, and Intervention Among Young Service Members Returning from OIF/OEF, Nursing Clinics of North America, 45(2), 153-168.


National Pressure Ulcer Advisory Panel [http://www.npuap.org/pr2.htm](http://www.npuap.org/pr2.htm)


Registered Nurses Association Ontario, Nursing Best Practice Guideline, Shaping the future of Nursing, Risk Assessment & Prevention of Pressure Ulcers; Revised March 2005.


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