

## Pressure Injury Assessment and Management

Approximately 2.5 million pressure-induced injuries are treated each year in acute care facilities in the United States (Berlowitz, 2022b). Hospital-acquired pressure injuries are associated with pain, risk of infection, delayed recovery, increased health care costs and length of stay. In addition, Stage 3 and 4 pressure injuries are no longer reimbursed by the Centers for Medicare and Medicaid (CMS). With vigilant nursing care, many pressure injuries can be prevented. At an organizational level, implementation of a structured multifaceted quality improvement program reduces the incidence of pressure injuries (NPIAP, 2019).

### Definition and Risk Factors

According to the National Pressure Injury Advisory Panel (NPIAP), a pressure injury (formerly called pressure ulcer) is localized damage to the skin or underlying soft tissue usually over a bony prominence or related to a medical or other device (NPIAP, 2019). The injury may present as intact skin or an open ulcer and may be painful. It can result from intense and/or prolonged pressure or pressure combined with shear.

Risk Factors for Pressure Injuries (Berlowitz, 2022b)	
Risk Factor	Clinical Considerations
<b>Immobility</b>	Most important host factor that contributes to pressure injuries
<b>Malnutrition</b>	Assess your patient's dietary intake and weight; lower body mass index (BMI < 25 kg/m <sup>2</sup> ) increases risk.
<b>Reduced Perfusion</b>	Due to volume depletion, hypotension, vasomotor failure, and vasoconstriction (shock, heart failure, or medications); pressure applied to skin for less than two hours may cause severe damage.
<b>Sensory Loss</b>	Due to neurologic diseases such as dementia, delirium, spinal cord injury and neuropathy
<b>Microclimate</b>	Temperature, humidity, and airflow at the skin surface (NPIAP, 2019)
<b>Comorbidities</b>	Cerebrovascular disease, cardiovascular disease, diabetes, and incontinence

### Risk Assessment (NPIAP, 2019):

- Use a structured risk assessment tool, such as the Braden scale, to identify all patients for their risk of pressure injury as soon as possible after admission.
- Identify additional risk factors such as:
  - Fragile skin
  - Existing pressure injury, as well as previously healed or closed pressure injuries
  - Vascular disease, diabetes, or tobacco use (result in impaired perfusion to the extremities)
  - Pain in areas of the body exposed to pressure
- Bedfast and chairfast patients are at increased risk for developing pressure injuries.
- Repeat the risk assessment at regular intervals and with any change in condition.
  - Acute care: every shift
  - Long term care: weekly for 4 weeks, then quarterly
  - Home care: at every nurse visit
- Develop a plan of care based on the risk assessment; prioritize and address identified issues.

## Pressure Injury Classification (NPIAP, 2019)

Use the staging system below to categorize the injury appropriately. Wounds should be staged based on the deepest area.

*Note: Changing the stage as healing occurs, or reverse staging, is not a recommended practice (Berlowitz, 2022a).*

### Stage 1 Pressure Injury: Non-blanchable erythema of intact skin

- Intact skin with a localized area of non-blanchable erythema; may look different in dark pigmented skin.
- Blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes.
- Does not include purple or maroon color changes; these may indicate deep tissue pressure injury.

### Stage 2 Pressure Injury: Partial-thickness skin loss with exposed dermis

- Wound bed is viable, pink or red, moist, and may be intact or a ruptured serum-filled blister.
- Adipose (fat) and deeper tissues are not visible; granulation tissue, slough and eschar are not present.
- Commonly results from adverse microclimate and shear in the skin over the pelvis and heel.

*Note: Do not use this stage to describe moisture associated skin damage (MASD) including incontinence-associated dermatitis (IAD), intertriginous [area where two skin areas may rub] dermatitis (ITD), medical adhesive-related skin injury (MARS), or traumatic wounds (skin tears, burns, abrasions).*

### Stage 3 Pressure Injury: Full thickness skin loss

- Adipose (fat) is visible in the ulcer; granulation tissue and epibole (rolled wound edges) are present.
- Slough and/or eschar may be visible; if slough/eschar covers the entire wound base, this is an unstageable pressure injury.
- Undermining and tunneling may be present.
- Depth of tissue damage varies by anatomical location (areas high in adipose may develop deep wounds).
- Fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed.

### Stage 4 Pressure Injury: Full thickness skin and tissue loss

- Exposed fascia, muscle, tendon, ligament, cartilage, or bone in the ulcer is present.
- Slough or eschar may be present; if slough/eschar covers the entire wound base, this is an unstageable pressure injury.
- Epibole, undermining and tunneling often occur which may underestimate the extent of the injury.
- Depth of tissue damage varies by anatomical location (areas high in adipose may develop deep wounds).
- Ulcers located on the bridge of nose, ear, occiput, and malleus may be shallow as these areas do not

have subcutaneous tissue (Berlowitz, 2022a).

#### **Unstageable Pressure Injury: Obscured full-thickness skin and tissue loss**

- Full thickness tissue loss; extent of tissue damage cannot be confirmed because base of the ulcer is covered by slough and/or eschar.
- If slough or eschar is removed, a Stage 3 or 4 pressure injury will be revealed.
- Stable (dry, adherent, intact) eschar on the heel or ischemic limb should not be softened or removed.

#### **Deep Tissue Pressure Injury (DTPI): Persistent non-blanchable deep red, maroon, or purple discoloration**

- Intact or non-intact skin with 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.
- Injury results from intense and/or prolonged pressure and shear forces between bone and muscle.
- 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).
- This stage should not be used to describe vascular, traumatic, neuropathic, or dermatologic conditions.
- May be difficult to detect in patients with dark skin; assess for painful, firm or spongy, boggy, warm, or cool skin compared with the surrounding tissue (Berlowitz, 2022a).

#### **Medical Device-Related Pressure Injury**

- Results from devices used for diagnostic or therapeutic purposes.
- Injury generally takes the pattern or shape of the device and should be staged using the staging system.

#### **Mucosal Membrane Pressure Injury**

- Found on mucous membranes with prior medical device use at the location of the injury.
- Due to the anatomy of the tissue, these ulcers cannot be staged using the NPIAP staging system.

### **Pressure Injury Prevention**

#### **General Skin Care (Berlowitz, 2022b; NPIAP, 2019)**

- Obtain patient history: assess for connective tissue disorders and other chronic diseases, previous surgeries, and factors limiting mobility; current medications, allergies, past therapies (radiation or chemotherapy) and tobacco and alcohol use.
- Perform physical examination: inspect all areas of the skin as soon as possible upon admission for signs of pressure injury, especially non-blanchable erythema.
  - Examine entire skin surface for pressure ulcers, epidermal excoriations, rashes, maceration, edema, and old scars.
  - Assess skin temperature, color, turgor, moisture, and integrity. Record any changes as soon as they are identified.
  - In darkly pigmented skin, look for changes in skin tone, skin temperature and tissue

consistency compared to adjacent skin.

- Assess pressure points, such as the sacrum, coccyx, buttocks, heels, ischium, trochanters and elbows, and beneath medical devices.
- Cleanse skin promptly after episodes of incontinence.
- Use skin cleansers that are pH balanced for the skin; avoid hot water.
- Avoid disturbing stable, hard, dry eschar in ischemic limbs or heels unless infection suspected.
- Apply skin moisturizers daily on dry skin.
- Apply a barrier product to protect skin from moisture.
- Avoid vigorous massage over bony prominences.
- Avoid positioning the patient on an area of erythema or pressure injury.

#### **Nutrition (Berlowitz, 2022a; NPIAP, 2019)**

- Use a valid tool to assess the patient's risk for malnutrition.
- Assess oral, enteral and parenteral intake and refer at-risk patients to a registered dietitian/nutritionist; assessment includes protein and caloric intake, hydration status, serum albumin and/or prealbumin, and total lymphocyte count.
- Support patients with adequate fluid intake and a balanced diet and correct any nutritional deficiencies.
- Assess adequacy of oral, enteral, and parenteral intake. Target protein intake is 1.25 to 1.5 g/kg/day.
- Assess weight changes over time.
- Nutritional supplements are only recommended when deficiencies are present, or if nutritional intake is not optimal.

#### **Repositioning and mobilization (Berlowitz, 2022b; NPIAP, 2019)**

- When possible, encourage mobility.
  - Immobilized patients may benefit from physical therapy.
  - Limit sedatives that contribute to immobility.
  - In critically ill patients, reposition using slow, gradual turns to allow time for stabilization of hemodynamic and oxygenation status.
- Turn and reposition all at-risk patients, unless contraindicated; schedule frequency based on the support surface in use, the tolerance of skin for pressure and the patient's preferences.
  - General recommendation is to reposition at least every two hours.
  - Chair-bound patients who are weak or immobile should be repositioned every hour.
  - Lengthen the turning schedule at night to allow the patient to sleep.
- When turning, place the patient in a  $\leq 30$ -degree side lying position, and ensure the sacrum is off the bed.
- Assess the level of immobility, exposure to shear, skin moisture, perfusion, body size and weight of the patient when choosing a support surface.
- Continue to reposition the patient when placed on any support surface.
- Use a breathable incontinence pad when using microclimate management surfaces.
- Use pressure redistributing cushions for patients sitting in chairs or wheelchairs.
- If the patient cannot be moved or is positioned with the head of the bed elevated over 30

degrees, place a polyurethane foam dressing on the sacrum.

- Place pillows or foam wedges between the ankles and knees if patients have no mobility in these areas.
- Elevate heels off bed or use polyurethane foam dressings on patients at high-risk for heel ulcers.
- Place thin foam or breathable dressings under medical devices.
- Encourage mobility, provide physical therapy, and limit sedative medications, if possible.

### Basic Wound Care (Berlowitz, 2022a)

Wound Care Recommendations by Stage	
Stage	Dressing and Treatment
Stage 1	<ul style="list-style-type: none"> <li>• Cover with transparent film for protection</li> <li>• Stage 1 can easily advance to Stage 2 without intervention. Implement intensive preventative measures to avoid progression of injury.</li> </ul>
Stage 2	<ul style="list-style-type: none"> <li>• For wounds with heavy exudate or chronic fluid build-up, an absorptive dressing (foams and alginates) may help absorb excess fluid and promote wound healing.</li> <li>• For dry wounds, if no infection is present, utilize a dressing that maintains a moist environment to promote wound healing. These include saline-moistened gauze, transparent films, and occlusive dressings such as hydrocolloids, and hydrogels.</li> <li>• Avoid wet-to-dry dressings.</li> </ul>
Stage 3 and 4	<ul style="list-style-type: none"> <li>• Treat infection if present.</li> <li>• Debride necrotic tissue and cover with appropriate dressing (as described in Stage 2).</li> <li>• Non-surgical forms of debridement include mechanical (irrigation), enzymatic, and biologic.</li> <li>• Surgical debridement is needed for extensive necrosis or thick eschar.</li> <li>• Sharp debridement should not be used over the heel due to proximity to the bone.</li> <li>• Discontinue debridement once all necrotic tissue has been removed and granulation tissue is present.</li> </ul>

### General wound care recommendations

- Change dressings once a day or every other day, as prescribed.
- Document wound size (length, width, and depth) in centimeters or millimeters with dressing changes.
- Assess and document pain using a pain scale such as the 0-10 intensity numeric rating scale.
- Manage pain with oral non-opioid medications for mild pain and opioid analgesics for moderate to severe pain. Administer pain medication prior to dressing changes and debridement.
- Culture wounds and treat infections with antibiotics, as prescribed.
- Evaluate patients with deep wounds for osteomyelitis.
- Monitor patient's progress.
- Provide psychosocial support.
- Consult with wound care department or specialist.

- Repositioning and mobilization as outlined above.

### Adjunctive Therapies (Berlowitz, 2022a; NPIAP, 2019)

- Negative pressure wound therapy (NPWT) promotes wound healing by increasing blood flow, decreasing edema, and promoting growth of granulation tissue. (See also: [Nursing PocketCard: Guide to Negative Pressure Wound Therapy](#))
- For non-healing pressure injuries, consider collagen dressings, platelet-rich plasma, or platelet-derived growth factor, but evidence is limited.
- Administer pulsed current electrical stimulation to facilitate wound healing in recalcitrant Stage II pressure injuries and Stage III or IV pressure injuries.
- Ultrasound and hyperbaric oxygen therapy (HBOT) may be beneficial, but studies are limited.
- Topical agents, such as becaplermin gel, phenytoin, sucralfate, and medicinal honey, may support healing in stage 2 ulcers, but evidence is limited.
- Surgical wound closure may be appropriate for some patients.
  - Procedures include skin grafts, skin flaps, or myocutaneous flap.
  - Wound should be free of necrotic tissue and infection.

### Documentation

Assess skin daily for pressure injuries, rashes, moisture, maceration, edema and changes in temperature and tissue consistency. Documentation of pressure injuries should occur with each dressing change and include the following:

- Location – in relation to bony prominence on the side of the body that is involved
- Category/stage – degree of tissue injury
- Size – measure length, width and depth in centimeters or millimeters
- Presence of sinus tracts/tunneling and undermining
- Tissue types and color
  - Granulation – moist, pink, red healing tissue
  - Slough – moist, fibrinous yellow, tan, or gray tissue
  - Necrotic/eschar – brown/black, dry, thick, and leathery
- Exudate – color, character, odor, amount, and type (serous, sanguineous, or purulent)
- Wound edge and presence of epithelialization (epithelial cell growth across the wound surface)
- Surrounding skin – assess for color changes (erythema, cyanosis, bruising), temperature, induration, tenderness, trauma, irritation, or drainage (redness, maceration, erosion)
- Status of the dressing if present
- Pain – assess using a valid and reliable pain scale
- Complications, such as infection
- Re-positioning and timing schedule

### Education (NPIAP, 2019)

- Teach patients and their family members about the risk for pressure injury and risk reduction

interventions.

- Encourage smoking cessation.
- Instruct patients and family members to optimize nutrition.

**References:**

Berlowitz, D. (2022a, April 1). Clinical staging and management of pressure-induced skin and soft tissue injury. *UpToDate*.  
<https://www.uptodate.com/contents/clinical-staging-and-management-of-pressure-induced-skin-and-soft-tissue-injury>

Berlowitz, D. (2022b, February 21). Epidemiology, pathogenesis, and risk assessment of pressure- induced skin and soft tissue injury. *UpToDate*. <https://www.uptodate.com/contents/epidemiology-pathogenesis-and-risk-assessment-of-pressure-induced-skin-and-soft-tissue-injury>

Berlowitz, D. (2022c, January 10). Prevention of pressure-induced skin and soft tissue injury. *UpToDate*.  
<https://www.uptodate.com/contents/prevention-of-pressure-induced-skin-and-soft-tissue-injury>

National Pressure Injury Advisory Panel (NPIAP). (2019). Prevention and Treatment of Pressure Ulcers.  
<https://internationalguideline.com/2019>