PRESSURE INJURY

AGS Geriatrics Evaluation and Management Tools (Geriatrics E&M Tools) support clinicians and systems that are caring for older adults with common geriatric conditions.

From the AMERICAN GERIATRICS SOCIETY

Geriatrics Evaluation & Management Tools

DEFINITION

A localized injury to the skin and/or underlying tissue, usually over a bony prominence, that results from pressure or from pressure in combination with shear as well as multiple underlying comorbidities.

SCREENING

- Validated scales for identifying older adults who are at risk of developing pressure injury: Braden Scale (www.bradenscale.com/images/bradenscale.pdf)
- Systematic skin inspection at least daily with emphasis on bony prominences for all at-risk older adults

DIFFERENTIAL DIAGNOSIS

Arterial ulcer, venous ulcer, skin tears, medical adhesive related skin injury (MARSI), dermatitis, moisture associated skin damage (MASD), excoriation, wound related to malignancy

PAST MEDICAL HISTORY (RISK FACTORS)

Impaired mobility	Depression	Venous or arterial disease	Fever/sepsis
Neurologic diseases (stroke, cognitive impairment)	Dermatologic diseases	Edema	Hypotension
Musculoskeletal illnesses	Incontinence/dermatitis	Diabetes	Anemia
Restraints	History of pressure injury	Congestive heart failure	The dying process
Devices (tubing, masks, etc)	Low BMI/malnutrition	Renal failure	
	Hypoalbuminemia	Malignancy	

SOCIAL HISTORY

Living situation, caregiver stress, substance abuse, tobacco use, history of abuse or neglect

MEDICATIONS

Sedating medications, long-term corticosteroid use, vasopressors, immunomodulators

PHYSICAL EXAMINATION

STAGE	DEFINITION
Deep tissue pressure 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. May be preceded by tissue that is painful, firm, mushy, boggy, or warmer or cooler than adjacent tissue. Evolution can be rapid and expose additional layers of tissue, even with optimal treatment. Depth is unknown.
Stage 1.	Intact skin with **nonblanchable** redness of a localized area, usually over a bony prominence. Can be difficult to detect in dark skin tones.
Stage 2.	**Partial-thickness loss** of dermis presenting as a shallow open ulcer with a red-pink wound bed, without slough. Can also present as an intact or open/ruptured serum-filled blister. Should **not** be used to describe skin tears, tape burns, perineal dermatitis, maceration, or excoriation.
Stage 3.	Full-thickness tissue loss. **Subcutaneous fat visible** but bone, tendon, or muscle is not exposed. Slough may be present but does not obscure the depth of tissue loss. Can include undermining and tunneling.
Stage 4.	Full-thickness tissue loss with **exposed bone**, **tendon**, or **muscle**. Slough or eschar can be present on some parts of wound bed. Often includes undermining and tunneling.
Unstageable	Full-thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green, or brown) or eschar (tan, brown, or black), or both, in the wound bed. Until enough slough and/or eschar is removed to expose the base of the wound, the true depth (and therefore stage, either 3 or 4) cannot be determined.
Medical Device—Related Pressure Injury	Pressure ulcers that result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure ulcer generally closely conforms to the pattern or shape of the device.

Clinicians should examine the patient for pressure injury and not rely solely on others for the information. Know local policy regarding photography of wounds.

- Location: Describe and pay attention to high-risk sites.
- Wound size and shape: Measure diameter, length, width, depth (from plane of skin and probe for undermining and tunneling).
- Wound bed: Describe color; presence of slough; necrotic, granulation, and/or epithelial tissue.
- Drainage: Describe amount, odor, purulence.
- Wound edges: Note if distinct, diffuse, rolled (epibole), necrosis.
- Periwound skin and soft tissue: Note erythema, edema, induration, temperature.
- Signs of wound infection: Note increased necrotic tissue, odor, purulence, increasing pain, warmth, redness, induration (differentiate from a thin rim of erythema surrounding most healing wounds).

DIAGNOSTIC TESTS

- Oxygen delivery: hemoglobin/hematocrit, ankle-brachial index, pulse volume recording, Doppler ultrasound
- Nutrition: albumin/pre-albumin (unreliable in setting of inflammation)
- Endocrinopathies: thyroid-stimulating hormone, hemoglobin A_{1c}
- Indicators of infection or inflammation: increased WBC count, erythrocyte sedimentation rate, C-reactive protein, MRI for suspicion of osteomyelitis, swab cultures are best reserved for wounds with purulent drainage in setting of high suspicion for infection

PREVENTION

Many pressure injuries are unavoidable and may be a marker of disease severity or impending death. The Centers for Medicare and Medicaid defines an unavoidable pressure injury as one that develops despite the provider having:

- Evaluated the individual's clinical condition and pressure injury risk factors
- Defined and implemented interventions consistent with individual needs, goals, and recognized standards of practice
- Monitored and evaluated the impact of the interventions, revising the approaches as appropriate

Skin care	■ Treat dry skin with moisturizers. ■ Avoid exposure to perspiration, wound drainage, or urine and fecal matter (incontinence).
Nutrition	■ Perform nutrition assessment and optimize nutrition.
Minimize pressure and shear	■ Use lubricants, protective films, protective dressings (eg, hydrocolloids), and protective padding. ■ Use bed-positioning devices (eg, pillows, foam wedges) and optimize chair cushioning to offload bony prominences. ■ Head of the bed should be at lowest degree of elevation consistent with medical conditions. ■ Use lifting devices (trapezes or draw sheet) to lift rather than slide the patient. ■ Reposition at least q2h if lying; shift weight q15min if seated. ■ Maintain or improve mobility if possible. ■ For at-risk patients, use a specialized support surface (eg, powered overlay, low air loss technologies).

GENERAL MANAGEMENT

- Consider and clearly document the patient's goals when forming a treatment plan.
- Primary dressings are applied directly to the wound bed; secondary dressings secure or cover the primary dressing.
- Consider using barrier paste (with a zinc base) for an open shallow wound that is exposed to incontinence.

Ulcer qualities	Shallow (Stages 1 or 2)	Deep (Stages 3 or 4)
Dry	**Primary dressing:** Thin hydrocolloid, thin polyurethane foam, transparent films, hydrogel **Secondary dressing:** Non adherent gauze	**Primary dressing:** Fill wound with hydrogel-impregnated gauze or cover with nonadherent contact layer (eg, vaseline gauze). **Secondary dressing:** Transparent thin film, polyurethane foam, nonadherent gauze
Wet (draining)	**Primary dressing:** Absorbant dressing such as alginate or foam **Secondary dressing:** Nonadherent gauze	**Primary dressing:** Foam, pack with alginate, single gauze strip/roll, foam or other absorbent dressing **Secondary dressing:** Transparent thin film, polyurethane foam, gauze

DRESSINGS

TYPE[a]	INDICATION(S)	CONTRAINDICATION(S)	SPECIAL INSTRUCTIONS
Transparent film	Stages 1 and 2; protects from friction; superficial scrape	Draining ulcers; suspected skin infection or fungus	Apply skin prep to intact skin to protect from adhesive
Foam[b]	Stages 2 and 3; low to moderate exudate	Excessive exudate; dry, crusted wound; dry eschar	Leave in place 3–5 days depending on assessment[c]
Hydrocolloid[b]	Stages 2 and 3; low to moderate drainage; autolytic debridement of slough; reduces wound pain, preventive for high-risk friction areas	Fragile skin; infected ulcer; heavily draining wounds, sinus tracts	Leave in place 3–7 days[c]; can combine with alginate to control drainage; apply skin prep to intact skin to protect from adhesive
Hydrogel[b], amorphous	Stages 2, 3, and 4; skin tears; necrotic ulcers; reduces pain; rehydrates ulcer bed; loosens slough and necrosis	Heavily draining wounds	Leave in place 1–3 days depending on type of gel; may require secondary dressing[c]
Hydrogel, sheet	Stage 2	Maceration, moderate to heavy exudate	Needs to be held in place with secondary dressing
Calcium alginate[b]	Stages 3 and 4; excessive drainage; sinus tracts, tunnels, or cavities	Dry or minimally draining wound; dry eschar; superficial wounds with maceration	Leave in place 1–2 days; apply dressing within wound borders; apply skin prep to intact skin to protect from adhesive; requires secondary dressing[c]
Collagen[b]	Stage 3 and selected Stage 4 (refer to package insert); light to heavy exudate; chronic, nonhealing ulcers	Sensitivity to collagen or bovine products; necrotic ulcers	Leave in place 1–3 days; may be combined with topical agents; rehydration may be necessary
Silver dressings	Malodorous, exudative wounds, and those highly suspicious for critical bacterial load	Sensitivity to silver; systemic infection; cellulitis; fungus; interstitial nephritis; skin necrosis; leukopenia	Need exudate, hydrogel, or collagen present to release silver; inactivates enzymatic debriding agents

[a] Other dressing types not discussed include 1) specialty absorptive dressings that are highly absorptive layers of fibers (eg, cellulose, cotton, rayon) and 2) composites that combine physically distinct components into a single dressing to provide a bacterial barrier, absorptive outer layer, and an adhesive border.
[b] Products also available with silver
[c] Must use caution to avoid periwound maceration

DEBRIDEMENT

- Decision to sharply debride necrotic tissue should be made by experienced clinicians.
- Stable (dry, adherent, intact, without erythema or fluctuance) eschar on extremities serves as "the body's natural (biological) cover" and should not be removed. Unstable (soft or lifting) eschars may need sharp debridement.
- Types of debridement include sharp, autolytic (eg, moisture-retaining dressings or hydrogels), mechanical (eg, wet-to-dry dressings), chemical (enzymatic debridement), and biologic (eg, larvae).

INFECTION CONTROL

- Wound cleansing and dressing changes are two of the most important methods for minimizing bacterial colonization.
- Consider topical antimicrobials if there is failure to heal or persistent odor and/or exudate (eg, silver sulfadiazine, topical metronidazole).
- Avoid routine cultures.
- If not healing, consider cellulitis, osteomyelitis, underlying abscess, or malignancy may require bone biopsy for diagnosis.

PALLIATIVE MANAGEMENT

- Mnemonic "SPECIAL": **S**tabilize the wound; **P**revent new wounds; **E**liminate odor; **C**ontrol pain; **I**nfection prophylaxis; **A**bsorbent wound dressings; **L**essen or reduce dressing changes

FOLLOW-UP/ REFERRAL

- Surgical referral is warranted for Stage 4 and severely undermined/tunneled ulcers and/or suspicion of necrotizing fasciitis or abscess. If wound is distal and arterial circulation is poor, consult vascular surgery.
- Monitoring: no reverse staging; rather, "This is a healing stage___"; use the Pressure Ulcer Scale for Healing or the Pressure Sore Status Tool.