

Cardinal Health SkinHealth360™

Wound Assessment



Contents

Normal lab values

Wound care associated lab values	1
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Normal lab rationale

Blood glucose	2
Creatinine	2
Complete blood count with differential	2
Serum albumin	2
Serum prealbumin	2
Total lymphocyte count (TLC)	2

Assess risk

Scoring on the Braden Scale	3
Sensory perception	3
Is the resident exposed to moisture?	4
Activity	4
Mobility	5
Nutrition	5
Friction and shear	6

Assess wound

Anatomic location and age of the wound	7
Size, shape, and stage of the wound	7
Sinus tracts and undermining	8
Exudate	8
Sepsis (septic wound)	8
Surrounding skin	9
Maceration	9
Edges and epithelialization	9
Necrotic tissue	9
Tissue bed	10
Status	10

Assessment tools

Ankle-brachial index (ABI)	10
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Normal lab values

Wound care associated lab values¹

Lab tests can be used to assess resident levels of nutrition, oxygen and cells required for wound healing.

Test	Normal value
Total red blood cell count (RBC)	Females: 4.0–5.5 M/mm ³ Males: 4.5–6.2 M/mm ³
Hematocrit	Females: 38–46% Males: 42–54%
Hemoglobin	Females: 12–16 g/dL Males: 14–18 g/dL
Total white blood cell count (WBC)	4,500–11,000/mm ³
Platelet (thrombocyte) count	150,000–400,000/mm ³
Total lymphocyte count (TLC)	>1,800 cells/mm ³
Serum albumin	3.5–5.5 g/dL
Serum prealbumin	16–40 mg/dL
Blood glucose (fasting)	70–110 mg/dL
Creatinine	0.8–1.2 mg/dL

Normal lab rationale¹

Blood glucose

- Increased blood sugar levels are associated with an increased risk of ulceration and impaired wound healing
- Hemoglobin A1C provides a long-term index of the resident's average blood glucose level and is used to monitor diabetes

Creatinine

- A measure of kidney function and protein status
- Malnutrition decreases creatinine levels

Complete blood count with differential

- A common test to evaluate three types of blood cells: red blood cells, white blood cells and platelets
- May be used to determine anemia, infection and oxygen-carrying capacity
- SED rate will determine infection/inflammatory process

Serum albumin

- Albumin is a plasma protein produced by the liver that accounts for more than half of all plasma proteins
- Levels fall rapidly with protein deficiency and malnutrition
- Levels less than 3.2 mg/dL are associated with longer length of stay and increased complications
- There is a positive correlation between low serum albumin and pressure ulcer severity
- While a marker for nutritional status, it has a long half-life (20 days); this precludes this measurement from being used to assess short term changes in nutritional status

Serum prealbumin

- Prealbumin is a major transport protein
- Mortality risk increases as prealbumin levels drop
- In contrast to albumin, prealbumin has a relatively short half-life (three to four days), making it a good indicator of the effect of nutritional intervention
- This measurement is not affected by the resident's overall hydration status

Total lymphocyte count (TLC)

- Lymphocyte count is an indirect measure of nutritional status and immune function
- Decreased TLC is associated with delayed wound healing and increased mortality
- Less than 1,500 cells/mm³ indicates immunocompromise
- Less than 1,200 cells/mm³ indicates protein deficiency

Assess risk

Use the Braden Scale to assess risk

Scoring on the Braden Scale²

Each category is rated on a scale of one to four (excluding friction and shear, which is rated on a one-to-three scale) for a possible total of six to 23 points. The level of risk indicates the intervention strategies that should be used.

≤18 A score of 18 or lower indicates that risk and prevention interventions should be employed.

≥19 A score of 19 or higher indicates that the resident is low risk with no need for treatment.

See the Braden Scale for predicting pressure sore risk for detailed descriptions of each criterion.

Very high risk	≤9
High risk	10–12
Moderate risk	13–14
Mild risk	15–18
No risk	19–23

Sensory perception

How does the resident respond to pressure related discomfort?

- 1 Completely limited**
Unresponsive to painful stimuli.
- 2 Very limited**
Responds only to painful stimuli or may have a sensory impairment.
- 3 Slightly limited**
Responds to verbal commands, but cannot always communicate.
- 4 No impairment**
Responds to verbal commands.

Assess risk (continued)

Use the Braden Scale to assess risk

Is the resident exposed to moisture?

- 1 Constantly moist**
Skin is almost always moist from perspiration, incontinence, etc.

- 2 Very moist**
Skin is often, but not always, moist. Linens must be changed at least once a shift.

- 3 Occasionally moist**
Skin is occasionally moist. Linen requires an extra 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 nonexistent. Cannot bear own weight and/or must be assisted into chair or wheelchair.

- 3 Walks occasionally**
Walks during day for 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 waking hours.

Assess risk (continued)

Use the Braden Scale to assess risk

Mobility

Ability to change and control body position

- 1 Completely immobile**
Cannot move without assistance.

- 2 Very limited**
Makes occasional slight movements 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

Usual food intake pattern

- 1 Very poor**
Never eats a complete meal, rarely eats more than one-third of any food offered, takes fluids poorly or is NPO (nothing by mouth) and/or maintained on clear liquids or IVs for more than five days.

- 2 Probably inadequate**
Rarely eats a complete meal and generally eats only about one-half of any food offered, occasionally will take a dietary supplement or receives less than optimum amount of liquid diet or tube feeding.

- 3 Adequate**
Eats more than half of most meals or is on a tube feeding or TPN regimen which might meet most nutritional needs.

- 4 Excellent**
Eats most of every meal, occasionally eats between meals and does not require supplementation.

Assess risk (continued)

Use the Braden Scale to assess risk

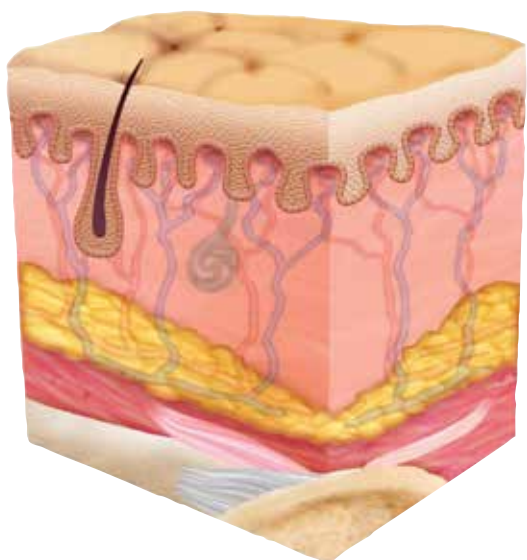
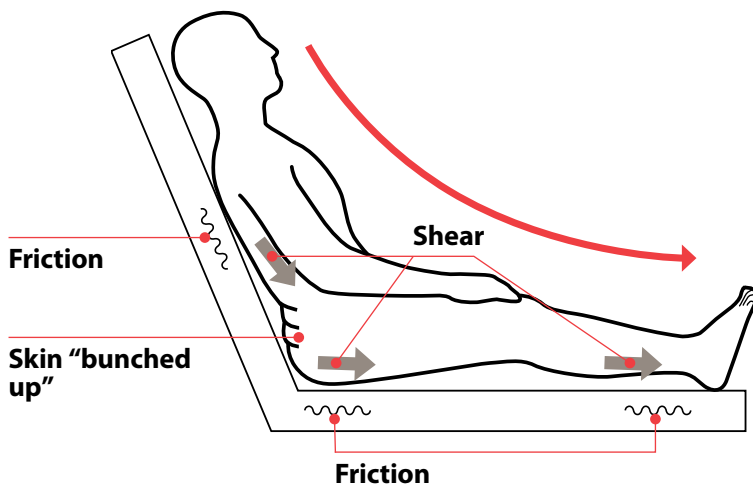
Friction and shear

- 1 Problem**

Requires moderate to maximum assistance in moving, frequently slides down in bed or chair. Spasticity, contractures or agitation leads to almost constant friction.
- 2 Potential problem**

Moves feebly or requires minimum assistance, maintains relatively good position in chair or bed most of the time.
- 3 No apparent problem**

Moves in bed and chair independently and has sufficient muscle strength to move.



- Epidermis is the outer layer and is water-resistant
- Dermis is the inner layer and consists of living cells
- Subcutaneous layer is a fatty layer, providing padding
- Muscle
- Bone

Assess wound³

A wound assessment form is an important component of wound treatment.

A well-designed form helps you to document your wound assessment findings more frequently, improving the continuity of care.

You can construct a form around the mnemonic A.S.S.E.S.S.M.E.N.T.S.

Anatomic location and age of the wound

Size, shape and stage

Sinus tracts and undermining

Exudate

Sepsis

Surrounding skin

Maceration

Eedges and epithelialization

Necrotic tissue

Tissue bed

Status

Anatomic location and age of the wound

- Document using correct anatomic terms to prevent any misunderstanding
- Document how long the resident has had the wound, which will help you decide whether to initiate acute or chronic wound healing interventions

Size, shape and stage of the wound

- Measure the wound's size; don't estimate it or compare it with objects, such as a quarter
- Measure the greatest length, width and depth of the wound in centimeters
- Use the appropriate wound classification tools:
 - NPUAP staging system for pressure injuries
 - Payne-Martin classification system for skin tears
 - Wagner or University of Texas wound classification system for neuropathic ulcers
 - CEAP (clinical, etiologic, anatomic and pathophysiology) system for venous ulcers

Assess wound³ (continued)

Sinus tracts and undermining

A sinus tract (or tunnel) is a channel that extends under the skin from any part of the wound. It involves an area that is larger than the wound's visible surface. These are commonly found in dehisced surgical wounds as well as in neuropathic and arterial wounds.

Undermining occurs when the wound edges pull away from the wound base and tissue around the wound perimeter is destroyed.

- Intervene by loosely packing the undermined area and applying an appropriate dressing, such as a hydrogel or alginate
- Document the sinus tracts and undermining by using the analogy of a clock (with the resident's head at noon)

Exudate^{1,2}

- | | | |
|--------------------------------------|------------------------------------|--|
| • Describe the amount of exudate as: | • Document wound exudate color as: | • Document wound exudate consistency as: |
| - None | - Pale yellow | - Watery |
| - Small | - Pink | - Thick |
| - Moderate | - Bloody red | - Purulent |
| - Large | | |

Sepsis (septic wound)

This infection can be local or systemic.

- Assess for signs and symptoms of infection, which include:
 - Erythema
 - Warmth
 - Edema
 - Purulent, or increased drainage
 - Induration
 - Tenderness or pain at and around the wound
- Culture the wounds by:
 - Tissue biopsy (gold standard)
 - A culture of aspirated fluid
 - A swab specimen to culture the wound
- Avoid applying the culture swab to necrotic tissue or into pus; the goal is to identify organisms present in viable wound tissue — not surface contaminants
- Document any wound odor, which may indicate infection

Assess wound³ (continued)

Surrounding skin

- Look for signs of allergic reactions to tape or dressing adhesives.
- Use your fingertips to gently palpate surrounding skin for evidence of induration or fluctuance

Maceration

Maceration is a whitish, waterlogged area of softened skin surrounding a wound. This may be a sign that the dressing can't absorb the amount of wound exudate.

- Protect the skin by:
 - Changing the type of dressing
 - Applying a barrier cream on the surrounding skin
 - Changing the dressing more frequently

Edges and epithelialization

Epithelialization is the movement of epithelial cells across the wound surface to regenerate the epidermis. This is characterized by a pearly or silvery and shiny look to the wound.

- Note that wound edges may:
 - Be attached to the wound bed
 - Be unattached
 - Be rolled inward
 - Help identify the wound's etiology
- Document the percentage of epithelialization

Necrotic tissue

Necrotic tissue is dead tissue. It inhibits wound healing and may be:

- yellow
- gray
- brown
- black

Slough is stringy, yellow necrotic tissue. Eschar is dry, hard, dark black or brown necrotic tissue.

- Document necrotic tissue by its percentage of the wound bed

Assess wound³ (continued)

Tissue bed

- Describe wound bed tissue by its color:
 - Pale pink
 - Pink
 - Red (a clean, granular wound bed usually is red)
 - Yellow
 - Black
- Document the percentage of:
 - Necrotic tissue
 - Epithelialization
 - Granulation tissue in the wound bed
- Assess the percentage of each tissue type to help document the outcome of care by tracking the improvement toward a clean, granular wound bed

Status

- Conclude documentation with the overall status of the wound and its progress
- Indicate any additional interventions (referrals or supportive therapies such as pressure-relief mattresses)
- Sign your name

Assessment tools

Ankle-brachial index (ABI)⁴

- Is a comparison of the perfusion pressures in the lower leg with those in the upper arm
- Screens residents for evidence of significant arterial insufficiency
- Can be used to identify residents requiring further workup

$$\text{ABI} = \frac{\text{Higher of two ankle pressures}}{\text{Higher of two brachial pressures}}$$

Abnormally high	>1.3
Normal range	1.0-1.3
Compression is considered safe	0.8-0.95
Arterial disease	<0.8

References: 1. Myers, B. *Wound Management: Principles and Practices*. 3rd ed. Tulsa, OK: Pearson; 2014. 2. Haesler, E. *Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline*. 2nd ed. Osborne Park, Western Australia: Cambridge Media; 2014. 3. Baranoski S, Ayello EA. Using a wound assessment form. *Nursing*. 2005;35(3):14-15. 4. Bryant RA, Nix DP. *Acute & Chronic Wounds: Current Management Concepts*. 4th ed. St. Louis, MO: Elsevier; 2016.

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