

Accredited Education  
NCC CE Provider Unit

## WOUND ASSESSMENT

### Acute and Chronic

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### OBJECTIVES

- Discuss classification systems and testing methods for pressure ulcers, venous, arterial and diabetic wounds
- List at least five items to be assessed and documented when evaluating an existing wound (acute and chronic)

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### ITEMS TO CONSIDER

- Items to be assessed and documented on a wound
- How the NPUAP defines a Stage I pressure ulcer
- What is undermining
- What are sinus tracts
- How to recognize slough
- Location of venous, diabetic and arterial ulcers
- Wound cultures
- Classification systems for pressure, diabetic, venous and arterial ulcers

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### ITEMS TO CONSIDER

- Interventions involved in wound bed preparation
- Dressings that facilitate autolytic debridement
- When to use advanced wound treatment modalities

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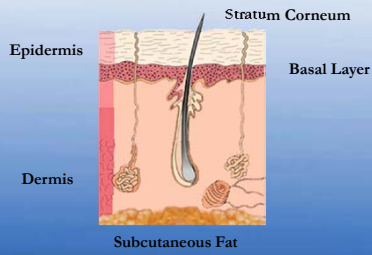
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### WOUND ASSESSMENT



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### WOUND ASSESSMENT

- Location
- Stage/Partial or full thickness
- Size
- Exudate
- Wound base
- Surrounding tissue
- Infection
- Pain

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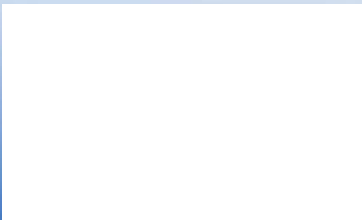
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**WOUND LOCATION**



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**CLASSIFICATION OF OTHER WOUNDS**

- Partial thickness
- Full thickness

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**WOUND TYPES**

- Pressure Ulcers
- Venous insufficiency
- Arterial ulcer
- Diabetic foot ulcer
- Traumatic wound
- Abdominal Compartment Syndrome (ACS)
- Dehisced wound

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## PRESSURE ULCER



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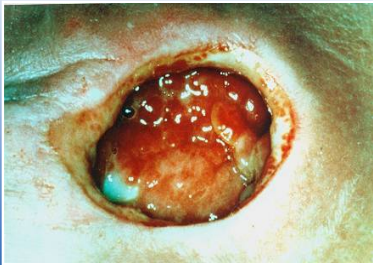
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## STAGING PRESSURE ULCERS



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## STAGE I DEFINITION

- 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.



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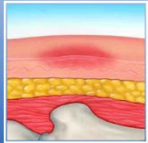
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### STAGE I DESCRIPTION

- The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue.
- Stage I may be difficult to detect in individuals with dark skin tones.
- May indicate “at risk” persons (a heralding sign of risk).



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### STAGE I



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### STAGE I



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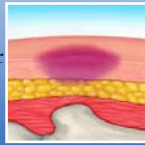
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### DEEP TISSUE INJURY DEFINITION

- 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.



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### DEEP TISSUE INJURY DESCRIPTION

- Deep tissue injury may be difficult to detect in individuals with dark skin tones.
- Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar.
- Evolution may be rapid exposing additional layers of tissue even with optimal treatment.



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### STAGE II DEFINITION

- Partial thickness loss of dermis presenting as a shallow open ulcer with a red or pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.



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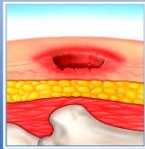
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### STAGE II DESCRIPTION

- Presents as a shiny or dry shallow ulcer without slough or bruising. \*
- This stage should not be used to describe skin tears, tape burns, perineal dermatitis, maceration or excoriation.



\*Bruising indicates suspected deep tissue injury.



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### STAGE II



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### STAGE II



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### STAGE III DEFINITION

- 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.



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### STAGE III DESCRIPTION

- The depth of a Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and Stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Stage III pressure ulcers.
- Bone/tendon is not visible or directly palpable.



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### STAGE III



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### STAGE III



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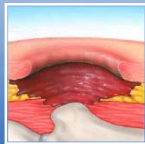
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### STAGE IV DEFINITION

- 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.



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### STAGE IV DESCRIPTION

- The depth of a Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and these ulcers can be shallow.
- Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis possible.
- Exposed bone/tendon is visible or directly palpable.



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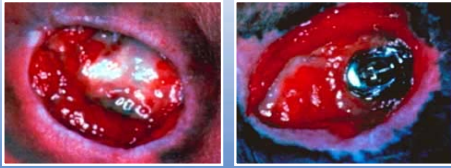
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## STAGE IV



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## UNSTAGEABLE DEFINITION

- 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.



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## UNSTAGEABLE DESCRIPTION

- Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined.
- Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as “the body’s natural (biological) cover” and should not be removed.



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## VENOUS INSUFFICIENCY ULCERS



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## VENOUS INSUFFICIENCY ULCERS

- Affects 1% of the general population
- Affects 3.5% of the population over 65 years of age
- Recurrence rate of 70%
- Seen more often in women than men



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## VENOUS INSUFFICIENCY



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**VENOUS INSUFFICIENCY**



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**VENOUS INSUFFICIENCY**



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**ARTERIAL ULCERS**



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### ARTERIAL ULCERS

- Arterial ulcers are not as common as venous insufficiency ulcers, but they are more difficult to treat due to decreased blood flow to the limb.

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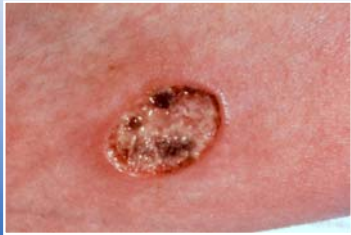
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### ARTERIAL ULCERS



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### TESTING



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## TESTING



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## EXAMPLE OF ABI

- Arm pressure = 140/80 and ankle pressure = 120
- $ABI = \frac{\text{systolic ankle pressure}}{\text{systolic arm pressure}}$
- $ABI = \frac{120}{140}$
- $ABI = 0.85$
- Claudication  $< 0.8$
- Severe arterial disease  $0.5 - .75$
- $< 0.5$  Limb threatening

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## THE DIABETIC FOOT



Prevention is Paramount

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### Risk Factors Conspicuously

- Vascular disease
- Level of formal education
- Nephropathy
- Retinopathy
- Impaired vision
- Alcohol or tobacco use
- Obesity



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### DIABETIC ULCERS



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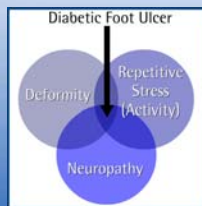
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### Etiology of Neuropathic Diabetic Foot Ulcers

Pressure x Cycles of Repetitive Stress = Wound



Morag & Cavanagh, J Biomech, 1999  
Armstrong et al, Diabetes Care, 2003

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## DIABETIC ULCERS

Table 4-2 Wagner Ulcer Grade Classification

Table 1  
University of Texas Wound Classification System

Stage	0	1	2	3
A	Pre- or postulcerative lesion completely epithelialized	Superficial wound, not involving tendon, capsule, or bone	Wound penetrating to tendon or capsule	Wound penetrating to bone or joint
B	With infection	With infection	With infection	With infection
C	With ischemia	With ischemia	With ischemia	With ischemia
D	With infection and ischemia	With infection and ischemia	With infection and ischemia	With infection and ischemia

5. Gangrene of the foot requiring amputation

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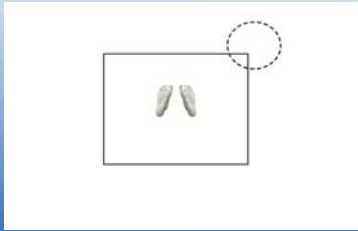
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## MONOFILAMENT TESTING




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## Diabetic Ulcer Goals of Treatment

- Remove cause
- Remove necrotic tissue
- Control infection
- Control exudate
- Maintain moist wound healing environment

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**TRAUMA**



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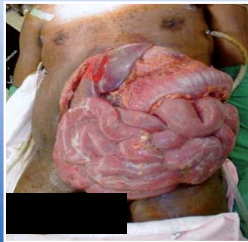
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**ABDOMINAL COMPARTMENT SYNDROME (ACS)**



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**DEHISCED**



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### Causes of Dehiscence

- Surgical technique
- Mechanical stress
- Systemic issues



### Early vs. Late Dehiscence

- Early – Related to suture failure and/or technique
- Late – Related to infection/abscess formation

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### MEASUREMENTS

- Size and depth
- Undermining
- Tunneling
- Sinus tracts



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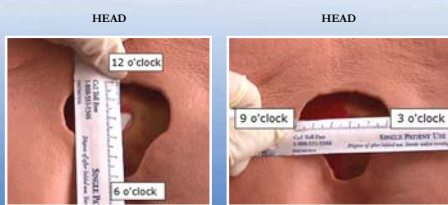
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### LENGTH & WIDTH MEASUREMENTS



Length

Width

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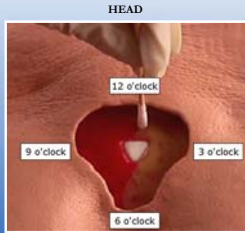
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## DEPTH MEASUREMENT



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## CONVERTING MEASUREMENTS



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## EXUDATE DESCRIPTION



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**WOUND BASE STATUS**



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**PERIWOUND SKIN SURROUNDING TISSUE**



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**INFECTION**



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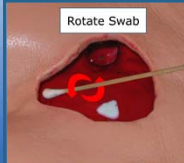
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### Wound Cultures: To Swab or Not to Swab

- Tissue biopsies are the gold standard
- Qualitative and quantitative swab cultures are a reasonable alternative to tissue biopsies in clinical practice
- Cultures are done to ensure that the correct antibiotic is being used



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### CLEANSERS (ANTISEPTICS)

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| <ul style="list-style-type: none"><li>• Dakins</li><li>• Acetic acid</li><li>• Providone-Iodine</li><li>• Hydrogen peroxide</li><li>• Hibiclens</li><li>• Normal saline</li></ul> | <ul style="list-style-type: none"><li>• Staph/Strep</li><li>• Pseudomonas</li><li>• Broad spectrum antibacterial</li><li>• Mechanical cleansing agent</li><li>• Anti-bacterial soap acceptable</li></ul> |
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### DEBRIDEMENT METHOD

- Autolytic – WBC/moisture, selective, slow
- Enzymatic – Topical application of debriding product
- Mechanical – Pulsed lavage, whirlpool, W/D dressing (nonselective)
- Surgical/Sharp – Selective (scissors, scalpels, lasers)



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### PRINCIPLES OF MOIST WOUND HEALING

- Oxygenation and circulation
- Remove necrotic tissue
- Control exudate
- Control infection
- Insulate wound
- Dead space
- Clean, moist environment

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### Wound Dressing Selection

- Dressing selection is based on wound assessment and the characteristics of the dressing
- Some dressings maintain a moist environment, protect, and insulate
- Examples of those dressings:
  - Films
  - Hydrocolloids
  - Hydrogels
  - Foams
  - Alginates



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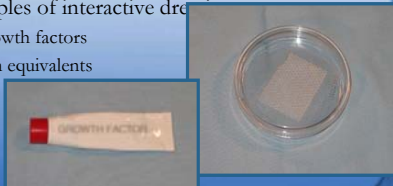
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### Wound Dressing Selection (continued)

- Active dressings interact with the wound bed to enhance healing
- Examples of interactive dressings:
  - Growth factors
  - Skin equivalents



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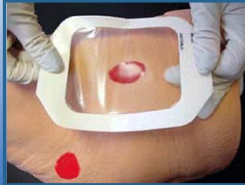
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### Dressings — Transparent Films

- Maintain moisture
- Autolytic debridement
- No absorption
- Protect and insulate



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### Dressings — Hydrocolloids

- Autolytic debridement
- Moist environment
- Absorption
- Change: dependent on amount of exudate
- Careful with infected wounds



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### Dressings — Hydrogels

- Water, glycerin, or aloe based
- Provide moisture to wounds
- Autolytic debridement
- Sheet dressings, impregnated gauze, and amorphous gels



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### Dressings — Foams

- Pads, sheets, cavity dressings
- Absorption of exudate
- Autolytic debridement (not effective with eschar)
- Maintains moisture
- Non-adherent surface
- Frequency of change dependent on amount of exudate



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### Dressings — Calcium Alginates

- Derived from seaweed
- Absorbent, comfortable
- Forms soft gel that maintains moist environment
- Autolytic debridement (not on eschar)
- Infected or non-infected wounds
- Available in sheets or ropes



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### Advanced Therapies: When to Use Them on Pressure Ulcers

- Large wounds
- Ulcers of long duration
- Wounds that do not have 30% healing by 2-3 weeks
- Stage III & IV pressure ulcers
- Wounds with exposed bone or tendon (hard to granulate areas)

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### Advanced Dressings and Therapies

- Dressings:
  - Collagen
  - Hyaluronic acid
  - Skin substitutes
- Drugs: topical growth factors (Regranex™)
- Surgical procedures: flaps and grafts
- Devices:
  - Provant® Wound Closure System
  - Electrical stimulation (E-stim)
  - Ultrasound
  - Negative Pressure Wound Therapy
- Biologicals: skin equivalents

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### Cost-Effective Care

- Cost-effective care means:
  - Shorter healing times
  - Fewer dressings
  - Decreased length of stay
  - Fewer home visits
  - Decreased personnel time
  - Improved quality of life
- Faster wound closure equals cost-effective care.

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### PAIN

- Acute, chronic, neuropathic, other?
- Elements – PQRST
- Wound pain
- Positioning pain
- Dressing pain
- Other



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**OUTCOMES**

- Assess
- Reassess
- Evaluate
- Reevaluate

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**QUESTIONS**

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**THE END**



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