Pressure Ulcers: Treatment and Prevention

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Goal

Consider the possibility of pressure ulcer development

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Objectives

- Identify ulcer stage during exam
- Recognize risk factors
- Implement strategies for prevention
- Utilize proper treatment
- Abandon unproven treatments

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What is a Pressure Ulcer?

- Any lesion caused by unrelieved pressure resulting in damage to underlying tissue
- Result of prolonged issue ischemia
- Development is variable due to severity of illness and comorbid conditions

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Why does it matter?

- 60,000 patients die yearly
- $11,000,000,000 spent yearly for treatment
- Up to $150,000 per ulcer
- 2,500,000 new pressure ulcers yearly
- 17,000 lawsuits per year
- Medical facilities are primarily responsible for prevention

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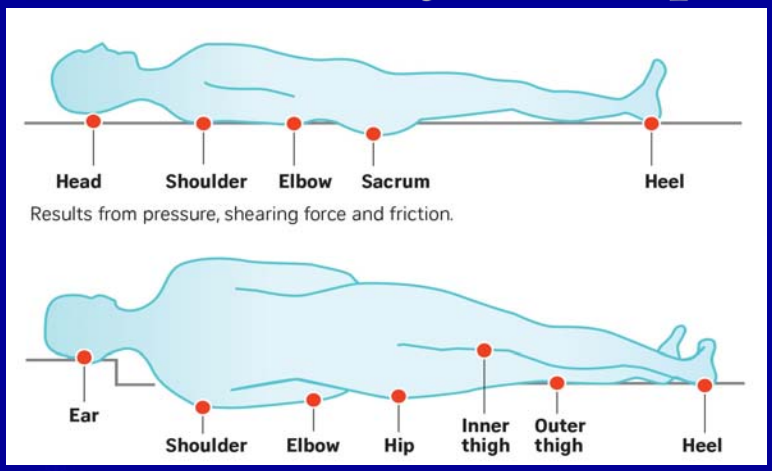
Where do they develop?



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How are they staged?

- Pressure ulcers are staged I – IV
- Eschared ulcers are called unstageable
- Deep tissue injury is a precursor to a pressure ulcer

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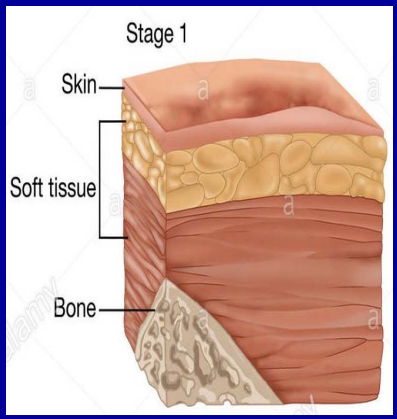
Stage I Ulcer

- Skin still intact
- Painful
- Density changes
- Temperature changes
- Color changes
- Non-blanchable



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Stage I Ulcer

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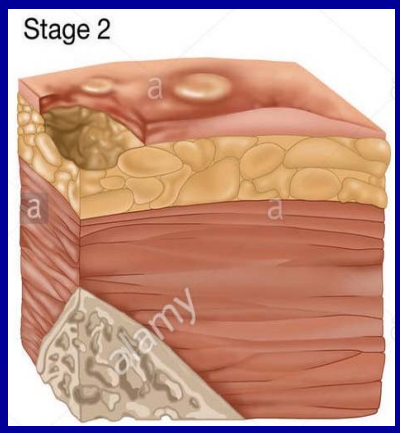
Stage II Ulcer

- Partial thickness
- Loss of dermis
- Bulla
- Minimal slough
- No bruising



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Stage II Ulcer

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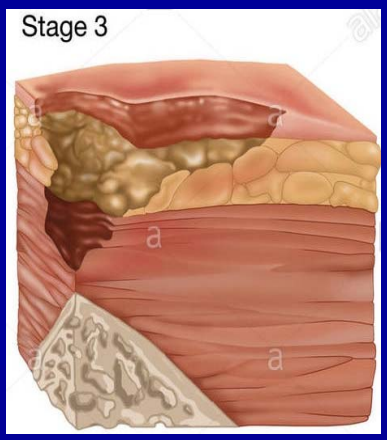
Stage III Ulcer

- Full thickness
- Undermining
- Tunneling
- No exposed structures
  - muscle, tendon, bone



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Stage III Ulcer

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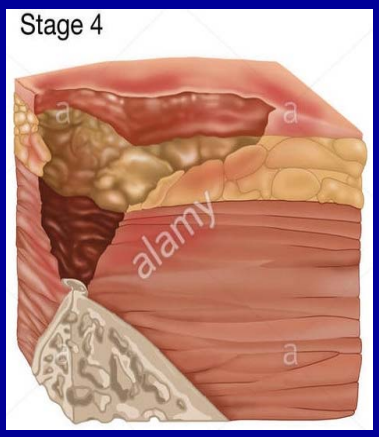
Stage IV Ulcer

- Full thickness
- Exposed structures
- Osteomyelitis risk



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Stage IV Ulcer

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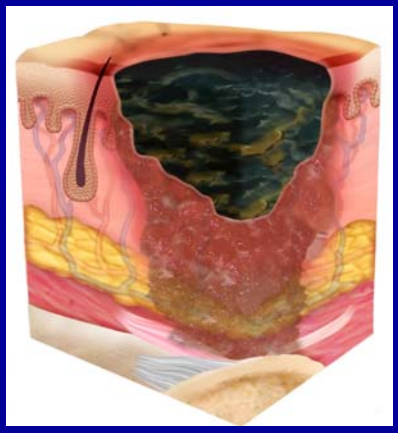
Unstageable Ulcers

- Full thickness
- Unable to visualize base
- Keep in place
- Protective



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Unstageable Ulcers

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Risk Factors

- Intrinsic: disease states and physiologic factors that increase the risk for pressure ulcer development
  - Age over 70
  - Malnutrition (low BMI)
  - Arterial disease
  - Dementia
  - Delirium
  - Frailty

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Risk Factors

- Extrinsic: external factors that damage skin
  - Pressure
  - Friction
  - Shear forces
  - Incontinence (urinary, bowel)
  - Tissue hydration (hyper, hypo)

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Risk Assessment Scales

- Norton Scale
  - Physical condition
  - Mental condition
  - Level of physical activity
  - Mobility
  - Continence or incontinence

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Risk Assessment Scales

- Braden Scale
  - Sensory perception: ability to respond to pressure-related discomfort
  - Moisture: degree of exposure to moisture
  - Activity: degree of physical activity
  - Mobility: ability to change and control body position
  - Nutrition: usual food intake

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Prevention Strategies

- Skin care
- Nutritional status
- Mechanical pressure reduction
- Mobility
- Support surfaces

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Prevention Strategies
Skin Care

- Daily skin assessment and cleaning
- Manage skin hydration
  - Moisturize when dry
  - Incontinence issues
- Special attention to bony prominences
- Manage shear forces and friction
  - Routine turn and position
  - Skin lubricants

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Prevention Strategies
Nutritional Status

- Protein-calorie malnutrition
  - Link to poor wound healing inconclusive
- Correct deficiencies only
  - No benefit in over-supplementing
- Enteral/parenteral route in severe cases
  - Need to discuss goals with patient/family

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Prevention Strategies
Mechanical Pressure Reduction

- Heel ulcer account for over 20%
  - Assess and moisturize
  - Socks to reduce friction
- Reposition every 2 hours
- Keep head of bed as low as possible
- Shift weight when sitting every 15 minutes
  - 'Doughnut pillows' no longer used

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Prevention Strategies
Mobility

- Patient's ability to change and control body position
- Improved mobility prevents ulcers
- Immobility leads to pressure ulcers
- Aggressive PT/OT when appropriate
- Passive ROM exercises beneficial

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Prevention Strategies
Support Surfaces

- Use for all at-risk patients
- Static support surface
  - Air, gel, water, foam
- Dynamic support surface
  - Alternating air mattress, low-air-loss mattress
  - Indicated for failure of static support surface
    - Morbid obesity, significant bony prominences

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Treatment Plan

- Plan based on several factors:
  - Comorbid conditions
  - Patient participation
  - Care goals per patient and family
  - Location and quality of ulcer

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Initial assessment

- Etiology of wound
- Exacerbating comorbities
  - Peripheral vascular disease
  - Autoimmune disease, immunocompromise
  - Medications
  - Malnutrition
- Patient care and compliance
  - Caregiver competency
  - Patient care goals

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Management

- Debridement
- Wound dressings
- Nutritional support
- Surgical options

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Management
Debridement

- Sharp debridement
  - Use of sharp instrument to remove tissue
  - Direct visualization of result
  - Allow for optimization of the 'woundscape'
    - Removal of callous
    - Optimized margins
    - Management of slough, devitalized tissue

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Management
Debridement

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Management
Debridement

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Management
Debridement

- Enzymatic debridement
  - Collagenase ointment (Santyl) most common
  - Breaks down necrotic tissue
  - No harm to living tissue, granulation tissue
  - Use in conjunction with sharp debridement
- Autolytic debridement
  - Not preferred
  - Allows dead tissue to dissolve spontaneously
  - Very slow process

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Management
Debridement

- Biotherapy
  - Use of live, disinfected maggots (fly larvae)
  - Digest only dead tissue
  - Applied for 2 – 3 days with special dressing
  - Not commonly used

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Management
Debridement

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Management
Debridement

- Mechanical (wet-to-dry, wet-to-moist)
  - Not recommended
  - Dead tissue adheres to dressing as it dries
  - Very painful when removed
  - No effective method to reduce pain
  - Live tissue often damaged during removal

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Management
Dressings

- Basic principle is to optimize moisture
  - Absorptive dressings for draining wounds
  - Hydrating dressings for dry wounds
  - Addition of silver for high bioburden

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Management
Dressings

- Wounds with moderate - heavy exudate
  - Alginate
    - Highly absorptive, forms gel
    - Derived from seaweed
    - Biodegradable
  - Hydrophilic dressing (foam)
    - Highly absorptive
    - Typically used over alginate
    - Can help cushion wound

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Management
Alginate Dressing

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Management
Dressings

- Wounds that are dry or minimal exudate
  - Hydrogels
    - Gel, impregnated gauze, sheet
    - 90% water
    - Will help to hydrate dry wounds
    - Often use for burn and partial thickness wounds

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Management
Dressings

- Wounds with heavy bioburden
  - Most dressings have silver option
    - Silver gel, silver alginate
  - Silver is a natural antimicrobial
  - Used to reduce local bioburden
  - Does not replace need for antibiotic

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Management
Nutrition Support

- Malnutrition can slow tissue repair
- Correct identified deficiencies
- Ensure adequate calorie and protein intake
  - > 30 calories/kg/day
  - > 1.5 grams protein/kg/day
- Multi- vitamin/mineral supplements not supported by evidence

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Management
Surgical Options

- Direct closure
  - skin grafting
  - Flaps – skin, musculocutaneous , free flaps
  - Does not correct underlying cause
  - High rate of recurrence
  - Must undergo anesthesia
  - Comorbid conditions that lead to ulcer often exclude surgical option

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Management
Surgical Options

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Management
Surgical Options

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Wound Clinics

- Discrete clinics specializing in wound care
- Staffed by certified physicians
- Highly structured treatment plan
  - Proven systematic approach
  - Management of comorbid conditions
  - Management of debridement and dressings
- Will follow patient regularly until healed

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Take home points

- Identifying high-risk patients is the key to prevention and early detection
- Pressure ulcers can lead to serious morbidity and mortality
- Unrelieved pressure, excessive moisture, friction and shear must be minimized
- Do not hesitate to refer to a wound clinic

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Cases

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