Overview

• Basic rules of assessment
• Identify risk factors
• Evaluation
• Management
• Complications
• Education

* Content based on Wound Healing Society “Guidelines for the treatment of pressure ulcers” Wound Repair and Regen; 2006 14:633-679 or www.woundheal.org

Rules for All Wounds

• Examine whole patient to identify risk factors and causes of tissue injury and correct them
• Examine nutritional status
• Examine tissue perfusion and oxygenation
• Ongoing and consistent documentation

✓ Size - base - periwound skin
✓ Exudates - staging - pain

• Wound infection defined as
  ✓ >10^5 CFU/gm tissue - AFTER debridement
  ✓ Or presence of β-hemolytic strep

• Bacterial balance defined as
  ✓ ≤ 10^5 CFU/gm tissue
  ✓ And no β-hemolytic strep
Risk Factors

- Poor nutritional status
- Flexion contractures
- Wheelchair - esp extremes of mobility
- Prolonged hospitalization with bedrest
- Mechanical/shear
  - Transfers
  - Hygiene
- Moisture – especially incontinence

Yeast Dermatitis

Incontinence Dermatitis

Etiology

- External pressure exceeds capillary pressure (20-30 mmHg)
- Pressure is greatest over bony prominences
  - Must be over bony prominence
  - Decubitus = pressure sore acquired while recumbent
  - Ischial sore = sitting sore
- Cone of destruction with apex at skin surface
  - Muscle tissue least tolerant of ischemia
  - Skin most tolerant to ischemia
Stage I Pressure Ulcer

Stage II Pressure Ulcer

Stage III Pressure Ulcer
Stage IV Pressure Ulcer

Deep Tissue Injury

Unstageable Pressure Ulcer

Evaluation

- Critical surfaces
  - Chair
  - Cushion
  - Mattress
- Pressure mapping
- Nutritional status
  - Pre-albumin
  - Albumin for renal failure patients
### Evaluation

- Assess nutrition on entry to new health care system or change in condition
- Ensure adequate dietary intake
- Encourage dietary supplements if deficiency suspected
  - Appetite stimulants
  - MVI
  - Increase protein intake
- Monitor nutritional status with weekly pre-albumin levels

### Evaluation

- Ambulatory status – avoid bedrest, unless an ischial sore is present
- Flexion contractures
- Spasticity
- Incontinence/moisture

### Evaluation

- Physical exam
  - Location
  - Measurements: L x W x D, tunneling
  - Appearance
    - Odor
    - Size
    - Base/necrotic debris
    - Periwound skin
    - Exudates
    - Staging

### Management

- Establish repositioning schedule and avoid positioning on wound
- Maintain head of bed at lowest elevation possible ( < 30° elevation)
- Use pressure reducing surface for high risk patients
- Get seat and cushion check yearly
Management

- Perform initial and maintenance debridement
- Remove all necrotic debris
  - Enzymatic
  - Sharp
  - Mechanical
- Infection control – reduce bacterial burden/achieve “bacterial balance”

Management

- Use topical antimicrobials to decrease infected wound bacterial levels
  - IV antibiotics do not effectively decrease bacterial levels in granulating wounds
  - Once in “bacterial balance” (10^5 CFU/gm tissue and no β-hemolytic strep) d/c topical antimicrobials
- Achieve “bacterial balance” before attempting surgical closure

Management

- Wounds can harbor persistent organisms due to contamination from distant sites of infection, e.g. urine
- Infection surveillance – obtain specimen AFTER debridement
  - Tissue biopsy - preferred
  - Quantitative swab culture
- Check for infection if ≥ 2 weeks stalled healing in debrided wound

Management

- Routine wound cleansing with neutral non-toxic solution
- Achieve local moisture balance
  - Maintain moist wound environment
  - Manage exudate to protect periwound skin
- Dressing must stay in place and minimize shear/friction/skin irritation
- Select cost effective dressing
Wound Dressings

<table>
<thead>
<tr>
<th>Dressing</th>
<th>Indications</th>
<th>Examples</th>
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<tr>
<td>foam</td>
<td>med exudate</td>
<td>Mepilex</td>
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<tr>
<td>antibacterial</td>
<td>infected</td>
<td>Kerlix AMD</td>
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<tr>
<td>alginate</td>
<td>hi exudate - requires secondary drsg</td>
<td>Kaltostat, Silverol</td>
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<tr>
<td>hydrogel</td>
<td>dry or fibrousous exudate, granulating</td>
<td>Duoderm gel</td>
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<tr>
<td>hydrocolloid</td>
<td>superficial wound with minimal exudate</td>
<td>Duoderm</td>
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<tr>
<td>hydrofiber</td>
<td>low exudate - autolytic debride</td>
<td>Aquacel (Ag)</td>
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<td>bioactive</td>
<td>advanced therapy</td>
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<td>barriers</td>
<td>periwound maceration</td>
<td>Aloe Vesta</td>
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<td></td>
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<td>Aloe Vesta antifungal</td>
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</tbody>
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Complications

- Infection
  - Tissue biopsy/quantitative swab for culture
  - Radiology
- Labs
- Secondary Amyloidosis
- Autonomic dysreflexia – peri-op
- Marjolin’s ulcer
- Urethrocutaneous fistula

Management

- Negative Pressure Wound Therapy
  - Indications
    - Stage III or IV ulcer
    - Clean wound
  - Contraindications
    - Dirty/not debrided (> 30% necrotic tissue)
    - Fistula
    - Stool or urine contamination
    - Active bleeding
    - Untreated osteo
Candidates for Surgery

- Grade III or Grade IV ulcer
- Clean wound
- Chair and cushion evaluated ≤ 12 mos
- Adequate nutritional status

Candidates for Surgery

- Spasticity controlled
- No significant flexion contractures
- Evidence of patient compliance
  - Post-op bedrest for 30 days
  - One sore repaired per surgery
- Adequate psychosocial support
  - Pt insight into ulcer condition
  - Evidence of social support structure
Causes of Surgical Failure

- Spasticity
- Flexion contractures
- Improper cushion
- Infection
  - Hold bowel regimen immed post-op x 72 hours
  - Urinary catheter
- Hematoma/seroma
- Shear - poor patient compliance with bedrest
- Poor nutritional status

Education

- Patient and their caregivers
  - Pressure relief
  - Moisture
  - Nutrition
  - Chair and cushion selection and maintenance
  - Psychosocial support
Education

- Health care providers - especially for prevention of ulcers
  - Pressure relief
  - Frequent checks
    - 3P’s: pain, positioning, potty
    - Skin- esp around devices, e.g splints, cervical collars, etc
  - Management of incontinence
  - Physical Therapy to prevent flexion contractures
  - Nutrition support
  - Infection surveillance
  - Consistent and ongoing documentation

Resources

- 1. Ohio State’s Wheelchair Seating and Positioning Clinic
  - Dodd Hall Rehabilitation Services Outpatient Therapy
    OSU Martha Morehouse Medical Plaza
    2050 Kenny Road, Suite 2100 • Columbus, Ohio 43221
    (614) 293-3647 (phone) • (614) 293-6400 (fax)

- 2. Information for finding a good rehab Supplier/Clinician outside of central Ohio:
  - http://resna.org/find-a-certification (has listing of ATP professionals across the country)
  - www.nrrts.org (resource for w/c suppliers)

Summary

- Optimize conditions for both prevention and healing
  - Pressure relief
    - Surfaces
    - Positioning
    - Chair and cushion pressure mapping
  - Moisture management
  - Nutritional monitoring/optimization
  - Infection surveillance
  - Prevention of flexion contractures
  - Education
    - Patient
    - Family/caregiver
    - Healthcare staff
  - Consider referral to Wound Care Center