Wound Assessment & Management

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Objectives

• Review:
  – Anatomy and physiology of skin
• Enhance knowledge of:
  – Risk factors that alter skin integrity
  – Wound healing process
  – Prevention strategies
  – Pressure sore staging
  – Wound assessment & management
Anatomy

- Epidermis
- Dermis
- Hypodermis (subcutaneous tissue)

Epidermis

- Avascular
- Outer layer composed of 5 layers
- .5 to 1.1mm thick
- Regeneration - stratum germinativum
- Keratinized cells (protein)
- Squamous Cells (scale like)
- Melanocytes (pigment)
**Dermis**

- Below epidermis
- Collagen & elastin
- Contains:
  - Blood and lymph vessels
  - Nerves and nerve endings
  - Glands (sebaceous and sweat)
  - Hair follicles

**Subcutaneous tissue (hypodermis)**

- Attaches dermis to underlying structures
- Outer fat layer
- Inner thin elastic layer
- Insulates, cushions and protects
Physiology of Skin

- Protection
- Temperature regulation
- Sensation
- Fluid and electrolyte balance
- Vit D synthesis

Risk Factors

- Aging
- Poor nutrition
- Altered metabolic state
- Medical diagnosis e.g. diabetes
- Impaired circulation
- Impaired sensation
- Moisture
- Medications
Mechanical Risk Factors

Pressure

• One direction force
  – Over bony prominence

Mechanical Risk Factors

Shearing

• Opposing forces
Mechanical Risk Factors
Friction

- The act of rubbing one object against another

Phases of Wound Healing
Tissue Repair Analogy

Courtesy of Dr. Dean Kane
**Inflammatory Phase**

- 2 to 5 days
- Hemostasis - Platelets / Vasoconstriction
- Inflammation - Vasodilatation/ Phagocytosis

**Proliferative/ Granulation Phase**

- 2 days to 3 weeks
- Granulation
- Contraction
- Epithelialization
Maturation/Remodeling Phase

- 1 to 2 years
- Type III collagen replaced
- 80% as strong as original tissue

Holistic View

Support systems
- Home/agency
- Patient
- Wound
Prevention is Key

Braden Scale

- Sensory Perception: 1-4
- Moisture: 1 - high risk
- Activity: 4 – minimal risk
- Mobility: 16 or less considered at risk of developing pressure ulcer
- Nutrition
- Friction & Shear

Bloorview
KIDS REHAB
Hygiene

• Bathing– PH balanced skin cleansers.
• Moisturizers

Vulnerable areas over bony prominences

• Temporal region and occipital region of the skull
• Ears
• Scapula,
• Spineous processes,
• Shoulders
• Elbows
• Sacrum, coccyx,
• Ischial tuberosities
• Femoral trochanters
• Knees
• Malleoli, metatarsals, heels, toes
• Tensors, anti-embolic stockings, or restrictive clothing
• Prosthesis, splints
• Equipment
### Best Practice for Selecting Bed Surfaces

<table>
<thead>
<tr>
<th><strong>Pressure Relief</strong></th>
<th><strong>Pressure Reduction</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduces pressure between body and surface below capillary</td>
<td>Reduces pressure between body and surface but does not</td>
</tr>
<tr>
<td>closing pressure</td>
<td>consistently maintain pressure below capillary closing</td>
</tr>
<tr>
<td></td>
<td>pressure</td>
</tr>
<tr>
<td>(AHCPR, 1994; Mulder, Jeter &amp; Fairchild, 1991)</td>
<td>(AHCPR, 1994; Mulder et al., 1991)</td>
</tr>
<tr>
<td>To prevent breakdown when cannot turn; or for those who</td>
<td>Conforms to bony prominences</td>
</tr>
<tr>
<td>have breakdown</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Little memory</td>
</tr>
<tr>
<td></td>
<td>Doesn’t bottom-out</td>
</tr>
<tr>
<td></td>
<td>Relieves shearing</td>
</tr>
<tr>
<td></td>
<td>Decrease maceration</td>
</tr>
<tr>
<td></td>
<td>Comfortable</td>
</tr>
</tbody>
</table>

### Examples of Pressure Relief Surfaces.
Examples of Pressure Reduction

Support surface: sitting
Pressure Ulcer Staging

• Defined by the National Pressure Ulcer Advisory Panel
  (NPUAP, 1989)

STAGE I

• Non-blanchable erythema of intact skin
• In individuals with darker skin
  – Discoloration
  – Warmth
  – Edema
  – Induration or hardness
Stage 2

- Partial-thickness skin loss involving epidermis/dermis or both
- Superficial
  - Abrasion, blister or shallow crater

Stage 3

- Full-thickness skin loss involving damage to or necrosis of subcutaneous tissue
- Extends into but not through the fascia
- Presents as a deep crater with or without undermining
Stage IV

- Full-thickness damage
- Undermining and sinus tracts
- Extensive destruction or damage to muscle, bone & supporting structures
  - Tendon, joints

Stage X

- Black eschar or tough slough
- Unable to determine the extent of damage underneath
Other Wounds

- Traumatic
- Incisions
- Burns
- Skin tears
- Diaper dermatitis
- Venous
- Arterial
- Diabetic foot ulcers

Arterial Brachial Pressure Index (ABPI)
Venous Ulcer

- History of varicose veins
- DVTs
- Pain at end of day
- Relief with elevation
  (Sibbald, et al., 2001)
- Hemosiderin – (iron pigment)
- Irregular shape
- Superficial
- Wooden
- Deep ruddy red

Arterial Ulcer

- Intermittent claudication (calf)
- Pain during rest
- Smoker
- Decreased absent pulses
- ABI ≤ 0.5
- Round, shallow
- Punched-out lesions
- Smooth margins
  (Sibbald, et al., 2001)
Lower Extremity Ulcers

- Mixed Ulcers
- Compression therapy
- Debridement
- Vascular consults

Diabetic Foot Ulcer

- Increase risk of lower extremity ulcers
- Peripheral neuropathy
- Plantar surface
- Over metatarsal heads
- Under heel
- Cellulitis/osteomyelitis
- Control blood sugars
- Assess peripheral vascular disease
- Offloading
- Frequent skin checks
Create a Care Plan

- Utilize an interdisciplinary approach to plan care
- Incorporate client & family goals into planning
- Allows for consistent approach
- Reevaluate plan

**WOUND MANAGEMENT CARE PLAN GUIDELINES:**

- Care Plan can be used for more than one wound location but must have the same treatment plan.
- Initiate a new care plan for other wounds with alternative treatment plans.

**Type of Wound**

- Incision
- Pressure Ulcer – Stage
- Other Specify

**Dressing Schedule**

- Date Initiated: __________
- Initial: __________

**Location(s):**

(Written in Nurses Treatment Record)

**Frequency:**

- Due: __________
- Special Products
  - VAC:
  - Intermittent
  - Continuous
  - Technology:
  - Clean
  - Sterile
  - Pressure Reduction Type
  - Other

**Cleansing:**

- Pressure Relief Type
- Other
- Other

- Supplier/Ordering Instructions & Telephone #: __________

**Filler/Packing:**

- __________

**Cover Dressing(s):**

- __________

**Special Observations:**

- __________

**Resources:**

- Refer to Bloorview MacMillan Wound Management Standards

**Educator Assessment:**

- __________

- __________
Eliminate the Cause

- Seating Assessments
- Pressure
- Health
- Nutrition
- Life style choices

Nutrition: fuel for healing

- Facilitates wound healing
- Maintains immune competence
- Decreases risk of infection
- Protein
- Carbohydrates
- Fat
- Vitamins
- Minerals
- Water
Key principles for local wound care

- Cleansing and debriding the wound
- Treating and controlling infection
- Absorbing excess exudate
- Eliminating dead space
- Maintaining moisture
- Covering the wound
- Assessing & reassessing

Wound cleansing

- Do not use skin cleansers or antiseptics e.g. povidine iodine, hydrogen peroxide
- Use normal saline, Ringer’s Lactate, sterile water or non-cytotoxic wound cleansers
- Warm to room temp
- Each dressing change
- Use 100-150 ml
- Pressure 4-15 psi

(Assessment & Management of Stage I to IV Pressure Ulcers, Best Practice Guideline, RNAO, 2002)
The solution to pollution is dilution

Cleanse then assess the wound bed
Wound Bed Preparation

Management of Bacterial Balance
Management of Debridement
Management of Moist Wound Healing

Debridement

- **Selective** methods include surgical or sharp, mechanical, autolytic debridement

- **Non-selective** methods include wet-to-dry dressings, pressurized irrigation and whirlpool

- **Autolytic** debridement is facilitated by covering the wound with a moisture-retentive dressing such as a hydrocolloid or transparent film

- **Enzymatic** debridement involves topical application of an exogenous enzyme that digests necrotic tissue
Sharp debridement of non-viable tissue

Product Selection

- Moisture retentive dressing
- Absorbs exudate
- Fills dead space
- Infection/colonization
- Time
- Cost
## Product Selection

<table>
<thead>
<tr>
<th>Product</th>
<th>Absorbency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foams</td>
<td>High</td>
</tr>
<tr>
<td>Hydrofibre</td>
<td></td>
</tr>
<tr>
<td>Algimates</td>
<td></td>
</tr>
<tr>
<td>Hydrogel</td>
<td></td>
</tr>
<tr>
<td>Hydrocolloids</td>
<td></td>
</tr>
<tr>
<td>Non-Adherents</td>
<td></td>
</tr>
<tr>
<td>Transparent Films</td>
<td>Low Absorbency</td>
</tr>
</tbody>
</table>

## Healthy Granulation Tissue
Sinus Tract

**Assessment & Documentation**

- Stage/depth
- Location
- Size – including depth & undermining
- Odour
- Sinus tracts/undermining/tunnelling
- Exudate
- Appearance of wound bed
- Periwound and edges
- Pain
### Wound Assessment/Management Record - Side 1

**Position Client to be in:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
<th>Date</th>
<th>Date</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Time</td>
<td>Time</td>
<td>Time</td>
<td>Time</td>
</tr>
</tbody>
</table>

**Wound Location** (Refer to diagram)

<table>
<thead>
<tr>
<th>Type of Wound</th>
<th>Incision</th>
<th>Pressure Ulcer</th>
<th>Other Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incision</td>
<td>Pressure Ulcer</td>
<td>Other Specify</td>
</tr>
</tbody>
</table>

**Length** cm/mm

<table>
<thead>
<tr>
<th>Width</th>
<th>cm/mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 o'clock</td>
<td></td>
</tr>
<tr>
<td>3 o'clock</td>
<td></td>
</tr>
<tr>
<td>6 o'clock</td>
<td></td>
</tr>
<tr>
<td>9 o'clock</td>
<td></td>
</tr>
<tr>
<td>Centre</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Undermining** (Note location on clock and depth)

**Sinus Tract** (Note location on clock and depth)

**CODES:**

- Wound Base Colour
  - b = black eschar
  - y = yellow eschar
  - r = red granulation
  - o = other describe

- Stage I - IV, Stage X (refer to Comorbid Pressure Other Diagnosis Tool)

- Wound Base Colour (Code)

**Nurse Initials**

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### Wound Assessment/Management Record - Side 2

**CODES:**

- Drainage Type
  - n = normal
  - p = purulent
  - s = serous
  - ss = sanguineous

<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
<th>Date</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Time</td>
<td>Time</td>
<td>Time</td>
</tr>
</tbody>
</table>

**Wound Location** (Refer to diagram)

<table>
<thead>
<tr>
<th>Drainage Type</th>
<th>Drainage Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odour (e.g., sweet, putrid)</td>
</tr>
</tbody>
</table>

**Wound** (Describe edges/surrounding skin)

**Treatment Plan:**

- (Refer to Cleansing Imaplan  (Solutions)
  - Cleansing
  - Fill/Packing
  - Cover Dressing(s)

**Frequency of Change**

<table>
<thead>
<tr>
<th>Photograph Consent</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photograph Taken</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Wound outline drawing**

<table>
<thead>
<tr>
<th>Photograph Taken</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

**Nurse Initials**
Colonization & Infection

- Treatment – cleansing, antibiotics, debridement
- Protect the wound
- Systemic antibiotics
- Topical antibiotics
- Sterile technique
- Culture
Wound Swabs

- Z-technique
- Irrigate with NS
- Viable tissue
- Rotate & press
- Cover entire wound bed

Other treatment options

- Vacuum assisted closure
- Electrical stimulation
- Ultrasound
- Ultraviolet light
- Growth factors
Conclusion

- RNAO Best Practice Guidelines
- Knowledge, Skill & Judgment
- Prevention
- Interdisciplinary
- Client is central

References

- Registered Nurses Association of Ontario (RNAO) (2002). *Nursing Best Practice Guideline; Risk assessment and prevention of pressure ulcers.*
- Registered Nurses Association of Ontario (RNAO) (2002). *Nursing best practice guideline: Assessment & management of stage I to IV pressure ulcers.* RNAO, Toronto: ON.
- www.rnao.org
Thank you

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