Basics of Pressure Ulcer / Injury Management

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The Agency for Healthcare Research & Quality (AHRQ) estimates >2.5 million people in the US develop pressure ulcers annually.

Pressure ulcers cost the US healthcare system $9.1 - $11.6 billion every year.

Centers for Medicare & Medicaid Services (CMS) discontinued acute care reimbursement 10.1.08.

>17,000 pressure ulcer-related lawsuits are filed in the US/year.

Senate Bill 1301

Scope of the Problem
*51,842 Medicare beneficiaries over a 2 year period*
*4.5% developed at least one new HAPU*
*More likely to die*
*Longer LOS*
*Increased 30 day readmission rates*

**HAPUs in Medicare Patients**

*Wound Care Principles

*Check list:

- ✔ Assessment
- ✔ Treatment goals
- ✔ Technique
- ✔ Wound bed preparation
  - ✔ Debridement requirements
  - ✔ Evidence of infection
- ✔ Product/Dressing options
Wound Care Principles

* Maintain a clean, *moist* wound bed
* Minimize trauma to wound bed
* Eliminate infection and necrotic tissue
* Support the body’s natural tissue defenses
* Eliminate dead space
* Utilize non-toxic solutions/products
Wound Care Principles

Diagrammatic Representation of Epidermal Migration in Moist vs. Dry Environment

*Pressure Ulcer Management*
Wound Care Principles

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*Pressure Ulcer Management*
Check list:

- Assessment
- Treatment goals
- Technique
- Wound bed preparation
  - Debridement requirements
  - Evidence of infection
- Product/Dressing options
Social Assessment

- Economics
- Caregiver availability
- Patient and Caregiver acceptance

Dressing choice is based on assessment and treatment goals

Local Management
Treatment Goals

* Resolve?
* Stabilize?
* Palliate?

Dressing choice is based on assessment and treatment goals

Local Management
Technique

* Clean vs Sterile
  * Clean = exam gloves with sterile solutions & products
  * Wash/degerm hands with every glove change
  * Begin with cleanest wound first

* Local Management
Debridement

- Sharp
- Mechanical
- Autolytic
- Enzymatic
- Biological

* Wound Bed Preparation
* Sharp

* very selective
* technique of choice in presence of advancing cellulitis/sepsis
* proceed with caution

* Debridement
**Mechanical**

"Wet to Dry"
* nonselective
* painful

"Damp to Damp"
* greater selectivity
* relatively painless

* Debridement
**Autolytic**

* self-digestion via wound fluid enzymes
* requires synthetic dressing
* conservative
* contraindicated in infected wounds

**Debridement**
Transparent Film

*Autolytic Debridement*
Transparent Film

*Autolytic Debridement*
Transparent Film

*Autolytic Debridement*
Enzymatic

Santyl®
- collagenase product
- hydrophobic base
- active in pH range of 6-8
- \( \Delta \) q 24 hours
- inactivated by heavy metal ions & \( \text{H}_2\text{O}_2 \)

Clostridium hystolyticum
250 u/gm

* Debridement

Pressure Ulcer/Injury Management
Maggot Debridement Therapy (MDT)

intentional sterile larval debridement

selective

painless
Do *not* debride hard, dry heel eschar in the absence of edema, erythema, fluctuance, or drainage!
Cleansing

* Goal: remove surface debris
* Limit to saline
* Irrigation: 19g angiocath with 30cc syringe at 12 inches delivers 8 psi to wound bed

* Wound Bed Preparation
Product Options

Observe your Facility Formulary
Acetic Acid

* vinegar
* fibroblast toxicity > bacterial toxicity at all dilutions
Betadine

* toxic to fibroblasts
* risk metabolic acidosis
* stains, drying
* side effects irreversible
* 0.001% bacteriostatic noncytotoxic
Hydrogen Peroxide

* $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} \text{ and O}_2$
* causes epithelial blistering
* creates crepitus
* fibroblast toxicity $>$ bacterial toxicity at all dilutions
Dakin’s
(Sodium Hypochlorite)

* inhibits neutrophil migration
* delays clotting
* delays re-epithelialization
* 0.005% bacteriostatic, noncytotoxic

Solutions

Pressure Ulcer/Injury Management

Henry Drysdale Dakin, PhD (1880-1952)
Saline

* only physiologic solution
* bottle must be dated and timed
* discard after 24 hours
Gauze (Plain)

* inert filler
* large interstices for debriding
* unfold & fluff to maximize absorptive capacity

* not for use in tracts
* avoid over-packing
* packaging is not strike-proof
Gauze (Plain)

**Bulkee II®**
- sponges
- rolls
- debrides
- good for larger wounds and tracts

**NuGauze®**
- fine mesh
- not for debriding
- good for small tracts

* Dressings
Gauze (Impregnated)

Vaseline®
* petrolatum impregnated fine mesh
* non-adherent
* good for partial thickness injuries

Iodoform®
* contains & releases free iodine
* lyse leukocytes

Dressings
**Gauze (Impregnated)**

**Non-Adhering Dressing®**
- knitted cellulose acetate
- impregnated with petrolatum emulsion
- non-adherent

**Xeroform®**
- fine mesh
- impregnated with 3% bismuth tribromphenenate & petrolatum
- mildly deodorizing
**Transparent Films**

- Tegaderm™
- polyurethane film
- semi-permeable; moisture-vapor permeable
- transparent
- *not* for use on fragile skin

*Dressings*

Pressure Ulcer/Injury Management

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Hydrocolloids

**DuoDerm®**
(Regular & Thin)
* carboxymethylcellulose
* hydrophilic
* occlusive
* good for autolytic debridement
* 7 day wear-time
DuoDerm® Thin

Pressure Ulcer/Injury Management
CalciCare™

* polysaccharide
* hydrophilic
* Na+ ions replace Ca+ ions → soluble
* do not use unless exudating
* Δ q 1 to 4 days
Foams

PolyMem™
*polyurethane foam with surfactant, glycerin, & absorbent polymer
*↑ drainage for first two weeks of use
*cleanse before first dressing only
*do not use with other topicals
Silicone Foam

Mepilex Lite®
- hydrophilic polyurethane foam bonded to semi-permeable polyurethane film
- self adhesive soft silicone contact layer
- safe for use on fragile skin
- may be lifted to assess wound bed
- change “every few days” based on drainage

Pressure Ulcer/Injury Management

4.6.17

Dressings
Silicone Foam

Mepilex Border®

* hydrophilic polyurethane foam, non-woven fabric, & superabsorbent polyacrylate fibers foam “absorbent core”
* self adhesive soft silicone contact layer
* safe for use on fragile skin
* may be lifted to assess wound bed
* change “every few days” based on drainage

Dressings

Pressure Ulcer/Injury Management
Hydrogels

SoloSite®

(amorphous)

* water & glycerin
* moisture retentive
* non-adherent
* limited absorptive capacity

* Dressings

Pressure Ulcer/Injury Management
Hydrogels

IntraSite®
(amorphous)

* single use packaging
* without preservative
* Solutions

* Silver products

* Cadexomer iodines

* Topical Antimicrobials
Silver Products

Silvadene™
* 1% silver sulfadiazine cream
* absorb 1% of the silver & 10% of the sulfadiazine
* approved by the FDA for burns

Topical Antimicrobials
Silver Products

Aquacel® Ag

* 1.2% ionic silver
* hydrophilic
* nonadherent
* used as contact layer only
* requires moisture retentive secondary dressing
* 7 day weartime

Topical Antimicrobials

Pressure Ulcer/Injury Management
Silver Products

Silvasorb® Gel

* releases ionic silver over a 72 hour period
* non-staining
* use on dry to moderately exudative wounds
* requires a cover dressing
Cadexomer Iodines

* Iodosorb® (amorphous) & Iodoflex™ (sheet)
* iodine is complexed with a polysaccharide matrix
* slowly releases 0.9% iodine
* absorbent
* $\Delta$ when color turns to yellow-gray
* Rx should not exceed 3 months
Cadexomer Iodines

Gel

Sheet

*Topical Antimicrobials
**Direct Approach**
(absorb / trap odors)

- Charcoal / Activated Carbon
- Pouches

**Indirect Approach**
(reduce bacterial bioburden)

- Silver
- Cadexomer Iodines
- Manuka honey

*Odor Control*

Metronidazole (off label)

* 1% solution
* 0.75% gel
* crushed tabs
* anaerobes

www.ncbi.nlm.nih.gov/pubmed/18382045


4.6.17
Pouches

Wound Drainage Collectors

* multiple sizes
* window for wound access
* may be connected to dependent drainage
* universal access ports

* Odor Control

Pressure Ulcer/ Injury Management

4.6.17
Universal Access Ports
Netting
Sof-Form™
Mesh Panties
Fuller Shields™
Montgomery Straps™

Products to Secure Dressings
Skin Barrier Wafers

Products to Secure Dressings
Medipore™ Tape

* soft cloth tape
* scored for tearing

* Products to Secure Dressings
Cavilon™ No Sting Skin Barrier Film

*provides polymer film interface between skin and adhesives
*alcohol-free
*film must be thoroughly dry prior to application of adhesives
*reapply every time adhesive product is removed

Skin Sealant
Vacuum Assisted Closure (V.A.C. Ultra™)

* stimulates granulation tissue

* ↑ blood flow

* ↓ edema & bacteria

* Negative Pressure Wound Therapy
V.A.C. Ulta™

Contraindications:
* necrotic tissue/eschar
* untreated osteomyelitis
* malignancy

Caution:
* anticoagulation therapy

* Negative Pressure Wound Therapy
* I hear and I forget.  
I see and I remember.  
I do and I understand. 

Confucius (551 BC - 479 BC)