Intact Skin is In: Bundling Evidence Based Strategies to Reduce Hospital Acquired Skin Injury

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Objectives

• Discuss the new strategies to determine patients at risk for injury

• Outline evidence-based prevention strategies for incontinence associated dermatitis, friction reduction and pressure injury prevention

• Describe key care process changes that lead to a successful reduction of skin injury and prevent healthcare worker injury

Notes on Hospitals: 1859

“It may seem a strange principle to enunciate as the very first requirement in a Hospital that it should do the sick no harm.”

Florence Nightingale

Advocacy = Safety
Protect The Patient From Bad Things Happening on Your Watch

Implement Interventional Patient Hygiene

Interventional Patient Hygiene

- Hygiene…the science and practice of the establishment and maintenance of health
- Interventional Patient Hygiene....nursing action plan directly focused on fortifying the patients host defense through proactive use of evidence based hygiene care strategies

Incontinence Associated Dermatitis Prevention Program
Background of the Problem

- HAPU are the 4th leading preventable medical error in the United States
- 2.5 million patients are treated annually in Acute Care
- NDNQI data base: critical care: 7% med-surg: 1-3.3%
- Acute care: 0-12%, critical care: 3.3% to 53.4% (International Guidelines)
- Most severe pressure ulcer: sacrum (44.8%) or the heels (24.2%)
- Pressure ulcers cost $9.1-$11.6 billion per year in the US.
  - Cost of individual patient care ranges from $20,900 to 151,700 per pressure ulcer
  - 17,000 lawsuits are related to pressure ulcers annually
- 60,000 persons die from pressure ulcer complications each yr.
- National health care cost $10.5-17.8 billion dollars for 2010

Reddy, M.et.al. JAMA, 2006; 296(8):974-984
Clarification of Definitions:

- Pressure Injury to replace Pressure Ulcer
- Accurately describes pressure injuries of both intact and ulcerated skin

Stage I and Deep Tissue Injury (DTI) describe intact skin

Stage II through IV describe open ulcers

PRESSURE INJURY

Label & Definitions of Pressure Injury

- Stage 1 Pressure Injury: Non-blanchable erythema of intact skin
- Stage 2 Pressure Injury: Partial thickness skin loss with exposed dermis
- Stage 3 Pressure Injury: Full thickness skin loss
- Stage 4 Pressure Injury: Full-thickness skin and tissue loss

http://www.npuap.org/resources/educational-and-clinical-resources/
Label & Definitions of Pressure Injury

- **Un-stageable Pressure Injury:** Obscured full-thickness skin and tissue loss

- **Deep Tissue Pressure Injury:** Persistent non-blanchable deep red, maroon or purple discoloration

- **Medical Device Related Pressure Injury:** Etiology-Described by staging system

- **Mucosal Membrane Pressure Injury:** Cannot be staged

NPUAP Consensus Statement on Avoidable/Unavoidable Pressure Ulcers

- Most PrUs are avoidable; not all PrUs are avoidable;
- Situations that render PrU development unavoidable;
  - hemodynamic instability that is worsened with physical movement
  - inability to maintain of advance directive prohibiting nutrition and hydration status
  - pressure redistribution surfaces cannot replace turning and repositioning
  - Even if enough pressure was removed from the external body the skin cannot always survive.
- Skin failure at end-of-life is not the same as pressure ulcers.
- CMS in long term care: Kennedy Terminal Ulcer (KTU) is not a pressure ulcer and is not caused by poor care (2104). These ulcers present as pear-shaped purple areas of skin with irregular borders that are often found in the sacrum/coccyx areas.

Moisture Injury: Incontinence Associated Dermatitis

- Inflammatory response to the injury of the water-protein-lipid matrix of the skin
  - Caused from prolonged exposure to urinary and fecal incontinence
- Top-down injury
- Physical signs on the perineum & buttocks
  - Erythema, swelling, oozing, vesiculation, crusting and scaling
- Skin breaks 4x more easily with excess moisture than dry skin

Brown DS & Sears M. OWM 1993;39:2-26

Systematic Review on Impact of Incontinence


- Review 2013-2014 incontinence data from International PUP survey
- Determine relative risk of pressure injury development from incontinence & Braden score grouping
- 91% acute care; 205,144 patients
  - 182,832 from US
  - 22, 282 Canada
  - Other-Europe/Middle East
- Results
  - 53% had incontinence
  - Mean Braden score significantly lower in incontinent group (16.5 vs 19.5 p<.0001)
  - Overall PI: 16.3% incontinent vs. 4.1% for continent patients (p<0.0001)
  - Facility acquired PI: 6.0% vs. 1.6% (p<0.0001)
IAD: Multisite Epidemiological Study

- 5342 patients in 424 facilities in Acute & Long Term Care in US
- Prevalence study
  - To measure the prevalence of IAD in the acute care setting,
  - To describe clinical characteristics of IAD, and
  - To analyze the relationship between IAD and prevalence of sacral/coccygeal pressure ulcers
- Results: 1716 patients incontinent (44%)
  - 57% both FI and UI, 27% FI, 15% UI
  - 24% IAD rate
    - 60% mild
    - 27% moderate
    - 5% severe
  - 73% was facility acquired
  - ICU a 36% rate
  - IAD 5x more likely to develop a HAPU

Giuliana K. Presented at the CAACN September 25-27th Winnipeg, Manitoba, CA
Gray M. Presenting a Wound Care Conference, 2016, New York City, NY

Part of the Picture

- Medical Adhesive-Related Skin Injury: Single center study shows prevalence rates 3.4% to 25%*
- Skin Tears: 1.5 million skin tears occurring in elderly residents of institutions in the US annually**

Beyond the Scope of this Talk

**Baranoski S. Adv Skin Wound Care 2009;16(2):74-6
Driving Change

- Gap analysis
- Build the Will
- Protocol Development

Structure

- Make it Prescriptive
- Overcoming barriers
- Daily Integration

Process

Outcomes

Gap Analysis of Prevention Strategies

- Assessment of Risk
- Pressure Injury/Turn/Shear reduction
- Health Care Worker Safety
- Early Mobility
- Device Related Injuries
- Managing Incontinence & Other Moisture
- Hemodynamic Instability
Identify Patients at High Risk

Risk Assessment on Admission, Daily, Change in Patient Condition (B)

- Use standard EBP risk assessment tool
- Research has shown Risk Assessment Tools are more accurate than RN assessment alone
- Braden Scale for Predicting Pressure Sore Risk
  - 6 subscales
  - Rated 1-4
  - Pressure on tissues
  - Mobility, sensory perception, activity
  - Tissue tolerance for pressure
  - Nutrition, moisture, shear/friction
  - Score 6-23

Clinical judgment of nurses alone achieve inadequate capacity to assess PU risk
Extremely obese patient 2x more likely to develop a PU*

www.ihi.org; Garcia-Fernandez FP, et al., JWOCN, 2014;41(1):24-34
Its About the Sub-Scale’s

- Retrospective cohort analysis of 12,566 adults patients in progressive & ICU settings for yr. 2007
- Identifying patients with HAPU Stage 2-4
- Data extracted: Demographic, Braden score, Braden subscales on admission, LOS, ICU LOS, presence of Acute respiratory and renal failure
- Calculated time to event, # of HAPU’s
- Results:
  - 3.3% developed a HAPU
  - Total Braden score predictive (C=.71)
  - Subscales predictive (C=.83)


Braden Score  Braden Sub-Scales

Multivariate model included 5 Braden subscales, surgery and acute respiratory failure C=0.91 (Mobility, Activity and sensory perception more predictive when combined with moisture or shear and friction)
**Vasopressors/Pressure Injury**

- Retrospective correlation design
- 306 medical surgical and CV ICU patients who receive vasopressors
- Examine the type, dose and duration of vaspressor agents and PU development

**Results**
- 13% PI rate
- MV > 72 hours 23x more likely to develop a PI
- Receiving 2 vasopressor (Norepi & vasopressin) significant

**Significant Predictors of PI Development**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>P</th>
<th>Exp (B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac arrest</td>
<td>1.359</td>
<td>0.605</td>
<td>3.831</td>
<td>.05</td>
<td>3.894</td>
<td>0.986-15.188</td>
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<tr>
<td>Mechanical ventilation &gt;72 hours</td>
<td>3.161</td>
<td>0.664</td>
<td>22.686</td>
<td>&lt;.001</td>
<td>23.044</td>
<td>6.427-66.868</td>
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<tr>
<td>Hours of MAP &gt;60 mm Hg while receiving vasopressors</td>
<td>0.052</td>
<td>0.037</td>
<td>6.199</td>
<td>.01</td>
<td>1.096</td>
<td>1.020-1.178</td>
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<tr>
<td>Use of vasopressin</td>
<td>1.572</td>
<td>0.542</td>
<td>8.423</td>
<td>.004</td>
<td>4.816</td>
<td>1.661-13.925</td>
</tr>
<tr>
<td>Cardiac diagnosis at ICU admission</td>
<td>-3.369</td>
<td>1.577</td>
<td>4.539</td>
<td>.039</td>
<td>0.002</td>
<td>0.764</td>
</tr>
</tbody>
</table>

*Abnormalities: ICI, intensive care unit; MAP, mean arterial pressure.
Norepinephrine (Norepi).*
"One’s mind, once stretched by a new idea, never regains its original dimensions.”

Oliver Wendell Holmes

The Goal: Patient & Caregiver Safety

- Safe Patient Handling
- Prevention of Pressure Ulcers
- Patient Progressive Mobility
Pressure & Shear as a Risk Factor

Sacrum & Heels

EBP Recommendations to Achieve Offloading & Reduce Pressure (A)

• Turn & reposition every (2) hours (avoid positioning patients on a pressure ulcer)
  - Repositioning should be undertaken to reduce the duration & magnitude of pressure over vulnerable areas
  - Consider right surface with right frequency*
  - Cushioning devices to maintain alignment /30 ° side-lying & prevent pressure on boney prominences
    • Between pillows and wedges, the wedge system was more effective in reducing pressure in the sacral area (healthy subjects) (Bush T, et al. WOCN, 2015;42(4):338-345)
  - Assess whether actual offloading has occurred
  - Use lifting device or other aids to reposition & make it easy to achieve the turn

EBP Recommendations to Reduce Shear & Friction

- Loose covers & increased immersion in the support medium increase contact area
- Prophylactic dressings: emerging science
- Use lifting/transfer devices & other aids to reduce shear & friction.
  - Mechanical lifts
  - Transfer sheets
  - 2-4 person lifts
  - Turn & assist features on beds
  - Do not leave moving and handling equip underneath the patient


Prophylactic Dressings: Emerging Therapies

- Consider applying a polyurethane foam dressing to bony prominences in the areas frequently subjected to friction and share (B)
- Consider placement prior to prolonged procedures or continuous head elevation (B)
- Consider ease of application and removal and the ability to reassess the skin.
- Continue to use all of other preventative measures necessary when using prophylactic dressings (C)

Systematic Review: Use of Prophylactic Dressing in Pressure Injury Prevention

- 21 studies met the criteria for review
- 2 RCTs, 9 had a comparator arm, five cohort studies, 1 within-subject design where prophylactic dressings were applied to one trochanter with the other trochanter dressing free


Evaluated nasal bridge device injury prevention
Evaluated sacral pressure ulcer prevention

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  - Mechanical lifts
  - Transfer sheets
  - 2-4 person lifts
  - Turn & assist features on beds
  - Breathable slide stay in bed glide sheet
  - Do not leave moving and handling equip underneath the patient

Current Practice:
Turn & Reposition

Draw Sheet/Pillows/Layers of Linen

Lift Device

Which Strategy Do You Use for Reposition and Turn in Bed

A. Mechanical lifts
B. 2-4 person lifts with draw sheet & pillows
C. Turn & Assist features on beds with pillows
D. Repositioning sheet that needs to be removed after use
E. Breathable glide sheet/stays on the bed & positioning wedges
• 50% of nurses required to do repositioning suffered back pain
• High physical demand tasks
  • 31.3% up in bed or side to side
  • 37.7% transfers in bed
• 40% of critical care unit caregivers performed repositioning tasks more than six times per shift
• Number one injury causation activity: Repositioning patients in bed

Injury Facts

• Back and other musculoskeletal “injuries” are the result of repeated exposure to ergonomic risk factors rather than a single, instantaneous event
• In an eight hour shift, the cumulative weight that nurses lift equal to an average of 1.8 tons per day

Harber P, et al. J Occupational Medicine, 27;518-524
Fragala G. AAOHN, 2011;59:1-6

Tuohy-Main, K. (1997). Geriactron, 15, 10-14
Number, Incidence Rate, & Median Days Away From Work for Occupational Injuries RN’s with Musculoskeletal Disorders in US, 2003 – 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Ownership</th>
<th>Occupation</th>
<th>Total Incidence Rate</th>
<th>Median Days Away From Work</th>
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<tbody>
<tr>
<td>2009</td>
<td>private industry</td>
<td>RNs</td>
<td>9,760</td>
<td>51.6</td>
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<tr>
<td>2010</td>
<td>Private industry</td>
<td>RNs</td>
<td>9,260</td>
<td>53.7</td>
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<tr>
<td>2011</td>
<td>Private industry</td>
<td>RN's</td>
<td>10,210</td>
<td></td>
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<tr>
<td>2012</td>
<td>Private industry</td>
<td>RN's</td>
<td>9,900</td>
<td>58.5</td>
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<td>2013</td>
<td>Private Industry</td>
<td>RN</td>
<td>9,820</td>
<td>56.2</td>
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<tr>
<td>2014</td>
<td>Private Industry</td>
<td>RN</td>
<td>9,820</td>
<td>55.3</td>
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<tr>
<td>2014</td>
<td>Private Industry</td>
<td>NA</td>
<td>18,510</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>private industry</td>
<td>RNs</td>
<td>9,060</td>
<td>-</td>
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<tr>
<td>2004</td>
<td>private industry</td>
<td>RNs</td>
<td>8,510</td>
<td>-</td>
</tr>
<tr>
<td>2003</td>
<td>private industry</td>
<td>RNs</td>
<td>10,050</td>
<td>-</td>
</tr>
</tbody>
</table>

* Incidence rate per 10,000 FTE


Achieving the Use of the Evidence For Pressure Ulcer Reduction

**Factors Impacting the ability to Achieve Quality Nursing Outcomes at the Point of Care**

- Breathable glide sheet/stays
- Foam Wedges
- Microclimate control
- Reduce layers of linen
- Wick away moisture body pad
- Protects the caregiver

Comparative Study of Two Methods of Turning & Positioning

• Non randomized comparison design
• 59 neuro/trauma ICU mechanically ventilated patients
• Compared SOC: pillows/draw sheet vs turn and position system (breathable glide sheet/foam wedges/wick away pad)
• Measured PU incidence, turning effectiveness & nursing resources

<table>
<thead>
<tr>
<th>Demographic Comparison</th>
<th>SOC</th>
<th>PPS</th>
<th>P</th>
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<tr>
<td>Mean time on product (range), d</td>
<td>7 (1-29)</td>
<td>7 (1-45)</td>
<td>1.00</td>
</tr>
<tr>
<td>Mean age (SD) (range), y</td>
<td>57.72 (18.45)</td>
<td>57.73 (17.67)</td>
<td>1.00</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>10</td>
<td>.43</td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Braden Scale score</td>
<td>12.77</td>
<td>13.23</td>
<td>.46</td>
</tr>
<tr>
<td>Mobility</td>
<td>0.1</td>
<td>0.1</td>
<td>1.00</td>
</tr>
<tr>
<td>BMI</td>
<td>29.62</td>
<td>30.97</td>
<td>.65</td>
</tr>
</tbody>
</table>

Results:

– Nurse satisfaction 87% versus 34%
– 30° turn achieved versus -15.4 in SOC/7.12 degree difference at 1hr (p<.0001)

<table>
<thead>
<tr>
<th></th>
<th>SOC</th>
<th>PPS</th>
<th>P</th>
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<tbody>
<tr>
<td>PU development</td>
<td>6</td>
<td>1⁰</td>
<td>.04</td>
</tr>
<tr>
<td># of times patients pulled up in bed</td>
<td>3.28</td>
<td>2.58</td>
<td>.03</td>
</tr>
<tr>
<td># of staff required to turn patient</td>
<td>1.97</td>
<td>1.35</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

1⁰ PU development with 24hrs of admission
Safe Patient Handling Initiative: Decreases Staff Musculoskeletal Injuries & Patient Pressure Ulcers

EBP Recommendations to Achieve Offloading & Reduce Pressure

- Turn & reposition every 2 hours (avoid positioning patients on a pressure ulcer)
  - Use active support surfaces for patients at higher risk of development where frequent manual turning may be difficult
  - Microclimate management
  - Heel Protection
  - Early Mobility programs
  - Seated support surfaces for patients with limit mobility when sitting in a chair
Support Surfaces In Critically Ill Patients

- Comparison cohort study of 2 different support surfaces in critically ill patients
- 52 critically ill patients with anticipated 3 day LOS in a 12 bed cardiovascular unit in a University Hospital in the Mid-west were included until d/c from ICU
- 31 patients: low air-loss weight-based pressure redistribution-microclimate management bed
- 21 patients: integrated powered air redistribution bed
- Measured: positioning, skin assessment, heel elevation
- Results:
  - Mean LOS 7 days (on the surface equal amount of days)
  - LAL-MCM bed = zero pressure ulcers
  - IP-AR bed = 4/21 or 18% (p=0.046)

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EBP Recommendations to Achieve Offloading & Reduce Pressure

- Ensure the heels are free of the bed surface
  - Heal-protection devices should elevate the heel completely (off-load) in such a way as to distribute weight along the calf
  - The knee would be in slight flexion
  - Remove device periodically to assess the skin

Roger S et al, OWM, 2007;54(10),56-60. www.ihi.org

Heel Protectors

Heel Pads

Miller SK, et al WOCN, 2015;42(4):346-351
Successful Prevention of Heel Ulcers and Plantar Contracture in the High Risk Ventilated Patients

**Study Inclusion Criteria**
- Sedated patient > 5 days
- May or may not be intubated
- Braden equal to or less than 16

**Procedure**
- Skin assessment and Braden completed on admission
- All pts who met criteria were measured for ROM of the ankle with goniometer, then every other day until pt did not meet criteria
- Heel appearance, Braden and Ramsey scores were assessed every other day and documented
- Identified and trained ICU nurses completed the assessments

**Results**

53 sedated patients over a 7 month period

![Graph showing percentage of patients with normal, abnormal, and no new HPUs](Meyers T. J WOCN 2010;37(4):372-378)

**Sustainability of Heel Injury Reduction: QI Project**
- 490 bed facility
- Evidence based quality Improvement initiative
- 4 tier Process
  - Partnership
  - Comprehensive product review
  - Education & engagement
  - Support structures & processes

![Graph showing heel injury reduction](Hanna-Bull D. WOCN, 2016;43(2):129-132)
EBP Recommendations to Achieve Offloading &Reduce Pressure

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  – Seated support surfaces for patients with limit mobility when sitting in a chair

Any Work on Skin Should Be Incorporated into a Progressive Mobility Protocol

Outcomes of Early Mobility Program

- ↓ incidence of skin injury
- ↓ time on the ventilator
- ↓ incidence of VAP
- ↓ days of sedation
- ↓ delirium
- ↑ ambulatory distance
- Improved function

Thomsen GE, et al. CCM 2008;36;1119-1124
Winkelman C et al., CCN, 2010;30:36-60
EBP Recommendations to Achieve Offloading & Reduce Pressure

- Turn & reposition every 2 hours (avoid positioning patients on a pressure ulcer)
  - Use active support surfaces for patients at higher risk of development where frequent manual turning may be difficult
  - Microclimate management
  - Early Mobility programs
  - Safe handling for out of bed & chair positioning


National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance.
Prevention & treatment of pressure ulcers: clinical practice guideline. Emily Haessler (Ed) Cambridge Media, Outcome Press; Western Australia 2014

Out of Bed Technology
Current Seating Positioning Challenges

Uncomfortable

Airway & Epiglottis compressed

Body Alignment

Shear/Friction

Sacral Pressure

Frequent repositioning & potential caregiver injury

Potential fall risk

Repositioning Patients in Chairs: An Improved Method (SPS)

- Study the exertion required for 3 methods of repositioning patients in chairs
- 31 caregiver volunteers
- Each one trial of all 3 reposition methods
- Reported perceived exertion using the Borg tool, a validated scale.

Method 1: 2 caregivers using old method of repositioning
246% greater exertion than SPS

Method 2: 2 caregivers with SPS

Method 3: 1 caregiver with SPS
52% greater exertion than method 2

Fragala G, et al. Workplace Health & Safety. 61:141-144
Prevention Strategies for IAD

Evidence-Based Components of an IAD Prevention Program

- Skin care products used for prevention or treatment of IAD should be selected based on consideration of individual ingredients in addition to consideration of broad product categories such as cleanser, moisturizer, or skin protectant. (Grade C)
  - A skin protectant or disposable cloth that combines a pH balance no rinse cleanser, emollient-based moisturizer, and skin protectant is recommended for prevention of IAD in persons with urinary or fecal incontinence and for treatment of IAD, especially when the skin is denuded. (Grade B)
  - Commercially available skin protectants vary in their ability to protect the skin from irritants, prevent maceration, and maintain skin health. More research is needed (Grade B)
EBP Recommendations to Reduce Injury From Incontinence & Other Forms of Moisture

- Clean the skin as soon as it becomes soiled.
- Use an incontinence pad and/or briefs that wick away
- Use a protective cream or ointment
  - Disposable barrier cloth recommend by IHI & IAD consensus group
- Ensure an appropriate microclimate & breathability
- < 4 layers of linen
- Barrier & wick away material under adipose and breast tissue
- Support or retraction of the adipose tissue (i.e. KanguruWeb)
- Pouching device or a bowel management system

References:
Doughty D, et al. JWOCN. 2012;36(3):305-315

Current Practice: Moisture Management

- Disposable Incontinence Pads
- Adult diaper
- Reusable Incontinence pads
- Airflow pads for Specialty Beds
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IAD/HAPU Reduction Study

- Prospective, descriptive study
- 2 Neuro units
- Phase 1: prevalence of incontinence & incidence of IAD & HAPU
- Phase 2: Intervention
  - Use of a 1 step cleanser/barrier product
  - Education on IAD/HAPU
- Results:
  - Phase 1: incontinent 42.5%, IAD 29.4%, HAPU 29.4%, LOS 7.3 (2-14 days), Braden 14.4
  - Phase 2: incontinent 54.3%, IAD & HAPU 0, LOS 7.4 (2-14), Braden 12.74

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- Pouching device/bowel management system/male external urinary device


Fecal Containment Device

- Provides a method for managing fecal incontinence.
- Remains securely attached to ambulatory patients
- Kit contains collection bag, closure clip, drainage bag adapter, powder adhesive and adhesive remover.
Before & After QI Project

- 60-day comparison
- Use of novel EMC device vs. indwelling catheter
- Inclusion criteria:
  - No restraints
  - No BPH
  - No neurogenic bladder
  - Cooperative
  - Hospitalized ≥ 2 weeks
- Monitored wear time, evaluated skin

Foley utilization rate, before, during & after

Fitzwater M, IP Kindred Albuquerque, 2015

Average Wear Time = 24hrs

Medical Device Related Pressure Ulcers

- Prospective descriptive study to determine, prevalence, risk factors and characteristics of MDR's PI
- 175 adults in 5 ICU's
- 27 developed non-device related HAPI (15.4%)
- 70 developed MDR’s HAPI (45%)
- 42% were stage 2

Medical Device Related Pressure Ulcers

National incidence estimated 25%-29%

Minnesota Hospital Association/ http://www.mnhospitals.org/pressure-ulcers


Having a medical device you are 2.4 x more likely to develop a HAPU of any kind (p=0.0008)

Prevention of MDR's-HAPI

Best Practices for Prevention of Medical Device-Related Pressure Ulcers in Critical Care

- Choose the correct size of medical device(s) to fit the individual
- Cushion and protect the skin with dressings in high-risk areas (e.g., nasal bridge)
- Inspect the skin in contact with device at least daily (if not medically contraindicated)
- Avoid placement of device(s) over sites of prior or existing pressure ulcer
- Educate staff on correct use of devices and prevention of skin breakdown
- Be aware of edema under device(s) and potential for skin breakdown
- Confirm that devices are not placed directly under an individual who is bedridden or immobile

Haugen V, Perspectives; 2016 http://www.perspectivesinnursing.org/current.html

"Even if you are on the right track, you will get run over if you just sit there." - Will Rogers
Hemodynamic Instability
Is it a Barrier to Positioning?

The Role of Hemodynamic Instability in Positioning¹,²

- Lateral turn results in a 3%-9% decrease in SVO₂, which takes 5-10 minutes to return to baseline
- Appears the act of turning has the greatest impact on any instability seen
- Minimize factors that contribute to imbalances in oxygen supply and demand
- Factors that put patients at risk for intolerance to positioning:³
  - Elderly
  - Diabetes with neuropathy
  - Prolonged bed rest
  - Low hemoglobin and cardiovascular reserve
  - Prolonged gravitational equilibrium⁴,⁵

Decision-Making Tree for Patients Who Are Hemodynamically Unstable With Movement

Screen for mobility readiness within 8 hrs of admission to ICU & daily initiate in-bed mobility strategies as soon as possible

Is the patient hemodynamically unstable with manual turning?
- O2 saturation ≤ 90%
- New onset cardiac arrhythmias or ischemia
- HR < 60 > 120
- MAP < 55 > 140
- SPB < 90 > 180
- New or increasing vasopressor infusion

No

Begin in-bed mobility techniques and progress out-of-bed mobility as the patient tolerates

Is the patient still hemodynamically unstable after allowing 5-10 minutes' adaption post-position change before determining tolerance?

No

Begin in-bed mobility techniques and progress out-of-bed mobility as the patient tolerates

Yes

Screen for mobility readiness within 8 hrs of admission to ICU & daily initiate in-bed mobility strategies as soon as possible

Has the manual position turn or HOB elevation been performed slowly?

No

Try the position turn or HOB maneuver slowly to allow adaption of cardiovascular response to the inner ear position change

Yes

Initiate continuous lateral rotation therapy via a protocol to train the patient to tolerate turning

HOB=head of bed; HR=heart rate; MAP=mean arterial pressure; SPB=systolic blood pressure.
Vollman KM. Crit Care Nurs Q. 2013;36:17-27

Clinical Findings Which Prevent Patient Turning

1. Development of life threatening arrhythmia with symptomatic response (VFIB/VTACH/SVT) This does not include asymptomatic AFIB.
2. Active Fluid Resuscitation: (i.e. no volume going in= no systemic blood pressure).
3. Active Hemorrhaging:
   - Following Cardiac Surgery/Active Tamponade
   - Massive GI bleeding with use of Blakemore tube.
   - Active hemorrhage following Trauma.
4. Change in baseline hemodynamic parameters (BP, HR, Oxygen Saturation, RR, etc) that does not recover within 10 Minutes of position change and is not an expected result based on diagnosis.

Recommended Interventions for the Unstable Patient

A TRIAL TURN SHOULD BE ATTEMPTED AT LEAST EVERY 8 HOURS TO DETERMINE ABILITY TO RESUME FREQUENT TURNING AT LEAST EVERY 2 HOURS
1. Provide mouth-drops.
2. Elevate head from surface of bed.
3. Reposition patient’s head, arms and legs at least every 30 minutes
5. When turning patient: GO SLOW! Provide serial small turns from supine to lateral position to achieve limb changes, hygiene checks, and reposition with wedges and pillows.

VCU Hemodynamic Instability Guideline

O4  Added a referernce
Owner, 5/10/2015
How Do We Make It Happen?

Driving Change

- Gap analysis
- Build the Will
- Protocol Development

- Make it Prescriptive
- Overcoming barriers
- Daily Integration

Structure

Process

Outcomes
Universal PUP Bundle with WOC Support = HAPU

- Quasi experimental pre-post design
- Intact skin on admission
- 180 pre received SOC and 146 post intervention received UPUPB & 2x weekly WOC rounding
- Results:
  - HAPU ↓ from 15.5% to 2.1%
  - 204 rounds over 6 months
  - ↑ adherence to heel elevation (p<.001) & repositioning
  - p<.015

SAFER

Universal PUP Bundle
- Skin Emollients
- Assessment
- Floating Heels
- Early Identification
- Repositioning

Patient Skin Integrity Bundle (InSPIRE)

Methodology
- Before & after design
- 105 ICU pts in experimental group
- 102 ICU pts in control group
- Control-SOC
- Intervention: InSPIRE
  - Skin assessment on admission (4hrs) & surface placement
  - Ongoing Q 12
  - Skin hygiene (1x bath pre-package)
  - Turning q 3hrs/turn clock
  - ET & NG evaluated q 12 & repositioned
  - Heel device
  - Microclimate

Results:
- Groups similar on major demographics (age, SOFA, ICU LOS)
- Cumulative HAPU ↓ in intervention group 18.1% vs. 30.4% (p=.04)
- Mucosal injuries ↓ 15% vs. 39% p <.001
- Overall processes of care did not differ
- Device observation/repositioned 76% vs 28% of days (p <.001)
- Bathed only 1x per day in intervention group
- Repositioning q3hrs 83% vs. 51% days observed (p<.01)
Intact Skin Is In: Making it Happen

- Advocacy
- Braden subscales
- Skin rounds/time frequency
- Hand-off communication
- The right products and processes—pressure/shear/moisture/prevent skin tear and medical adhesive related injuries
- Quarterly prevalence/incidence of PU & IAD
- Skin liaison/champion nurses
- Creative strategies to reinforce protocol use
  - Visual cues in the room or medical record
  - Rewards for increase compliance
- Yearly competencies on beds or positioning aids to ensure correct and maximum utilization

Prevention Strategies Focus

- Pressure Ulcer/Turn/Shear reduction
- Health Care Worker Safety
- Early Mobility
- Managing Incontinence & Other Moisture
- Hemodynamic Instability
The Goal: Patient & Caregiver Safety

- ↓ Hospital LOS
- ↓ ICU LOS
- ↓ Skin Injury
- ↓ CAUTI
- ↓ Delirium
- ↓ Time on the vent

- ↓ Repetitive motion injury
- ↓ Musculoskeletal injury
- ↓ Days away from work
- ↓ Staffing challenges
- Loss of experienced staff
- Nursing shortage

- ↓ Skin Injury
- ↓ Costs
- ↓ Pain and suffering
- ↓ Hospital LOS
- ↓ ICU LOS

Forbid yourself to be deterred by poor odds just because your mind has calculated that the opposition is too great. If it were easy, everyone would do it.
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