Do No Harm: Evidence Based Strategies to Prevent Health Care Acquired Injuries

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Disclosures

- Sage Products Speaker Bureau & Consultant
- Hill-Rom Speaker Bureau
- Eloquest Healthcare Speaker Bureau & Consultant
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
**INTERVENTIONAL PATIENT HYGIENE (IPH)**

- VAP/HAP
- Oral Care/Mobility
- HAND
- Patient
- HYGIENE
- Catheter Care
- Skin Care/Bathing/Mobility
- CA-UTI
- CA-BSI
- SSI
- Falls
- HASI


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**Missed Nursing Care**

- “Any aspect of required patient care that is omitted (either in part or whole) or significantly delayed.”
- A predictor of patient outcomes
- Measures the process of nursing care

**SORRY WE MISSED YOU!**
Hospital Variation in Missed Nursing Care

Figure 2. Elements of care most and least frequently missed. The solid bars represent the means across all 10 hospitals, and the range lines indicate the standard deviations.

What Does it Mean to Be in a Safe Culture for You & Your Patient?
Safety is avoiding both short- and long-term harm to people resulting from unsafe acts and preventable adverse events.

Current infrastructure "silos" safety programs, creating one for patients, another for workers, and yet another for others who may be at risk. (Quality department, Risk Management, Employee Health, SPH)

The organizational culture, principles, methods, and tools for creating safety are the same, regardless of the population whose safety is the focus.

A true culture of safety—and the organization leaders who create and sustain it—will not be considered legitimate and genuine if the culture excludes some groups within the organization.

Changing the Perception of Safety on Your Unit

- Safety for the patient and healthcare worker are integrated
- Transcends individual improvement initiatives and departmental walls
- High reliable unit/organization: engaged leadership, culture of safety, organizational processes and infrastructure to support safe practices
- Implement and maintain successful worker and patient safety improvement initiatives within your unit & organization.
- Create measurements that integrate patient safety and healthcare worker safety

Castro GM. Am J SPHM, 2015;5(1)34-35
Add ANA-

The Goal: Patient & Caregiver Safety

[Diagram showing leadership, patient progressive mobility, safe patient handling, and prevention of pressure injuries]
How Well Are We Doing?

Do We Even Achieve the Minimum Mobility Standard… “Q2 Hours”? 
Body Position: Clinical Practice vs. Standard

- **Methodology**
  - 74 patients/566 total hours of observation
  - 3 tertiary hospitals
  - Change in body position recorded every 15 minutes
  - Average observation time 7.7 hours
  - Online MD survey
- **Results**
  - 49.3% of observed time no body position change
  - 2.7% had a q 2 hour body position change
  - 80-90% believed q 2 hour position change should occur but only 57% believed it happened in their ICU

Krishnagopalan S. Crit Care Med 2002;30:2588-2592

Positioning Prevalence

- **Methodology**
  - Prospectively recorded, 2 days, 40 ICU’s in the UK
  - Analysis on 393 sets of observations
  - Turn defined as supine position to a right or left side lying
- **Results:**
  - 5 patients prone at any time, 3.8% (day 1) & 5% (day 2) rotating beds
  - Patients on back 46% of observation
  - Left 28.4%
  - Right 25%
  - Head up 97.4%
  - Average time between turns 4.85 hrs (3.3 SD)
  - No significant association between time and age, wt, ht, resp dx, intubation, sedation score, day of wk, nurse/patient ratio, hospital

Goldhill DR et al. Anaesthesia 2008;63:509-515
Environmental Scan of EM Practices

- 687 randomly selected ICU's stratified by regional density & size- 500 responded (73% response rate)
- Demographics:
  - 51% academic affiliation, mixed medical/surgical (58%) or medical (22%) with a median of 16 beds (12–24)
  - 34% dedicated PT or OT for the ICU
  - Performed a median of 6 days, 52% began on admission

Factors associated with EMP:
- Dedicated PT/OT
- Written sedation protocol
- Daily MDR
- Daily written goals
Outcomes of Early Mobility Programs

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

Thomsen GE, et al. CCM 2008;36;1119-1124.
Winkelman C et al, CCN, 2010;30:36-60.

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 injury: sacrum (44.8%) or the heels (24.2%)
• Pressure injuries 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 injury
  • 17,000 lawsuits are related to pressure injuries annually
  • 60,000 persons die from pressure injury complications each yr.
• National health care cost $10.5-17.8 billion dollars for 2010

Whittington K, Briones R. Advances in Skin & Wound Care. 2007;20:499-d.
Reddy, M et al. JAMA, 2006; 296(8):974-84
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

PROBLEM IN NEED OF SOLUTIONS

Musculoskeletal disorders among healthcare workers providing direct care.

This requires attention and effective solutions!
• 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 or 3600 lbs. per shift

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

Tuohy-Main, K. (1997). Geriaction, 15, 10-14
ANA SPH and Mobility Standards 2014
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 Cases</th>
<th>Incidence Rate*</th>
<th>Median Days Away From Work</th>
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<td>RN's</td>
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<td>2013</td>
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<td>9,820</td>
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<tr>
<td>2014</td>
<td>Private Industry</td>
<td>NA</td>
<td>18,510</td>
<td>-</td>
<td>6</td>
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* Incidence rate per 10,000 FTE

Factors Associated With Safe Patient Handling Behaviors Among Critical Care Nurses

- Patient handling is a major risk factor for musculoskeletal (MS) injury among nurses.
- A cross-sectional study conducted nationwide involving 361 critical care nurses
- More than half of participants had no lifting equipment on their unit
- 74% reported that they performed all patient lift or transfer tasks manually
- STUDY MAJOR CONCLUSION: safety of work behaviors among critical care nurses is shaped by the organizational safety culture and psychosocial work environment.

Skin Risk Factors

Skin & Immobility

Care Giver Risk

Prevention Strategies

**Moisture**
- Clean & Protect
- Repetitive motion, Lifting

**Pressure**
- Reduce Pressure & Shear
- Repetitive motion, Lifting & Limb holding

**Shear**
- In-bed & Out of Bed Mobility
- Repetitive motion, Dragging, patient weight

**Friction**
- Clean & Protect
- Repetitive motion, Lifting

Driving Change

- Gap analysis
- Build the Will
- Protocol Development

- Make it Prescriptive
- Overcoming barriers
- Daily Integration

Structure + Process → Outcomes
Gap Analysis of Prevention Strategies

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

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
    - Mobility, sensory perception, activity
    - Pressure on tissues
    - 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*


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)

“One’s mind, once stretched by a new idea, never regains its original dimensions.” Oliver Wendell Holmes
Vasopressors/Pressure Injury

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

IAD Assessment Tool

The Bath: The First Line Of Defense

Nurse!!!

- Early Detection of Skin Injury
- Reducing Microorganism spread
- Efficiency & Effectiveness
- Health/Social Well Being

Optimal Hygiene

- pH balanced (4-6.8)
  - Stable pH discourages colonization of bacteria & ↓ risk of infection
  - Bar soaps may harbor pathogenic bacteria
- Excessive washing/use of soap compromises the water holding capacity of the skin
- Non-drying, lotion applied
- Multiple steps can lead to large process variation

Traditional Bathing

Why are there so many bugs in here?

Soap and water basin bath was an independent predictor for the development of a CLABSI

Bath Basins: Potential Source of Infection

- Multicenter sampling study (3 ICU’s) of 92 bath basins
- Identify & quantify bacteria in patients basins
- Sampling done on basins used > 2x in patients hospitalized > 48 hours & preformed 2 hours post bath
- Cultures sent to outside laboratory
- Qualitative vs. quantitative measures used to exclude growth that may have occurred in transport
- Bathing practices not controlled & no antiseptic soaps used to bathe

The Evidence: Bath Basins
Potential Source of Infection

Multicenter Sample Study to Identify and Quantify Bacteria in Basins

- Enterococci 54%
- Gram negative 32%
- S. aureus 23%
- VRE 13%
- Less than 10% growth rates
  - MRSA 8%
  - P. aeruginosa 5%
  - Candida albicans 3%
  - E. coli 2%

98% grew bacteria


Bath Basins
Potential Source of Infection

Large multi-center study evaluates presence of multi-drug resistant organisms

Total hospitals: 88
Total basins: 1103

- Contaminated 62%
  686 basins/88 Hospital
  35%
  3%

- Gram negative bacilli 45%
  495 basins/86 hospitals

- Colonized w/ VRE 36%
  385 basins/80 hospitals

- MRSA 33%
  36 basins/28 hospitals

Mechanisms of Contamination

- Skin flora
- Multiple-use basins
  - Incontinence cleansing
  - Emesis
  - Product storage
- Bacterial biofilm from tap water


Waterborne Infection

Hospital Tap Water
- Most overlooked source for pathogens
- 29 studies demonstrate an association with HAIIs and outbreaks
- Transmission:
  - Drinking
  - Bathing
  - Rinsing items
  - Contaminated environmental surfaces
- Immunocompromised patients at greatest risk

Prepackaged Disposable Bathing

Prepackaged disposable bathing cloths result in...

- Nurse satisfaction
- Improved skin condition
- 78% fewer UTIs
- Amount of product used
- Time spent
- Cost
- Variation in bathing process

Larson E. et al. AJCC. 2004; 13(3):235-41

For Successful Banning of Basins for Patient Care

- We need to provide alternatives for the other functions:

<table>
<thead>
<tr>
<th>Current</th>
<th>New</th>
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<tbody>
<tr>
<td>Emesis</td>
<td>Emebags being installed in every adult and ped pt. room, ACU, PACU</td>
</tr>
<tr>
<td>Storage of patient items</td>
<td>Clear plastic &quot;baggies&quot; Trial of &quot;Concierge List&quot; to decrease waste of unused/unneeded products</td>
</tr>
<tr>
<td>Foot soaks</td>
<td>Shampoo caps, prepackaged</td>
</tr>
<tr>
<td>Shampoo patient's hair</td>
<td>Shampoo caps par’d on all units</td>
</tr>
<tr>
<td>24 hour urine, ice</td>
<td>Store some basins in lab to be dispensed with each 24 hour jug.</td>
</tr>
<tr>
<td>Bath cloths with no insulation, cold halfway through bath.</td>
<td>Bath cloths with insulation to stay warm longer</td>
</tr>
</tbody>
</table>

 Quinn B, Presented at NACNS National Conference, March 5-7th, 2015, San Diego CA
Pressure & Shear as a Risk Factor

In Bed & Out of Bed Mobility

The Goal: Patient & Caregiver Safety
**EBP Recommendations to Achieve Offloading & Reduce Pressure (A)**

- Turn & reposition every (2) hours (avoid positioning patients on a pressure injury)
  - 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


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**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

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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 injury prevention
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
  - Breathable slide stay in bed glide sheet
  - Do not leave moving and handling equip underneath the patient


Current Practice: Turn & Reposition

Specialty Bed
Disposable Slide Sheets
Breathable Glide Sheet
Draw Sheet/Pillows/Layers of Linen
Lift Device
The Goal: Patient & Caregiver Safety

ANA Safe Patient Handling and Mobility Interprofessional National Standards

1. Establish a Culture of Safety
2. Implement and Sustain a Safe Patient Handling and Mobility Program
3. Incorporate Ergonomic Design Principles to Provide a Safe Environment of Care
4. Select, Install, and Maintain SPH Technology
5. Establish a System for Education, Training, and Maintaining Competence
6. Integrate Patient-Centered SPHM assessment Plan of Care, and Use of SPHM Technology
7. Include SPHM in Reasonable accommodation and Post-Injury Return to Work
8. Establish a Comprehensive Evaluation System
What is Safe Patient Handling?

**Manual Patient Handling**
- The transporting or supporting of a patient by hand or bodily force, including pushing, pulling, carrying, holding, and supporting of the patient or a body part.

**Safe Patient Handling**
- Evidence-based approach to reducing risk to caregivers. Includes risk assessment, use of equipment, patient assessment, algorithms, peer safety leaders, and after-action reviews.


Achieving the Use of the Evidence For Pressure injury Reduction

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

**Value & Accountability**

**Resources & System**
- 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

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<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>
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<tr>
<td>Mean age (SD) (range), y</td>
<td>57.72 (18,45) (18-89)</td>
<td>57.73 (17,67) (23-92)</td>
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<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>
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<tr>
<td>Braden Scale score</td>
<td>12.77</td>
<td>13.23</td>
<td>.46</td>
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<tr>
<td>Mobility</td>
<td>6.1</td>
<td>0.1</td>
<td>1.00</td>
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<tr>
<td>BMI</td>
<td>29.62</td>
<td>30.97</td>
<td>.65</td>
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Comparative Study of Two Methods of Turning & Positioning

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

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<tr>
<th></th>
<th>SOC</th>
<th>PPS</th>
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<tr>
<td>PU development</td>
<td>6</td>
<td>1</td>
<td>.04</td>
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<tr>
<td># of times patients pulled up in bed</td>
<td>3.28</td>
<td>2.58</td>
<td>.03</td>
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<tr>
<td># of staff required to turn patient</td>
<td>1.97</td>
<td>1.35</td>
<td>&lt;.0001</td>
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1ª PU development with 24hrs of admission

Safe Patient Handling Initiative: Decreases Staff Musculoskeletal Injuries & Patient Pressure Injuries

Way H. Presented at the 2014 Safe Patient Handling East Conference on March 27, 2014

Turning, Boosting & Lateral Transfer

Salsbury S. Presented at NTI May 2016, New Orleans, LA
Implementation Strategy for Boosting

EBP Recommendations to Achieve Offloading & Reduce Pressure

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

Includes complex, intubated, hemodynamically unstable and stable intubated patients; may include non-intubated patients. Includes intubated, non-intubated hemodynamically stable/stabilizing, no contraindications.

**LEVEL I**
- RASS -5 to -3
- Goal: clinical stability, passive ROM
- CLRT/Pronation initiated if patient meets criteria based on institutional practice
- Q 2 hr turning

**LEVEL II**
- RASS -3 & up
- Goal: upright sitting, increased strength and moves arms against gravity
- PT consultation pm
- OT consultation pm

**LEVEL III**
- RASS -1 & up
- Goal: increased trunk strength, moves legs against gravity and readiness to weight bear
- PT: Active Resistance Exercises
- OT consultation prn

**LEVEL IV**
- RASS 0 & up
- Goal: stands w/min. to mod. assist, able to march in place, weight bear and transfer to chair
- PT x 2 daily
- OT x1 daily

**LEVEL V**
- RASS 0 & up
- Goal: increase distance in ambulation & ability to perform some ADLs
- PT x 2 daily
- OT x1 daily

For each position/activity change allow 5-10 minutes for equilibration before determining the patient is intolerant.

- Mobility is the responsibility of the RN, with the assistance of the Unlicensed Assistive Personnel and PT/OT. PT and OT may assist the team with placement to the appropriate mobility level of activity, always prioritizing patient and provider safety. Placement is based on clinical judgment.

**START HERE**
- Perform initial mobility screen w/ in 8 hours of ICU admission
- Reassess mobility level at least every 24 hours (Recommended at shift Δ)
- Refer to the following criteria to assist in determining mobility level

- PaO2/FiO2 > 250
- Peep <10
- O2 Sat > 90%
- RR 10-30
- No new onset cardiac arrhythmias or ischemia
- HR >60 <120
- MAP >55 <140
- SBP >90 <180
- No new or increasing vasopressor infusion
- RASS > 3
- **NO**

- Start at level I and progress*

- **YES**

- Start at level II and progress*
Progressive Mobility + Care Giver Safety + Skin Safety

EBP Recommendations to Achieve Offloading & Reduce Pressure

- Turn & reposition every 2 hours (avoid positioning patients on a pressure injury)
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  - Microclimate management
  - Early Mobility programs
  - Seated support surfaces for patients with limit mobility when sitting in a chair
Out of Bed Technology

Current Seating Positioning Challenges

- Airway & Epiglottis compressed
- Body Alignment
- Shear/Friction
- Sacral Pressure
- Uncomfortable

- Frequent repositioning & potential caregiver injury
- Potential fall risk

Sacral Sitting
Repositioning Patients in Chairs: An Improved Method (SPS)

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

Method 1: 2 care givers 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


Progressive Mobility + Care Giver Safety + Skin Safety

Journey to tolerating upright position, turning, tilt, sitting, standing and walking and out of bed chair sitting can occur quicker through the use of technology
EBP Recommendations to Achieve Offloading & Reduce Pressure

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


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

Successful Prevention of Heel injuries 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


Miller SK, et al WOCN, 2015;42(4):346-351
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

Prevention Strategies for IAD
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

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 injuries
- 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
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


Current Practice: Moisture Management

- Reusable Incontinence pads
- Disposable Incontinence Pads
- Adult diaper
- Airflow pads for Specialty Beds

EBP Recommendations to Reduce Injury From Incontinence & Other Forms of Moisture

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References:
**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


**EBP Recommendations to Reduce Injury From Incontinence & Other Forms of Moisture**

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

Staff Perceived Barriers & Facilitators

- 33 nurses participated in 49 interviews (10 interviews before protocol & 39 after)
- Results/Interview
  - 41/49 in-bed activities
    - Unstable VS (59%) & low respiratory and energy reserves (46%) most common reasons for restricting activity
    - 34% stated safety issues/falling or tube/catheter integrity
    - 27% reported sedation
  - 9 out of Bed activities (7/9 after protocol launch
    - 100% - pt cooperative today
    - 44% - MD order &/or good O2 reserve

Hemodynamic Instability

Is it a Barrier to Positioning?

The Role of Hemodynamic Instability in Positioning\textsuperscript{1,2}

- Lateral turn results in a 3%-9% decrease in SVO\textsubscript{2}, 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:\textsuperscript{3}
  - Elderly
  - Diabetes with neuropathy
  - Prolonged bed rest
  - Low hemoglobin and cardiovascular reserve
  - Prolonged gravitational equilibrium\textsuperscript{4,5}

\textsuperscript{2}Price P. \textit{Dynamics}. 2006;17:12-19.
\textsuperscript{3}Vollman KM. \textit{Crit Care Nurs Q}. 2013;36:17-27.
Decision-Making Tree for Patients Who Are Hemodynamically Unstable With Movement

1. **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?**
   - Oxygen saturation ≤ 90%
   - New onset cardiac arrhythmias or ischemia
   - HR < 60 < 120
   - MAP < 55 > 140
   - SBP < 90 > 180
   - New or increasing vasopressor infusion

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

   **No**
   - Is the patient still hemodynamically unstable after allowing 5-10 minutes' adaption post-position change before determining tolerance?

     **Yes**
     - Allow the patient a minimum of 10 minutes of rest between activities, then try again to determine tolerance

     **No**
     - Try the position turn or HOB maneuver slowly to allow adaption of cardiovascular response to the inner ear position change

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

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

   **No**
   - Try the position turn or HOB maneuver slowly to allow adaption of cardiovascular response to the inner ear position change

HOB = head of bed; HR = heart rate; MAP = mean arterial pressure; SBP = systolic blood pressure.

Vollman KM. Crit Care Nurs Q. 2013;36:17-27
O4  Added a reference
Owner, 5/10/2015
It is not enough to do your best, you have to know what to do and then do your best.

E Deming

How Do We Make It Happen?
Driving Change

- Gap analysis
- Build the Will
- Protocol Development

- Make it Prescriptive
- Overcoming barriers
- Daily Integration

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

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<.001)

Prevention Strategies Focus

• Pressure injury/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

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Intact Skin Is In: Making it Happen

- Advocacy
- Braden subscales
- Skin rounds/time frequency
- Hand-off communication
- The right products and processes
- 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

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Prevention of Pressure Injuries

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