

Put Some Skin in the Game:

Evidence-Based Strategies for Prevention of Pressure Injuries



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Disclosures

- Consultant-Michigan Hospital Association Keystone Center
- Subject matter expert CAUTI, CLABSI, HAPI, Safety culture for American Hospital Association
- Consultant and speaker bureau
 - △ Stryker's Sage
 - △ Baxter Healthcare
 - △ Potrero Medical



Objectives

- 🔍 Examine the new definitions for staging of pressure injuries and use of subscales for assessing risk.
- 🔍 Outline evidence-based prevention strategies for moisture, shear, pressure and device related injuries.
- 🔍 Discuss the steps to start a prevention program on your unit



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



Do the staff you work with
see pressure injury harm
the same way they view
CAUTI/CLABSI harm?



Immediate Huddle Learn from a Defect

Learning from Defect: Pressure Injury Facility Acquired

Date: _____

sticker

Attendees: _____

Instructions:

When HAPI is identified, staff nurse to notify unit manager. Manager will notify team of super huddle time. Super huddle to include any staff nurses and PSTs available, wound care nurse, CNS, CL, and NEC if available, and respiratory if applicable. If this occurs on nights, huddle can be done at night with any staff available, and then info passed on to manager to follow up with wound care, CL, CNS, NEC.

Manager to complete the form AT the BEDSIDE with input from everyone present. Once Section I has been completed, clinical leader (or manager designee) will complete Section II. Return completed form to Quality Department. Manager to keep a copy and have available for review at Pressure Injury Task force.

*if manager is off, contact whomever is covering, i.e. other manager or clinical leader.

Section I:

Location of the Pressure Injury: Unit _____ Date of Pressure Injury: _____

What happened? (brief description from RN caring for patient)

- Anatomical location of the HAPI: _____
- LOS when discovered: _____
- Stage when discovered: _____
- Was the patient transferred prior to discovery? ☐ yes ☐ no
- Was there an OR procedure within 72 hours of discovery? ☐ yes ☐ no
- Time in ED from admit order to admission to floor > 8 hours? ☐ yes ☐ no

Why did it happen?

Wound Nurse Comments:

Risk:

- What risks were identified? ☐ immobility ☐ Shear ☐ Medical device ☐ HD patient
☐ Moisture/incontinence ☐ hemodynamic instability with turning ☐ nutrition risk

Skin Assessment:

- Redness was recognized before the skin broke down. ☐ Yes ☐ no ☐ N/A

Pressure/Shear and Patient Movement: complete on how patient is currently positioned

- If the patient is in bed, what position are they currently in? ☐ back ☐ Rt side lying
☐ Lt side lying ☐ prone ☐ N/A
- Immobile patients are moved using lifting equipment to minimize shear and caregiver injury?
☐ Yes ☐ no ☐ N/A -not immobile
- Heels are floated with pillows if temporary (<8hrs)? ☐ Yes ☐ no ☐ N/A
- Heel floated with a device if >8 hrs of immobility? ☐ Yes ☐ no ☐ N/A
- Sacral foam dressing in place? ☐ Yes ☐ no
- HOB greater than 30 degrees? ☐ Yes ☐ no

Incontinence/Moisture

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15. Urine and fecal containment per policy if patient is incontinent? ☐ Yes ☐ no ☐ N/A

16. Was barrier cream in room if patient is incontinent? ☐ Yes ☐ no ☐ N/A

Support Surface:

17. At risk patient is on appropriate surface? ☐ Yes ☐ no ☐ N/A

Medical Devices (check all that apply) (If none check proceed to the questions in a box)

- ☐ Trach ☐ noninvasive mask ☐ oxygen N/C ☐ cervical collar ☐ arterial line
☐ Endotracheal tube ☐ Endo Tube Holder ☐ orthotics ☐ cooling blanket ☐ SCD/Stocking
☐ Immobilizer/splint/arm board

18. Were protective measures taken to prevent injury? (Foam padding, protective dressing, repositioning?) ☐ Yes ☐ No ☐ N/A

What happened to cause the defect?	What prevented it from being worse?
------------------------------------	-------------------------------------

What can we do to prevent this from happening to someone else?

Action Plan	Responsible person	Targeted date	Evaluation Plan: How will we know risk is reduced?

With whom shall we share our learning? (communication plan)

Who	When	How	Follow up

Section II:

Additional Data to be completed when able:

- Was Braden risk identified? yes ☐ no ☐
- 4 eyes head to toe assessment performed on admission? ☐ Yes ☐ no
- 4 eyes head to toe assessment performed per shift (last 24hrs)? ☐ Yes ☐ no
- 4 eyes assessment of skin underneath device done q 12 hrs by RT.? ☐ Yes ☐ no ☐ N/A
- Patient pressures redistributed and documented q 2? ☐ Yes ☐ no
- Was patient placed on a specialty surface in OR (>4hrs) ☐ Yes ☐ no ☐ N/A
- Was patient placed on specialty surface in ER? (>4hrs) ☐ Yes ☐ no ☐ N/A
- Was a nutritional consult placed/completed in patients at high risk? ☐ Yes ☐ no ☐ N/A
- Document significant co-morbidities: _____
- Doctor notified of the pressure injury: ☐ yes ☐ No

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Pressure Injury Prevention



Background of the Problem

- ▶ HAPU are the 4th most common preventable medical error in the United States
- ▶ 2.5 million patients are treated for HAPU annually in acute care
- ▶ 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%)

<http://www.ahrq.gov/professionals/systems/hospital/pressureulcertoolkit/putool1.html#11>

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

Vanderwee KM, et al., *Eval Clin Pract* 13(2):227-32. 2007

European Pressure Ulcer Advisory Panel/ National Pressure Injury Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers/injuries :Clinical Practice Guideline. Emily Haesler (Ed).EPUAP/NPIAP/PPPIA. 2019

Chen H, et al. *Wounds*. 2012;24(9):234-241.

Padula WV, et al. *Int Wound J*. 2019;16(3):634-640.

Padula WV. Et al BMJ Qual Safety, 2019;28:132-41



Background of the Problem

- 🌈 Cost Stage 1-2 \$2770.54, Stage 3-4 \$ 71,000 to 127,000
 - 17,000 lawsuits are related to pressure ulcers annually
- 🌈 60,000 persons die from pressure ulcer complications each year in US
- 🌈 National healthcare cost \$26.8 billion per year in US

Targeted pressure injury prevention to patients with low Braden scores < 15 vs standard care does save money and results in better quality per life year (QALYs)

<http://www.ahrq.gov/professionals/systems/hospital/pressureulcertoolkit/putool1.html#11>
Reddy, M, et al. JAMA, 2006; 296(8): 974-984
Vanderwee KM, et al., *Eval Clin Pract* 13(2):227-32. 2007
European Pressure Ulcer Advisory Panel/ National Pressure Injury Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers/injuries :Clinical Practice Guideline. Emily Haesler (Ed).EPUAP/NPIAP/PPPIA. 2019
Chen H, et al. *Wounds*. 2012;24(9):234-241.
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Padula WV. Et al BMJ Qual Safety, 2019;28:132-41



Incidence of Pressure Injuries in Critical Care

- 🔗 22 studies, 10 reported cumulative incidence of PI
- 🔗 Incidence: 10-25.9%
- 🔗 Prevalence: 16.9-23.8%
- 🔗 Excluding Stage 1 Incidence: 0.0 to 23.8%
- 🔗 Location: 5 studies (406 patients)
 - △ Sacrum: 26.9-48%
 - △ Buttock: 4.1-46%
 - △ Heel: 18.5-38.9%
 - △ Hips: 10.9-15.7%
 - △ Ears: 4.3-19.7%
 - △ Shoulders: 0.0-40.2%

1 out of every
4-5 patients in
the ICU will
develop a PI

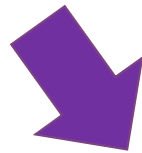


Clarification of Definitions:

- ▶ 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



Top-Down vs Bottom-Up Tissue Damage



Top-Down

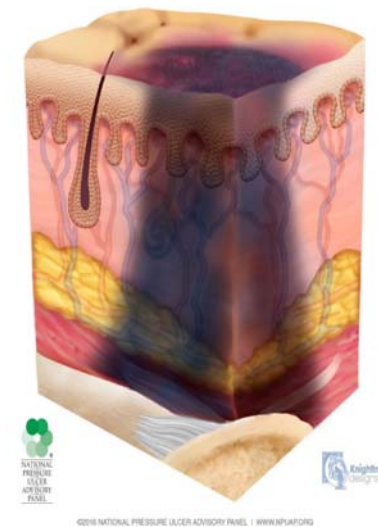
Stage 1, 2



Bottom-Up

- Stage 3, 4, Unstageable, DTI

Deep Tissue Pressure Injury



Persistent non-blanchable deep red, maroon or purple discoloration

Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood filled blister

COVID Skin Manifestations

Right Buttock on Day 1



Right Buttock, sacrum and coccyx on Day 3



COVID versus DTI?

- Purple areas on non pressure loaded surfaces lack of pressure shear ideology and should not be classified as pressure injuries
- Purple areas on pressure loaded surfaces weather prone or supine require further investigation

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
Gray M et al OWM 2007;34(1):45-53.
Doughty D, et al. JWOCN. 2012;39(3):303-315
Kottner J, et al. Clin Biomech, 2018;59:62-70

IAD: Multistate Epidemiology Study



5,342 patients in 189 acute care facilities in 36 states

Prevalence study

- To measure the prevalence of IAD, describe clinical characteristics of IAD, and analyze the relationship between IAD and prevalence of sacral/coccygeal pressure ulcers

Results: 2,492 patients incontinent (46.6%)

- 57% both FI and UI, 27% FI, 15% UI
- 21.3% IAD rate overall/14% also had fungal rash
- 45.7% in incontinent patients
 - 52.3% mild
 - 27.9% moderate
 - 9.2% severe
- 73% was facility-acquired
- ICU a 36% rate
- IAD alone and in combination with immobility statistically associated with FAPI

GLOBIAD

The Ghent Global Categorization tool

Category 1: Persistent redness

1A - Persistent redness without clinical signs of infection



Critical criterion

- Persistent redness
A variety of tones of redness may be present. Patients with darker skin tones, the skin may be paler or darker than normal, or purple in colour.

Additional criteria

- Marked areas or discolouration from a previous (healed) skin defect
- Shiny appearance of the skin
- Macerated skin
- Intact vesicles and/or bullae
- Skin may feel tense or swollen at palpation
- Burning, tingling, itching or pain

1A

1B - Persistent redness with clinical signs of infection



Critical criteria

- Persistent redness
A variety of tones of redness may be present. Patients with darker skin tones, the skin may be paler or darker than normal, or purple in colour.
- Signs of infection
Such as white scaling of the skin (suggesting a fungal infection) or satellite lesions (pustules surrounding the lesion, suggesting a *Candida albicans* fungal infection).

Additional criteria

- Marked areas or discolouration from a previous (healed) skin defect
- Shiny appearance of the skin
- Macerated skin
- Intact vesicles and/or bullae
- The skin may feel tense or swollen at palpation
- Burning, tingling, itching or pain

1B

Category 2: Skin loss

2A - Skin loss without clinical signs of infection



Critical criterion

- Skin loss
Skin loss may present as skin erosion (may result from damaged/eroded vesicles or bullae), denudation or excoriation. The skin damage pattern may be diffuse.

Additional criteria

- Persistent redness
A variety of tones of redness may be present. Patients with darker skin tones, the skin may be paler or darker than normal, or purple in colour
- Marked areas or discolouration from a previous (healed) skin defect
- Shiny appearance of the skin
- Macerated skin
- Intact vesicles and/or bullae
- Skin may feel tense or swollen at palpation
- Burning, tingling, itching or pain

2A

2B - Skin loss with clinical signs of infection



Critical criteria

- Skin loss
Skin loss may present as skin erosion (may result from damaged/eroded vesicles or bullae), denudation or excoriation. The skin damage pattern may be diffuse.
- Signs of infection
Such as white scaling of the skin (suggesting a fungal infection) or satellite lesions (pustules surrounding the lesion, suggesting a *Candida albicans* fungal infection), slough visible in the wound bed (yellow/brown/grayish), green appearance within the wound bed (suggesting a bacterial infection with *Pseudomonas aeruginosa*), excessive exudate levels, purulent exudate (pus) or a shiny appearance of the wound bed.

Additional criteria

- Persistent redness
A variety of tones of redness may be present. Patients with darker skin tones, the skin may be paler or darker than normal, or purple in colour
- Marked areas or discolouration from a previous (healed) skin defect
- Shiny appearance of the skin
- Macerated skin
- Intact vesicles and/or bullae
- Skin may feel tense or swollen at palpation
- Burning, tingling, itching or pain

2B

Identify Patients at High Risk



Risk Assessment on Admission, Daily, Change in Patient Condition

Use standard EBP risk assessment tool

Research has shown risk assessment tools are more accurate than RN assessment alone

Epidemiological study risk factors	Braden Scale ¹⁴⁶	Norton Scale ¹⁴⁷	Waterlow Score ¹⁴⁸	Cubbin-Jackson Scale ¹⁴⁹ (critically ill individuals)	SCIPUS ¹⁵⁰ (individuals with SCI)	Braden Q Scale ¹⁵¹ (children)
Activity and mobility limitations	• Mobility* • Activity* • Friction-shear*	• Mobility* • Activity*	Mobility	• Mobility • Hygiene	• Mobility • Level of activity • Complete SCI • Autonomic dysreflexia/ severe spasticity	• Mobility* • Activity* Friction-shear*
Skin status	Not included	Not included	Skin type (in visual areas, partial measure of skin status)	General skin condition	Not included	Not included
Diabetes	Not included	Not included	Not included	Not included	Blood glucose levels	Not included
Perfusion and oxygenation	Not included	Not included	Special Risk (partial measure of perfusion)	• Oxygen requirements • Respiration • Hemodynamics	• Tobacco use • Cardiac disease	• Tissue perfusion oxygenation
Poor nutritional status	Nutrition	• Food intake • Fluid intake (modified scale)	• Appetite • Build (weight for height)	• Weight/tissue viability • Nutrition	Not included	Nutrition
Increased skin moisture	Moisture*	Incontinence	Continence	Incontinence	Urine incontinence or constant moistness	Moisture*
Increased body temperature	Not included	Not included	Not included	Not included	Not included	Not included
Advanced age	Not included	Not included	Gender/Age	Age	Age	Not included
Sensory perception	Sensory perception*	Not included	Neurological Deficit	Not included	Not included	Sensory perception*
Abnormal laboratory blood results	Not included	Not included	Not included	Not included	• Albumin • Hematocrit	• Not included
General health status	Not included	• Physical condition • Mental condition*	• Major Surgery/Trauma • Medications	• Mental condition • Past medical condition	• Respiratory disease • Renal disease • Impaired cognitive function	• Not included

Garcia-Fernandez FP, et al. JWOCN, 2014;41(1):24-34
European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers/injuries :Clinical Practice Guideline. Emily Haesler (Ed).EPUAP/NPIAP/PPPIA. 2019

Picking the Right Scale

Scales (cut-off)	Sensitivity Median (range)	Specificity Median (range)	Positive likelihood ratio	Negative likelihood ratio	AUROC Median (range)	Relative Risk (95% CI)
Braden (≤ 18) ^{118,135}	0.74 ^a (0.33 to 1)	0.68 ^a (0.34 to 0.86)	2.31 ^a	0.38 ^a	0.77 ^b (0.55 to 0.88)	4.26 ^f (3.27 to 5.55)
Norton (≤ 14) ^{118,135}	0.75 ^c (0 to 0.89)	0.68 ^c (0.59 to 0.95)	2.34 ^c	0.37 ^c	0.74 ^c (0.56 to 0.75)	3.69 ^g (2.64 to 5.16)
Waterlow (≥ 10) ^{118,135}	1.00, 0.88 ^d	0.13, 0.29 ^d	1.15, 1.24 ^d	0.0, 0.41 ^d	0.61 ^e (0.54 to 0.66)	2.66 ^h (1.76 to 4.01)
Cubbin-Jackson (≤ 24) ^{135,145}	0.72 ⁱ	0.68 ^j	—	—	0.763 ^j	8.63 ^k (3.02 to 24.66)
SCIPUS (≥ 8) ¹³⁰	0.85 ^m	0.38 ^m	1.4 ^m	—	0.64 ^m (0.59 to 0.70)	—
Braden Q (≤ 13) ¹⁵²	0.86 ^p (0.76 to 0.96)	0.59 ^p (0.55 to 0.63)	2.09 ^p (0.95 to 4.58)	—	0.72 ^p (0.76 to 0.78)	—
^a 16 studies, n=5,462 ^d 2 studies, n=419 ^g 15 studies, n=4,935 ^k 2 studies, n=151			^b 7 studies, n=4,811 ^e 4 studies, n=2,559 ^h 12 studies, n=2,408 ^m 1 study (n=759)		^c 5 studies, n=2,809 ^f 31 studies, n=7,137 ⁱ 1 study, n=829 ^p 1 study, n=625	

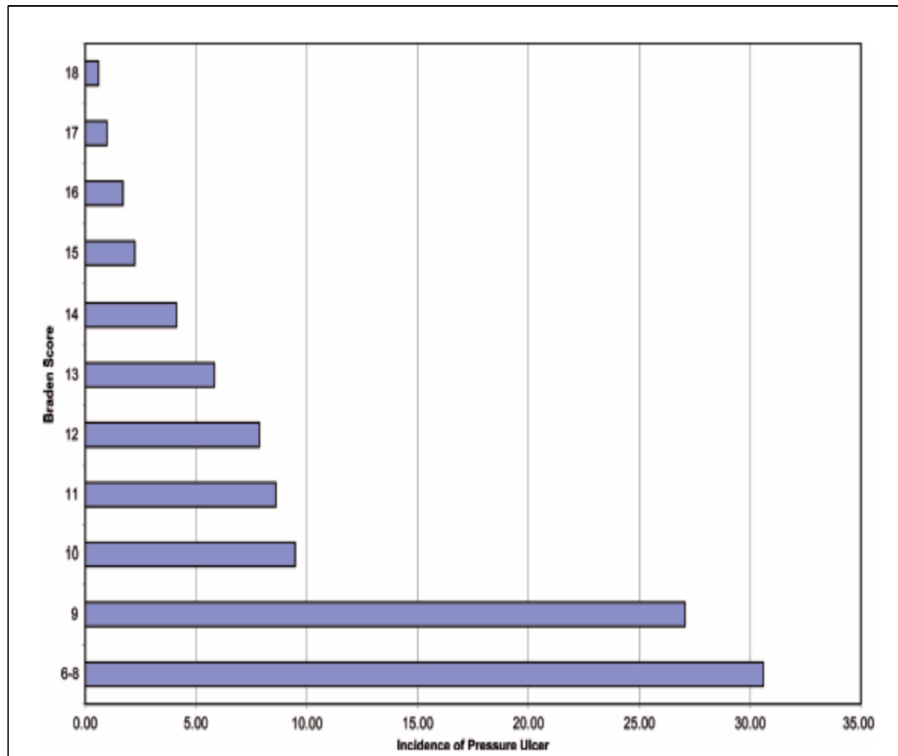
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It's About the Sub-Scales

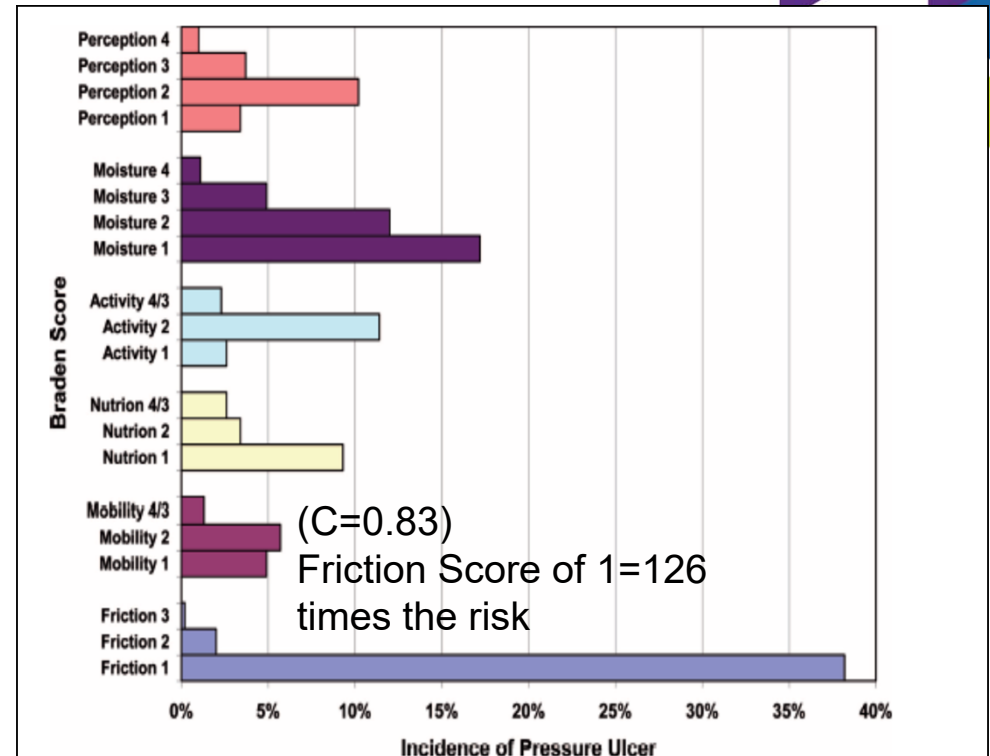


- 🔗 Retrospective cohort analysis of 12,566 adult patients in progressive & ICU settings for yr. 2007
- 🔗 Identifying patients with HAPU Stage 2-4
- 🔗 Data extracted: Demographic, Braden score, Braden subscales on admission, LOS, ICU LOS, presence of Acute respiratory and renal failure
- 🔗 Calculated 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)

Jackson/Cubbin

Risk level

- △ 48 max score-low risk
- △ 9 minimum score-high risk

Comparison to Braden

- △ Both reliable & valid scales
- △ Predictability to determine patients at low and high risk better with the Jackson/Cubbin

Age (years)	Score point	Hemodynamics	Score point
<40	4	Stable without inotropes	4
40-54	3	Stable with inotropes	3
55-70	2	Unstable without inotropes	2
>70	1	Unstable with inotropes	1
Weight/tissue viability		Respiration	
Average weight BMI 18-25.9 kg/m ²	4	Spontaneous	4
Obese 26-39.9 kg/m ²	3	Non-nvasive, CPAP/BiPAP	3
Cachectic <18 kg/m ²	2	Mechanical ventilation	2
Any of the above plus severe edema or >40 kg/m ²	1	Mechanical ventilation. No spontaneous breathing	1
Past medical history		Oxygen requirements	
None	4	Requires <40% O ₂ , stable on movement	4
Mild	3	Requires 40%-60% O ₂ , stable on movement	3
Severe	2	Requires 40%-60% O ₂ , stable ABGs but desaturates on movement	2
Very Severe	1	Requires 60% O ₂ or above. Inability to maintain ABGs/desaturates at rest	1
General skin condition		Nutrition	
Intact	4	Full diet + fluids	4
Red skin affecting areas prone to pressure	3	Clear IV fluids only	3
Grazed/excoriated superficial skin areas	2	Light diet, oral fluids, enteral feeding	2
Deep wounds, necrotized or heavily exuding wounds	1	Parenteral feeding	1
Mental condition		Incontinence	
Awake and alert	4	None/anuric/catheterized (urine and/or feces catheter)	4
Agitated/restless/confused	3	Urine/profound sweating	3
Apathic/sedated but responsive	2	Feces/occasional diarrhea	2
Coma/unresponsive/paralyzed and sedated	1	Urine and feces/prolonged diarrhea (≥3 times/day)	1
Mobility		Hygiene	
Walks with help	4	Independent	4
Very limited, chairbound	3	Needs assistance	3
Immobile but tolerates change of position	2	Needs much assistance	2
Unable to tolerate movement, nursed prone	1	Fully dependent	1
Deduct points			
Deduct 1 point, if patient has been in surgery or transported to CT, MRI or HBOT during the last 48 hours			
Deduct 1 point, if patient has required blood or clotting factors during last 24 hours			
Deduct 1 point, if patient has hypothermia of 35°C or under (core temperature)			

Revised sections (marked as bolded) of the Jackson/Cubbin risk scale¹⁴ Utilized in this program to improve the clarity and reproducibility of the scale. The maximum score is 48 (low risk) and the minimum score 9 points signifying high risk.
 BMI = body mass index; CPAP= continuous positive airway pressure; BiPAP = bilevel positive airway pressure; ABGs = arterial blood gases; CT = computerized tomography; MRI = magnetic resonance imaging; HBOT = hyperbaric oxygen therapy

IAD Assessment Tool

Hospital Survey on Incontinence & Related Skin Injury

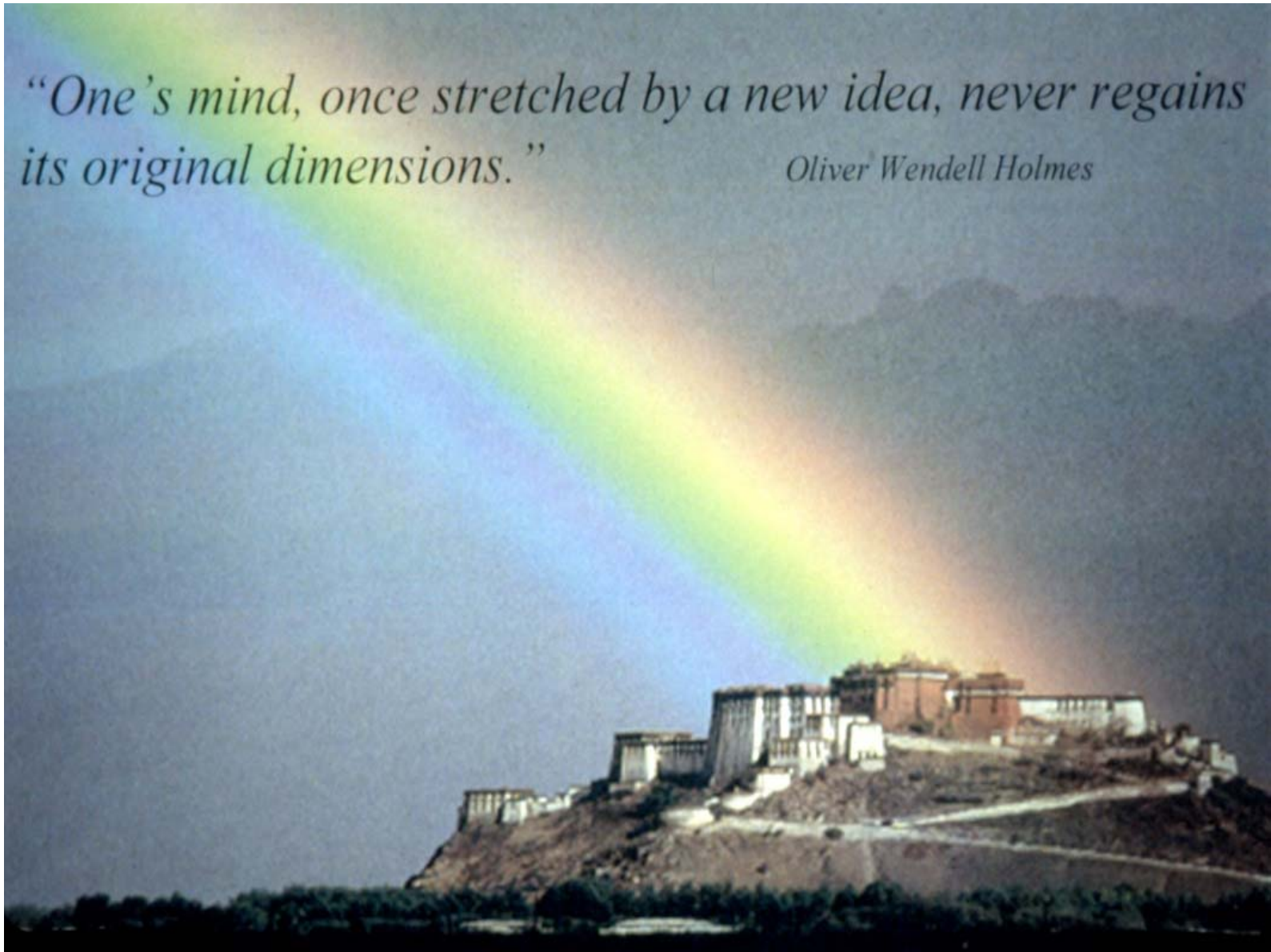
Unit / Work Area		
Instructions: This survey is limited to inpatient care areas and excludes the following: Labor & Delivery, Obstetrics, Nursery, Emergency Department & Operating Room. Note: Complete ONLY ONE form for each unit.		
Date of Survey: ____/____/____		Unit: _____
Please check the unit specialty that best describes the care provided.		
<input type="checkbox"/> Burn <input type="checkbox"/> Cardiac Surgery <input type="checkbox"/> CCU - General <input type="checkbox"/> CCU - Interventional <input type="checkbox"/> ICU - Cardiovascular <input type="checkbox"/> ICU - General <input type="checkbox"/> ICU - Medical <input type="checkbox"/> ICU - Neuro <input type="checkbox"/> ICU - Neonatal <input type="checkbox"/> ICU - Pediatric <input type="checkbox"/> ICU - Surgical	<input type="checkbox"/> LTAC <input type="checkbox"/> LTC <input type="checkbox"/> Medical <input type="checkbox"/> Med/Surg <input type="checkbox"/> Neurology <input type="checkbox"/> Oncology <input type="checkbox"/> Orthopedic <input type="checkbox"/> Other <input type="checkbox"/> PACU <input type="checkbox"/> Pediatrics <input type="checkbox"/> Psychiatric - General	<input type="checkbox"/> Psychiatric - Geriatric <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Renal/Urology <input type="checkbox"/> Respiratory/Pulmonary <input type="checkbox"/> SNF/Transitional Care <input type="checkbox"/> Skilled Care (LTC) <input type="checkbox"/> Stepdown/Transition <input type="checkbox"/> Surgical <input type="checkbox"/> Telemetry - General <input type="checkbox"/> Telemetry - Medicine <input type="checkbox"/> Telemetry - Surgical <input type="checkbox"/> Wound Care
Patient Census of Unit at Time of Survey: _____		
Incontinence Collection Products:		
Check all that apply to a specific unit/work area.		
<input type="checkbox"/> Pad/Chux <input type="checkbox"/> Reusable cloth <input type="checkbox"/> Disposable plastic-backed <input type="checkbox"/> Disposable air flow-backed	<input type="checkbox"/> Diaper/Brief <input type="checkbox"/> Reusable cloth <input type="checkbox"/> Disposable plastic-backed <input type="checkbox"/> Disposable air flow-backed	<input type="checkbox"/> Collection Device
Incontinence Cleanup & Skin Protection:		
Check all product categories that are available in a specific unit/work area.		
Cleansing: <input type="checkbox"/> Soap/Water/Basin <input type="checkbox"/> Peri-Wash (spray) <input type="checkbox"/> Cleansing Foam <input type="checkbox"/> Washcloth (circle type) <input type="checkbox"/> reusable / disposable <input type="checkbox"/> Premoistened Wipe (thin, not washcloth)	Barrier Protection (Tubes, Bottles or Sprays): <i>Must contain one of the "Active Ingredients" listed below</i> <input type="checkbox"/> Petroleum <input type="checkbox"/> Zinc Oxide <input type="checkbox"/> Dimethicone <input type="checkbox"/> Liquid Film Barrier <input type="checkbox"/> Other _____	All-in-one products: <i>Must combine cleansing, moisturizing & barrier protection</i> <input type="checkbox"/> Barrier cloth with skin protectant
Moisturizers: <input type="checkbox"/> Lotion <input type="checkbox"/> Cream <input type="checkbox"/> Ointment		

Page 10141C

Patient Information		
Patient Unit: _____ (from Unit/Work Area date collection form)		
Section 1 - Complete for all patients surveyed		
Demographic Information:		
Patient Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female	Patient Age Group: <input type="checkbox"/> 0 to 12 months <input type="checkbox"/> 1 to 3 yrs <input type="checkbox"/> 4 to 12 yrs <input type="checkbox"/> 13 to 19 yrs <input type="checkbox"/> 20 to 29 yrs <input type="checkbox"/> 30 to 39 yrs	<input type="checkbox"/> 40 to 49 yrs <input type="checkbox"/> 50 to 59 yrs <input type="checkbox"/> 60 to 69 yrs <input type="checkbox"/> 70 to 79 yrs <input type="checkbox"/> 80 + yrs
Continence Status:		
Incontinence = inability to control the flow of urine and/or stool in the preceding 24 hours		
Urine: <input type="checkbox"/> Continent <i>Note: A patient with a Foley Catheter is deemed "continent"</i> <input type="checkbox"/> Patient has Foley <input type="checkbox"/> Incontinent	Stool: <input type="checkbox"/> Continent <i>Note: A patient with an indwelling fecal collection device is deemed "continent"</i> <input type="checkbox"/> Incontinent <input type="checkbox"/> Liquid or semi-liquid stools <input type="checkbox"/> Frequency _____ <input type="checkbox"/> Patient has indwelling fecal collection device <input type="checkbox"/> Patient has external fecal collection device	
Section 2 - Complete only for incontinent patients		
Contributing Factors & Co-Morbidities		
Check all that apply: <input type="checkbox"/> Low albumin <input type="checkbox"/> Anemia <input type="checkbox"/> Continuum diffuse stool positive <input type="checkbox"/> Tube feeding	<input type="checkbox"/> Braden Score _____ <input type="checkbox"/> Mobility Score _____ <input type="checkbox"/> Friction & Shear Score _____ <input type="checkbox"/> Nutrition Score _____	<input type="checkbox"/> Diabetic with recent hyperglycemia <input type="checkbox"/> Obesity with deep groin/abdominal skin folds <input type="checkbox"/> Immunosuppressed <input type="checkbox"/> Other _____
Incontinence Cleanup & Skin Protection:		
Check products used on patient: Cleansing: <input type="checkbox"/> Soap/Water/Basin <input type="checkbox"/> Peri-Wash (spray) <input type="checkbox"/> Cleansing Foam <input type="checkbox"/> Washcloth (circle type) <input type="checkbox"/> reusable / disposable <input type="checkbox"/> Premoistened Wipe (thin, not washcloth)	Barrier Protection: (Tubes, Bottles or Sprays) <i>Must contain one of the "Active Ingredients" listed below</i> <input type="checkbox"/> Petroleum <input type="checkbox"/> Zinc Oxide <input type="checkbox"/> Dimethicone <input type="checkbox"/> Liquid Film Barrier <input type="checkbox"/> Other _____	All-in-one products: <i>Must combine cleansing, moisturizing & barrier protection</i> <input type="checkbox"/> Barrier cloth with skin protectant
Section 3		
Complete only for incontinent patients with redness of buttock or perineal skin		
Perineal Skin Injury		
Check all that apply: Condition: <input type="checkbox"/> Incontinence Associated Dermatitis <input type="checkbox"/> Red and dry <input type="checkbox"/> Red and weepy <input type="checkbox"/> Present on Admission <input type="checkbox"/> Pressure Ulcer (anal, rectal or urethral) <input type="checkbox"/> How many? _____ <input type="checkbox"/> Stage(s) _____ <input type="checkbox"/> Present on Admission <input type="checkbox"/> Fungal/yeast appearing rash <input type="checkbox"/> Other _____ <input type="checkbox"/> Specify _____	Area Affected: <input type="checkbox"/> Buttocks <input type="checkbox"/> Coccyx <input type="checkbox"/> Rectal Area <input type="checkbox"/> Scrotum/Vulva <input type="checkbox"/> Lower Abdomen <input type="checkbox"/> Upper Thighs <input type="checkbox"/> Genital area <input type="checkbox"/> Groins	Containment Products: <input type="checkbox"/> Fecal Seal Fecal Collection Device <input type="checkbox"/> Zappi Fecal Collection Device <input type="checkbox"/> Nasal Trumpet <input type="checkbox"/> Other _____ <input type="checkbox"/> Reusable cloth <input type="checkbox"/> Disposable plastic-backed <input type="checkbox"/> Disposable air flow-backed <input type="checkbox"/> Were incontinence briefs worn by patient?

“One’s mind, once stretched by a new idea, never regains its original dimensions.”

Oliver Wendell Holmes



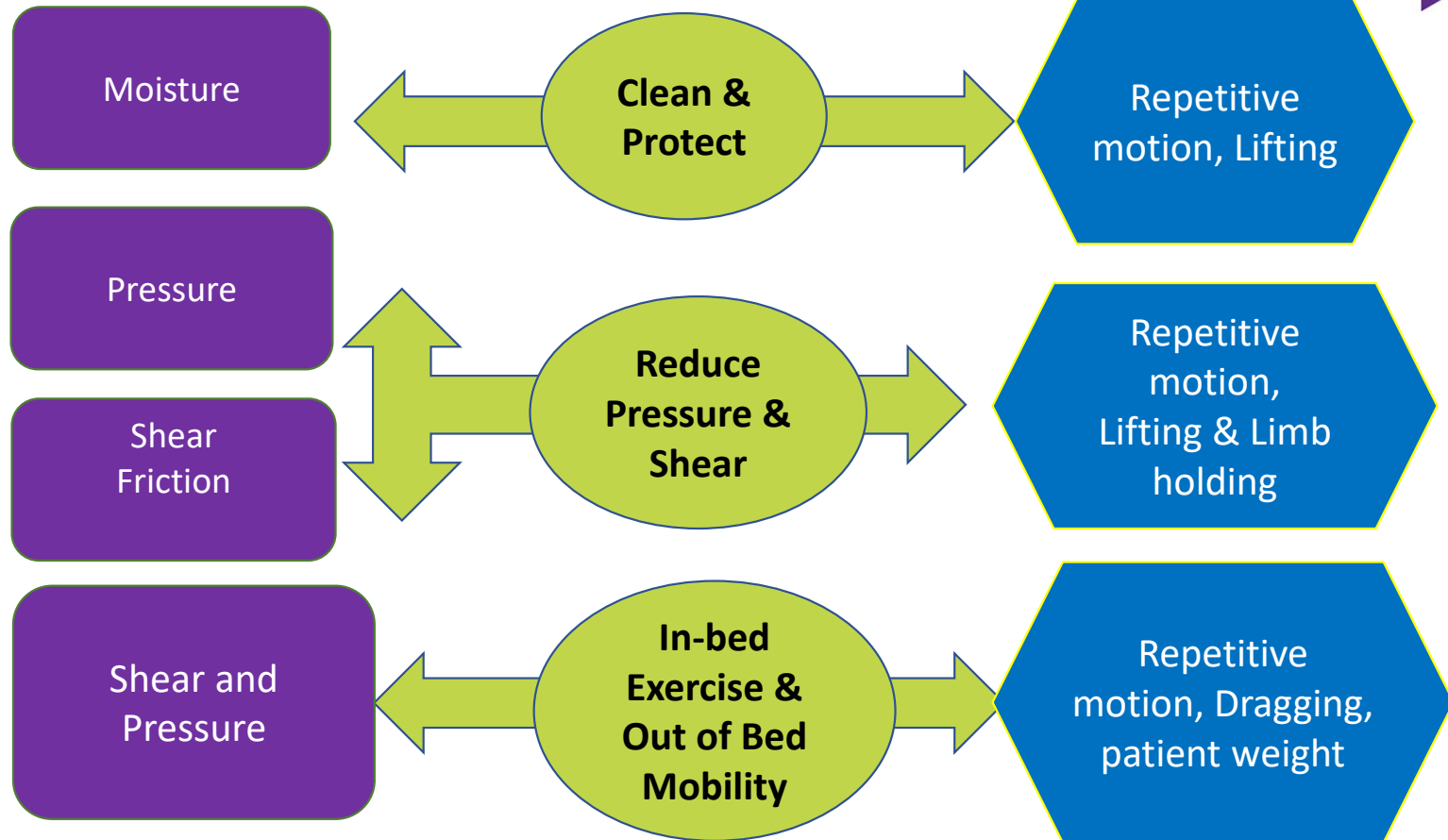
The Goal: Patient & Caregiver Safety



Immobility Risk
Skin Risk Factors

Mobility, Skin & Fall
Prevention Strategies

Care Giver Risk



Pressure & Shear as a Risk Factor



EBP Recommendations to Achieve Offloading & Reduce Pressure

- 🌈 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 bony prominences
 - Between pillows and wedges, the wedge system was more effective in reducing pressure in the sacral area (healthy subjects)
 - Between pillows and wedges, wedges maintain lateral position better
 - △ Assess whether actual offloading has occurred
 - △ Use lifting device or other aids to reposition & make it easy to achieve the turn



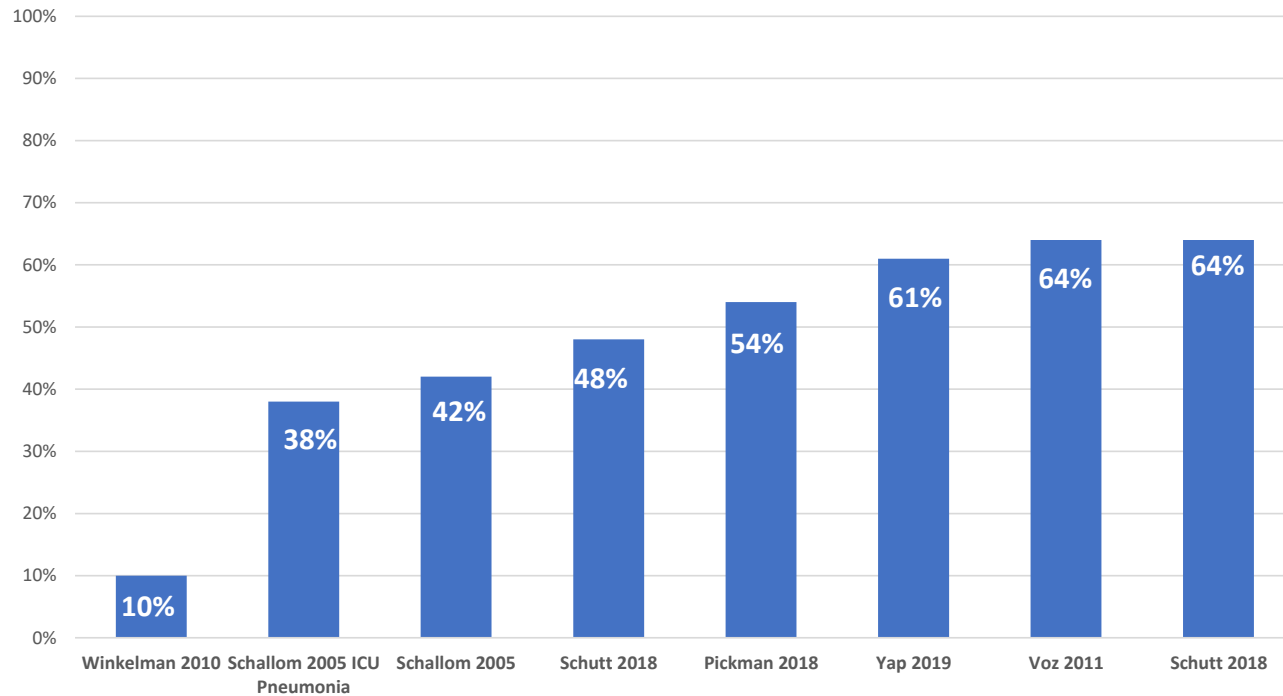
1. McNichol L, et al. J Wound Ostomy Continence Nurse, 2015;42(1):19-37.
2. Bush T, et al. WOCN, 2015;42(4):338-345
3. Kapp S, et al. Int Wound J, 2019;1-7
EPUAP/NPIAP/PPPIA, 2019

European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers/injuries :Clinical Practice Guideline. Emily Haesler (Ed). EPUAP/NPIAP/PPPIA, 2019

Assessing Compliance of Positioning



Adherence to Turning Protocols

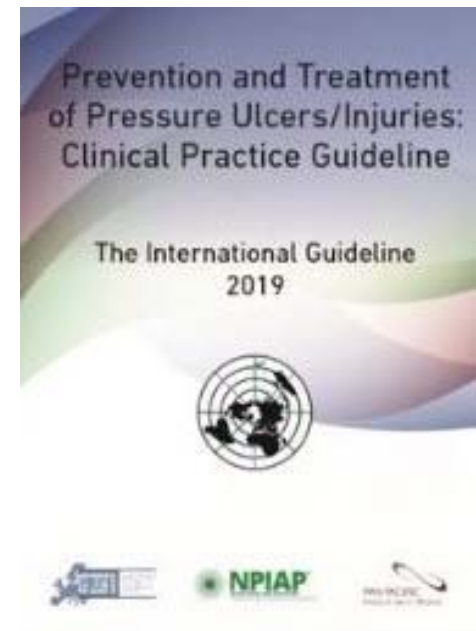


48% Average
Adherence



EBP Recommendations to Reduce Shear & Friction

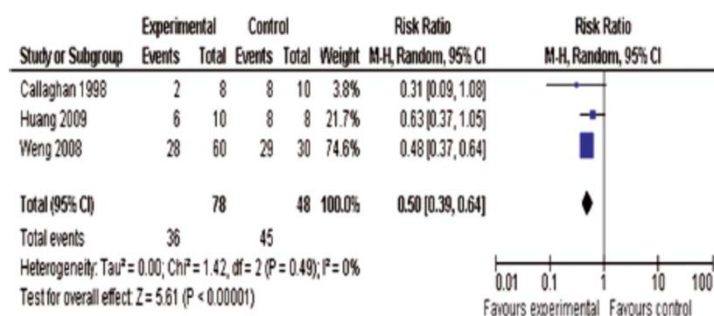
- Loose covers & increased immersion in the support medium increase contact area
- Prophylactic dressings (recommendation strength ↑)
- Reposition the individual to relieve or redistribute pressure using manual handling techniques and equipment that reduce shear & friction.
 - △ Mechanical lifts
 - △ Transfer sheets
 - △ 2-4 person lifts
 - △ Turn & assist features on beds
- Do not leave moving and handling equip underneath the patient, unless it is specifically designed for this purpose-breathable



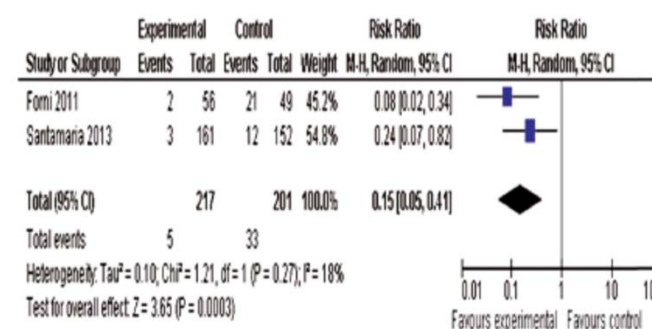
Systematic Review: Use of Prophylactic Dressing in Pressure Ulcer Prevention



- 21 studies met the criteria for review
- 2 RCTs, 9 had a comparator arm, 5 cohort studies, 1 within-subject design where prophylactic dressings were applied to one trochanter with the other trochanter dressing free



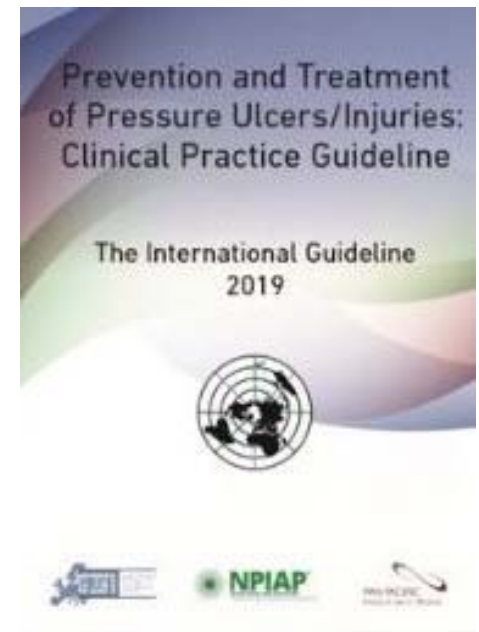
Evaluated nasal bridge device ulcer prevention



Evaluated sacral pressure ulcer prevention

EBP Recommendations to Reduce Shear & Friction

- Loose covers & increased immersion in the support medium increase contact area
- Prophylactic dressings: emerging science
- Reposition the individual to relieve or redistribute pressure using manual handling techniques and equipment that reduce shear & friction.
 - △ Mechanical lifts
 - △ Transfer sheets
 - △ 2-4 person lifts
 - △ Turn & assist features on beds
- Do not leave moving and handling equipment underneath the patient, unless it is specifically designed for this purpose





Specialty Bed



Disposable Glide/Slide Sheets



**Breathable Shear
Reduction Glide Sheet**



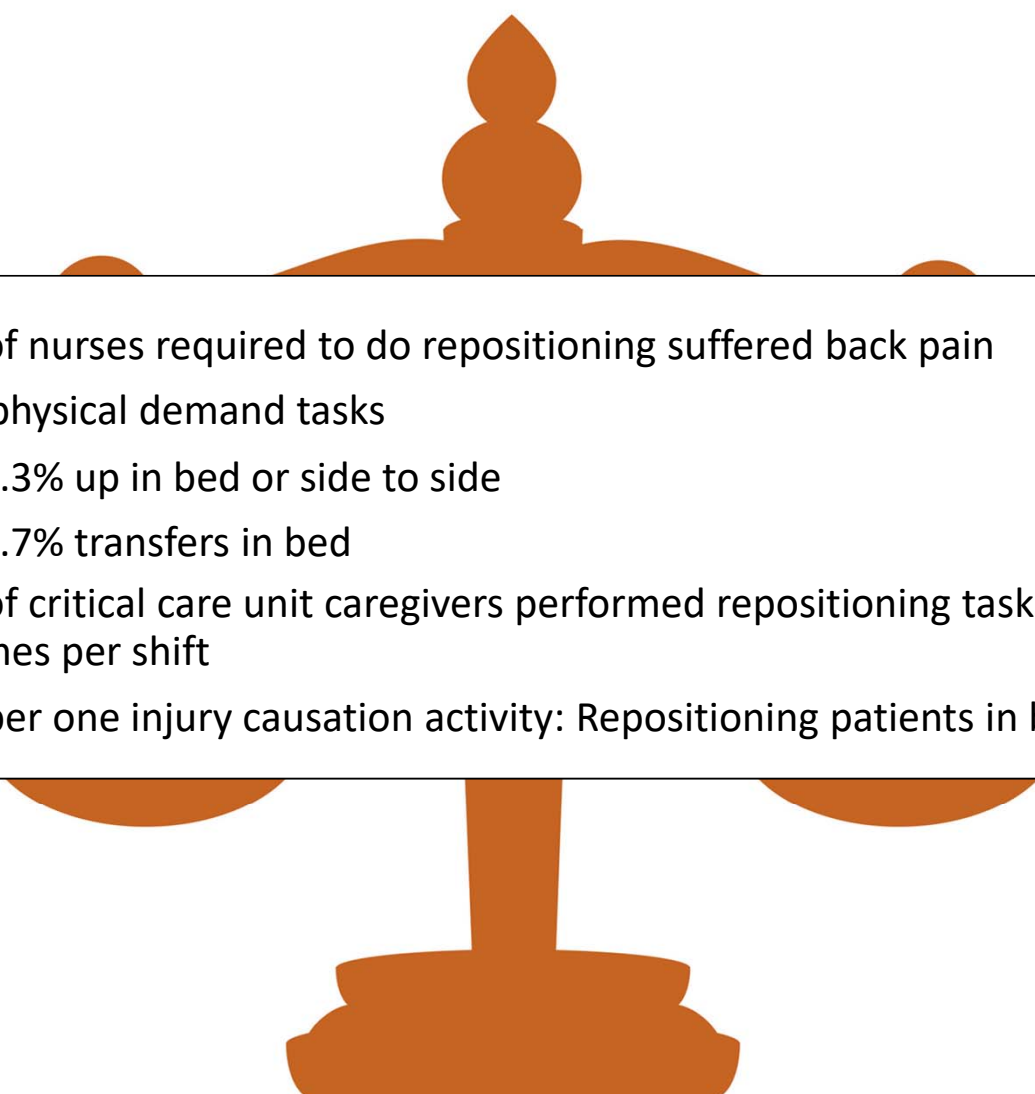

Current Practice: Turn & Reposition

Draw Sheet/Pillows/Layers of Linen



Lift Device



- 
- 
- 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

Oh, My Aching Back!

Back Pain Incidence in Nursing:

- 8 out of 10 nurses work despite experiencing musculoskeletal pain¹
- 62% of nurses report concern regarding developing a disabling musculoskeletal injury¹
- 56% of nurses report musculoskeletal pain is made worse by their job¹
- Nursing assistants had the 2nd highest and RNs had the 6th highest number of musculoskeletal disorders in the U.S.²



1. American Nurses Association. (2013). ANA Health and Safety Survey. Retrieved from <http://www.nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Work-Environment/Work-Environment/2011-HealthSafetySurvey.html> 2. U.S. Department of Labor, Bureau of Labor Statistics. (2014). Table 16. Number, incidence rate, and median days away from work for nonfatal occupational injuries and illnesses involving days away from work and musculoskeletal disorders by selected worker occupation and ownership, 2014. Retrieved from <http://www.bls.gov/news.release/osh2.t16.htm>



Contributing Factors to Injury

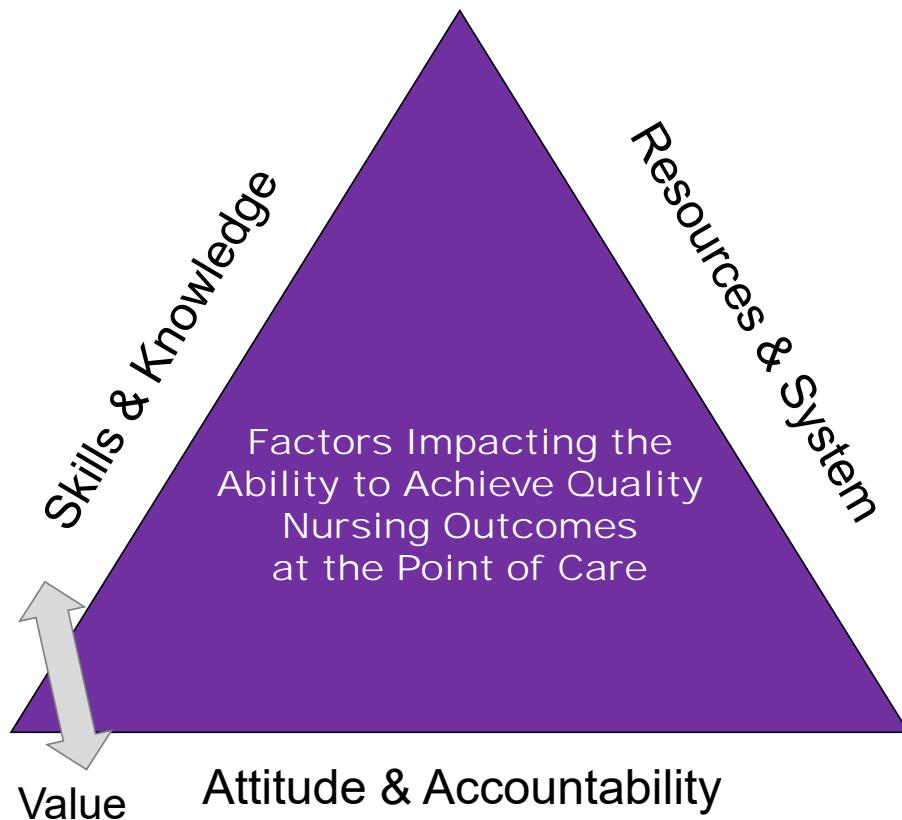
- ▶ Healthcare is the only industry that considers 100 pounds to be a “light” weight
- ▶ Other professions use assistive equipment when moving heavy items
- ▶ On average, nurses and assistants lift 1.8 tons per shift (ANA, n.d.)



(Kelly, 2015)

American Nurses Association. (n.d.). Safe Patient Handling Movement. Retrieved from <http://nursingworld.org/DocumentVault/GOVA/Federal/Federal-Issues/SPHM.html>

Achieving the Use of the Evidence for Pressure Injury Reduction



Resource & System

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

Technological Strategies to Improve Adherence & Quality of the Turn

Leaf technology

△ Turn frequency, turn adequacy, tissue recovery time

△ Pragmatic RCT-2 ICU's

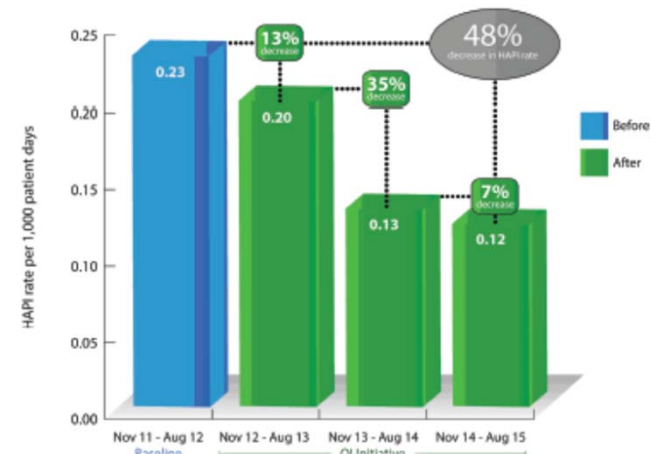
- Randomized to LEAF system N=659 or traditional care n=653
- No difference in demographic data, pressure injury risk similar
- Turning compliance: 67% LEAF, 54% traditional care
- Degree of turn similar: 20°, discussed setting accuracy to 30° & use position stabilizers
- 70% reduction in pressure injury's



NNT 62

Reducing HAPI & Patient Handling Injuries

- Compared pre-implementation turning practice: pillows/draw sheet vs turn and position system (breathable glide sheet/foam wedges/wick away pad)
- Baseline: November 2011-August 2012
- Implementation period: November 2012 to August 2015
- 3660 patients
- Compared HAPI rates, patient handling injuries, and cost



PATIENT HANDLING INJURY AND COSTS				74% reduction
	January 2012 to October 2012 (Before)	November 2012 to August 2013 (After)	November 2013 to August 2014 (After)	November 2014 to August 2015 (After)
Injuries/Cost	19/\$427,500	8/\$180,000	2/\$45,000	5*/\$112,500
Average cost calculated by estimating \$22,500 per injury. ¹⁷				
*1 PCI in critical care, 4 PCIs in medical. We were unable to determine if the patients were eligible for the repositioning system.				



Does Use of a Positioning Aid ↑ Compliance

- ▲ Multicenter, clustered, three arm RCT
- ▲ 270 at risk patients from 29 wards in 16 hospitals (39 ICU, 129 geriatrics, 59 rehab)
- ▲ Wards assigned to 2 experimental & 1 control
- ▲ Primary: Examine compliance to repositioning frequencies
- ▲ Secondary: Incidence of PI and IAD, nurses and patient comfort, acceptability of intervention and budget.

De Meyer D, et al. J Adv Nurs. 2019 May;75(5):1085-1098

- ▲ Exp Group 1: PROTECT (positioning is tailored to individual risk) & turn and reposition system
- ▲ Exp Group 2: Usual positioning protocol & turn and reposition system
- ▲ Control Group: Usual care

Results

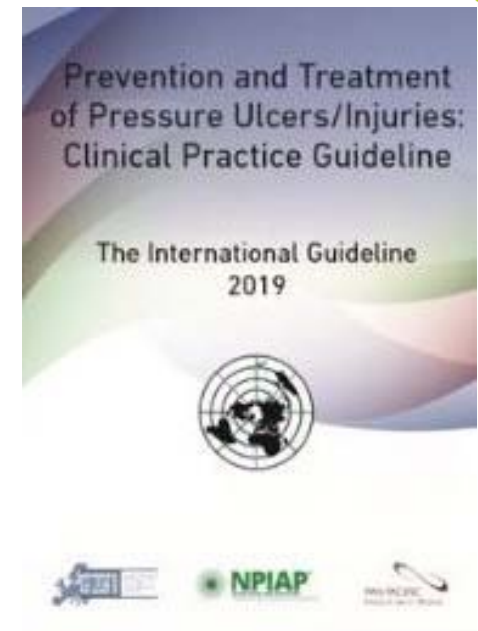
- Body posture in bed
 - △ 30 degree & use of turn & position system
- Group 1=no PI
- Group 2= 1 suspected DTI
- Control= 3 sacral PI's
- Overall positive response on use of turn and position system by nurses and patients
- Cost higher in control because of median time to turn is longer

Turning Compliance

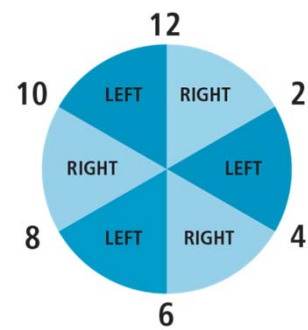
	% (n/N)		Adjusted odds ratio (OR) (95% CI)	Adjusted X ² statistic	p value
	Visit 1	Visit 2			
Compliance bed					
Exp. group 1	65.1 (28/43)	94.6 (35/37)	25.97 (3.65–184.68)	10.59	0.001
Exp. group 2 and control group	63.2 (43/68)	69.0 (40/58)			
Exp. group 1 and 2	62.9 (39/62)	84.9 (45/53)	6.80 (1.41–32.75)	5.71	0.017
Control group	65.3 (32/49)	71.4 (30/42)			
Compliance chair					
Exp. group 1	68.4 (26/38)	58.1 (18/31)	0.04 (0.01–0.27)	10.59	0.001
Exp. group 2 and control group	65.3 (47/72)	83.9 (47/56)			
Exp. group 1 and 2	69.4 (50/72)	69.8 (37/53)	0.15 (0.03–0.71)	5.71	0.017
Control group	60.5 (23/38)	82.4 (28/34)			

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 limited mobility when sitting in a chair



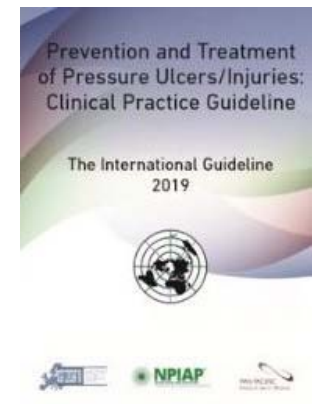
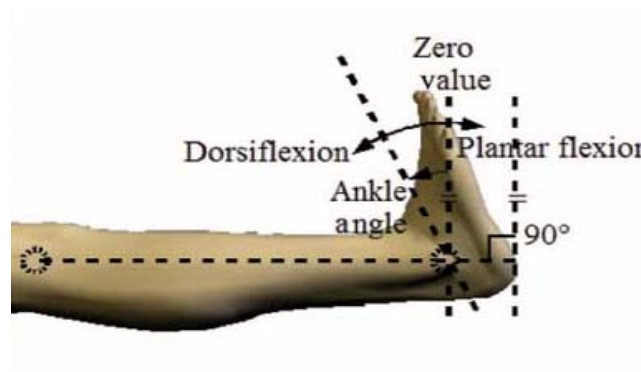
In-Bed Technology



EBP Recommendations to Achieve Offloading & Reduce Pressure

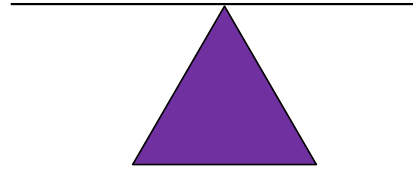
Ensure the heels are free of the bed surface

- △ Heel protection devices should elevate the heel completely (off-load) in such a way as to distribute weight along the calf
- △ The knee should be in slight flexion
- △ Remove device periodically to assess the skin



Roger SI et al, OWM, 2007;53(10):50-58, www.ihl.org
European Pressure Ulcer Advisory Panel/ National Pressure Injury Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers/injuries :Clinical Practice Guideline. Emily Haesler (Ed).EPUAP/NPIAP/PPPIA. 2019

Heel Protectors



Heel Pads



RCT: Prevention of Heel Injuries and Plantar Flexion Contractures

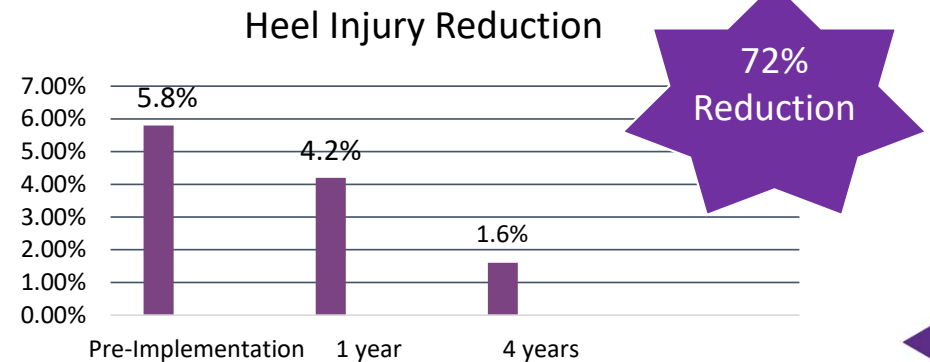
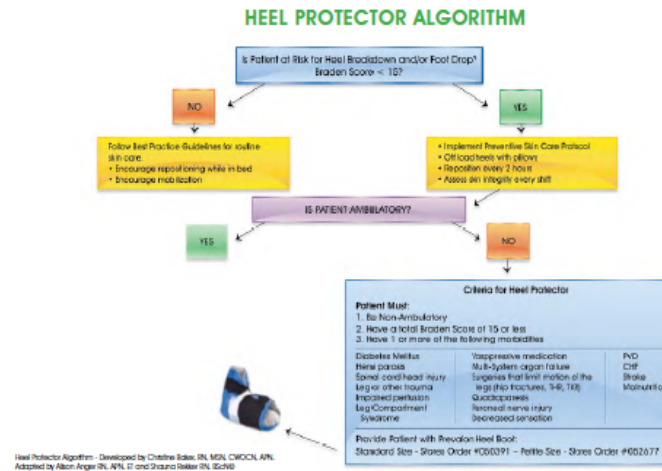


- 🔗 Surgical intensive care unit, medical intensive care unit, and neurotrauma intensive care unit.
- 🔗 Inclusion criteria; 5 days of sedation related to care for a critical illness, immobility for 6 to 8 hours before study initiation. Braden ≤ 18 , mobility subscale ≤ 2 & pre-existing PI
- 🔗 54 subjects: 37 intervention 19 control
- 🔗 Measured pressure injury and goniometric scores
- 🔗 Intervention: Heel protector Control: Pillows
- 🔗 Results:
 - △ PI: 0% versus 41% developed by day 2
 - △ Goniometric scores: Significant day 3 lower goniometric score as well as last study day.
 - 10 patients had improved PFC in intervention group
 - 1 patient had improved PFC in control group

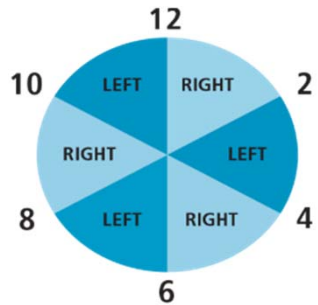


Sustainability of Heel Injury Reduction: QI Project

- 490 bed facility
- Evidence-based quality improvement initiative
- 4 tier process
 - △ Partnership
 - △ Comprehensive product review
 - △ Education & engagement
 - △ Support structures & processes



Transition: In-Bed to Out-of-Bed & Back



Prevention Strategies for IAD



Evidence-Based Components of an IAD Prevention Program



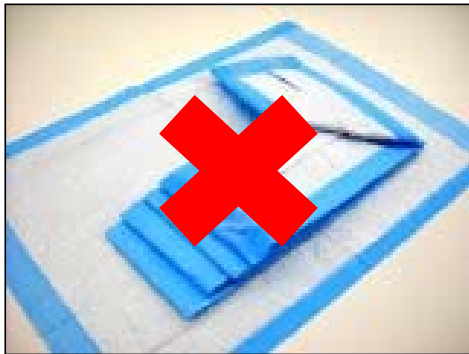
- 🌀 Skin care products used for prevention or treatment of IAD should be selected based on consideration of individual ingredients in addition to consideration of broad product categories such as cleanser, moisturizer, or skin protectant. (Grade C)
 - △ A skin protectant or disposable cloth that combines a pH balanced 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 moisture
- 🌈 Use a protective cream or ointment
 - △ Disposable barrier cloth recommended 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



Disposable incontinence pads



Airflow pads for specialty beds



Reusable incontinence pads



Adult diaper

468 patients randomized to absorbent pad versus reusable Pad
IAD rates 4.8% vs. 11.5% $p=0.02$

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

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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



IAD Prevention Practices: Implementation Science Approach



- Identified evidence gaps in previous study (4 hospitals-250 patients)
- Using implementation science approach to introduce evidence based IAD practices
- IAD committee: education about correct pad sizing, washable and disposable pads and plastic sheets removed from the wards. All in one barrier cloth that cleans, protects and moisturizes was introduced
- Nurses from wards ask to participate in 1 of 6 focus groups post implementation



IAD Prevention Practices: Results

Variable	Pre-Implementation N=250	Post Implementation N=259	P value
IAD	23 (9.2%)	6 (2.3%)	.015
HAPI	9 (3.6%)	2 (0.8%)	.034
Bed protection use	154 (64.7%)	6 (2.3%)	<.01
Continent patients with incontinent products	73 (29.2%)	28 (10.8%)	<.01

Nurse Focus Groups: 31 nurses, 4 themes

- Benefit to patient: improved skin condition, patient comfort
- Usability: fewer steps
- Problems encountered: not seeing barrier in place
- Related factors: confusion between IAD and pressure injury

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

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- 🌈 Pouching device or a bowel management system



Urine and Fecal Containment Device



10% incidence in a recent metanalysis

- 26% nasal oxygen tubing
- 9% airway pressure masks
- 7.7% sequential compression devices
- 5.6% nasal oxygen prongs
- 5.5percent tracheostomy tubes under flange
- 5% nasogastric tube
- 2.4% cervical collar under the rim

Jackson D, et al. International J of Nursing Studies. 2019;92:109-120




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



Black JM., et al. International Wound J, 2010;7(5)358-365

Prevention of MDR's-HAPI

- 🔺 Selected based on their ability to cause the least degree of damage from pressure or shear forces
 - △ use devices made of softer material
- 🔺 Sized correctly to avoid excessive pressure
 - △ tension on securement device should be checked regularly and adjusted
- 🔺 Securement devices that splint the tubes (for NG's) allowing them to float
- 🔺 Remove as soon as clinical possible
- 🔺 Skin under device assessed minimum q 12 (more freq if fluid shifts or localized edema seen)
- 🔺 Devices lifted at frequent intervals or rotated
- 🔺 Use dressings to cushion medical devices



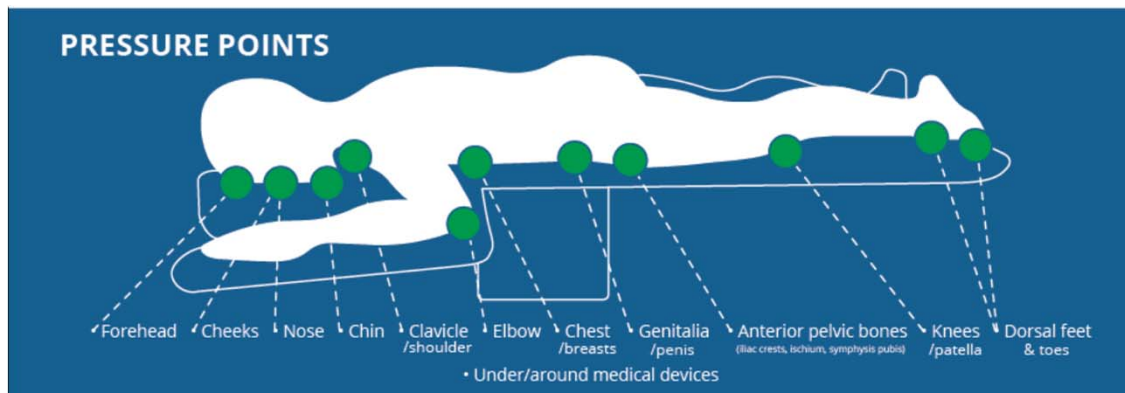
Best Practices for Prevention of Medical Device-Related Pressure Ulcers in Critical Care

- 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

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Prone Positioning: Prevent Skin Injury

- ▶ Pressure redistribution surface
- ▶ Skin assessment before, during and after positioning prone
- ▶ Positioning devices to offload pressure points (Do not use ring or donut-shaped positioning devices)
- ▶ Avoid shear and friction during the turning process
- ▶ Small micro turns while prone/swimmer position shifts q 2-4 hrs.
- ▶ Placement of prophylactic dressings over all potential pressure injury risk areas



https://cdn.ymaws.com/npiap.com/resource/resmgr/online_store/posters/npiap_pip_tips_-_proning_202.pdf NPIAP 2020

WHEN WOULD NOW BE A GOOD TIME TO DO THIS?

A person with a backpack is silhouetted against a vast, snow-covered mountain range under a clear blue sky. The person is standing on a rocky outcrop, looking towards the distant peaks. The mountain has patches of snow and exposed rock.

**It is not enough to do your
best, you have to know what to
do and then do your best.**

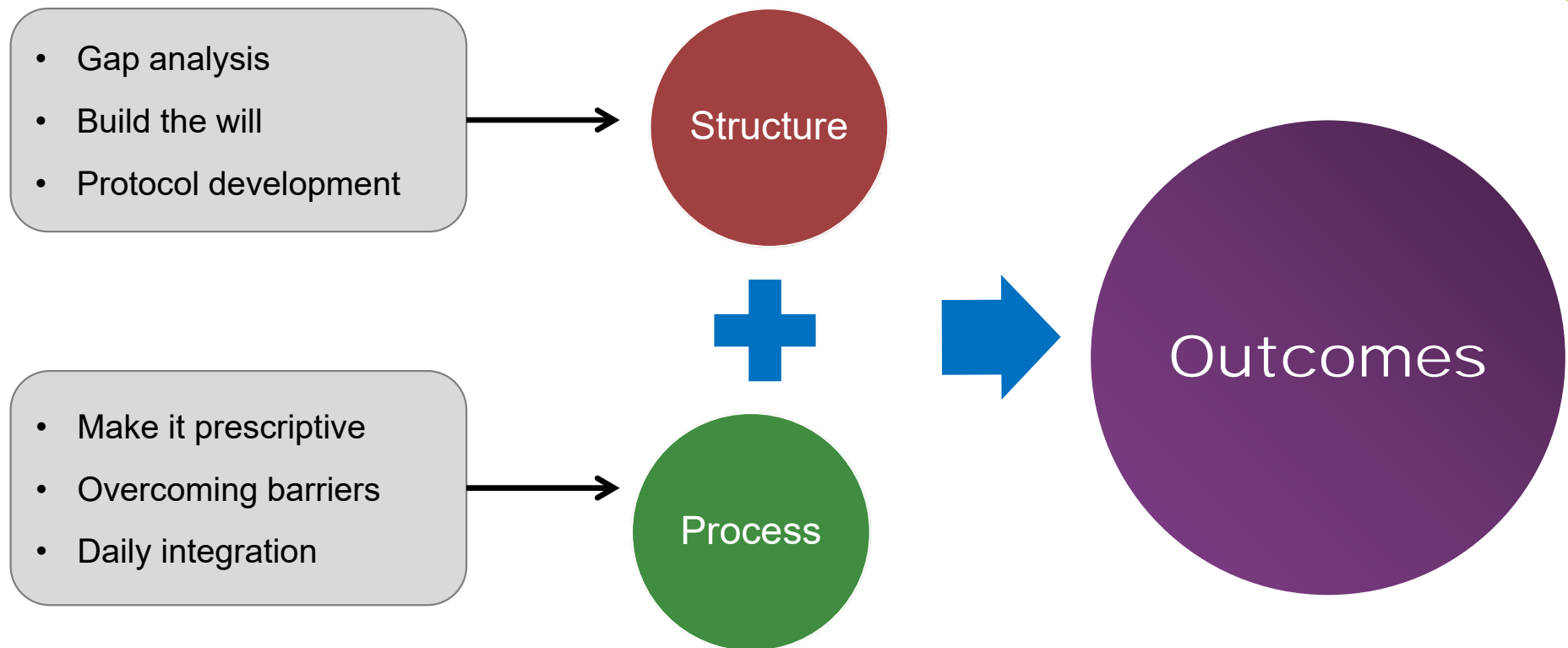
E Deming



An abstract geometric design featuring a large purple triangle on the left, a series of smaller triangles in blue, green, and purple in the center, and a complex cluster of small triangles in various colors on the right.

How do we make it happen?

Driving Change



Intact Skin Is In: Making it Happen

- Advocacy
- 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 PI & IAD
- Skin liaison/champion nurses
- Yearly competencies on beds or positioning aids to ensure correct and maximum utilization





Please contact me with questions at
kvollman@comcast.net

