Strategies to Reduce Skin Injury in Critically Ill Patients

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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

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 billon dollars for 2010

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

Dorner, B., Posthauer, M.E., Thomas, D. (2009), www.npuap.org/newroom.htm

Whittington K, Briones R. *Advances in Skin & Wound Care. 2004;17:490-4.*

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

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

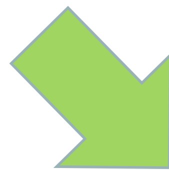
National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers :clinical practice guideline. Emily Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014.

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

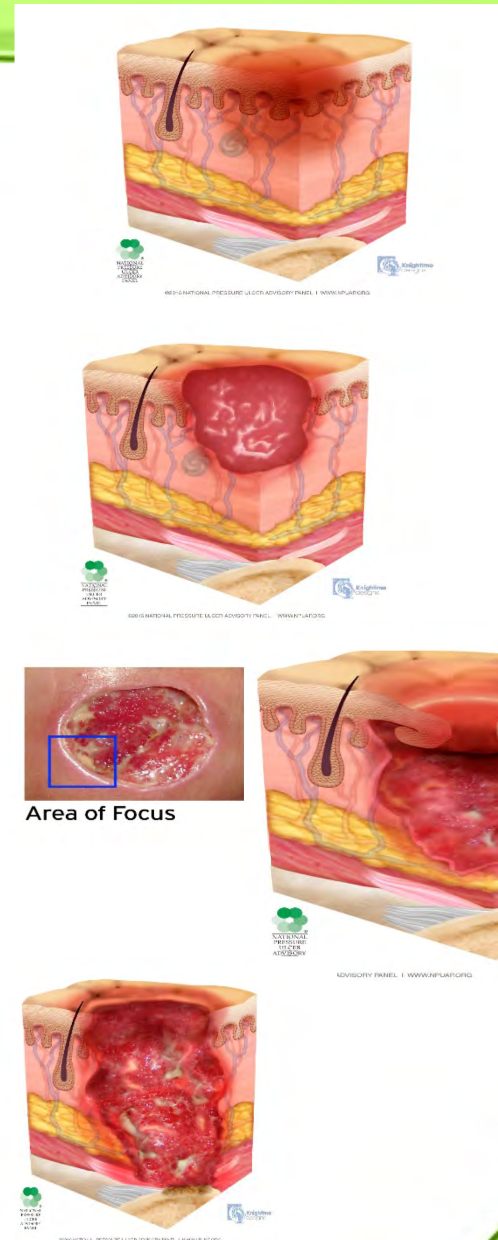
Stage II through IV describe open ulcers



PRESSURE INJURY

Label & Definitions of Pressure Injury

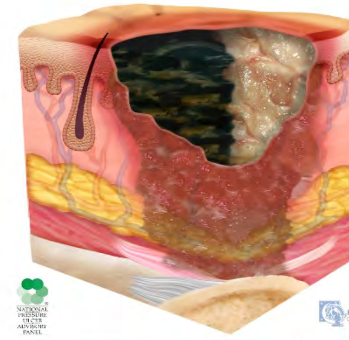
- Stage 1 Pressure Injury: Non-blanchable erythema of intact skin
- Stage 2 Pressure Injury: Partial thickness skin loss with exposed dermis
- Stage 3 Pressure Injury: Full thickness skin loss
- Stage 4 Pressure Injury: Full-thickness skin and tissue loss



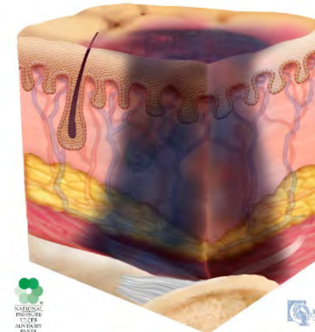
http://www.npuap.org/resources/educational-and-clinical-resources/

Label & Definitions of Pressure Injury

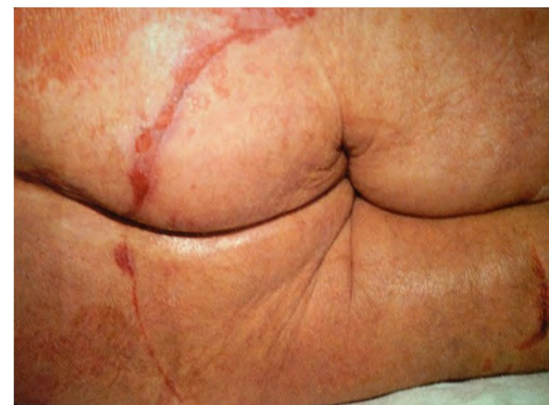
- Un-stageable Pressure Injury: Obscured full-thickness skin and tissue loss



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



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

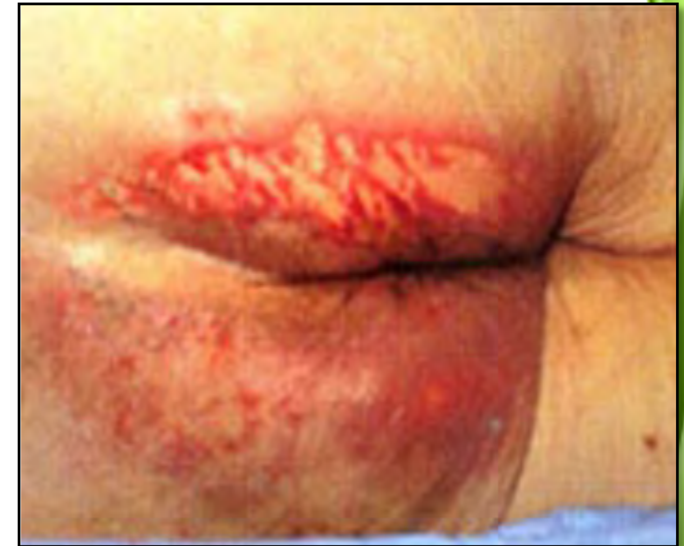


- Mucosal Membrane Pressure Injury: Cannot be staged

http://www.npuap.org/resources/educational-and-clinical-resources/

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 OWN 2007;34(1):45-53.
Doughty D, et al. JWOCN. 2012;39(3):303-315

Systematic Review on Impact of Incontinence

Lachenbruch C, et al J Wound, Ostomy Continence Nurs. 2016;43(3):235-241

- 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 $p<0.0001$)
  - 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

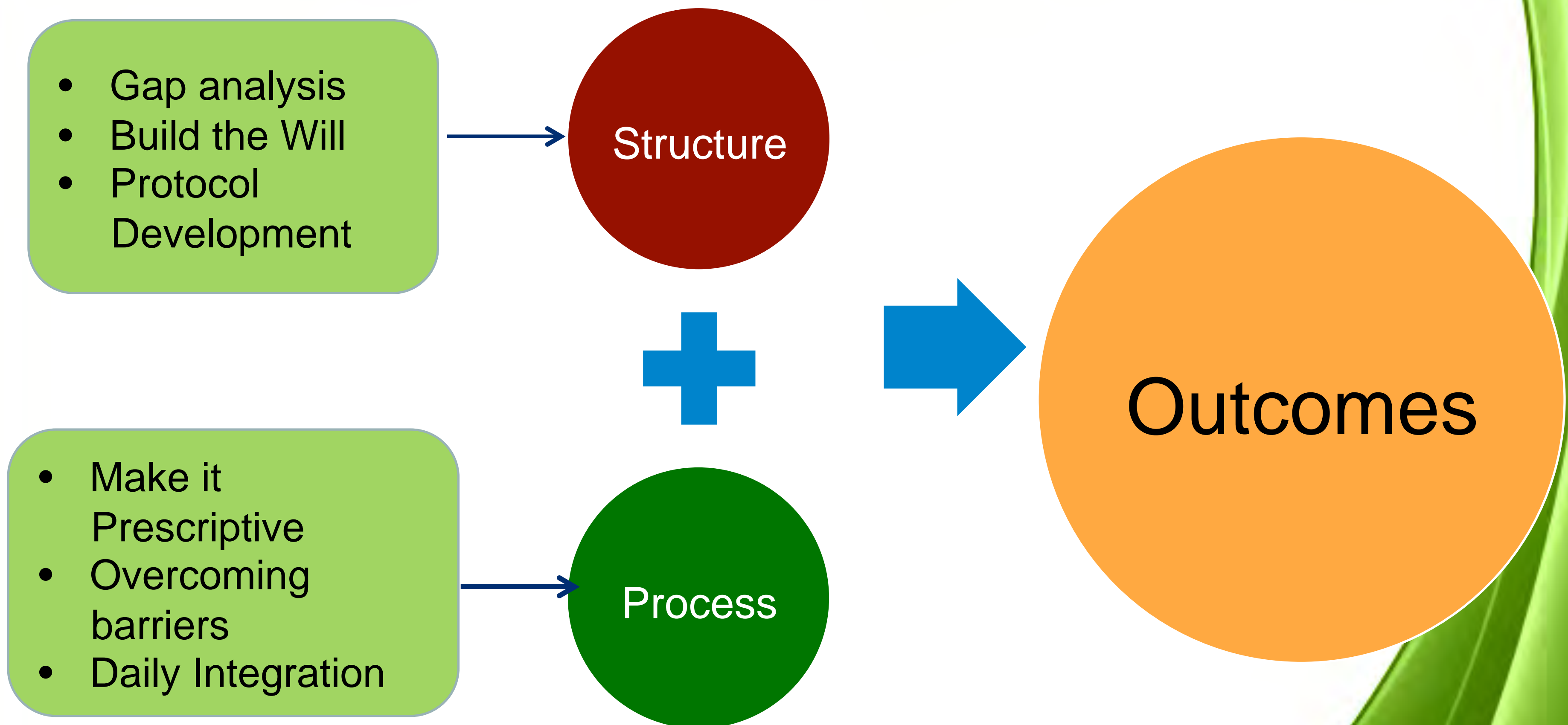
Part of the Picture

- 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

*Faris MK, et al WOCN, 2015;42(6):589-598
**Baranoski S. Adv Skin Wound Care 2005;18(2):74-5

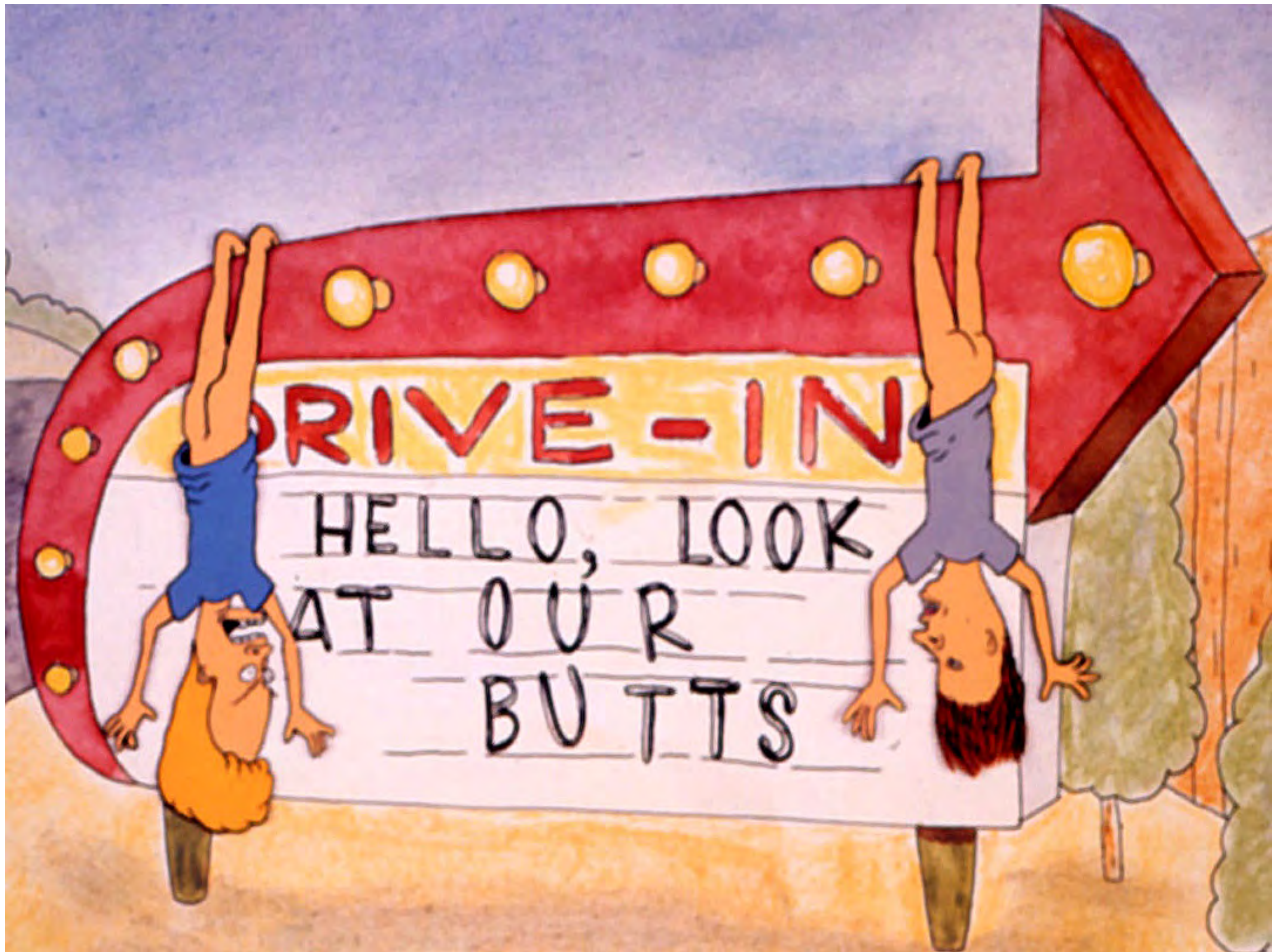
Driving Change



Gap Analysis of Prevention Strategies

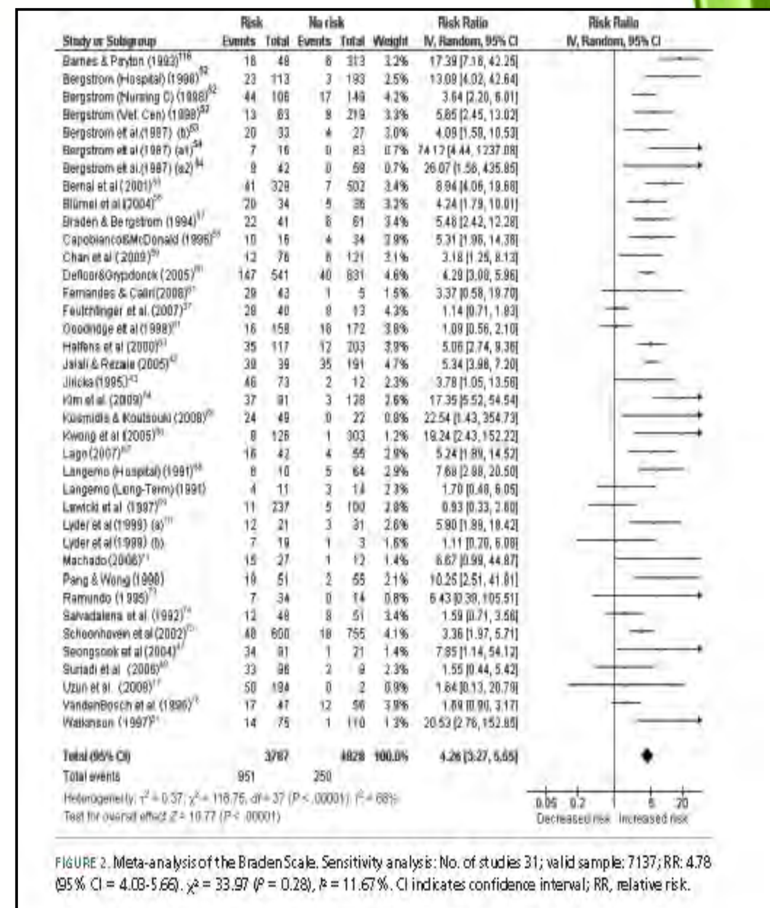
- Assessment of Risk
- Pressure Injury/Turn/Shear reduction
- Health Care Worker Safety
- Early Mobility
- Device Related Injuries
- Managing Incontinence & Other Moisture
- Hemodynamic Instability

Identify Patients at High Risk


DRIVE-IN
HELLO, LOOK
AT OUR
BUTTS

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



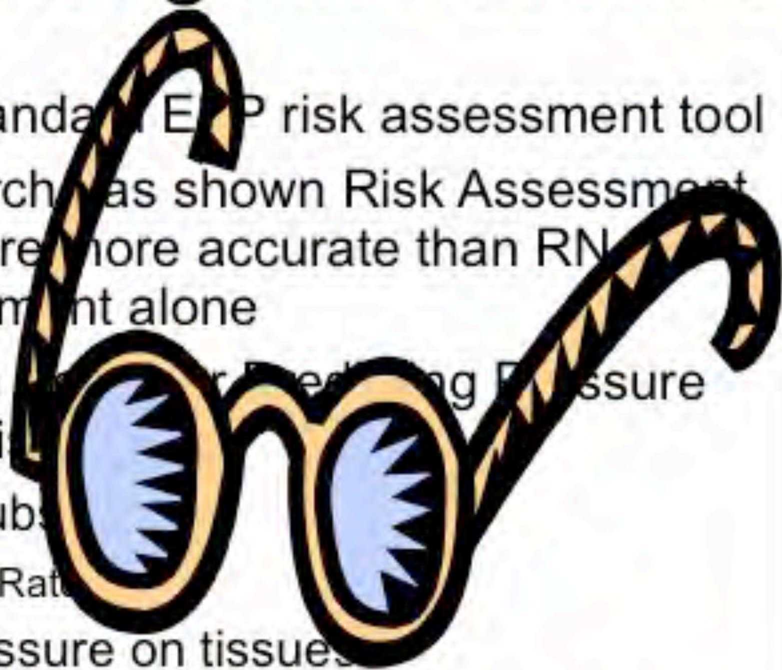
Study or Subgroup	Risk Events	Risk Total	No risk Events	No risk Total	Weight	Risk Ratio IV, Random, 95% CI
Barnes & Payton (1993)[116]	18	48	8	313	3.2%	17.39 [7.18, 42.25]
Bergstrom (Hospital) (1998)[52]	23	113	3	193	2.5%	13.09 [4.02, 42.64]
Bergstrom (Nursing C) (1998)[52]	44	106	17	149	4.2%	3.64 [2.20, 6.01]
Bergstrom (Vet. Cen) (1998)[57]	13	63	9	219	3.3%	5.85 [2.45, 13.02]
Bergstrom et al.(1987) (b)[53]	20	33	4	27	3.0%	4.09 [1.58, 10.53]
Bergstrom et al (1987) (a1)[54]	7	16	0	83	0.7%	74.12 [4.44, 1237.08]
Bergstrom et al.(1987) (a2)[54]	9	42	0	58	0.7%	26.07 [1.56, 435.85]
Bernal et al (2001)	41	329	7	502	3.4%	8.94 [4.06, 19.68]
Blümel et al (2004)	20	34	5	36	3.2%	4.24 [1.79, 10.01]
Braden & Bergstrom (1994)	22	41	6	61	3.4%	5.48 [2.42, 12.28]
Capobianco&McDonald (1996)	10	16	4	34	2.9%	5.31 [1.96, 14.38]
Chan et al (2009)	12	76	6	121	3.1%	3.18 [1.25, 8.13]
Defloor&Grypdonck (2005)	147	541	40	631	4.6%	4.29 [3.08, 5.96]
Fernandes & Caliri(2008)	29	43	1	5	1.5%	3.37 [0.58, 19.70]
Feutchtinger et al. (2007)[37]	28	40	8	13	4.3%	1.14 [0.71, 1.83]
Goodridge et al (1998)	16	158	16	172	3.8%	1.09 [0.56, 2.10]
Halfens et al (2000)	35	117	12	203	3.9%	5.06 [2.74, 9.36]
Jalali & Rezaie (2005)	39	39	35	191	4.7%	5.34 [3.98, 7.20]
Jiricka (1995)	46	73	2	12	2.3%	3.78 [1.05, 13.56]
Kim et al. (2009)	37	91	3	128	2.6%	17.35 [5.52, 54.54]
Kosmidis & Koutsouki (2008)	24	49	0	22	0.8%	22.54 [1.43, 354.73]
Kwong et al (2005)	8	126	1	303	1.2%	19.24 [2.43, 152.22]
Lago (2007)	16	42	4	55	2.9%	5.24 [1.89, 14.52]
Langemo (Hospital) (1991)	8	10	5	64	2.9%	7.68 [2.88, 20.50]
Langemo (Long-Term) (1991)	4	11	3	14	2.3%	1.70 [0.48, 6.05]
Lewicki et al (1997)	11	237	5	100	2.8%	0.93 [0.33, 2.60]
Lyder et al (1999) (a)	12	21	3	31	2.6%	5.90 [1.89, 18.42]
Lyder et al (1999) (b)	7	19	1	3	1.6%	1.11 [0.20, 6.08]
Machado (2006)	15	27	1	12	1.4%	6.67 [0.99, 44.87]
Pang & Wong (1998)	18	51	2	65	2.1%	10.25 [2.51, 41.81]
Ramundo (1995)	7	34	0	14	0.8%	6.43 [0.39, 105.51]
Salvadalena et al. (1992)	12	48	8	51	3.4%	1.59 [0.71, 3.56]
Schoonhoven et al (2002)	48	600	18	755	4.1%	3.36 [1.97, 5.71]
Seongsook et al (2004)	34	91	1	21	1.4%	7.85 [1.14, 54.12]
Suriadi et al (2006)	33	96	2	9	2.3%	1.55 [0.44, 5.42]
Uzun et al. (2009)	50	194	0	2	0.9%	1.64 [0.13, 20.79]
VandenBosch et al (1996)	17	47	12	56	3.9%	1.69 [0.90, 3.17]
Watkinson (1997)	14	75	1	110	1.3%	20.53 [2.76, 152.85]
Total (95% CI)		**3787**		**4828**	**100.0%**	**4.26 [3.27, 5.55]**
Total events	951		250			

Heterogeneity: $\tau^2 = 0.37$; $\chi^2 = 118.75$, df = 37 ($P < .00001$); $I^2 = 68\%$
Test for overall effect: $Z = 10.77$ ($P < .00001$)

FIGURE 2. Meta-analysis of the Braden Scale. Sensitivity analysis: No. of studies 31; valid sample: 7137; RR: 4.78 (95% CI = 4.03-5.66). $\chi^2 = 33.97$ ($P = 0.28$), $I^2 = 11.67\%$. CI indicates confidence interval; RR, relative risk.

www.ihi.org;
Garcia-Fernandez FP, et al. JWOCN, 2014:41(1):24-34
*Hyun S, et al. Am J of Crit Care, 2014:23(6):494-501

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



- Use standa E P risk assessment tool
- Research as shown Risk Assessm Tools are ore accurate than RN assessm nt alone
- Braden ssure Sore Ri
  - 6 sub
    - Rat
  - Pressure on tissue
    - Mobility, sensory perception, activity

Clinical judgment of nurses alone achieve inadequate capacity to assess PU risk

Extremely obese patient 2x more likely to develop a PU*

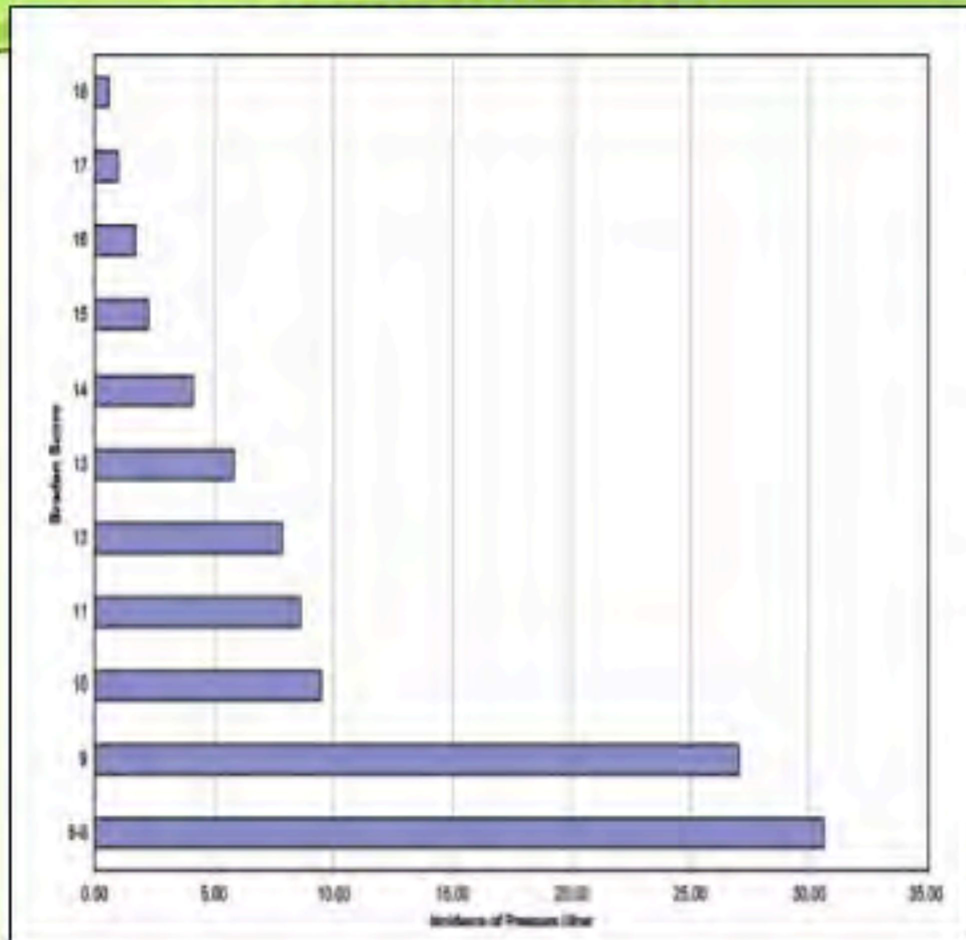
www.ihi.org;
Garcia-Fernandez FP, et al. JWOCN, 2014;41(1):24-34
*Hyun S, et al. Am J of Crit Care. 2014;23(6):494-501

Its About the Sub-Scale's

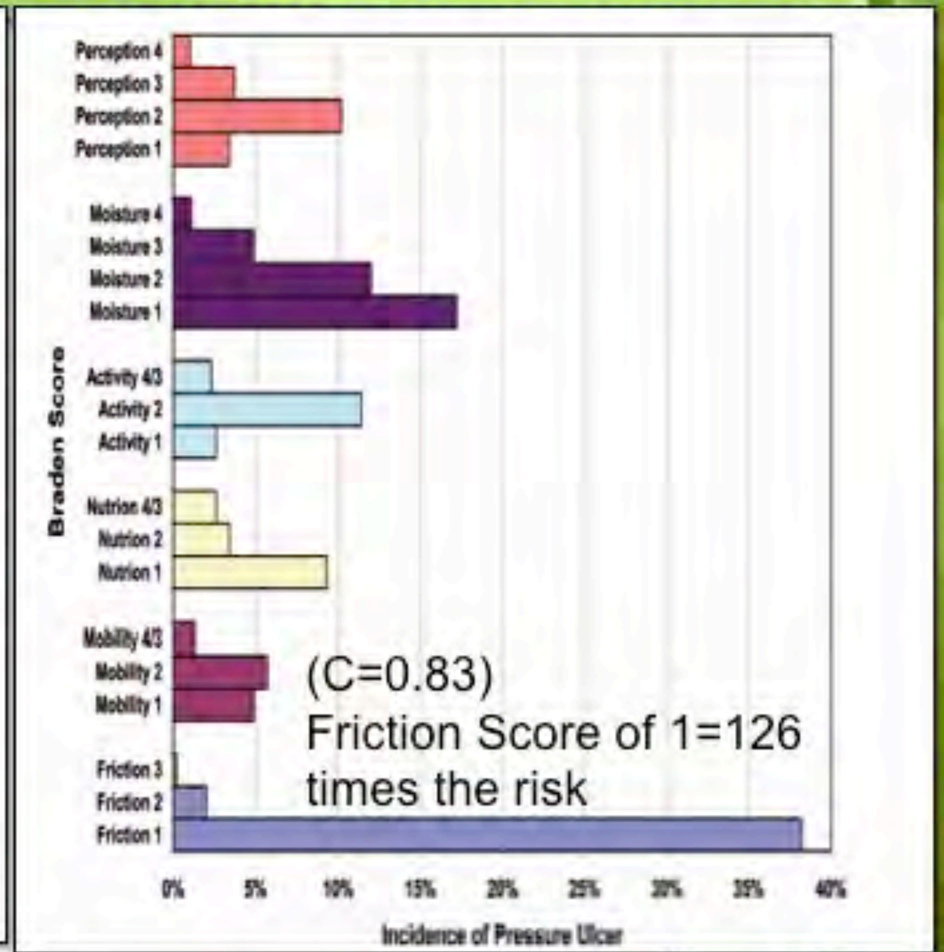
- Retrospective cohort analysis of 12,566 adults patients in progressive & ICU settings for yr. 2007
- Identifying patients with HAPU Stage 2-4
- Data extracted: Demographic, Braden score, Braden subscales on admission, LOS, ICU LOS, presence of Acute respiratory and renal failure
- Calculated time to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

Tescher AN, et al. J WOCN. 2012;39(3):282-291

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

Cox J, et al Am J Crit Care, 2015;24(8):501-510

- 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

Variable	B	SE	Wald	P	Exp (B)	95% CI
Cardiac arrest	1.359	0.605	3.831	.05	3.894	0.998-15.188
Mechanical ventilation > 72 hours	3.161	0.664	22.686	<.001	23.604	6.427-86.668
Hours of MAP < 60 mm Hg while receiving vasopressors	0.092	0.037	6.199	.01	1.096	1.020-1.178
Use of vasopressin	1.572	0.542	8.423	.004	4.816	1.666-13.925
Cardiac diagnosis at ICU admission	-3.360	1.577	4.539	.03	0.035	0.002-0.764

Abbreviations: ICU, intensive care unit; MAP, mean arterial pressure.
[a] Nagelkerke $R^2 = 0.571$; Hosmer and Lemeshow test: $\chi^2 = 5.3$; $df = 8$; $P = .73$.

Addition of a second agent

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.

- ___ Burn
- ___ Cardiac Surgery
- ___ CCU - General
- ___ CCU - Interventional
- ___ ICU - Cardiovascular
- ___ ICU - General
- ___ ICU - Medical
- ___ ICU - Neuro
- ___ ICU - Neonatal
- ___ ICU - Pediatric
- ___ ICU - Surgical
- ___ LTAC
- ___ LTC
- ___ Medical
- ___ Med/Surg
- ___ Neurology
- ___ Oncology
- ___ Orthopedic
- ___ Other
- ___ PACU
- ___ Pediatrics
- ___ Psychiatric - General
- ___ Psychiatric - Geriatric
- ___ Rehabilitation
- ___ Renal/Urology
- ___ Respiratory/Pulmonary
- ___ SNF/Transitional Care
- ___ Skilled Care (LTC)
- ___ Stepdown/Transition
- ___ Surgical
- ___ Telemetry - General
- ___ Telemetry - Medicine
- ___ Telemetry - Surgical
- ___ Wound Care

Patient Census of Unit at Time of Survey: ________

Incontinence Collection Products:

Check all that apply to a specific unit/work area.

- ___ Pad/Chux
- ___ Reusable cloth
- ___ Disposable plastic-backed
- ___ Disposable air flow-backed
- ___ Diaper/Brief
- ___ Reusable cloth
- ___ Disposable plastic-backed
- ___ Disposable air flow-backed
- ___ Collection Device

Incontinence Cleanup & Skin Protection:

Check all product categories that are available in a specific unit/work area.

Cleansing:

- ___ Soap/Water/Basin
- ___ Peri-Wash (spray)
- ___ Cleansing Foam
- ___ Washcloth *(cable type)*
- ___ reusable / disposable
- ___ Premoistened Wipe *(thin, not washcloth)*

Barrier Protection (Tubes, Bottles or Sprays):
Must contain one of the "Active Ingredients" listed below

- ___ Petroleum
- ___ Zinc Oxide
- ___ Dimethicone
- ___ Liquid Film Barrier
- ___ Other ____________________

Moisturizers:

- ___ Lotion
- ___ Cream
- ___ Ointment

All-in-one products:
Must combine cleansing, moisturizing & barrier protection

- ___ Barrier cloth with skin protectant

sage#0141C

Patient Information

Patient Unit: ________________ *(from Unit/Work Area data collection form)*

Section 1 - Complete for all patients surveyed

Demographic Information:

Patient Gender:

- ___ Male
- ___ Female

Patient Age Group:

- ___ 0 to 12 months
- ___ 1 to 3 yrs
- ___ 4 to 19 yrs
- ___ 20 to 29 yrs
- ___ 30 to 39 yrs
- ___ 40 to 49 yrs
- ___ 50 to 59 yrs
- ___ 60 to 69 yrs
- ___ 70 to 79 yrs
- ___ 80 + yrs

Continence Status:

Incontinence = inability to control the flow of urine and/or stool in the preceding 24 hours
Check all that apply

Urine:

- ___ Continent
  Note: A patient with a Foley Catheter is deemed "continent."
  - ___ Patient has Foley
- ___ Incontinent

Stool:

- ___ Continent
  Note: A patient with an indwelling fecal collection device is deemed "incontinent."
- ___ Incontinent
  - ___ Liquid or semi-liquid stools
  - ___ Frequency ____________
- ___ Patient has indwelling fecal collection device
- ___ Patient has external fecal collection device

Section 2 - Complete only for incontinent patients

Contributing Factors & Co-Morbidities

Check all that apply.

- ___ Low albumin
- ___ Antibiotics ____________________
- ___ Clostridium difficile stool positive
- ___ Tube feeding
- ___ Braden Score
- ___ Mobility Score
- ___ Friction & Shear Score
- ___ Nutrition Score
- ___ Diabetic with recent hyperglycemia
- ___ Obesity with deep groin/low abdomen skin folds
- ___ Immunocompromised
- ___ Other ____________________

Incontinence Cleanup & Skin Protection:

Check products used on patient

Cleansing:

- ___ Soap/Water/Basin
- ___ Peri-Wash (spray)
- ___ Cleansing Foam
- ___ Washcloth *(cable type)*
- ___ reusable / disposable
- ___ Premoistened Wipe *(thin, not washcloth)*

Barrier Protection: (Tubes, Bottles or Sprays)
Must contain one of the "Active Ingredients" listed below

- ___ Petroleum
- ___ Zinc Oxide
- ___ Dimethicone
- ___ Liquid Film Barrier
- ___ Other ____________________

Moisturizers:

- ___ Lotion
- ___ Cream
- ___ Ointment

All-in-one products:
Must combine cleansing, moisturizing & barrier protection

- ___ Barrier Cloth with skin protectant

Section 3
Complete only for incontinent patients with rash/redness of buttock or perineal skin

Perineal Skin Injury

Check all that apply

Condition:

- ___ Incontinence Associated Dermatitis
  - ___ Red and dry
  - ___ Red and weepy
  - ___ Present on Admission
- ___ Pressure Ulcer (sacral, coccyx or ischial)
  - ___ How many?
  - ___ Stage(s) ____________
  - ___ Present on Admission
- ___ Fungal/yeast appearing rash
- ___ Other
- ___ Specify ____________

Area Affected:

- ___ Buttocks
- ___ Coccyx
- ___ Rectal Area
- ___ Scrotum/Labia
- ___ Lower Abdomen
- ___ Upper Thighs
- ___ Gluteal cleft
- ___ Groins

Containment Products:

- ___ FlexiSeal Fecal Collection Device
- ___ Zassi Fecal Collection Device
- ___ Nasal Trumpet
- ___ Other ____________________

Y N Is there leakage around device at the anus?

Y N Was there an underpad present?

- ___ Reusable cloth
- ___ Disposable plastic-backed
- ___ Disposable air flow-backed

Y N Were incontinence briefs worn by patient?

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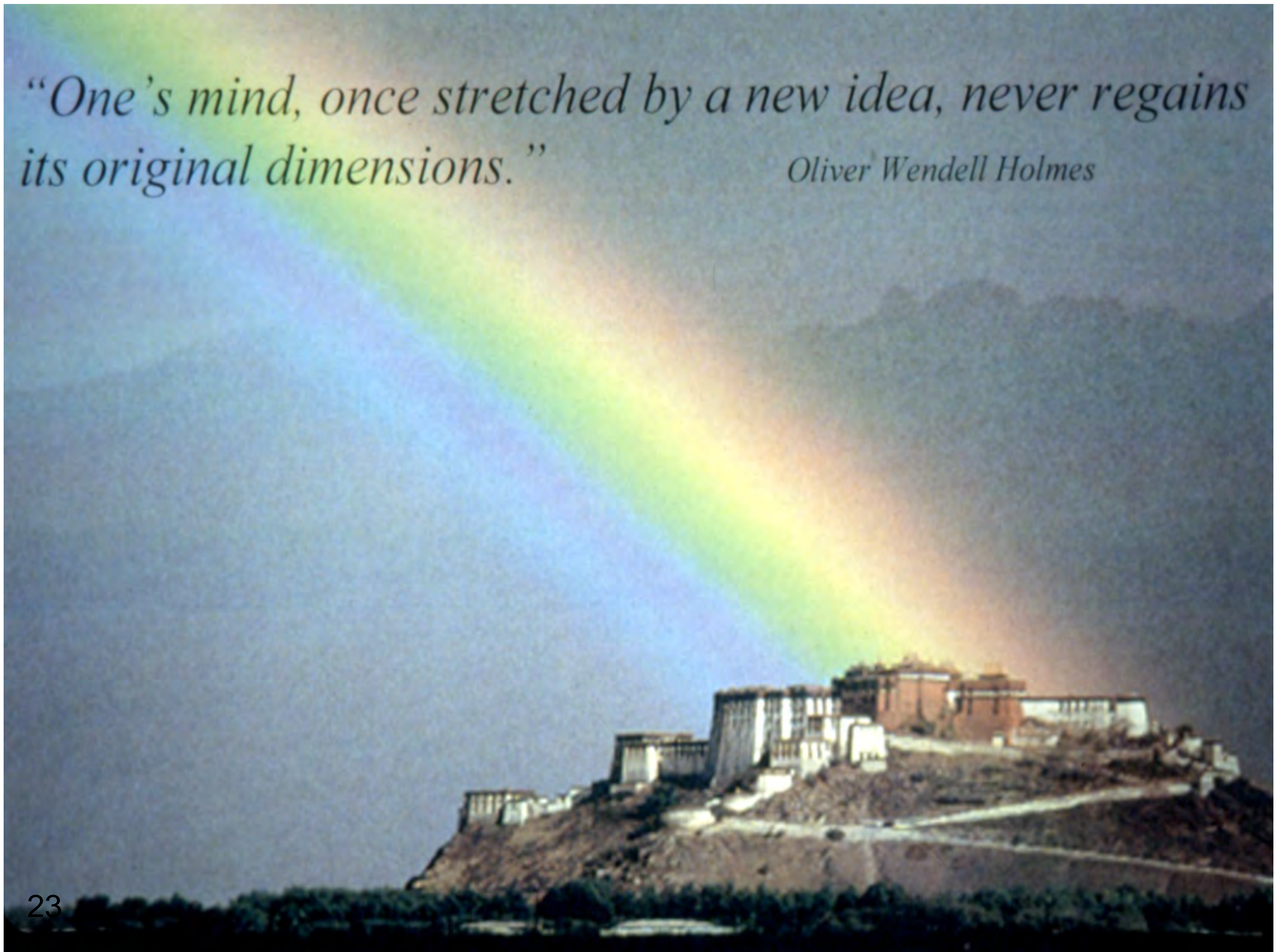
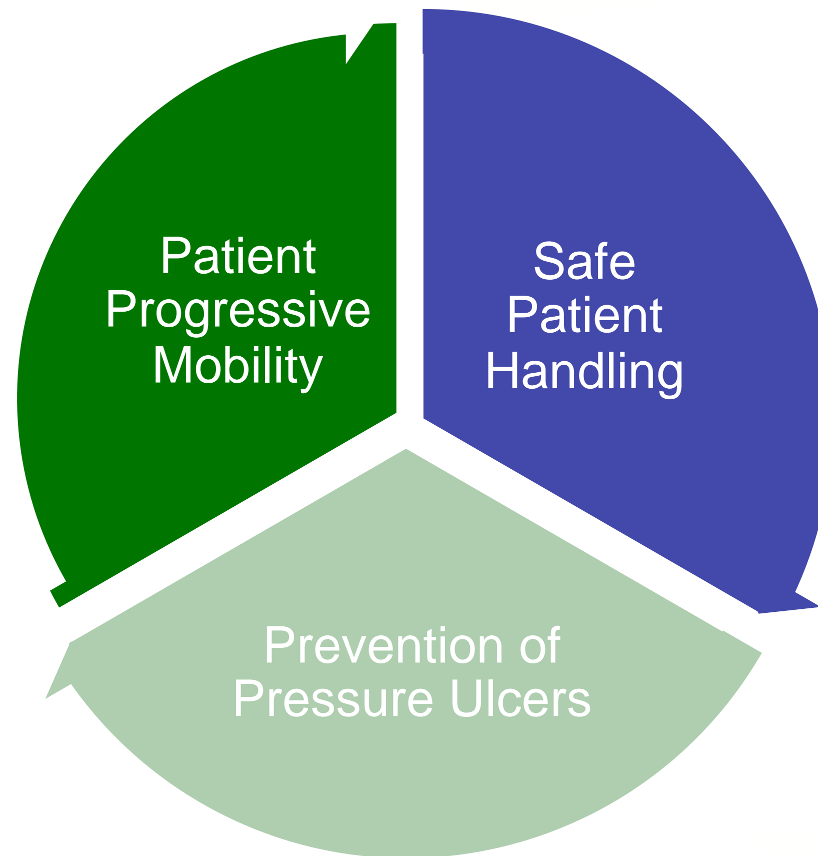
Junkin J, Selek JL. J WOCN 2007;34(3):260-269

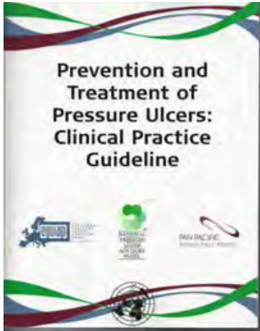

"One's mind, once stretched by a new idea, never regains its original dimensions."
Oliver Wendell Holmes

The Goal: Patient & Caregiver Safety



Pressure & Shear as a Risk Factor

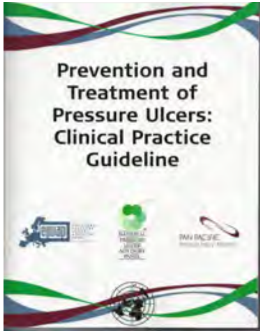
Sacrum & Heels



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

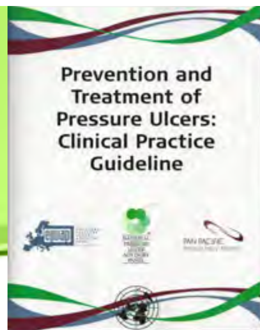
Reger SI et al, OWM, 2007;53(10):50-58, www.ihi.org
National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure ulcers :clinical practice guideline. Emily Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014
*McNichol L, et al. J Wound Ostomy Continence Nurse, 2015;42(1):19-37.



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

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 Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014.



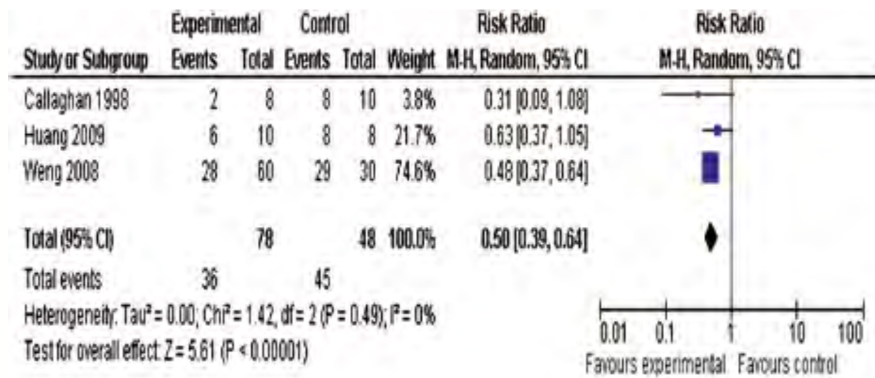
Prophylactic Dressings: Emerging Therapies

- 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)

Black J, et al. International Wound Journal. 2014;doi:10.111/iwj.12197
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 Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2

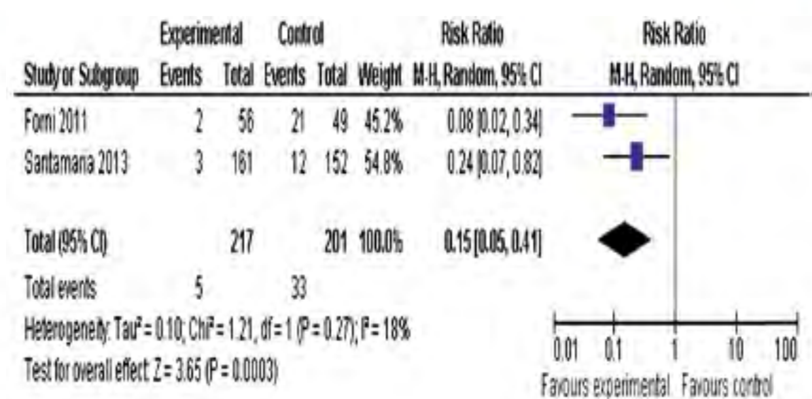
Systematic Review: Use of Prophylactic Dressing in Pressure Injury Prevention

- 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



Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Callaghan 1998	2	8	8	10	3.8%	0.31 [0.09, 1.08]
Huang 2009	6	10	8	8	21.7%	0.63 [0.37, 1.05]
Weng 2008	28	60	29	30	74.6%	0.48 [0.37, 0.64]
Total (95% CI)		78		48	100.0%	0.50 [0.39, 0.64]
Total events	36		45			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.42$, df = 2 (P = 0.49); $I^2 = 0\%$
Test for overall effect: Z = 5.61 ($P < 0.00001$)



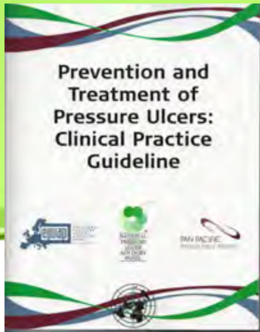
Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Forni 2011	2	56	21	49	45.2%	0.08 [0.02, 0.34]
Santamaria 2013	3	161	12	152	54.8%	0.24 [0.07, 0.82]
Total (95% CI)		217		201	100.0%	0.15 [0.05, 0.41]
Total events	5		33			

Heterogeneity: $Tau^2 = 0.10$; $Chi^2 = 1.21$, df = 1 (P = 0.27); $I^2 = 18\%$
Test for overall effect: Z = 3.65 (P = 0.0003)

Evaluated nasal bridge device injury prevention

Evaluated sacral pressure ulcer prevention

Clark M, Black J, et al. Int Wound J 2014; 11:460–471



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

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 Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014.

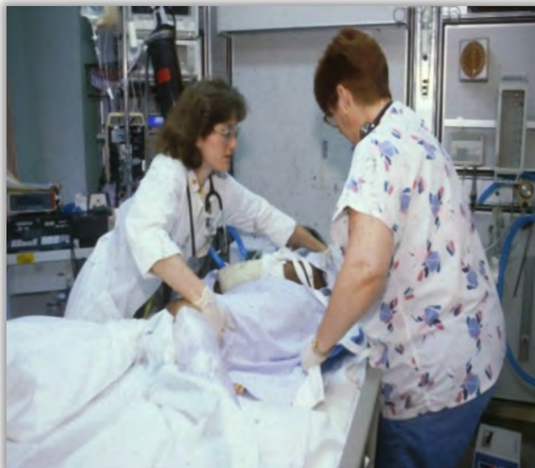
Specialty Bed

Disposable Slide Sheets

Breathable Glide Sheet

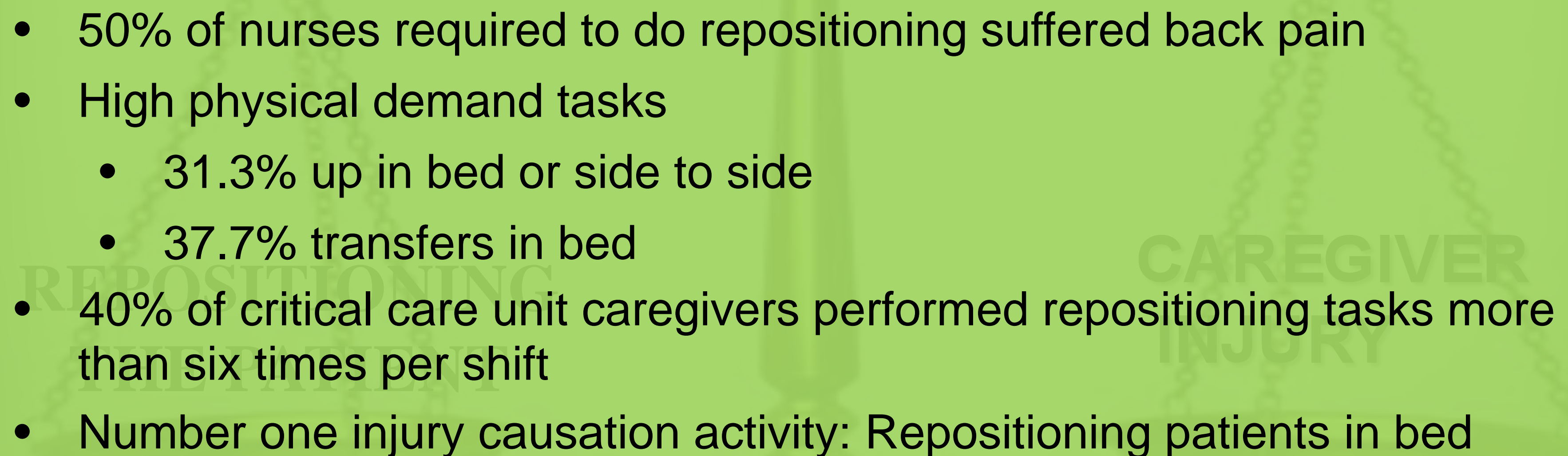
Current Practice: Turn & Reposition

Draw Sheet/Pillows/Layers of Linen



Lift Device

CAREGIVER
INJURY



- 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

Smedley J, et al. J Occupation & Environmental Med,1995;51:160-163)
(Knibbe J, et al. Ergonomics1996;39:186-198)
Harber P, et al. J Occupational Medicine, 27;518-524)
Fragala G. AAOHN, 2011;59:1-6

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

Tuohy-Main, K. (1997). Geriaction, 15, 10-14)

Number, Incidence Rate, & Median Days Away From Work for Occupational Injuries RN's with Musculoskeletal Disorders in US, 2003 – 2014

Year	Ownership	;Occupation	Total Cases	Incidence Rate	Medial Days Away From Work
2009	private industry	RNs	8,760	51.6	8
	local government	RNs	1,060	55.0	7
	state government	RNs	660	56.1	14
2008	private industry	RNs	8,120	48.4	6
	local government	RNs	960	-	5
	state government	RNs	540	-	9
2007	private industry	RNs	8,580	53.4	6
2006	private industry	RNs	9,200	59.1	6
2005	private industry	RNs	9,060	-	7
2004	private industry	RNs	8,810	-	7
2003	private industry	RNs	10,050	-	6

* Incidence rate per 10,000 FTE

Bureau of Labor Statistics, U.S. Department of Labor, February 14, 2011. Numbers for local and state government Unavailable prior to 2008/Nov 2011, Release 10:00 a.m. (EST) Thursday, November 8, 2012, 2013 data http://www.bls.gov/news.release/pdf/osh2.pdf. Accessed 01/07/2016 http://www.bls.gov/news.release/pdf/osh2.pdf

Number, Incidence Rate, & Median Days Away From Work for Occupational Injuries RN's with Musculoskeletal Disorders in US, 2003 – 2014

Year	Ownership	;Occupation	Total Cases	Incidence Rate *	Medial Days Away From Work
2009	private industry	RNs	8,760	51.6	8
2010	Private industry	RNs	9,260	53.7	6
2011	Private industry	RN's	10,210		8
2012	Private industry	RN's	9900	58.5	8
2013	Private Industry	RN	9820	56.2	7
2014	Private Industry	RN	9820	55.3	9
2014	Private Industry	NA	18,510		6
2005	private industry	RNs	9,060	-	7
2004	private industry	RNs	8,810	-	7
2003	private industry	RNs	10,050	-	6

* Incidence rate per 10,000 FTE

Bureau of Labor Statistics, U.S. Department of Labor, February 14, 2011. Numbers for local and state government Unavailable prior to 2008/Nov 2011, Release 10:00 a.m. (EST) Thursday, November 8, 2012, 2013 data http://www.bls.gov/news.release/pdf/osh2.pdf. Accessed 01/07/2016 http://www.bls.gov/news.release/pdf/osh2.pdf

Achieving the Use of the Evidence For Pressure Ulcer Reduction

Vollman KM. Intensive Care Nurse 2013;29(5):250-5

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

Demographic Comparison	SOC	PPS	*P*
Mean time on product (range), d	7 (1-29)	7 (1-45)	1.00
Mean age (SD) (range), y	57.72 (18.45) (18-89)	57.73 (17.67) (23-92)	1.00
Gender			
Female	14	10	.43
Male	16	19	
Braden Scale score	12.77	13.23	.46
Mobility	0-1	0-1	1.00
BMI	29.62	30.97	.65

Powers J, J Wound Ostomy Continence Nur. 2016;43(1):46-50

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)

	SOC	PPS	P
PU development	6	1[a]	.04
# of times patients pulled up in bed	3.28	2.58	.03
# of staff required to turn patient	1.97	1.35	<.0001

1[a] PU development with 24hrs of admission

Powers J, J Wound Ostomy Continence Nur, 2016;43(1):46-50

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

SAFE PATIENT HANDLING INITIATIVE PROTOCOL

1. Does the patient have a total Braden Score of 14 or less, including Braden mobility score of 1 and/or a Braden moisture score of <2?
2. Does the patient have ANY of the following co-morbidities?
   - Limited mobility post-op for 24 hours or more
   - Morbid Obesity
   - Limited mobility in general due to condition
   - Para/Quad paresis
   - Unconscious/Comatose
3. Does the patient have a past history of pressure ulcers?

If YES to the above questions, please use the turning and repositioning device

If ordering a turning and repositioning device, also order 1 heel protector and rotate foot every 2 hours

If patient is at risk for foot drop or heel ulcers, order 2 heel protectors i.e. immobile patients

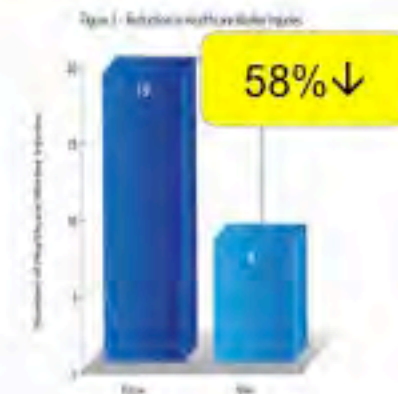
DISCONTINUE USE:

1. When patient is able to independently perform a turn.
2. No longer at risk for potential moisture injury.
3. Braden mobility score of 3 and/or moisture score of 3.

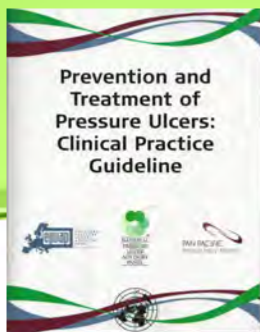
PRECAUTIONS:

1. Single use only. If soiled, wipe the glide sheet or body wedge with damp cloth to clean. DO NOT launder.
2. Periodically check product for signs of wear. Replace if product is damaged.

RESULTS



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



EBP Recommendations to Achieve Offloading & Reduce Pressure

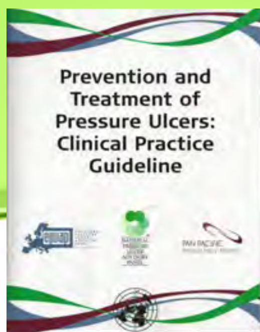
- Turn & reposition every 2 hours (avoid positioning patients on a pressure ulcer)
  - Use active support surfaces for patients at higher risk of development where frequent manual turning may be difficult
  - Microclimate management
  - Heel Protection
  - Early Mobility programs
  - Seated support surfaces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

Reger SI et al, OWM, 2007;53(10):50-58, www.ihi.org
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 Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014

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
- 31patients: 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)

Black J, et al. JWOCN. 2012;39(3):267-273



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Reger SI et al, OWM, 2007;53(10):50-58, www.ihi.org
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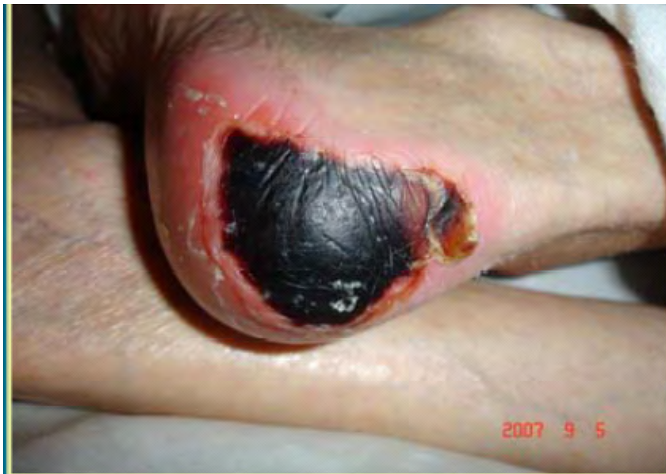
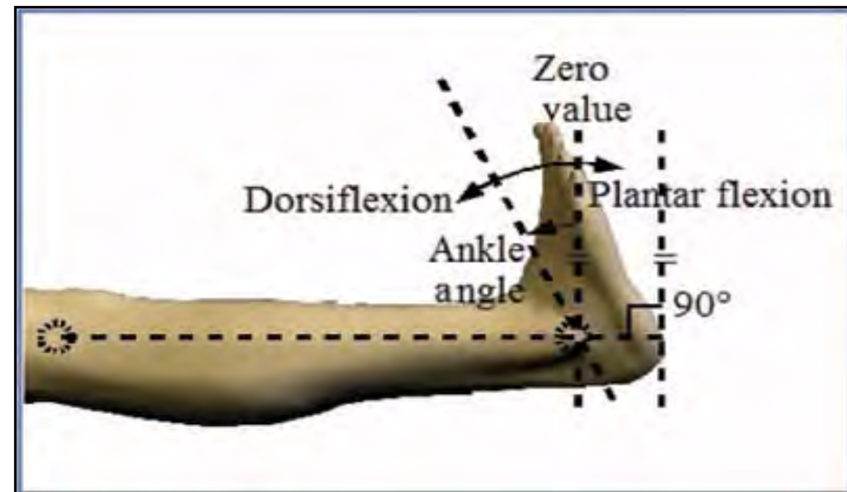
Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline

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





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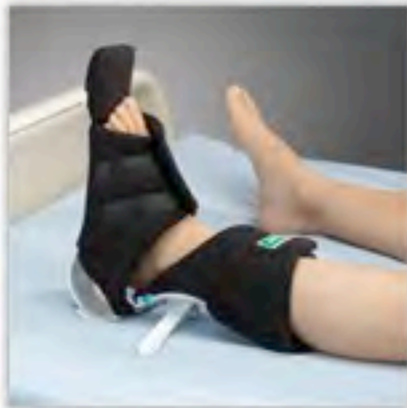
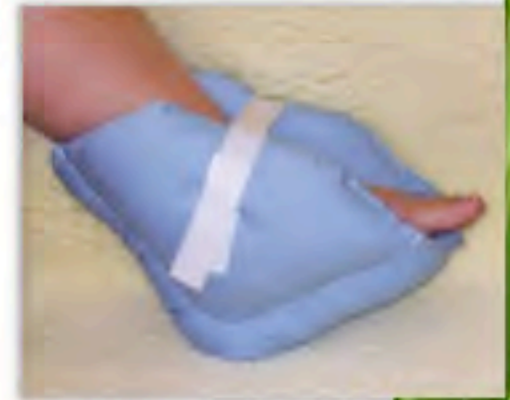
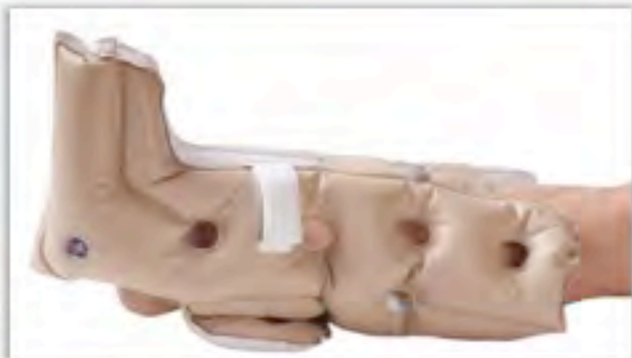
Heel Protectors

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

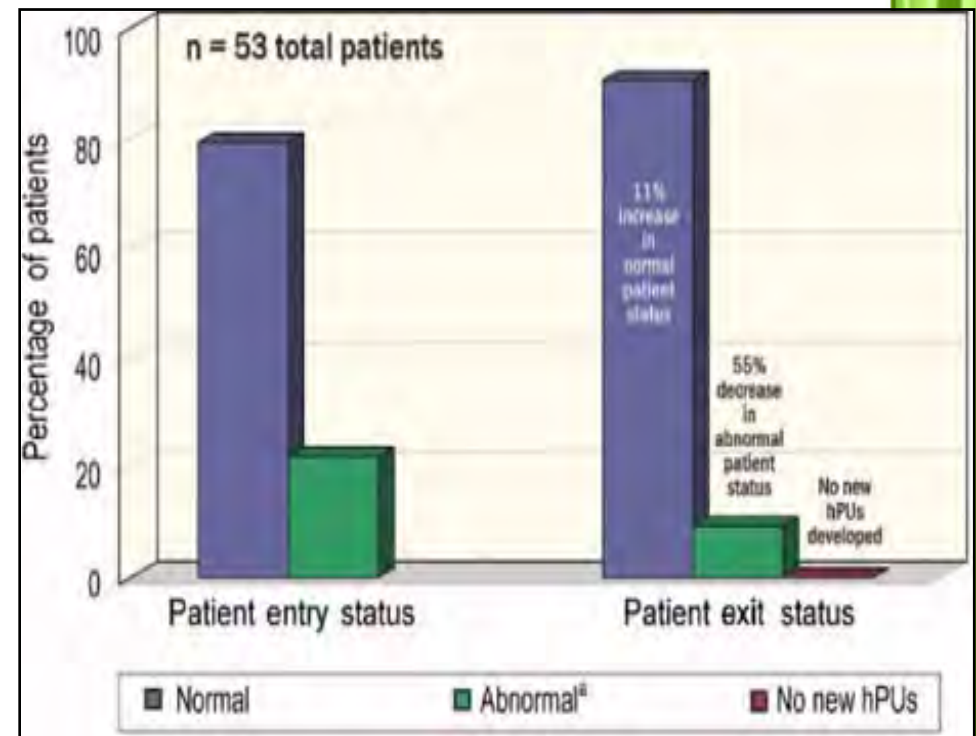
- Sedated patient > 5 days
- May or may not be intubated
- Braden equal to or less than 16

53 sedated patients over a 7 month period

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

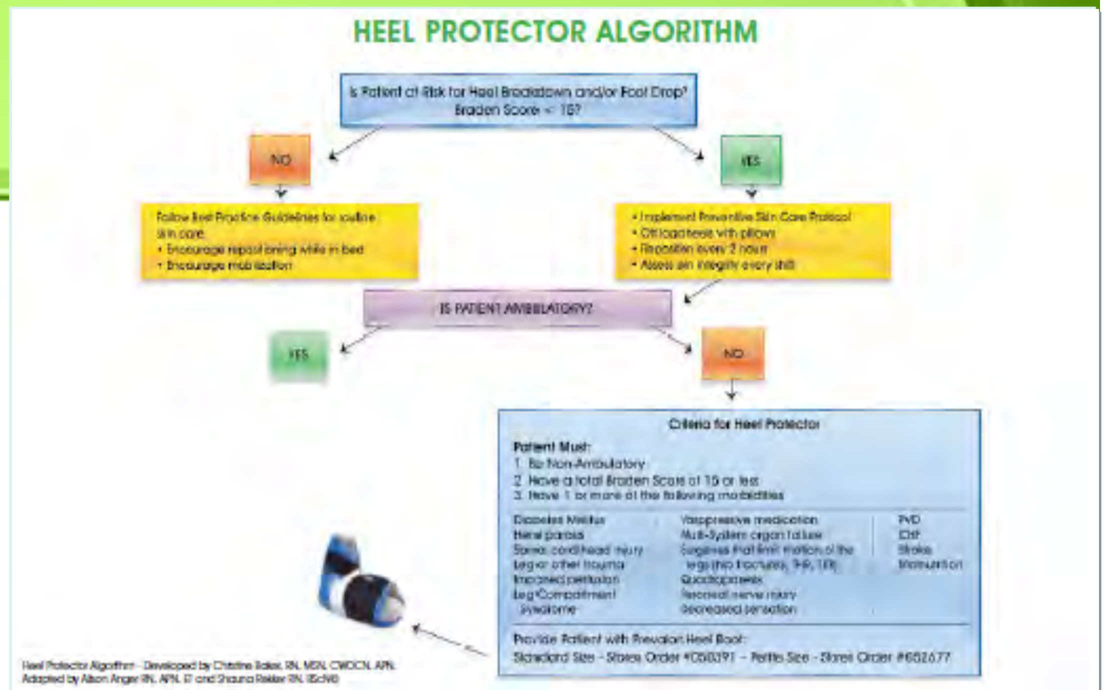


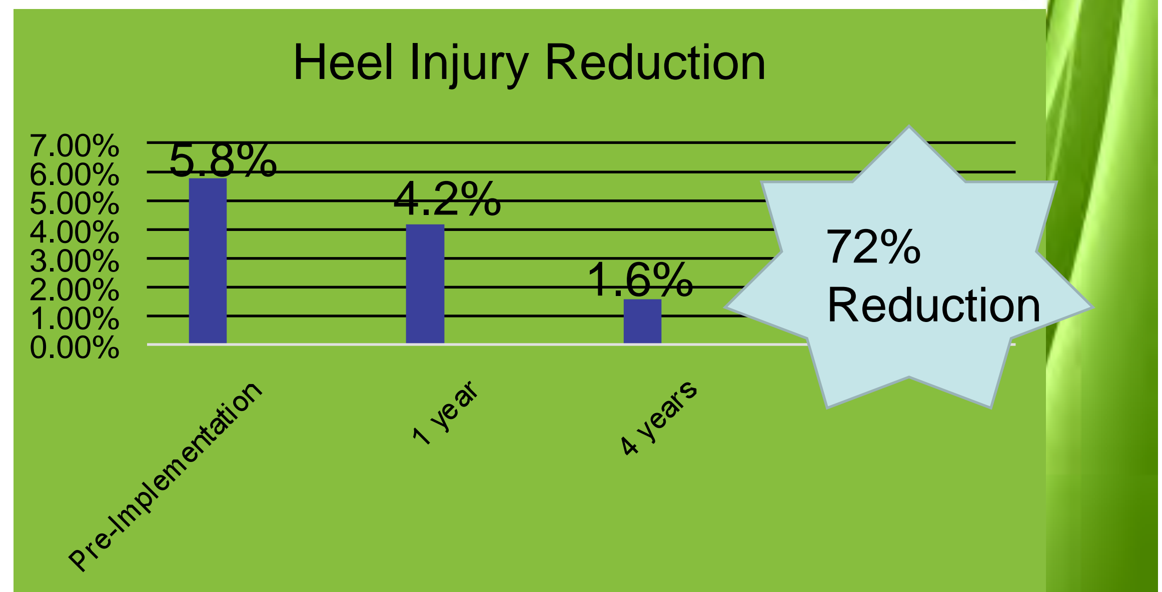
Meyers T. J WOCN 2010;37(4):372-378

46

Sustainability of Heel Injury Reduction: QI Project

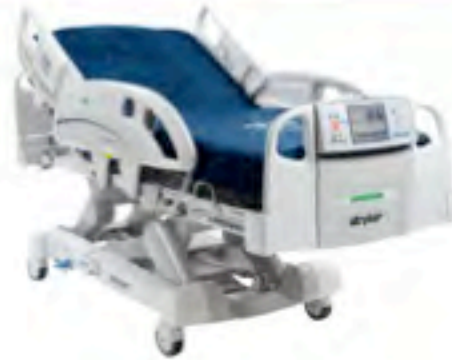
- 490 bed facility
- Evidence based quality Improvement initiative
- 4 tier Process
  - Partnership
  - Comprehensive product review
  - Education & engagement
  - Support structures & processes

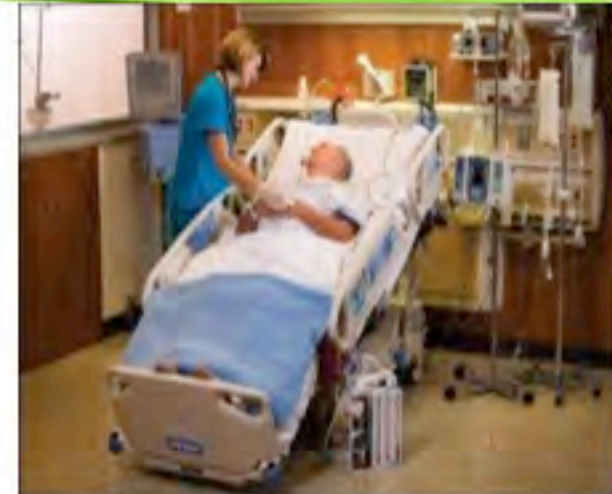


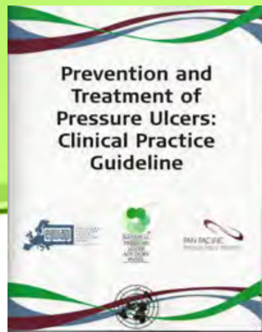


Hanna-Bull D. WOCN, 2016;43(2):129-132

In-Bed Technology



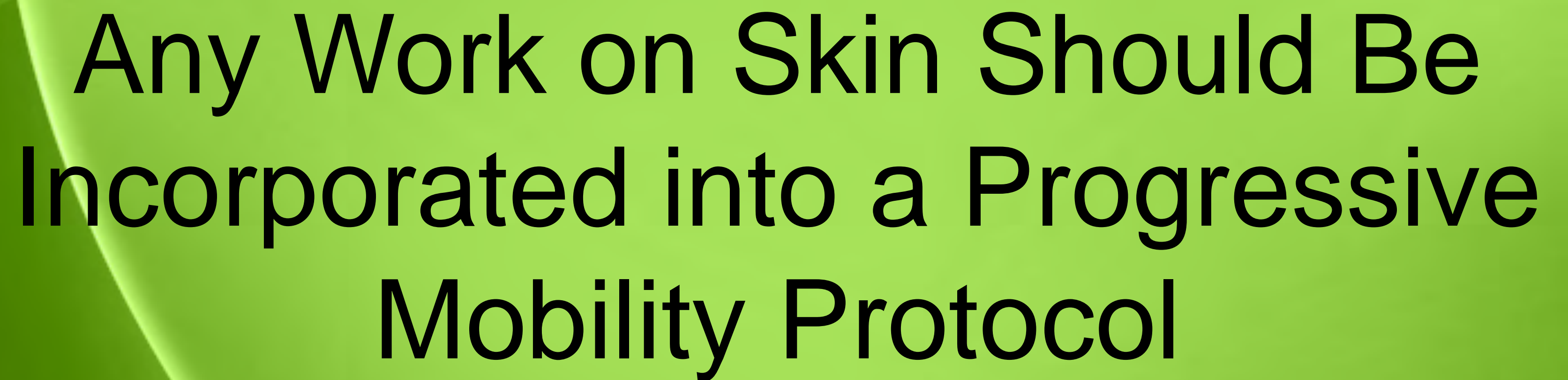




EBP Recommendations to Achieve Offloading & Reduce Pressure

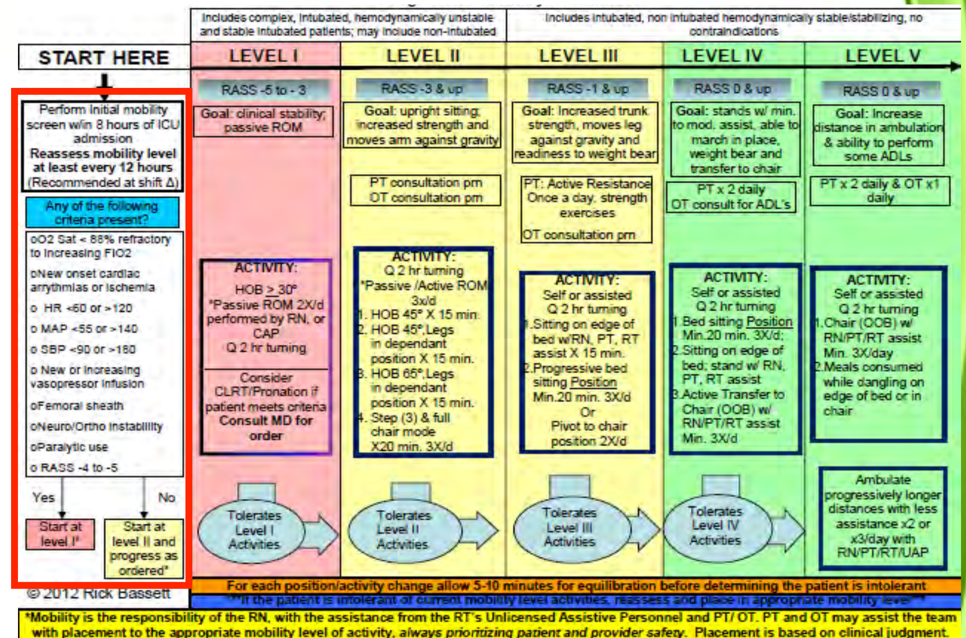
- Turn & reposition every 2 hours (avoid positioning patients on a pressure ulcer)
  - Use active support surfaces for patients at higher risk of development where frequent manual turning may be difficult
  - Microclimate management
  - Early Mobility programs
  - Seated support surfaces for patients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

Reger SI et al, OWM, 2007;53(10):50-58, www.ihi.org
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 Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014

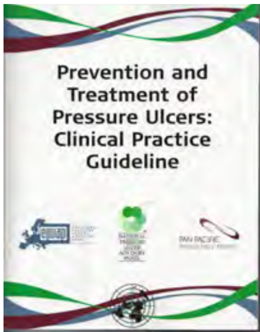

Any Work on Skin Should Be
Incorporated into a Progressive
Mobility Protocol

Outcomes of Early Mobility Program

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



Bassett R, et al. Intensive & Crit Care Nurs, 2012;28:88-97
Staudinger t, et al. Crit Care Med, 2010;38.
Abroung F, et al. Critical Care, 2011;15:R6
Morris PE, et al. Crit Care Med, 2008;36:2238-2243
Pohlman MC, et al. Crit Care Med, 2010;38:2089-2094
Schweickert WD, et al. Lancet, 373(9678):1874-82.
Thomsen GE, et al. CCM 2008;36;1119-1124
Winkelman C et al, CCN,2010;30:36-60
Dickinson S et al. Crit Care Nurs Q, 2013;36:127-140

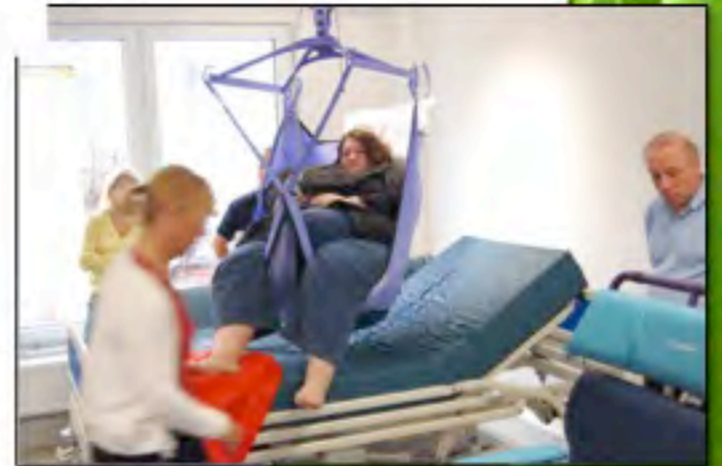


EBP Recommendations to Achieve Offloading & Reduce Pressure

- 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

Reger SI et al, OWM, 2007;53(10):50-58, www.ihi.org
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 Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014

Out of Bed Technology

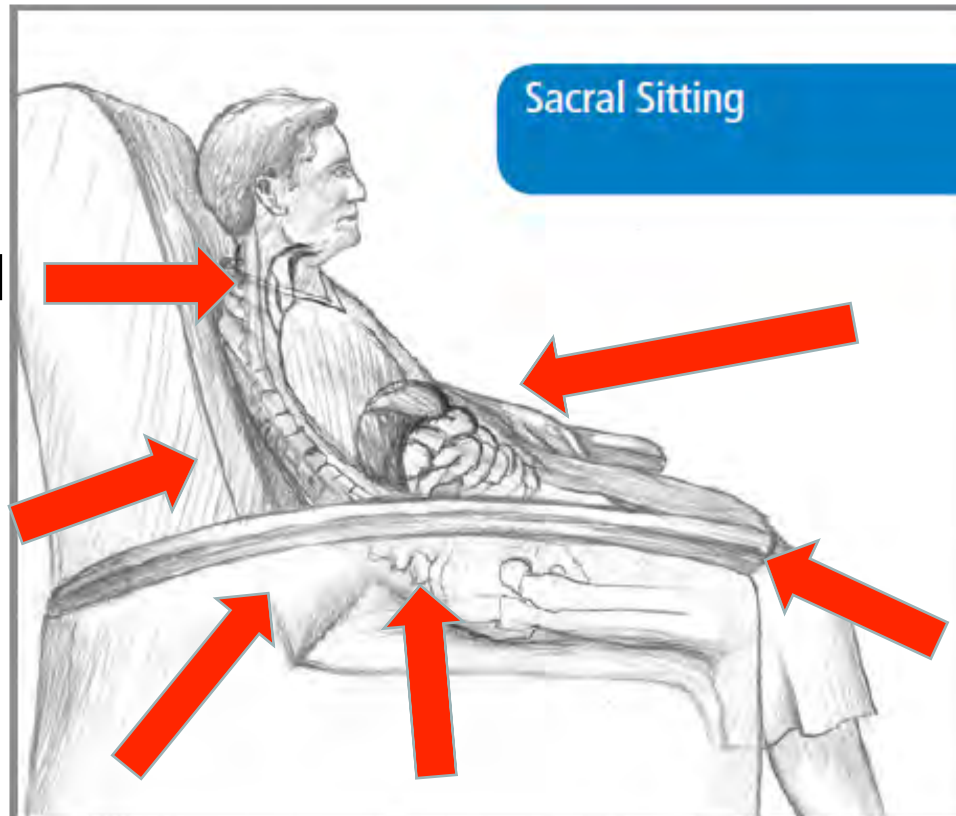


Current Seating Positioning Challenges

Uncomfortable

Airway & Epiglottis compressed

Body Alignment



Frequent repositioning & potential caregiver injury

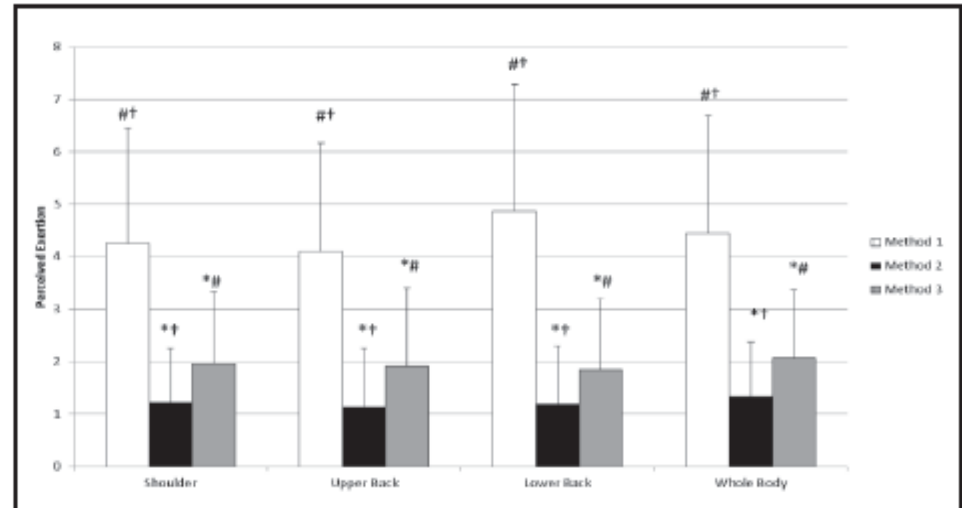
Potential fall risk

Shear/Friction

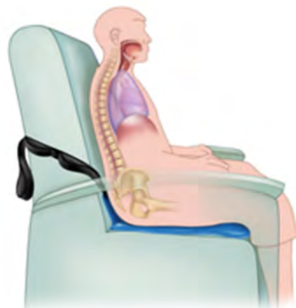
Sacral Pressure

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.

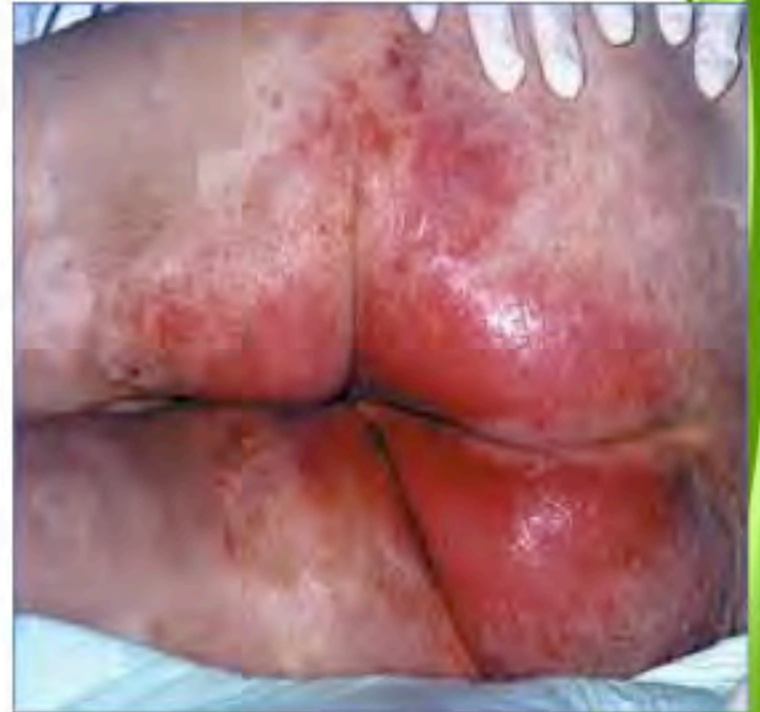


Method 1: 2 care givers using old method of repositioning
246% greater exertion than SPS
Method 2: 2 caregivers with SPS
Method 3: 1 caregiver with SPS
52% greater exertion than method 2



Fragala G, et al. Workplace Health & Safety;61:141-144

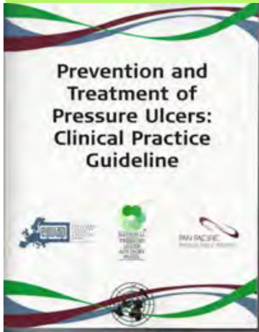
Prevention Strategies for IAD



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)

Doughty D, etal. J WOCN. 2012;39(3):303-315



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

National Pressure Ulcer Advisory Panel and European Pressure Ulcer Advisory Panel. Pressure ulcer prevention & treatment :clinical practice guideline. Washington, DC: National Pressure Ulcer Advisory Panel; 2009.
Williamson, R, et al (2008) Linen Usage Impact on Pressure and Microclimate Management. Hill-Rom
www.ihi.org
Doughty D, et al. JWOCN. 2012;39(3):303-315

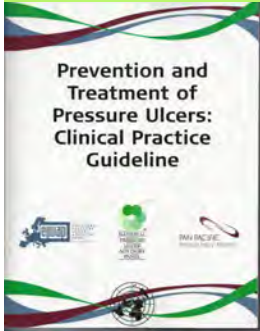
Reusable Incontinence pads

Adult diaper

Current Practice: Moisture Management

Disposable Incontinence Pads

Airflow pads for Specialty Beds



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

National Pressure Ulcer Advisory Panel and European Pressure Ulcer Advisory Panel. Pressure ulcer prevention & treatment :clinical practice guideline. Washington, DC: National Pressure Ulcer Advisory Panel; 2009.
Williamson, R, et al (2008) Linen Usage Impact on Pressure and Microclimate Management. Hill-Rom
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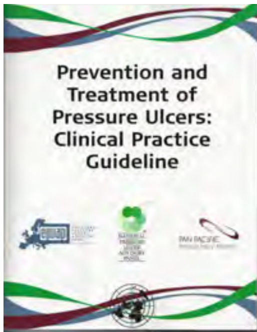
Doughty D, et al. JWOCN. 2012;39(3):303-315

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

Hall K, et al. Ostomy Wound Management, 2015;61(7):26-30



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- Barrier & wick away material under adipose and breast tissue
- Support or retraction of the adipose tissue (i.e. KanguruWeb)
- Pouching device/bowel management system/male external urinary device

National Pressure Ulcer Advisory Panel and European Pressure Ulcer Advisory Panel. Pressure ulcer prevention & treatment :clinical practice guideline. Washington, DC: National Pressure Ulcer Advisory Panel; 2009.
Williamson, R, et al (2008) Linen Usage Impact on Pressure and Microclimate Management. Hill-Rom
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Doughty D, et al. JWOCN. 2012;39(3):303-315

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

Table 3. Type of attached medical devices and rate of MDR HAPUs

	Medical de-vices rate (n=175 patients)		Ulcer rate by medi-cal device type (n=211 devices)	
	n[a]	%	n[b]	%
Monitoring				
ECG leads	173	98.8	7	3.3
ECG electrodes	172	98.2	2	0.9
BP cuff	171	97.7	2	0.9
SpO_2 probe	170	97.1	17	8.0
GI/GU				
Nasogastric	43	24.5	10	4.7
Orogastric	15	8.5	-	-
PEG	1	0.5	-	-
Foley	162	92.5	6	2.8
Vascular lines				
Central	72	41.1	1	0.4
Arterial	118	67.4	1	0.4
Peripheral	89	50.8	1	0.4
Respiratory				
ET tube	67	38.2	95	45.0
Nasal cannula	54	30.8	14	6.6
CPAP mask	20	11.4	22	10.4
Oxygen mask	40	22.8	15	7.1
Preventive devices				
TED	38	21.7	5	2.3
Cervical collar	4	2.2	-	-
Splint	2	1.1	-	-
Other devices[c]	18	10.2	13	6.1
Total			211	100.0

MDR HAPU = medical device-related hospital-acquired pressure ulcer; BP = blood pressure; CPAP = continuous positive airway pressure; ECG = electrocardiograph; ET = endotracheal; GI/GU = gastrointestinal/genito-urinary; PEG = percutaneous endoscopic gastrostomy; SpO2 = peripheral oxygen saturation of hemoglobin; TEDs = thrombo-embolism deterrent.

[a] n >175 due to >1 medical device per patient; [b] n > 211 due to >1 MDR PU per device; [c] Airway, endotracheal tube holder,and plaster

HanonuS & Karadag A. OWN, 2016;62(2):12-22

Medical Device Related Pressure Ulcers

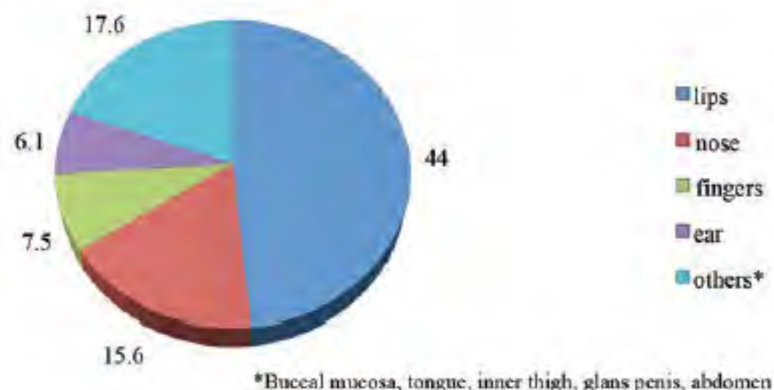


Figure 2. Distribution (percentage) of MDR PU's by anatomical location (n=211).

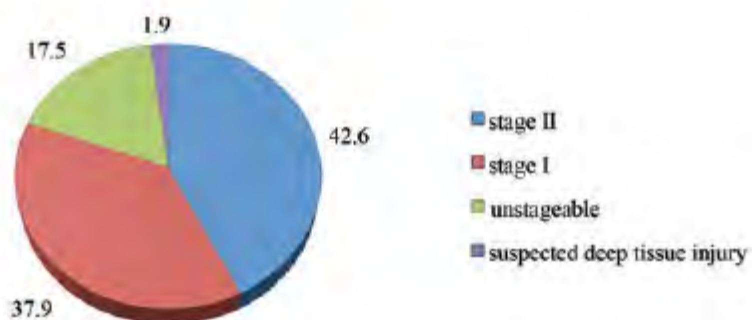


Figure 1. Distribution (percentage) of MDR PU's by stage (n=211).

Table 4. Odds ratios of MDR HAPU risk factors (n=564)

Risk factors	P	OR	95% CI for OR Lower	Upper
Advanced age[a]	.095	1.023	.996	1.050
Enteral feeding	.045[b]	2.12	0.785	3.125
With traditional HAPUs	.001[b]	6.600	1.210	15.120
Medical ICU	.001[b]	7.041	2.144	23.126
Neurosurgical ICU	.011[b]	6.221	1.520	25.454
Chest diseases ICU	.009[b]	6.014	1.557	23.228
Anesthesia-Resuscitation ICU	.078	3.478	.870	13.898
High risk Braden Scale score	.040[b]	1.815	1.029	3.205
Mechanical ventilation	.147	2.075	.773	5.568
Use of steroids	.649	.806	.318	2.042
Use of anticoagulants	.138	2.079	.791	5.466
Use of sedatives	.088	2.565	.868	7.578
Low albumin g/dl[c]	.056	.527	.280	.990
Low hemoglobin g/dl[d]	.104	1.170	.968	1.413

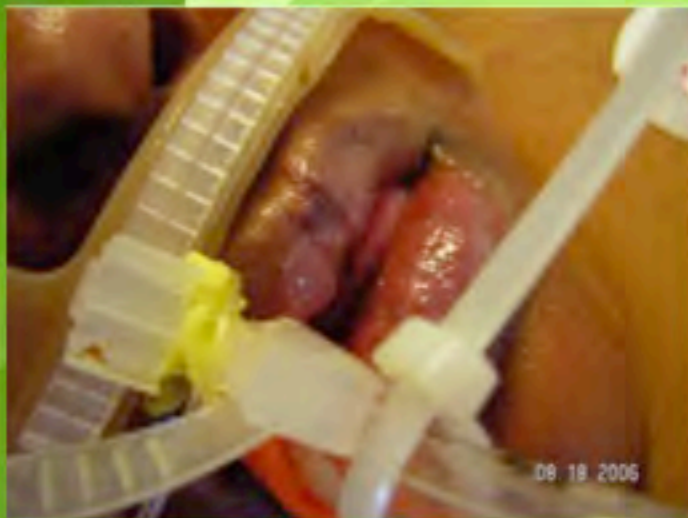
HAPUs = hospital-acquired pressure ulcers; ICUs = intensive care units; MDR PU = medical-device related pressure ulcers; CI= confidence interval; OR = odds ratio
[a]mean age 67.4±16.1; [b]P <0.05; [c]mean albumin 2.8±0.7; [d]mean hemoglobin 9.7±1.7

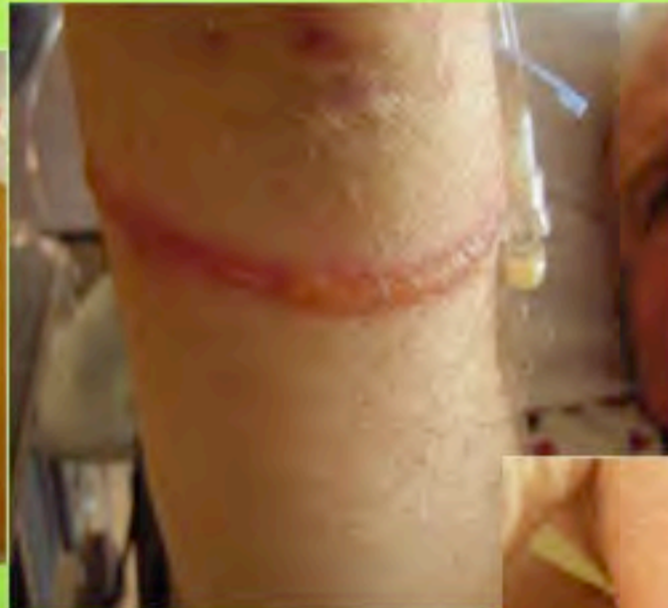
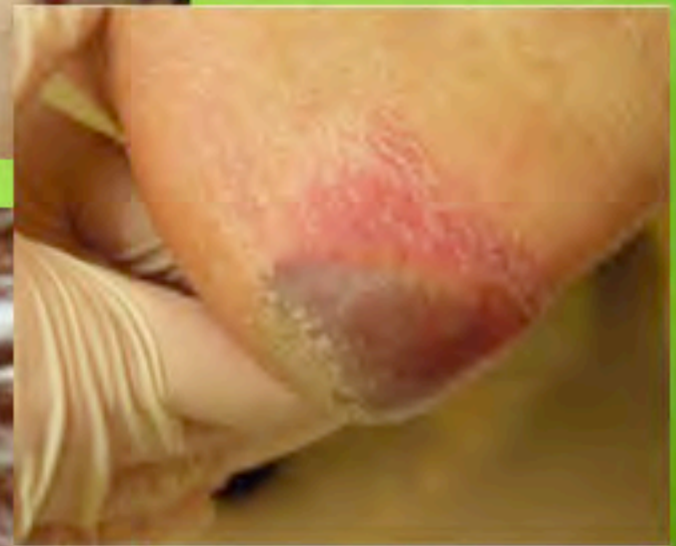
National incidence estimated 25%-29%

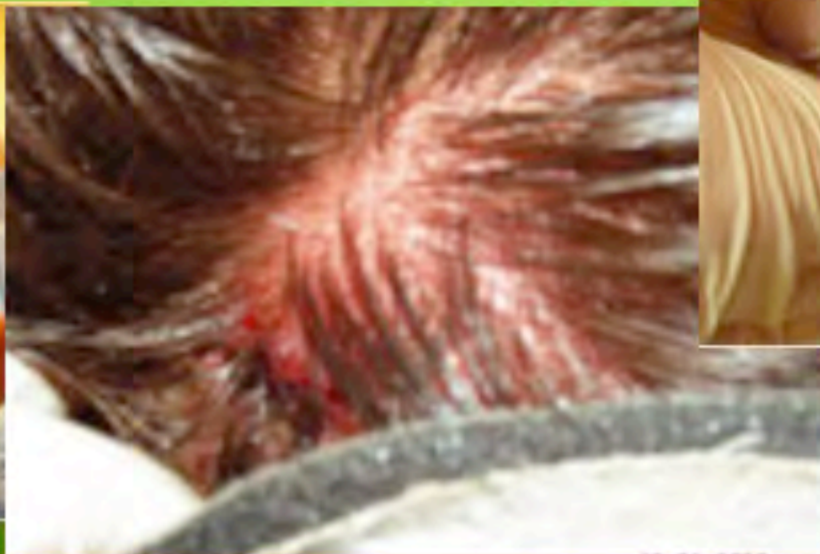
Minnesota Hospital Association/http://www.mnhospitals.org/pressure-ulcers

Apoid J, et al. J of Nurs Care Quality, 2012;27:28-34

HanonuS & Karadag A. OWN, 2016;62(2):12-22





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

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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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

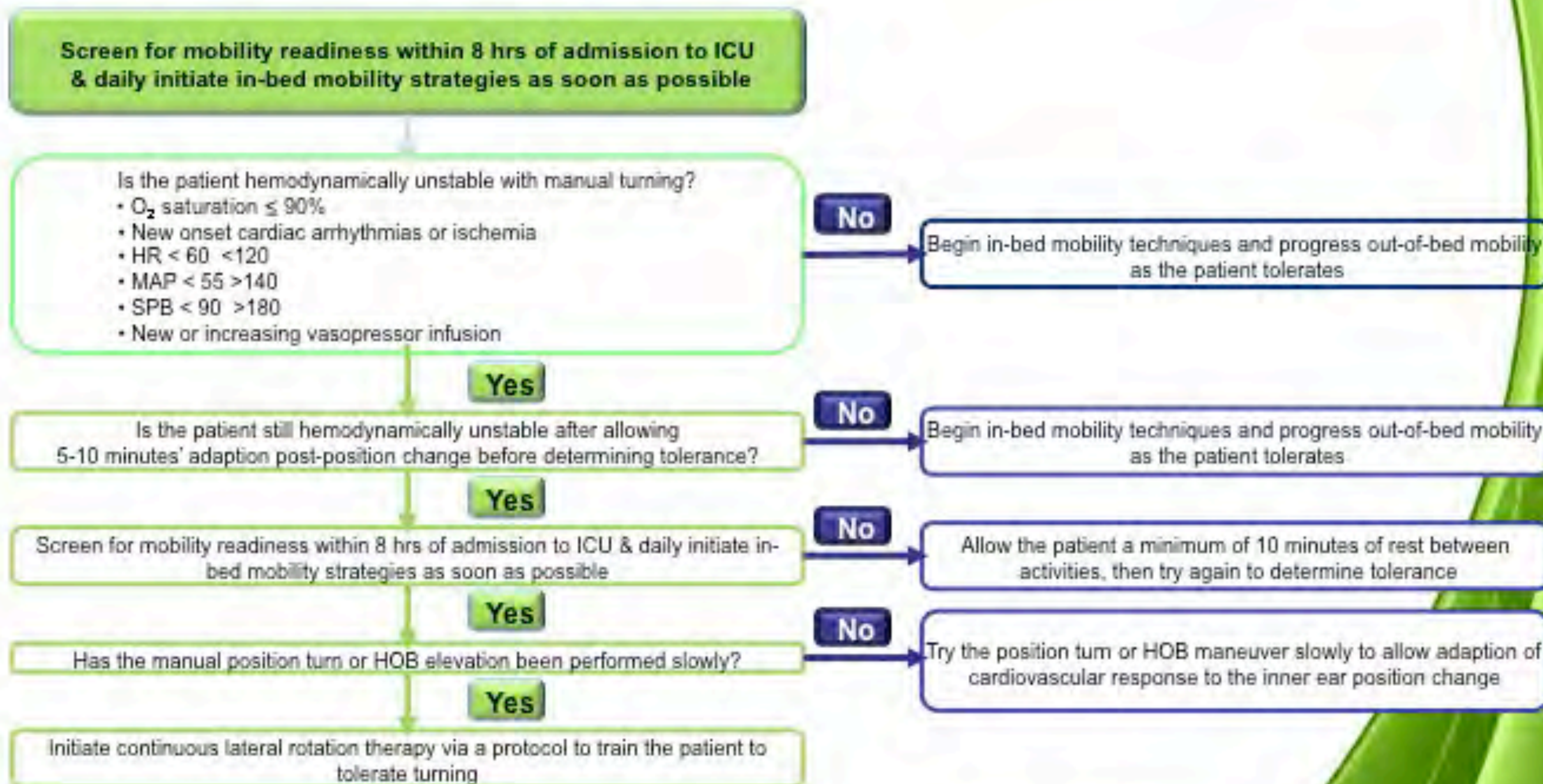
Is it a Barrier to Positioning?

The Role of Hemodynamic Instability in Positioning[1,2]

- Lateral turn results in a 3%-9% decrease in SVO_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:[3]
  - Elderly
  - Diabetes with neuropathy
  - Prolonged bed rest
  - Low hemoglobin and cardiovascular reserve
  - Prolonged gravitational equilibrium[4,5]

1.Winslow EH, et al. *Heart Lung.* 1990;19:557-561.
2.Price P. *Dynamics.* 2006;17:12-19.
3.Vollman KM. *Crit Care Nurs Q.* 2013;36:17-27
4. Vollman KM. Crit Care Nurs Clin of North Amer, 2004;16(3):319-336
5..Vollman KM. *Crit Care Nurs Q.* 2013 Jan;36(1):17-27

Decision-Making Tree for Patients Who Are Hemodynamically Unstable With Movement[1,2]



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

Vollman KM. *Crit Care Nurse*. 2012;32:70-75.
Vollman KM. *Crit Care Nurs Q*. 2013;36:17-27.
Hamlin SK, et al. Amer J of Crit Care. 2015;24:131-140.

VCU Hemodynamic Instability Guideline

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

IF PATIENT IS DEEMED TOO UNSTABLE TO TURN BY ABOVE PARAMETERS:

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 mini-turns**
2. **Weight shift patient at least every 30 minutes**
3. **Elevate heels from surface of bed**
4. **Reposition patient's head, arms and legs at least every hour, consider passive ROM**
5. **Consider use of Continuous Lateral Rotation Therapy to prevent development of "gravitational equilibrium". Begin: SLOW AND LOW angles of turning to gauge patient response.**
6. **When turning patient: GO SLOW! Provide serial small turns from supine to lateral position to achieve linen changes, hygiene checks, and reposition with wedges and pillows.**

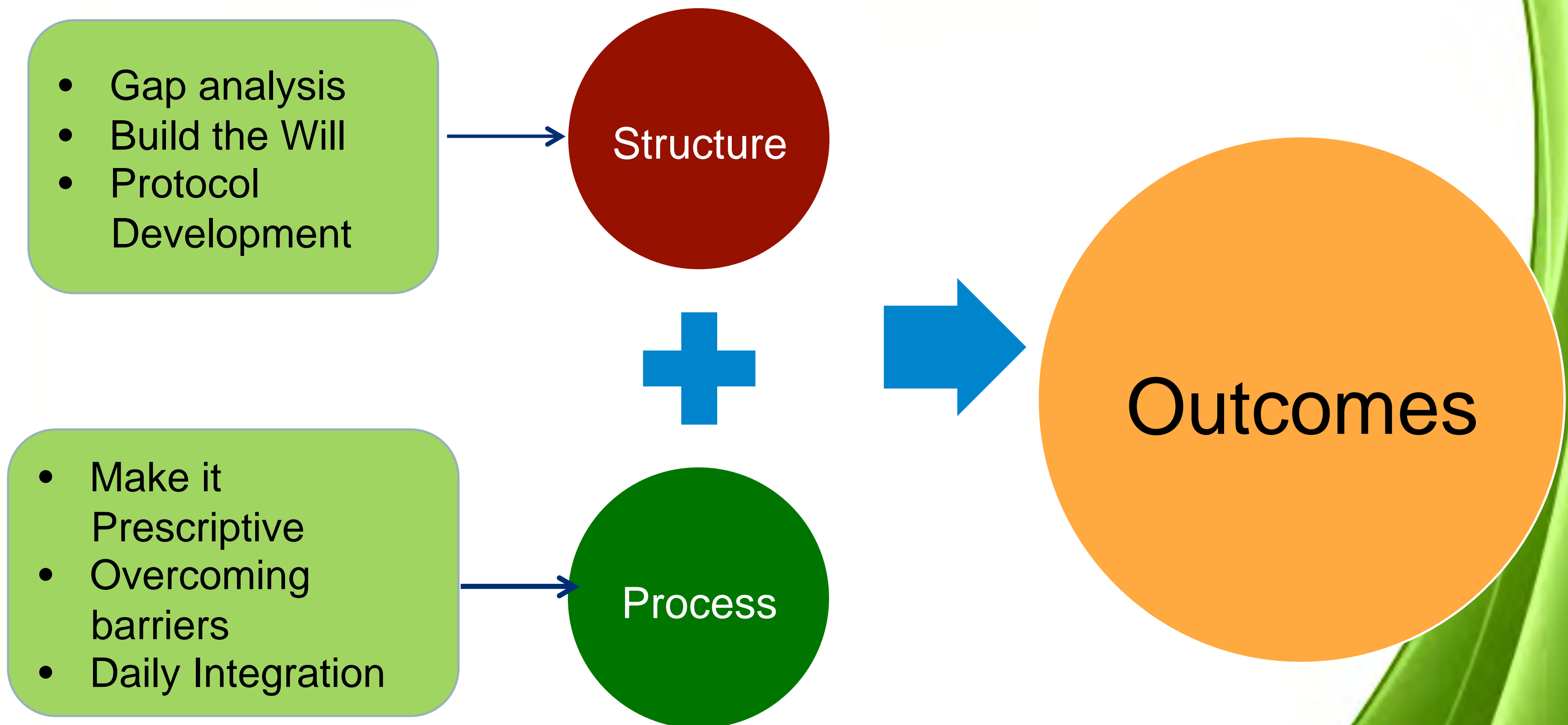
UNSTABLE FRACTURES

1. Patient's with unstable pelvis injuries LOG ROLL PATIENT ONLY with approval of Attending MD. Consider wedges or pillows placed between the legs to maintain proper alignment.
2. DO NOT use continuous loateral rotation therapy (CLRT) with unstable spinal fractures: these patients should be positioned with multiple wedges to maintain proper alignment
3. Cervical Fractures / UNSTABLE: Patient must have appropriately fitted cervical collar in place. Ensure security and proper positioning of collar, then log roll patient, and wedge in proper aligmment.

Brindle TC, et al. WOCN, 2013;40(3): 254-267

How Do We Make It
Happen?

Driving Change



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

Anderson M, et al, J of Wound Ostomy Continence. 2015;42(3):217-225

Patient Skin Integrity Bundle (InSPiRE)

Coyer F, et al. American J Crit Care. 2015;24(3):199-209

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)

Intact Skin Is In: Making it Happen

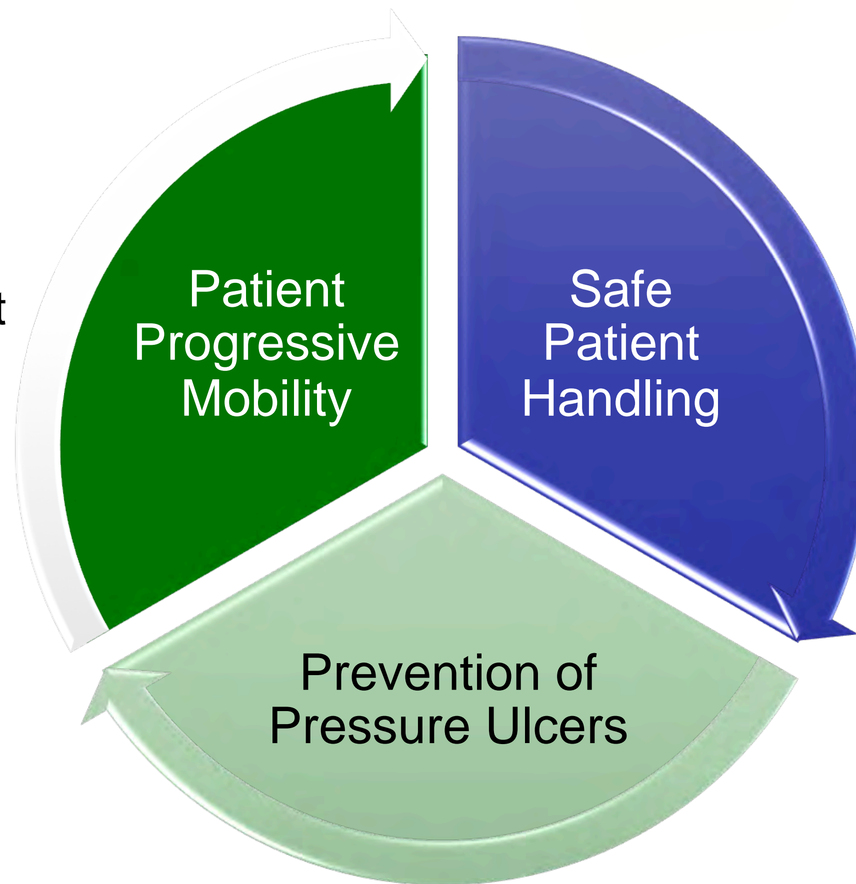
- Advocacy
- Braden subscales
- Skin rounds/time frequency
- Hand-off communication
- The right products and processes-pressure/shear/ moisture/prevent skin tear and medical adhesive related injuries
- Quarterly prevalence/incidence of PU & IAD
- Skin liaison/champion nurses
- Creative strategies to 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.

Contact Kathleen Vollman at

kvollman@comcast.net

www.Vollman.com

June 23 **EXPLORING THE ROLE OF ENVIRONMENTAL SURFACES IN OCCUPATIONAL INFECTION PREVENTION**
Dr. Amber Mitchell, International Safety Center, and Barbara DeBaun, Cynosure Health

June 29 *(South Pacific Teleclass)*
SHARPS INJURY PREVENTION
Dr. Terry Grimmond, Grimmond & Associates Ltd., New Zealand

July 14 **RESULTS OF QUALITATIVE RESEARCH ON IMPLEMENTATION OF INFECTION CONTROL BEST PRACTICES IN EUROPEAN HOSPITALS**
Dr. Hugo Sax, University Hospital Zurich, Switzerland

July 21 **BEHAVIOURAL AND ORGANIZATIONAL DETERMINANTS OF SUCCESSFUL INFECTION PREVENTION AND CONTROL INTERVENTIONS**
Dr. Enrique Castro-Sánchez, Imperial College London, England

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