

Pressure Ulcers: Putting Pressure on Prevention Across the Continuum

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University of Rochester Medical Center
 Strong Memorial Hospital
 2013 Critical Care Nursing Symposium



Center of Nursing Excellence

Session Objectives

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- ❑ Recap understanding of 'what contributes to a pressure ulcer'
- ❑ Discuss strategies to identify patients at risk for skin injury among critically ill patients.
- ❑ Understand the NPUAP and EPUAP pressure ulcer classification system & correctly grade pressure ulcers.
- ❑ Examine the newest Randomized Clinical Trials, demonstrating cost effective PrU prevention, using a Silicone Border Sacrum Dressing.
- ❑ Describe key processes or program components to a successful pressure ulcer prevention program to reduce skin injury in the ICUs.
- ❑ Discuss how direct care nurses can impact nursing's sensitive indicators to improve and sustain outcomes among adult and pediatric critically ill patients.

Pressure Ulcer Facts

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- 4th Leading preventable medical error in U.S.
- **NDNQI data base: Estimates of incidence of PUs range from 2.1% to 28% acute care hospitals, (5.0%-25%) ICUs, and 4.4% to 33% for community care patients.** 1
- **PUs in pediatric intensive care units (PICUs) 5% to 27%;***
- **Neonatal intensive care units (NICUs) up to 28%***
- Treatment costs on PUs varies, with an estimated range between \$37,800 and \$70,000
- National health Care annual costs in the U.S. as high as \$11-17.8 billion dollars for 2010. 2
- *Bashore-Laini, MM, Rutiff, CR. (2007). Pressure Ulcers in Neonates and Children: An NPUAP White Paper: Advances in Skin & Wound Care, 20, 4, 208-219.

Disclosures

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Mölnlycke Health Care, LLC, US.
 Consultant and Speaker's Bureau



It is Time to Change!

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- 44,000 to 98,000 preventable death in hospitals related to medical errors annually (IOM report, 1999)
- 92,888 deaths directly attributable to safety indicators between 2005-2007 (HealthGrades 2009)
 - Failure to rescue, pressure ulcers* and post-op infections
- **Hospital Acquired Infections the 5th leading cause of death nationally**
- **2013-lowest percent improvement / 1% total Medicare cut**
- **(\$50 billion) for preventable injury**



Medical Device Related PUs (MDRs)

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MDRs can occur under any medical device, and can become full thickness ulcers. MDRs are reasonably preventable with thin dressings under device (e.g. Mepilex)
 *Location (sacral, buttock, heel, occipital)

Prevalence
 19.9% Ears; 14.3% sacrum; 10.2% heels; 8.8% buttocks (1)

- Back Boards; neck collars
- Endotracheal tubes; trachs
- Face and nasal bridge of patients
- with non-invasive positive pressure ventilation (NIPPV) and CPAP



50% of pediatric PUs due to MDRs
 Masks; O2 Tubing; feeding tubes;
 Occipital; lips; nose most common



1. Vangilder C, AS, Harrison P, Meyer S. Results of the 2008-2009 International Pressure Ulcer Prevalence Survey and a 3-year, acute care, unit-specific analysis. *Wound Management*. 2009;5:39-45.

Pressure Ulcer Facts



- Mortality
 - Several studies show a 60% mortality for older persons with PU within 1 year of hospital discharge
 - Most often PU don't cause death but may be a predictor of mortality
- 60,000 patients die each year from PU complications

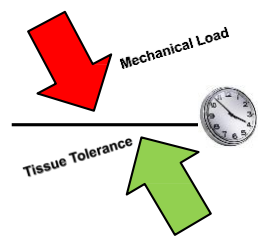
The Impact of Pressure Ulcers

- Patient suffering increases**
 - Increased pain and distress
 - Creates body image disturbance (occipital wound –permanent alopecia)
 - Reduced QoL
 - Increased risk of infections
 - Increased mortality risk
- **Cost of care increases**
 - Increased length of stay
 - Increased nurse time
 - Increased cost of consumables
 - Increased cost of pharmaceuticals
 - Stage III and IV and unable to stage pressure ulcers are state reportable.
 - One of CMS never events



What Causes PUs?

- Mechanical loading**
 - Pressure
 - Friction
 - Shear
- Tissue Tolerance**
 - Ability of skin and supporting structures to redistribute pressure
 - Affected by extrinsic/ intrinsic factors

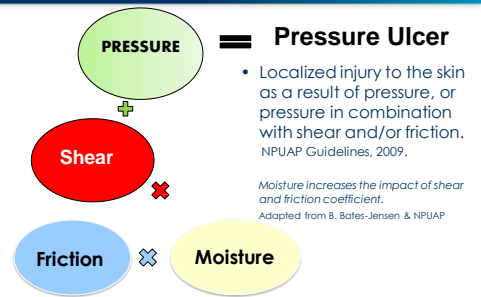


Pressure Ulcer Facts

- Lawsuits—More than 17,000 lawsuits related to pressure ulcers annually
 - 2nd most common claim after wrongful death and greater than falls and emotional distress



Pressure Ulcers



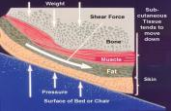
Is This Familiar?



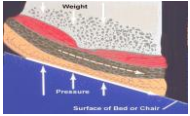
SKIN EXPOSED TO PRESSURE, FRICTION AND MOISTURE

Mechanical Loading


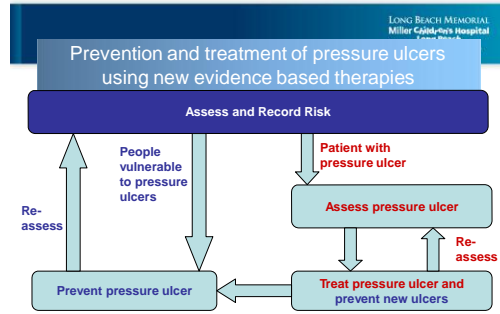
Shear:
Tissue layers slide against each other, disrupts or angulates blood vessels



Friction:
Used to describe all phenomena that r/t interface properties & sliding of surfaces with respect to each other. This injury seen on elbows & heels (rubbing on sheets)



Pressure
Pressure keeps blood from getting to the tissue, causing cells to die and the skin to break down. Most common sites the sacrum, ischial tuberosities, trochanters, malleoli, and heels, -yet, PUs can develop anywhere.


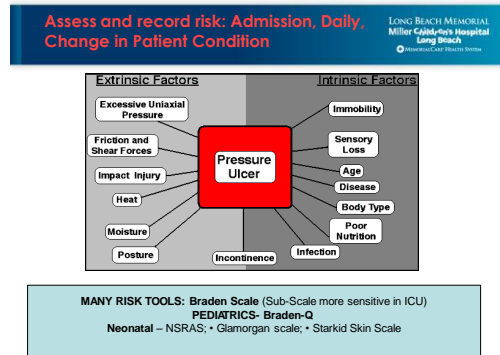
Nutritional Assessment

- Both poor nutritional intake and poor nutritional status have been shown to correlate with the development of PU's as well as protracted healing of wounds.
- Malnutrition**—status of nutrition in which a deficiency or excess, or imbalance of energy, protein and other nutrients causes measurable adverse effects on tissue, body structure, body function and clinical outcome. In the guideline, malnutrition refers to a status of *under-nutrition or under-mourishment*.
- Dehydration**—common and under-recognized Nutritional risk and PU risk, *consider enteral nutrition*
- Nutritional support—assess, monitor, evaluate, and reassess
- Minimum of 35 kcal per kg body weight per day, with 1.5 g/kg/day protein and 1 ml per kcal /day of fluid intake

International P.U. Guidelines, EPUAP/NPUAP, 2009

Moisture Injury: Incontinence Associated Dermatitis

- Inflammatory response to the injury on 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
- Patients with fecal incontinence **22** times more likely to have PUs than those without

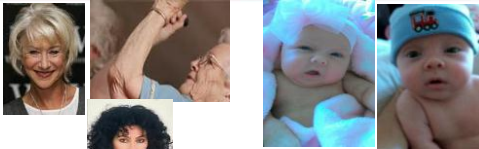



Skin assessment

- Assess skin regularly – inspect most vulnerable areas
- Frequency - based on vulnerability and condition of patient
- Encourage individuals to inspect their skin
- Look for:
 - persistent erythema
 - non-blanching hyperemia
 - blisters
 - localized heat
 - localized edema
 - localized induration
 - purplish/bluish localized areas
 - localized coolness if tissue death occurs

Skin Changes as We Age

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- * Less elasticity
- * Easily traumatized
- * Decrease in sebaceous glands
- * Decrease in immune response
- * Changes in thermoregulation



Skin Failure in Critically Ill Patient's

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- 18 month prospective descriptive study to describe ICU patients with skin failure and determine relationships to other factors
 - 100% had 1 or more other organ failures
 - 90% albumin level <3.5 mg/dL
 - Time from adm to skin failure 7.7 days
 - Other factors in 75% of patients:
- Other factors in 75% of patients
 - Generalized edema, Ventilator use >50yrs old, weight >150lbs, Cr >1.5 mg/dL, MAP <70MMHG, Use of sedatives/analgesics
- Correlations of paired variables
 - Sepsis & renal failure
 - Concurrent use of vasoactive
- SCALE: Skin Changes at Life's End, Consensus Document. WOUNDS 2009;21(12):329-336



Defined as an event in which skin & underlying tissues die due to hypoperfusion concurrent with critical illness, is considered to be unavoidable.

Curry K, et al. Ostomy Wound Management, 2012;56:36-43.

PRESSURE ULCER PREVENTION EBP Recommendations

- ♦ Use of Wound Dressings
- ♦ Repositioning
- ♦ Support Surfaces
- ♦ Reducing Moisture Related Injury



EBUP and MBUP: Prevention and treatment of pressure ulcers: quick reference guide. Washington, DC: National Pressure Ulcer Advisory Panel; 2008.

Assessment of PUs

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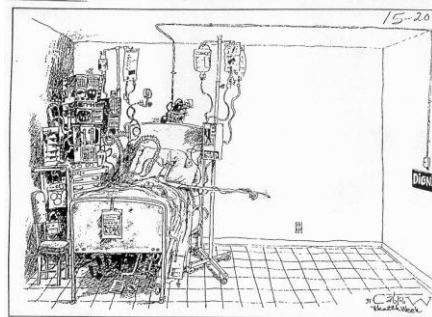
Assess:

- cause
- site/location
- dimensions
- stage or grade
- exudate amount and type
- local signs of infection
- pain
- wound appearance
- surrounding skin
- undermining/tracking, sinus or fistula
- odor

Record

- Document:
 - depth
 - estimated surface area
 - grade using NPUAP/EPUAP
- Support with photography and/ or tracings
- Report pressure ulcers stage II according to P & P; and clinical incident system

Initial and on-going ulcer assessment is the responsibility of a registered healthcare professional



Evidence for Use of Wound Dressings for Pressure Ulcer Prevention Protocols

2 Randomized Clinical Trials to Prevent Sacral and Heel Pressure Ulcers

- Peggy Kalowes RN, PhD, CNS, FAHA
- Nick Santamaria RN, PhD

1. Santamaria N, Gerdtz M, Sage S, McCann J, Freeman A, Vassilou T, DeVincenzo S, Ng AW, Manias E, Liu W, Knott J. A randomized controlled trial of the effectiveness of soft silicone multi-layered foam dressings in the prevention of sacral and heel pressure ulcers in trauma and critically ill patients: the border trial. *Int Wound J*. 2013.
2. Brindle C. Prophylactic dressing application to reduce pressure ulcer formation in cardiac surgery patients. *J Wound Ostomy Continence Nurs*. 2010;30:114-18.
3. Brindle CT W J. Prophylactic Dressing Application to Reduce Pressure Ulcer Formation in Cardiac Surgery Patients. *J Wound Ostomy Continence Nurs*. 2010;30(2):129-142.
4. Consensus Statement. Global evidence based recommendations for the use of wound dressings to augment pressure ulcer prevention protocols- August 2013, Second Edition. International Consensus Panel, NPUAP/EPUAP.

Use of a Soft Silicone Bordered Sacrum Dressing to Reduce Pressure Ulcer Formation in Critically Ill Patients: A Randomized Clinical Trial

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Background of Problem:

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- Development of pressure ulcers (PUs) is complex and multifactorial.
- In the intensive care unit (ICU), PUs serve as an additional comorbid threat in those who are already compromised.
- PUs harm patients, cause pain, infections and extend length of stay (LOS); Increase health care cost and personal burdens.¹
- Estimates of incidence of PUs range from 4.7% to 28% in acute care hospitals, (5.0% -25%) ICUs and 4.4% to 33% for community care patients.¹¹ Data on treatment costs on PUs varies, with an estimated range between \$37,800 and \$70,000, with total annual costs in the U.S as high as \$11 billion.^{2,12}
- **Our hospital-acquired PU incidence rate was 2.6% to 4.5 (all units); and ICUs (3.57–6.90) 2010-2011.**

SECONDARY AIMS

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- Describe patient characteristics and examine the role of multiple variables (age, sex, condition related factors; treatment and patient related factors) as potential correlates to development of PUs.
- **Secondary Endpoints:**
- Reduction in length of stay (LOS), resource utilization and incremental cost effectiveness.
- Evaluate the effectiveness of the Braden Scale⁸ and our proposed skin care policy interventions for prevention.

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Investigative Team

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Kelly Martinez RN, BSN
Adele Sandusky, RN, BSN



Long Beach Memorial and Miller
Children's Hospital, A 569-bed,
Tertiary Academic/Trauma Center,
Long Beach, CA



PRIMARY AIM

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- Aim of this randomized controlled trial was to determine if prophylactic application of a *Silicone Border Sacrum dressing (**Intervention**) would reduce the incidence of PU formation in ICU patients, when compared to a group (**Control**) receiving usual care (Evidence Based SKIN** Bundle)



*PRODUCT NOTATION:
Mylab® Border Sacrum Dressings, provided
by Medline Health Care, Inc. US, LLC,
Norcross, GA, (MHC-2012-490) for the pilot
phase of this study.

**SKIN Bundle: Gibbons et al. Eliminating
facility-acquired pressure ulcers at Ascension
Health. Joint Commission/American Quality
and Patient Safety. 2008;32:488-496

Primary Endpoint:

- Incidence rates of PUs in ICU expressed as total number of pressure ulcers that develop among both groups.

Research Hypotheses / Ethics Review

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- H1.1 The rate of pressure ulcer incidence will be significantly lower in the intervention group compared to the control group.
- H2.1 There will be a reduction in medical costs and resource utilization as measured by number of days of hospitalization.
- MemorialCare Institutional Review Board (IRB) approval was obtained, study project #908-11

METHODOLOGY

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Design

- A prospective, experimental design was used to randomize (1:1 basis) total of **367** patients.
- (**N=184**) enrolled in the intervention group (IG) receiving the SKIN BUNDLE** and application of the Silicone Border Sacrum dressing, and (**N=183**) Control Group (CG) receiving usual care, including SKIN BUNDLE.**

Setting

- 31-bed Medical/Surgical/Trauma ICU; and a 23-bed cardiac care unit (CCU).

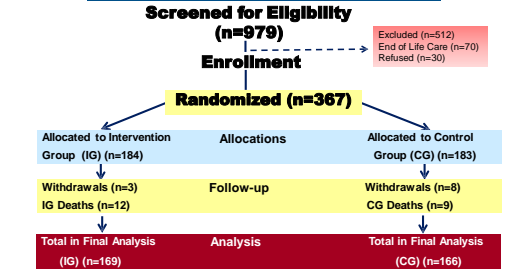
Inclusion Criteria

- All adult patients admitted to the ICU/CCU with a Braden Scale Score ≤ 13 , and intact skin, were study eligible.

Exclusion Criteria

- Braden Scale Score ≥ 14
- Existing sacral pressure ulcers or moisture related skin damage.
- Patients receiving end of life (EOL) care or withdrawal of life-sustaining treatments

FLOW OF PARTICIPANTS THRU STUDY



SKIN Bundle

Pressure Ulcer Prevention

Protect Your Patient's SKIN

- Surface:** Specialty Mattress, Fluidized positioner, Static air cushion, Reposition contraction stockings and pumps every shift
- Keep Turning:** Reposition at least every two hours, Heels offloaded, Silicone dressing
- Incontinence:** Perineal care every two hours, Moisture barrier, Avoid adult diapers except for excessive stool, urine
- Nutrition:** Dietary consult for nutritional deficits, Carry out orders

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Children's Memorial Hospital
Miller Children's Hospital Long Beach
Orange Coast Memorial
Good Samaritan Hospital

Instruments and Measures

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- Demographic Recording Tool** – PI designed tool to record data on study variables extracted from electronic medical record, (age, date of birth (DOB); race; language; religion; gender; co-morbidities; length of ICU and hospital stay, risk factors.
- Braden Scale** ⁸ – used as enrollment index. Braden Scale is a clinically validated tool used to predict patients risk for pressure ulcers.
- Daily Skin Assessment;** study team evaluated subject's skin condition daily for signs of breakdown; and for use of SKIN Bundle and policy driven interventions. Sacrum dressing changed every 3-days per protocol & PRN.
- Acute Physiology and Chronic Health Evaluation (APACHE) IV**
APACHE IV is a scoring system predicting severity of illness and prognosis of ICU patients, and is used for hospital mortality assessment for critically ill patients. Range (.60-.90%) is high risk for death.^{5,6}

STUDY CHARACTERISTICS (N = 367)	
Gender	87.5 (15) 21-96
Male	2.20 (60.3)
Female	1.47 (39.8)
Braden Score Mean (SD) range	11.2 (1.12) (6-13)
Co-Morbidities >4+ (%)	2.56 (7.0)
Mechanical Ventilation (MV) (% of Cohort on MV)	2.75 (7.5)
% of Patients who developed PUs	4 (S.O)
Continuous Sedation/Paralyzing	1.48 (4.0)
Use of Vasopressor/Inotropes >48 hours (Norepinephrine; Epinephrine; Vasopressin)	2.45 (6.7)
Mortality	
Intervention Group (184)	0 (4%)
Control Group (183)	11 (5%)
ICU LOS Range (0-120 days)	6.82
Hospital LOS	8.89
APACHE IV Mortality Risk (%) Mean range study cohort	16.2 days (.60-.90)

Results

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PRESSURE ULCER INCIDENCE			
Intention to Treat Analysis (N=335)			
	Control Group	Intervention Group	p-Value
8 Pressure Ulcers in 10-month study period	7	1	
(%) Incidence	4.21 %	.6%	p=.001

Risk Factors Found to be Strong Correlates (r = 0.72) Among Patients Who Developed Pressure Ulcers:

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- Altered Level of Consciousness (LOC)
- Increased Length of Stay (LOS)
- Vasopressors
- Mechanical ventilation
- 4+Comorbidities

Clinical Pearls the Nurses Shared at Study End

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- The Mepilex® Border Sacrum Dressing provided superb absorption, and appears to reduce friction, shear, moisture, by providing a barrier between the patient and the bed.
- "Dressing remained in place, yet allowed for daily inspection and smoothed back down without wrinkles"
- "Adheres gently and securely to dry, intact surrounding skin"
- "Atraumatic to skin Impermeable to stool and urine"
- "Patient's reported less pain and trauma before, at and after dressing changes"
- **We developed a Mepilex® Policy & Procedure and Clinical Practice Guidelines for Use for all units.**



Pressure Ulcer Location

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CONTROL GROUP (N=7)		INTERVENTION GROUP (N=1)	
PU Location	PU Final Stage	PU Location	PU Final Stage
Coccyx	Unstageable	Coccyx	Deep Tissue Injury
Coccyx	Stage II		
Buttock	Stage II		
Buttock	Deep Tissue Injury		
Coccyx/Sacrum	Unstageable		
Coccyx	Stage II		
Coccyx	Stage II		

NPUAP 2009, Updated Staging Guidelines 10*

Key Study Findings

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- This RCT attempted to validate the effectiveness of the silicone sacrum dressing in the prevention of PUs. **Our results showed an incidence of (4.21%) Control and (.6%), Intervention group which was statistically significant (p=.001).**
- **Overall the ICU incidence *(all patients) was ↓ from 5.10% at baseline to 2.41% in the units at conclusion of the study. Our current rate is zero to 1.2**
- Absence of fungal Infection or dermatitis beneath the dressing throughout the study, and too date.

Recommendations

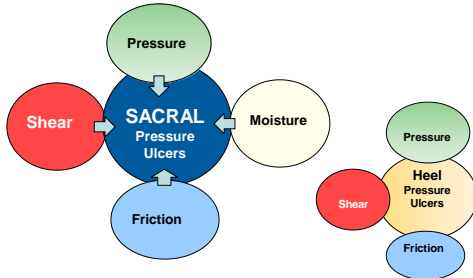


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- **The MemorialCare Six-Hospital System adopted this 5-Layered Silicone Border® Sacrum Dressing 1-year ago. Since adoption (\$325,000+ cost savings in PU treatment) in our facility alone.**
- **Product cost annualized for prevention (\$40,000).**
- Our findings validate recent studies^{1,2,3,4} thus, adding more science to guide clinicians to become early adopters of this new wound technology.
- **The findings from this RCT and translation of this work to practice (nationally / internationally) supported our journey to Magnet® designation in January 2013.**
- **In October, 2013 we're receiving an Award** from the Collaborative Alliance for Nursing Outcomes (CALNOC), an organization that collects and benchmarks nursing sensitive indicators, for making the most progress in reducing HAPUs and sustaining zero for the past year in Calif.

Pressure Ulcers

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A randomised control trial of the effectiveness of soft silicone foam multi-layered dressings applied in the prevention of sacral and heel pressure ulcers in trauma and critically ill patients: The Border Trial.

Nick Santamaria RN, PhD
University of Melbourne & Melbourne Health



RMH Team



A prospective randomised control trial of the effectiveness of silicone dressings applied in ED in preventing ICU pressure ulcers (The Border Trial)

- Professor Nick Santamaria, University of Melbourne & Royal Melbourne Hospital
- A/Professor Marie Gerdtz, Melbourne Health & University of Melbourne
- Sarah Sage, Clinical Nurse Consultant Wound Care, Royal Park Hospital
- Amy Freeman, Podiatrist, Royal Melbourne Hospital
- Jane McCann, Podiatrist, Royal Park Campus
- Theresa Vassiliou, Research Nurse ED, Royal Melbourne Hospital
- Stephanie De Vincentis, Clinical Nurse Consultant Wound Care, Royal Melbourne Hospital
- Ai Wei Ng, Clinical Nurse Consultant Wound Care, Royal Park Hospital
- A/Professor Jonathan Knott, Deputy Director Emergency Department, Royal Melbourne Hospital & University of Melbourne
- Dr Wei Liu Royal Melbourne Hospital

RMH Intensive Care Unit



Background



- Pressure ulcer prevention in critically ill ICU patients is challenging with high incidence rates in some centres.
- Pressure ulcers increase mortality, costs, LOS and decrease bed availability
- It is suggested that pressure ulcers in ICU trauma patients may have originated in the Emergency Department (ED) and/or Operating Room
- There is emerging evidence that some foam dressings may decrease pressure, shear and friction (Brindle et al 2010,2012)
- There are no RCTs reported in the literature that investigate the effectiveness of these types of dressings in the ED/ICU patient

Hypothesis



Patients treated with Mepilex Border Sacrum and Mepilex Heel dressings will have a lower incidence rate of sacral and heel pressure ulcer development than patients receiving standard care.

Methods



Design

Prospective randomised controlled open label trial

Subjects and Sampling

All trauma and critically ill patients admitted to the Emergency Dept. and to be transferred to ICU

Methods



Sample size

Calculated to detect a decrease in the ICU pressure ulcer incidence rate of 3.5% (from 4% to 0.5%) in the intervention group with power set at 80% and alpha of 0.05

Total of 440 patients (220 patients per group).

Inclusion criteria

- ED and ICU admission for critical illness and/or major trauma
- Over 18 years old

Exclusion criteria

- Less than 18 years old
- Suspected or actual spinal injury
- Pre-existing sacral or heel pressure ulcer
- Trauma to sacral and/or heel area

Intervention: Mölnlycke Mepilex Heel dressings and retained with Tubifast applied on admission to ED, inspected daily and changed every 3 days in ICU



Methods



Primary endpoint

- Incidence rates of pressure injuries in ICU expressed as the total number of pressure ulcers developed in both groups

Secondary endpoint

- Cost/benefit of dressings to prevent pressure ulcers

Intervention: Mölnlycke Border Sacrum dressing applied on admission to the Emergency Department and inspected daily and changed every 3 days in ICU



Measurement: Sacrum and heels examined daily for duration of ICU stay or until endpoint reached.



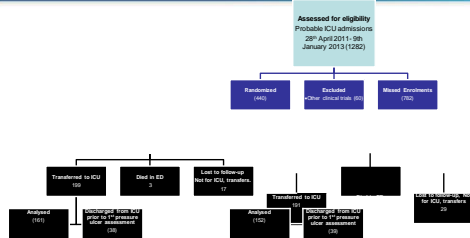
Pressure ulcers

- Pressure ulcer incidence
- Pressure ulcers staged according to the Australian Wound Management Association (AWMA) staging

Physiological data

- Physiological data collected in ICU
- Mechanical ventilation
- APACHE II
- Braden Score
- Mattress type
- Dressing changes
- BMI

Flow of participants through study (CONSORT)



Results n=313 Intention to treat analysis(ITT)



Pressure ulcer development	Control N=152	Intervention N=161	p
Patients who developed PU	20	5	0.001
Incidence (%)	13.1	3.1	0.002
Number of pressure ulcers	27	7	0.002
Sacral pressure ulcers	8	2	0.05
Heel pressure ulcers	19	5	0.002

Conclusions



- Intervention and control groups were comparable on key demographics on Emergency Dept. admission and enrollment into the trial
- The intervention (dressings) group had significantly different outcomes to controls:
 - Less patients with a pressure ulcer
 - Less pressure ulcers in total
 - Took longer to develop a pressure ulcer
 - Lower PU incidence rate
 - Lower cost to treat intervention group (3.6 times less than controls)
- When applied in ED, Mepilex dressings offer protection against ICU acquired sacral and heel PUs.

Patient characteristics n=440



	Control N=219	Intervention N=221
Age (mean)	54	54
Sex (M/F)	132/82	126/99
MAP (mmHg)	93	94
Temp	36.2	36.1
Pulse (mean)	95	99
Braden score (median)	12	12
ATIS	2	1.5
APACHE II	19.5	19
ED admission classification	147	114
Critical illness	65	69
Major trauma	6	6
LDS (hours)		
ED	86	91
ICU	5	4
OR		
Mechanical ventilation	156/54	140/87
ED Y/N		
ICU	155/41	153/39
Transfer to OR from ED	20	27

Results – Costs to discharge from RMH



Cost components	Control N=152	Intervention N=161
Average treatment costs per PU	\$1103.52	\$1103.52
Weighted average treatment costs	\$144.56	\$34.21
Average marginal costs	-	\$46.45
Total average costs per patient	\$144.56	\$80.66
Total costs per group	\$25,173.20	\$6,920.20

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PRESSURE ULCER PREVENTION

EBP Recommendations
 Offloading \ Repositioning
 Support Surfaces
 Reducing Moisture Related Injury

EPUAP and NPUAP. Prevention and treatment of pressure ulcers: quick reference guide. Washington DC: National Pressure Ulcer Advisory Panel; 2009.



Offloading / Reposition to Reduce Pressure in Critically Ill



Component of Prevention

- Turn & reposition q2hr (avoid placing on a PU)
- Repositioning must take into consideration the condition of the patient and the support surface in use
- Repositioning frequency—influenced by the pt.'s condition and support surface in use
 - DeFloor (2005) study: turning every 4 hours on a visco-elastic foam mattresses resulted in statistically less pressure ulcers compared to turning 2 or 3 hours on a standard hospital mattress.
- Cushioning devices to maintain alignment / 30 deg. Side-lying & prevent pressure on bony prominences.
- Use lifting device or other aids to reposition and make it easier to turn

Surface Selection International Guidelines (NPUAP, 2009)



- **Goal of Support Surfaces -Facilitation of wound prevention/healing**
 - Maximize blood flow
 - Minimize extrinsic risk
 - Pain management/Client comfort
 - Improve sleep patterns

CATEGORIES OF SUPPORT SURFACES

- **Prevention ("Pressure reduction")**
 - products reduce interface pressure to prevent PUs and treat partial thickness ulcers through stage II. Pain management.
- **Therapeutic ("Pressure relief")**
 - products reduce tissue deformation and redistribute interface pressure to treat full thickness pressure ulcers through stage IV and myocutaneous flaps and grafts. May additionally be used for moisture and heat dissipation, comfort and pain management.

Support Surfaces in Critically Ill Patients, Research



- Comparison cohort study of 2 different support surfaces in ICU Pts.
- 52 critically ill pts with anticipated 3 day LOS in a 12-bed CV Unit in univ. hospital in mid-west were included until DC ICU
- 31 patients: low air-loss weight-based pressure redistribution-microclimate management bed (LAL-MCM)
- 21 patients: integrated powered air redistribution (IP-AR) bed
- Measured: positioning, skin assessment, heel elevation
- **Results:**
 - Mean LOS 7days (on the surface equal amount of days)
 - LAL-MCM bed=zero pressure ulcers
 - IP-AR-bed=4/21 or 18% (p=0.46)

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

Offloading / Reposition to Reduce Pressure



- Early mobility and walking program was developed to provide guidelines for early mobility that would assist clinicians working in ICUs, especially clinicians working with patients who are receiving mechanical ventilation.
- Limit the time sitting in a chair & use pressure relief
- Select position that is acceptable to the individual and minimizes pressure and shear exerted on skin and soft tissue
- **Heal-protection devices should elevate the heel completely (off-load) in such a way as to distribute weight along the calf**
 - Use pillows to offload if expected immobility < 8hrs
 - Use device if pt. expected to be immobile > 8 hrs
- Apply MÖlnlycke Border Sacrum for heels



Surface Selection International Guidelines



Configurations

- ❖ Overlays
- ❖ Mattress replacement
- ❖ Full bed system



Technologies

Non-powered

- ❖ Air Floatation
- ❖ Fluid

Powered

- ❖ Low air loss
- ❖ Alternating pressure
- ❖ Powered air
- ❖ Rotation beds
- ❖ Air fluidized
- ❖ Hybrid systems

Support Surfaces



- Continue to turn & reposition (LIFT TEAMS –ICU)
- Use a pillow under the calf to elevate the heels
- Heel protecting devices should elevate the heel completely so to distribute the weight of the leg along the calf without putting pressure on the Achilles tendon
- Seating surface need more repositioning than when in a lying position



EBP Recommendations to Reduce Shear & Friction



- Use lifting/transfer devices & other aids to reduce shear & friction
 - Mechanical lifts
 - Transfer sheets
 - 2-4 person lifts
 - Turn & assist features on beds
- Loose covers & increased immersion in the support medium increase contact area
- Use of Silicone Dressing to Reduce Shear & Friction (Sacrum, Heel, beneath medical devices)

Preventing Harm? We Can Do This!!



Keys to Success



Pressure Ulcers occur in all settings, work together



Think out of the box. What can your institution/practice do to create a Center of Pressure Ulcer Prevention

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



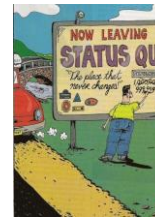
- Use of an Evidence Based SKIN CARE BUNDLE
 - Clean skin as soon as it becomes soiled
- Use a protective cream or ointment on the skin to protect it from wetness
 - Disposable barrier cloth prevents unprotected episodes (www.ihc.org 5 Million Lives Campaign)
 - Use an incontinence pad and/or briefs to absorb/wick away wetness from the skin.
 - Consideration of pouching device or a bowel management system if no foley catheter, or if FC removed.
 - Ensure an appropriate microclimate & breathability
 - <4 layers of linen

Building a Safety Culture of "zero" Pressure Ulcers



Key steps to prevent patient harm

- Overall organizational goal of "zero" preventable harm
- **TEAMWORK** - House wide Pressure Ulcer Prevention team, Multidisciplinary \ "Key Leadership
- Dashboards/Visibility Boards displaying data
- Quarterly house-wide prevalence study
- Skin care rounds/Daily Huddles in ICU / PICU/NICU
- Skin care champions
- Hourly Rounding (includes patient/family education)
- Report stage II and greater pressure injuries to our Preventable harm index
- Just Culture, but embrace accountable & safe care



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