Preventing Pressure Ulcers in the ICU: An Evidence-Based Practice Change

Paula Munch, MSN, RN, CCRN, Carol Siciliano-Klein, BSN, RN, & Christina VanLandschoot, BSN, RN, CCRN

Scottsdale Healthcare - Shea Medical Center

Purpose

The purpose of the evidence-based nursing strategy is to reduce and prevent pressure ulcers (PU) in the ICU where patients are at the greatest risk of acquiring a PU. The goal, to meet and/or exceed the national benchmark set by the National Database of Nursing Quality Indicators (NDNQI) for PU, was measured by quarterly prevalence studies.

Background

Pressure Ulcers are a challenge to healthcare institutions across the nation.

- Institute for Healthcare Improvement (IHI) - 1.3 to 3 million people develop PU each year (Dorner, et al., 2009; Lachenbuch, 2008)
- US healthcare institutions spend 8-11 billion dollars in treatment of PU annually (Baldelli & Pacella, 2008; Edlich, et al., 2004; Riordan & Voegeli, 2009)
- The cost associated with stage IV hospital-acquired pressure ulcers (HAPU) and related complications are as high as $129,248 (Brem, et al., 2010)
- Mortality Rates
  - 60,000 acute care deaths per year are related to complications of PU (Lachenbuch, 2008)
  - Primary diagnosis of pressure ulcer, 1 in 25 resulted in death (Dorner et al., 2009)
  - Secondary diagnosis, 1 in 8 resulted in death (Dorner et al., 2009)
- Increase nursing care hours by as much as 50% (Baldelli & Pacella, 2008)
- The National Institute of Nursing Research estimates 73% of expenditures for PU treatment are for nursing care hours (Lachenbuch, 2008)

In May of 2010, two patients were discharged from the ICU at Scottsdale Healthcare (SHC) - Shea with stage III-IV HAPU. While the two patients prompted the start of this evidence-based practice change, the nurses on the unit realized that unit-acquired pressure ulcers (UAPU) had been a problem for some time. The ICU had only met the national benchmark set by NDNQI for pressure ulcer prevention (PUP) one quarter out of the previous four quarters.

Methods

- Developed a Multidisciplinary Task Force - Nurses, Wound Care, Nutrition, Physician
- Researched Current Practice Standards/Recommendations by organizations with dedicated resources and research in PUP
  - Agency of Healthcare Research and Quality (AHRQ)
  - National Pressure Ulcer Advisory Panel (NPUAP)
- Conducted CINHAL and Medline search for any newly published research studies
- Conducted assessment of current practice
  - Reviewed nursing protocols
  - Reviewed equipment, products, and linens
- Developed a PUP Guideline to be implemented on ALL patients in the ICU

Assessment Findings

- A quality issue with mattresses. In figure 1, the gel structure in mattress A was symmetrical and firm, while the gel structure in the SHC mattress was asymmetrical, more squishy than firm, and the seam was coming apart. After further evaluation, a quality issue was identified with the mattresses and during December 2010, 600 mattresses were replaced throughout the SHC system.
- Linens were inhibiting the pressure redistributive qualities of the bed.
  - Fitted sheets were too tight causing a hammocking effect
  - Quilted chux were too thick increasing heat, pressure, and moisture, and were less moisture wicking than alternatives
- Not all of the PUP interventions recommended by AHRQ and NPUAP were being practiced in the ICU.

Mattress A	SHC Mattress
	

Figure 1: Quality Problem Identified with the mattresses.

PUP Guideline

All Patients in the ICU

Assessment/ Documentation	▪ Complete head to toe skin assessment documented and cosigned by second RN and physician signature (Ayello, et al., 2008; Baldelli & Pacella, 2008) ▪ Accurate Risk Assessment - Braden Scale
Positioning/ Bedding	▪ Continue repositioning schedule of Q2H (Ayello, et al., 2008; Baldelli & Pacella, 2008; Riordan & Voegeli, 2009) ▪ Reposition in chair Q1H (Baldelli & Pacella, 2008) ▪ HOB <30 unless contraindicated (Baldelli & Pacella, 2008) ▪ Elevate knees if HOB >30 (Baldelli & Pacella, 2008) ▪ Elevate heels with pillows (Ayello, et al., 2008; Baldelli & Pacella, 2008) ▪ Eliminate use of quilted chux and fitted sheets (Bacco & Phillips, 2010; Williamson & Sauser, 2009) ▪ Use flat sheet and breathable disposable pads only (Ayello, et al., 2008; Wedge & Gosney, 2005)
Skin Care/ Incontinence	▪ Eliminated use of diapers (Baldelli & Pacella, 2008) ▪ Scheduled Moisturizer (Ayello, et al., 2008; NPUAP, 2009) ▪ Eliminated the use of soap, and hot water (Ayello, et al., 2008) ▪ Do not massage boney prominences (Ayello, et al., 2008; NPUAP, 2009) ▪ Fecal management system

Causative	Intrinsic Contributing	Extrinsic Contributing
▪ Pressure ▪ Shearing	▪ Nutrition/hydration ▪ Reduced or Immobility ▪ Extremes of Age ▪ Heat/Temperature ▪ Sensory Impairment ▪ Incontinence ▪ Pain ▪ Chronic/Acute/ Terminal Illness ▪ Vascular disease ▪ LOC ▪ Previous History PU	▪ Friction ▪ Moisture ▪ Poor moving and handling ▪ Medication

Figure 2: When Causative and Contributing Factors are combined pressure ulcer formation is accelerated. The pressure ulcer prevention guideline was designed to reduce as many causative and contributing factors as possible. (Edlich et al., 2004; Lachenbuch, 2008; Riordan & Voegeli, 2009; & Zhong, et al., 2008)

PUP Order Set

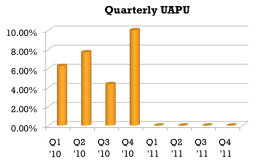
Initiated on patients with a Pressure Ulcer or identified as medium to high risk per Braden score of 14 or less

More advanced PUP strategies:

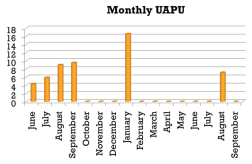
- Wound Consult (Bacco & Phillips, 2010)
- Nutrition Consult (Baldelli & Pacella, 2008; Dunleavy, 2008; Ayello, et al., 2008; NPUAP, 2009; Edlich et al., 2004; Crowe & Bracknell, 2009)
- Guidelines for ordering a Low Air Loss Surface (Dunleavy, 2008; Lachenbuch, 2008)
- Medicated anti-fungal cream

Implementation/Data Collection

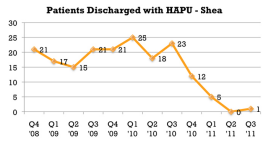
- Project was submitted and approved by the IRB
- Mandatory education to all staff in the ICU throughout September 2010
- Guideline and order set went live October 1, 2010
- Weekly quality rounds were conducted for six months to ensure consistency in guideline
- Monthly Prevalence Studies were started in May 2010 and continued through 12 months post-implementation
- Quarterly prevalence rates reported to NDNQI continued for four quarters post implementation
- Total number of patients discharged from the hospital with a HAPU was monitored quarterly to see if a reduction in UAPU would have an effect on the entire campus



Graph A: Quarterly Unit Acquired Pressure Ulcer Rates



Graph B: Monthly Unit Acquired Pressure Ulcer Rates

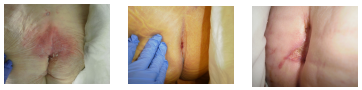


Graph C: Number of Patients Discharged from Scottsdale Healthcare-Shea Campus Per Quarter with a Hospital-Acquired Pressure Ulcer. Statistical significance achieved in the 2nd and 3rd Quarters of 2011.

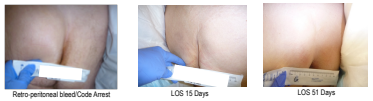
Results

The PUP guideline was successful in reducing pressure ulcer rates in the ICU. Pre-implementation UAPU rates which ranged from 4.35% to 10% were reduced to 0% in the following four quarters post-implementation (Graph A). Monthly prevalence studies demonstrated 0% UAPU rates for 10 of 12 months post-implementation (Graph B). Reducing UAPU rates in the ICU had a positive effect on the number of patients discharged from SHC Shea with HAPU and for the first time in over two years Shea had ZERO patients discharged with a HAPU (Graph C).

Skin Before



Skin After



Retro-peritoneal bleed/Code Arrest | LOS 15 Days | LOS 51 Days

Nursing Implications

As nurses we are obligated to give the best possible care to each and every patient. This EBP change has demonstrated phenomenal outcomes in our patients. While we cannot narrow the success down to one single intervention, what we do know is that the combination of interventions is successful. In this change project and with any change project, success is only possible if the nurses get on board. Consistency in practice, continual education and re-education, and constant motivation and encouragement is key to successful implementation and sustainability. The success of this project has been the motivation for the nurses and has changed the culture in the ICU and our perceptions of PUP. Today we challenge you to also say NO to pressure ulcers. If we can do it, You can too!!

Contact Information

Paula Munch, MSN, RN, CCRN; pmunch@shc.org; (480) 323-3301

Carol Siciliano-Klein, BSN, RN; cklein@shc.org; (480) 323-3301

Christina VanLandschoot, BSN, RN, CCRN; cmvanlandschoot@yahoo.com; (480) 323-3301

References Available