Optimizing Skin Integrity: One Simple Change for Hospitalized Children

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Purpose
Medical-device related pressure injuries (MDRPI) describe an etiology, generally conforming to the pattern or shape of the medical device. The magnitude of pressure injuries & the associated rate of complications in pediatric populations remains relatively unknown. The National Pressure Ulcer Advisory Panel (NPUAP) published an article in 2011, which reviewed and analyzed the 24 known articles polished between 2000-2011 that spoke to incidence & prevalence rates of pediatric pressure injuries (PIs). This systematic review revealed MDRPIs to account for up to 50% in the pediatric population, as compared to the adult population where MDRPIs were only accounting for 35% of all HAPIs.

Armed with the literature and the scope of the problem, we wanted to see how our organization compared to national benchmarks. Our hospital prevalence data from 2015 to July 2016 revealed MDRPIs accounted for 76% (n=56) of our hospital-acquired pressure injury prevalence (HAPI) rates. Electroencephalogram (EEG) leads was identified as our number one offender, closely followed by respiratory device related injuries. Our institutions Skin Team (ST) initiated a collaborative quality improvement (QI) initiative to mitigate injuries.

Relevance/Significance
Early identification of patients at-risk for PIs, with subsequent application of preventative device padding, is an essential component of nurse drive quality care. Preventative padding directly correlates with decreased development of MDRPIs in at-risk hospitalized patients.

EEG studies continue to challenge skin health at the electrode-skin interface, resulting in MDRPIs. These specific MDRPIs are mechanical in nature, resulting from direct and unrelieved pressure under the EEG electrodes. This effect becomes profoundly enhanced when it is coupled with a circumferential turban wrap, traditionally used to minimize migration or dislodgement of the EEG leads, ensuring a quality read. As a result, the use of turbans increases the risk of EEG-associated MDRPIs. Upon reviewing historical data we revealed, our institutions EEG PIs prevalence rate had been accelerating despite vigilant use of skin protectors. By July 2016, 40 EEG PIs occurred, surpassing all EEG PIs in 2015 (n=37), with 75% (n=34) occurring in the three Intensive Care Units (ICUs).

Building on the successes and lessons learned through the eighteen month EEG interdisciplinary quality improvement (QI) project, One Simple Change (OSC) were introduced in early 2018.
OSCs challenged each unit/department Skin Team (ST) to make one simple change, focusing on improving PI prevalence rates, overall skin health, & or prevention focused specific to their patient population. Respiratory device-related PIs were a rising concern, particularly in our three intensive care units (ICUs). Our hospitals’ neonatal intensive care unit (NICU) ST observed nasal septum breakdown related to non-invasive ventilation cannulas in their tiniest patients. An initial spot prevalence check of NICU patients with these respiratory devices yielded 18 patients on RAM/NC, seven (39%) were appropriately padded and 11 (61%) were not. Early identification of at-risk patients and swift application of nasal septum protection became their OSC.

**Strategy/Intervention**

In late July 2016, an inter-professional quality improvement (QI) EEG taskforce was formed specifically aimed at alleviating EEG-related PIs in our most vulnerable patients. Clinical nurses on the ST collaborated with Neurology physicians and EEG technicians to reduce EEG MDRPIs through an interprofessional QI initiative. The first phase of this robust initiative targeted the most vulnerable patients in two of the three ICUs, where we decided to trial turban-less EEG studies on sedated patients. Concurrently, with leadership support, the institution purchased new EEG leads with a flatter electrode surface, hoping minimize surface pressure at the skin-electrode interface. Initiation of weekly EEG rounds was implemented by members of this interprofessional team, to confirm: 1) turbans were not in place on sedated ICU patients, 2) monitoring of quality EEG readings on turbanless patients, 3) turbans on non-sedated patients were not tight, and 4) consistent use of skin protectors for all patients. During phase two, intensive didactic education was delivered to members’ of the ST during a prevalence study educational day by a neurologist. This lecture was immediately followed by hands-on learning directed by our lead EEG technician. Both educational opportunities were provided by members of the EEG taskforce. Education to frontline nursing staff was then implemented on skin protector assessment and techniques to relieve turban pressure. Building on the successful EEG QI initiative, OSC projects were introduced in early 2018, as a yearlong project. The goal of OSC projects were to challenge each unit/department ST to identify an area of vulnerability as it pertained to PI prevalence rates, overall skin health, and or prevention focused specific to their patient population. These changes were to be simple and specific.

The NICU ST focus was directed to non-invasive ventilation cannulas, which had become the number one offender of our institutes MDRPIs. An inter-professional team consisting of NICU ST members, NICU clinical registered nurses (RNs), and ICU Respiratory Therapists (RTs) worked collaboratively to create, implement, and audit preventative padding on these devices. Preventative padding interventions were applied for all NICU patients on non-invasive ventilation cannulas based on current evidence-based practices (EBP) for this specific patient population. Preventative padding interventions were based upon patient weight, those patients weighing less than or equal to two kilograms (kg) required a hydrocolloid and foam dressing, whereas, patients greater than two kg required only a hydrocolloid dressing. Compliance monitoring was preformed bi-monthly, was performed by NICU ST members’ to assess: 1) appropriate preventative padding was in place based upon patient weight, 2) if no preventative padding was observed, what was the status of the patients skin under the non-invasive ventilation cannula (e.g. reddened, breakdown, healthy), 3) factors inhibiting application of appropriate preventative padding.
Staff education was accomplished through multiple e-mail reminders, which included: photographs of current patients with nasal septum breakdown related to lack of preventative padding, tips on padding application, and the Skin Care Nurse Practice Guideline (NPG) Cushion & Protect algorithm. Other education included: strategically placed nasal septum padding educational poster that outlined appropriate padding and tips on application, real-time education when inappropriate or lack of preventative padding was observed, and formal didactic and hands-on education during NICU new hire orientation.

The respiratory therapy educator also provided concurrent didactic and hands-on education to all ICU RTs regarding appropriate preventative padding upon initiation of non-invasive ventilation cannula and subsequent checks, ensuring padding remained in place for duration of therapy.

**Outcomes**

The factors associated with MDRPIs demanded unique inter-professional collaboration, creative solutions, and system-wide practice changes. Since implementing turbanless EEG studies in July 2016, there have been: 1) no EEG-related PIs on patients undergoing a turban-less study, 2) no impediments in the quality of EEG readings, and 3) an overall 80% decrease in EEG-related PIs house-wide.

The NICU ST saw immediate initial success. Between months’ five to eight inconsistent use of nasal septum protection was observed. An observed road block at month five was easy fast access to preventative padding supplies. Cutting and applying the padding was time consuming for already busy bedside RNs. The NICU ST answered this by creating pre-packaged nasal septum packet that were conveniently available for RNs and RTs to ‘grab and go’. Attention was also directed towards the interdisciplinary collaboration between NICU RNs and RTs on increased vigilance of nasal septum protection, this was achieved through joint rounding on this patient population subset. Equally noted was the lack of ability to document preventative padding in the patients’ electronic medical record (EMR). The NICU ST is in collaboration with nursing informatics and technology team to create a location to document padding of non-invasive ventilation cannulas. Currently reinforcement of nasal septum padding is audited monthly on PI prevalence study days.

The Neuro-Science Unit (NSU) ST, led by two patient care technicians, identified patients on continuous EEG had minimal if any advocacy for their skin integrity once the EEG was placed. These EEGs could remain in place for greater than 72 hours on their patients, all whom are non-sedated, thus requiring the use of turbans. NSUs OSC project focused on directing attention to the importance of skin integrity checks for their patients with EEGs in place for greater than 24 hours.

**Implications for Practice**

Implementations of nurse-driven EBP QI initiatives that are simple, effective, and easily replicated have a sustainable reduction in NSI and improved patient outcomes. There has been continued inter-professional collaboration between the NSU Skin Team (PCTs) and EEG Techs/Neurology providers to monitor their patients (non-sedated) on long-term video EEG. Best practices highlight inter-professional collaboration and innovative unit/department specific practice changes.

**Title:**
Optimizing Skin Integrity: One Simple Change for Hospitalized Children
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References:

Abstract Summary:
The quality improvement (QI) initiative “One Simple Change” (OSC²) represents the application of knowledge and skills related to skin and wound management by unit-based skin teams (ST) to optimize patient outcomes. Two successfully implemented OSC² initiatives, addressing medical device-related pressure injuries (MDRPIs), improve care for our institute’s most vulnerable patients.

Content Outline:
• Introduction
  1. The early identification and prevention of pressure injuries in hospitalized patients is an essential nurse-sensitive indicator of patient care quality.
  2. Inter-professional collaboration to address specific pressure injury (PI) risks for two pediatric patient populations.
• Body - tackling medical device related pressure injuries (MDRPIs)
  1. Identification of historical top MDRPIs (EEG, respiratory - 2015)
1. EEGs
   1. 2016 Jan – July EEG MDRPI surpassed all of EEG-related injuries in 2015, making it #1 priority
   2. Interprofessional collaboration with Skin Team, neurology, EEG Techs led to EEG surveillance rounding.
3. Rounding led to a 2 phased intervention
   1. Phase 1: turbanless EEGs & consistent use of skin savers (monitored with weekly rounds), new flatter EEG leads, QA on EEG studies
   2. Phase 2: education to frontline nursing staff & EEG techs, verification of skin savers, techniques to minimize turban pressure
2. Sustainability
   1. 2017 & 2018
   2. NSU Skin Team (PCTs) in collaboration with EEG Techs/Neurologist to monitor skin integrity on non-sedated patients on long-term (>24 hours) EEG
3. Continued surveillance on turbanless patients in CICU/PICU
   1. One Simple Change (OSr) Projects
      1. Building on success of EEG initiative
      2. Continued interprofessional collaboration
   2. Challenged each unit/department Skin Team to make one simple change, focusing on improving PI prevalence rates, overall skin health, & or prevention focused
   1. Pre-data, literature, plan, data collection tool/monitoring, challenges/road blocks encountered
   1. NICU focused on respiratory devices (which had now secured #1 status for MDRPI)
   1. All patients on RAM/Nasal Cannula, appropriate padding in place Y/N, Include weight (less than 2kg requires Duoderm & foam dressing & greater than 2kg requires only Duoderm), Indicator if no padding is in place is site red/breakdown?
2. Interprofessional – NICU Skin Team members, NICU RNs, Respiratory Therapists
3. Results of year long OSC Project
4. Lessons learned & future of OSC
   1. Working with Nursing IT/Cerner to build documentation of padding to protect option

**Conclusion**
1. Unanticipated challenges encountered with OSC projects
   1. Not simple & rarely one
   2. Lack of
2. OSC surveys
   1. Current barriers, what was needed from co-leads, and if given choice would they continue with current project or start a new one
   1. Findings - time, how to educate/engage staff, how to interpret data for PDSA
   2. Future goals for 2019 for OSC

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Author Summary: Laura is the Professional Practice Specialist on a general pediatric medical floor at Children’s National Health System. She has been a part of the institution’s Skin Team since its inception in 2006. She became wound care certified (WCC certification) in 2015, and completed Emory University’s Wound, Ostomy, and Continence program in 2016. She is currently the co-lead of the Skin Team responsible for the planning, education, and outcomes for the team.

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