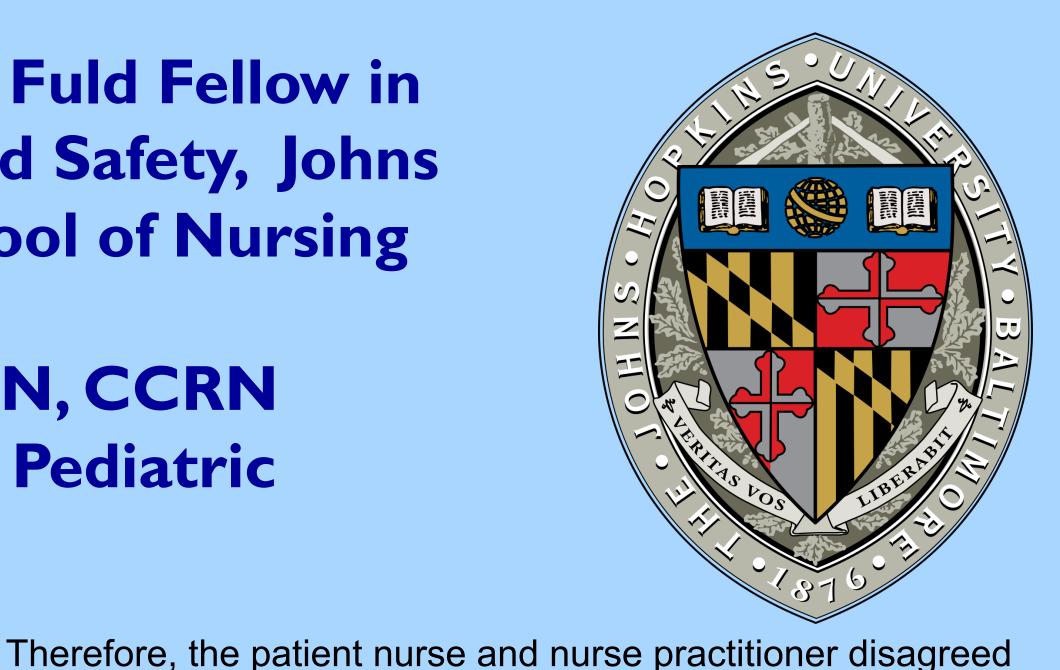
Pediatric Pressure Ulcer Prevention at the Johns Hopkins Hospital PICU

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		Intensity and Duration o	f Pressure		
Mobility The ability to change and control body position	Completely immobile: Does not make even slight changes in body or extremity position without assistance.	Very Limited: Makes occasional slight changes in body or extremity position but unable to completely turn self independently.	3. Slightly Limited: Makes frequent though slight changes in body or extremity position independently.	No Limitations: Makes major and frequent changes in position without assistance.	Score
Activity The degree of physical activity	Bedfast: Confined to bed	Chair fast: Ability to walk severely limited or nonexistent. Cannot bear own weight and/or must be assisted in to chair or wheelchair.	3. Walks Occasionally: Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	4. All patients too young to ambulate OR walks frequently: Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.	
Sensory Perception The ability to respond in a developmentally appropriate way to pressure-related discomfort	Completely Limited: Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation OR limited ability to feel pain over most of body surface.	Very Limited: Responds only to painful stimuli. Cannot communicate discomfort except by meaning or restlessness OR has sensory impairment which limits the ability to feel pain or discomfort over half of body.	3. Slightly Limited: Responds to verbal commands, but cannot always communicate discomfort or need to be turned OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	No Impairment: Responds to verbal commands. Has no sensory deficit, which limits ability to feel or communicate pain or discomfort.	
	Tole	erance of the Skin and Suppor	ting Structure		
Moisture Degree to which skin is exposed to moisture	Constantly Moist: Skin is kept moist almost constantly by perspiration, urine, drainage, etc. Dampness is detected every time patient is moved or turned.	Very Moist: Skin is often, but not always moist. Linen must be changed at least every 8 hours.	Occasionally Moist: Skin is occasionally moist, requiring linen change every 12 hours.	Rarely Moist: Skin is usually dry, routine diaper changes, linen only requires changing every 24 hours.	
Friction - Shear Friction: occurs when skin moves against support surfaces Shear: occurs when skin and adjacent bory surface slide across one	Significant Problem: Spasticity, contracture, itching or agitation leads to almost constant thrashing and friction.	Problem: Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance.	3. Potential Problem: Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relative good position in chair or bed most of the time but occasionally slides down.	No Apparent Problem: Able to completely lift patient during a position change; Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.	
Nutrition Usual food intake pattern	I. Very Poor: NPO and/or maintained on clear liquids, or IVs for more than 5 days OR Albumin <2.5 mg/dl OR Never eats a complete meal. Rarely eats more than half of any food offered. Protein intake includes only 2 servings of meat or dairy products per day. Takes fluids poorly. Does not take a liquid dietary supplement.	2. Inadequate: Is on liquid diet or tube feedings/TPN which provide inadequate calories and minerals for age OR Alburnin <3 mg/dl OR rarely eats a complete meal and generally eats only about half of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement.	3. Adequate: Is on tube feedings or TPN, which provide adequate calories and minerals for age OR eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered.	4. Excellent: Is on a normal diet providing adequate calories for age. For example: eats/drinks most of every meal/feeding. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.	
Tissue Perfusion and Oxygenation	I. Extremely Compromised: Hypotensive (MAP <50mmHg; <40 in a newborn) OR the patient does not physiologically tolerate position changes.	2. Compromised: Normotensive; Oxygen saturation may be <95 % OR hemoglobin may be < 10 mg/dl OR capillary refill may be > 2 seconds; Serum pH is < 7.40.	3. Adequate: Normotensive; Oxygen saturation may be <95 % OR hemoglobin may be < 10 mg/dl OR capillary refill may be > 2 seconds; Serum pH is normal.	4. Excellent: Normotensive, Oxygen saturation >95%; Normal Hemoglobin; & Capillary refill < 2 seconds.	
				Total:	

Background

The main purpose of the Pediatric Intensive Care Unit (PICU) pressure ulcer prevention project at Johns Hopkins Hospital was to standardize methods for reducing skin breakdown. Using an audit tool developed by a previous Fuld fellow, data were obtained via nurse documentation audits and observational audits regarding nurse compliance to such methods. The population of intubated pediatric patients is particularly vulnerable to altered skin integrity (Noonan et al, 2006). Immobility, inactivity, and presence of multiple medical devices, which is typical for intubated patients, can contribute to pressure ulcers and skin breakdown. Several observed patients developed skin breakdown at tracheostomy sites and EKG lead sites because the devices rested on the skin.

The Braden Q scale was developed by Quigley and Curley (1996) as an adaptation from the scale used on adult patients. Used correctly, the scale has a 88% sensitivity value and a 58% specificity value (Noonan et al, 2011). These values are consistent with the predictive validity of the adult Braden Scale (Noonan et al, 2011). A chart review revealed that the Braden Q Scale was scored incorrectly in 18.1% of patient assessments (Noonan et al, 2011). To predict risk for altered skin integrity, correct scoring and objectivity are necessary to obtain accurate results. Comparison of documentation audits and observational audits revealed subjectivity within Braden Q scoring at the JHH PICU.

This project is essential from a quality care and patient safety standpoint, as well as a business standpoint. Hospitalacquired conditions, such as pressure ulcers, are quality indicators and are typically not reimbursed. Therefore, the unit has access to many cushions and devices to ensure patient skin integrity. Available preventative devices include special mattresses, heel-float cushions, pillows, neck rolls, and Z-flo cushions. The Z-flo is a fluidized positioner aid used to offload bony prominences and contour to the patient's body. Preventative interventions include rotation of medical devices, e.g. EKG leads and O₂ saturation probes, and a two-hour The problem stems from a lack of turning schedule. standardized means of documenting use of preventative devices and interventions. The aim of this study is to assess the accuracy of Braden Q scoring and the use of preventative measures, standardized interventions, and proper documentation.

Methods

Using the audit tool, the project began by using nurse documentation to obtain information for accurate and complete patient documentation for all intubated patients at the JHH PICU. After a few months the project moved to observational audits. A nursing student and a pediatric nurse practitioner observed patient skin integrity for all intubated patients. Key areas of observation include use of Sage Barrier clothes, diaper rash creams, heel protectors, Z-flo cushions, neck rolls, and pillows. Then verification with the patient nurse included asking if patient was turned side to side every 2 hours and if the O2 saturation probe and EKG leads were rotated during the shift.

Using the audit tool developed by VergesolutionsTM software, data was input to yield nurse compliance data. The audit tool assessed the Braden Q for that shift, days patient has been on a ventilator, pain score, presence of edema and skin breakdown, use of medical devices, rotation of EKG leads and O₂ saturation probe, and use of Sage Barrier clothes, preventative creams, Z-flo cushions, pillows, a neck roll, and heel protectors.

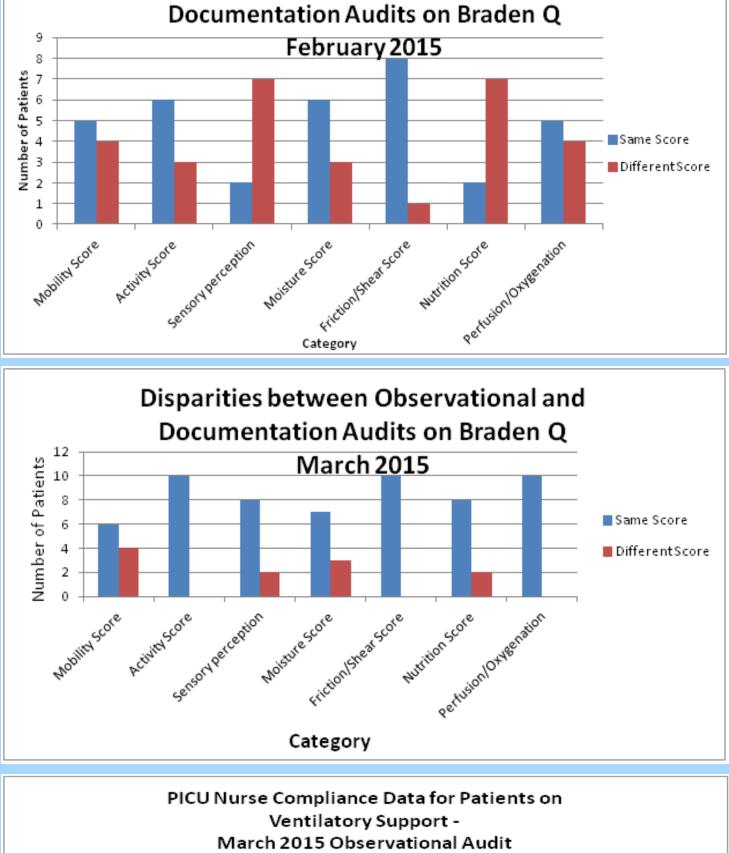
Documentation audits were held every Tuesday from September 2014 to January 2015. Two observational audits took place in February and March 2015. The answers were mostly checkboxes; however, some measures were answered as "Yes," "No," or "Non-applicable." A text box was included for any additional notes or comments. After data collection, information was stored using VergesolutionsTM software and then monthly compliance reports were generated to be included in the unit newsletter.

3 Results

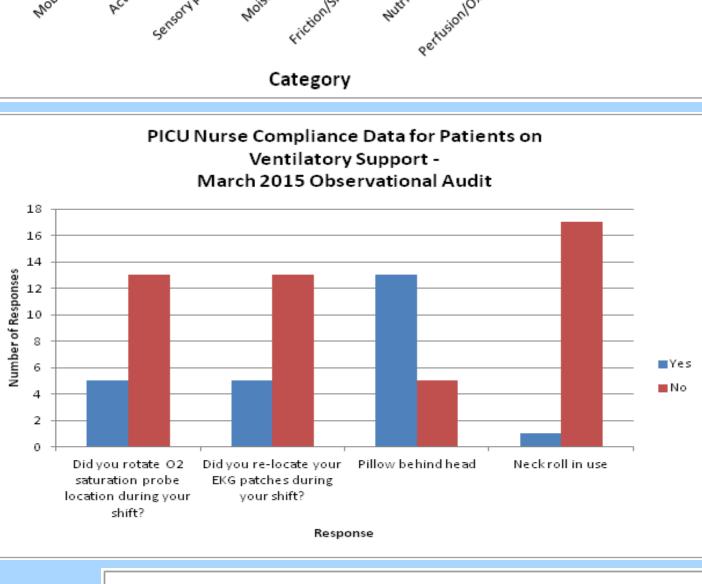
During the phase of documentation audits, the most common issue was incomplete documentation. If the two-hour turning schedule was not documented every two hours, then that category received "No" as not being completed for that shift. During the phase of observational audits, comparison of documentation vs. observation revealed that many measures were completed, but not properly documented. For example, if the heel-float boots were not in use the nurse typically did not document it as in use although Z-flo devices or pillows were in use to float the patient's heels off the mattress. Between February and March 2015, no undocumented wounds or pressure ulcers were found during the observational audits.

The most common response regarding O2 saturation probe rotation and EKG lead rotation was that those tasks were usually night shift responsibilities; however, most nurses were unaware if the previous night shift nurse did rotate the devices.

For documentation and observational audit comparison, scores show the difference in response from what was documented in the patient chart by the day shift nurse compared to the nurse practitioner performing the audit. The differences shown exemplify the subjectively in the Braden Q scoring. For February, the graph shows that the most differences were in the categories for sensory perception and nutrition scoring with only a 22% agreement in those scores.



Disparities between Observational and



Graphs 1 and 2: **These scores show the difference in response from what was documented in the patient chart by the day shift nurse compared to the nurse practitioner performing the audit. The differences shown above exemplify the subjectively in the Braden Q scoring.

Graph 3: Compliance data for

measures to ensure skin integrity

PICU Nurse Compliance Data for Patients on **Ventilatory Support** March 2015 creams in use? to side q 2 hours?or heels elevated off bed (infants)? Response

- * Goal for nursing compliance in each category is 90%. Only Sage Barrier Clothes achieved this rate ** Results show combined values from observational and documentation audits for the month of March. During observational audits, all nurses replied that patients were being turned side to side q2h; however, most did not have clear documentation stating the turning schedule.
- ** Most nurses replied that preventative creams were not in use because there was no order or prescription for a cream

and that the Sage barrier clothes were maintaining the patient's skin integrity.

nurses err on being more cautious. 4 Conclusions

The Braden is still much more of a subjective assessment despite the scale's efforts to quantify intensity and duration of pressure with tolerance of the skin and supporting structure (Curley, Razmus, Roberts, Wypij, 2003). In comparing the Braden Q scoring, the most common incorrectly scored subscales for February 2015 were sensory and nutrition. According to Noonan et al (2011), the most common difference is within the activity category. The number of different scores decreased substantially in March 2015 potentially because the nurse practitioner was not blind to the nurse scores and tried to understand the nurse's logic to decrease the number of differences.

78% of the time in those categories. In the February audit, the

reviewed before the observational audit and were compared.

perfusion were all scored the same. The largest difference in

scoring was in the mobility score with 40% of the scores being

two of the differences shown were responses from the nurse of

different. Of the eleven differences noted in the graph, only

a higher score than the nurse practitioner; therefore, most

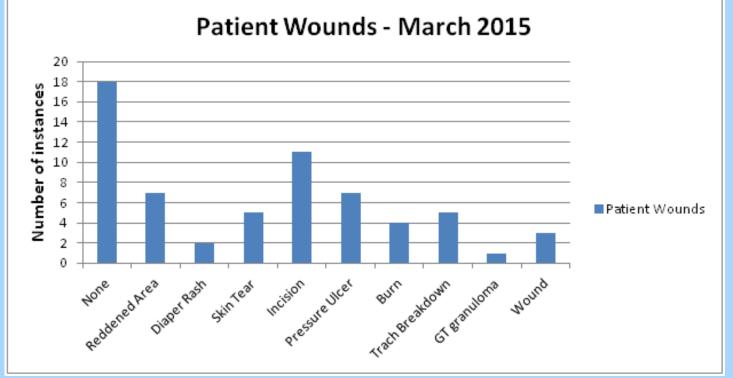
nurse practitioner was blind to what the patient nurse had

scored for the Braden Q, but in March the scores were

For March, the categories of activity, friction/shear, and

Perhaps having a place to document in the patient chart would make an actual rotation schedule more concrete for devices such as O2 saturation probe and EKG leads. The use of Z- flo cushions and pillows over bony prominences, side-to-side movement every two hours, and heel floats coupled with multidisciplinary care has significantly decreased pressure ulcer incidence.

The main purpose of the Braden Q is to assess patient risk for wounds and pressure ulcers. The use of this scale is important because it can decrease skin breakdown. It is important to objectively score each patient because a higher score could result in decreased skin breakdown precautions and a lower score could result in overutilization of resources and unnecessary care.



Graph 5: ** Wounds listed were observed through observational audit or documentation audit. This is a total from both audits in March 2015

Future Directions

To further standardize care and documentation for all potential causes of skin breakdown, the Braden Q scoring requirements could be available within the chart for nurses to reference to objectively score. Also, additional parameters in the "Treatments and Cares" flowsheet could incorporate EKG rotation and O2 saturation.

References

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Noonan, C., Quigley, S., & Curley, M.A.Q. (2006). Skin integrity in hospitalized infants and children: A prevalence study. Journal of Pediatric Nursing, 21(6), 445-453.

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