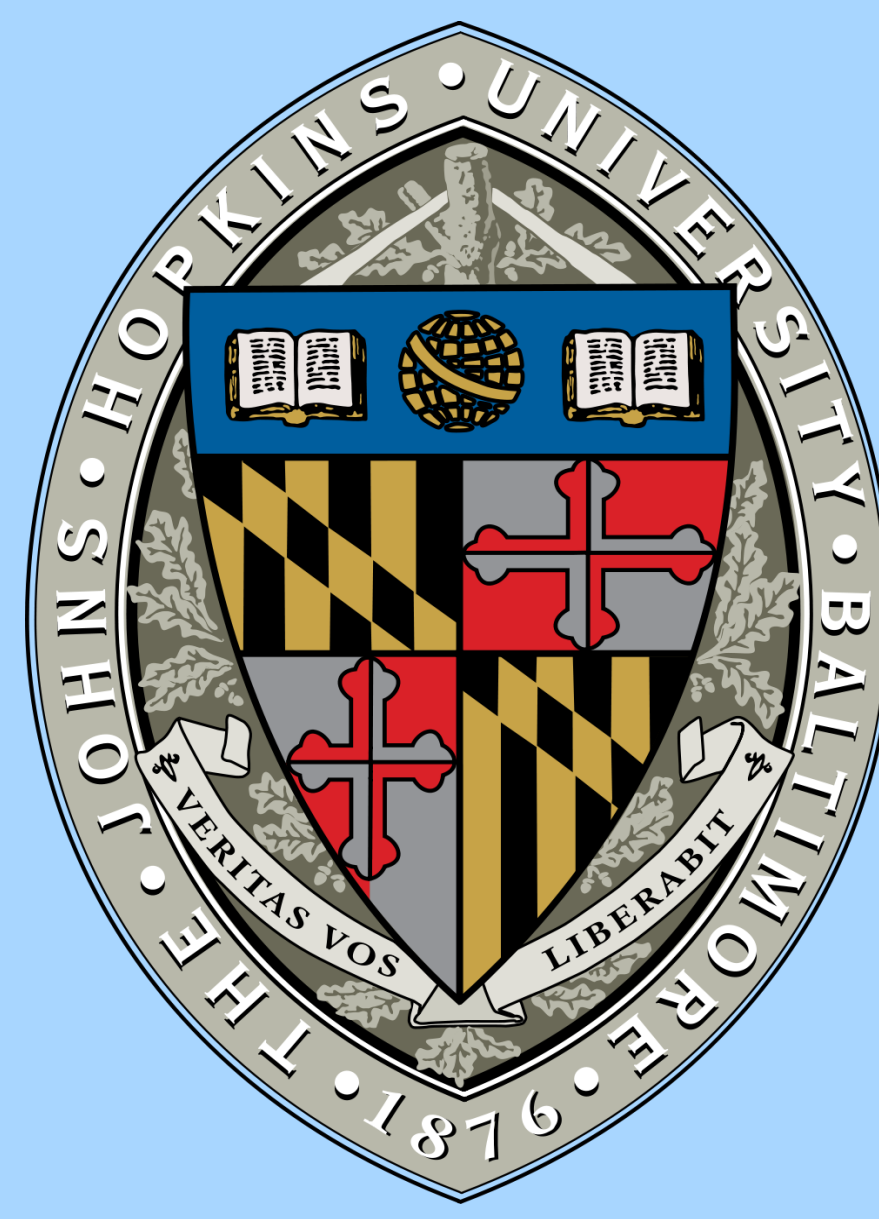


Pediatric Pressure Ulcer Prevention at the Johns Hopkins Hospital PICU

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1 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. Hospital-acquired 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 turning schedule. The problem stems from a lack of 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.

2 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 Vergesolutions™ 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 Vergesolutions™ software and then monthly compliance reports were generated to be included in the unit newsletter.

Table 1: Braden Q Scale used at Johns Hopkins Hospital Pediatric Intensive Care Unit

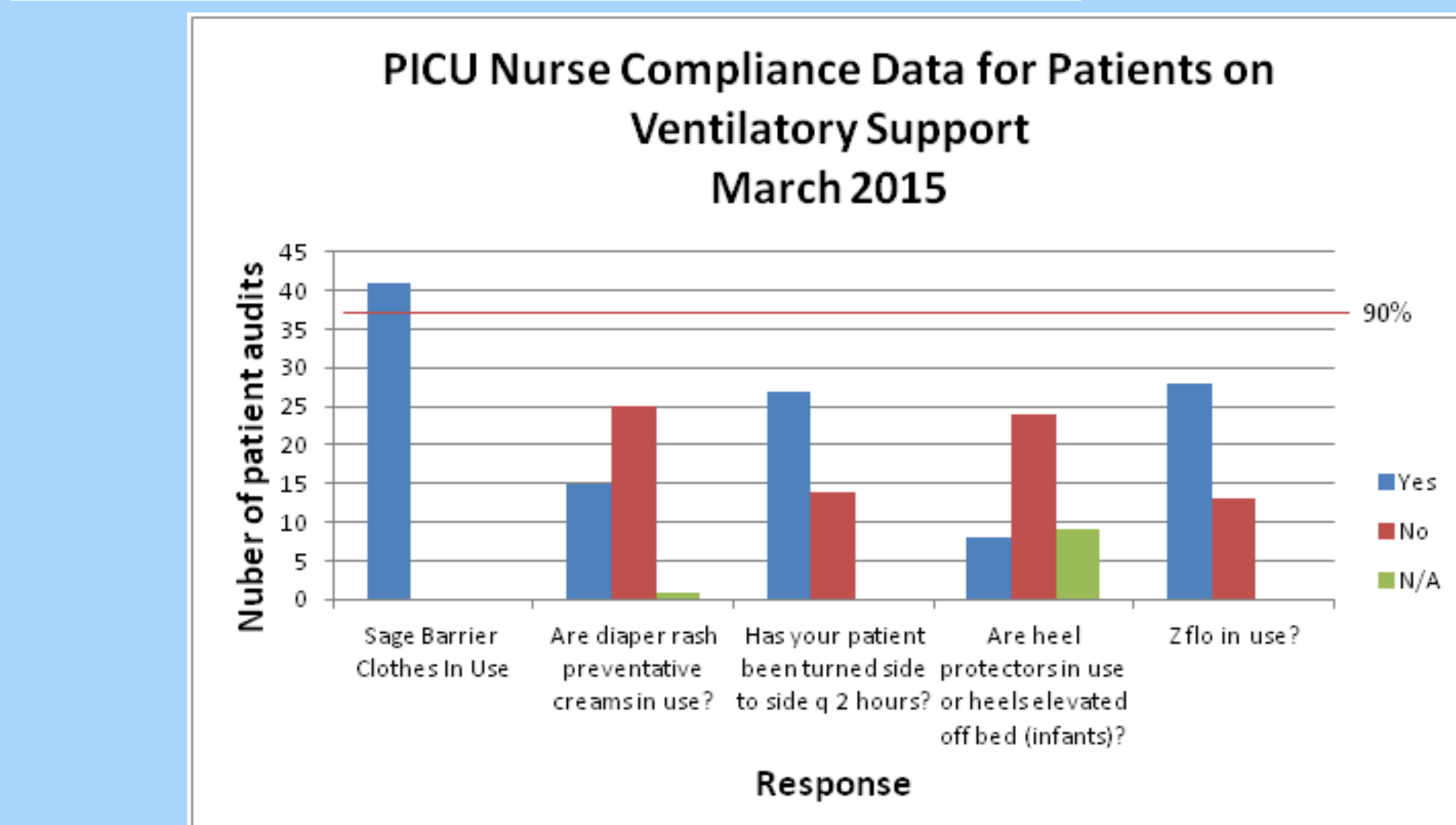
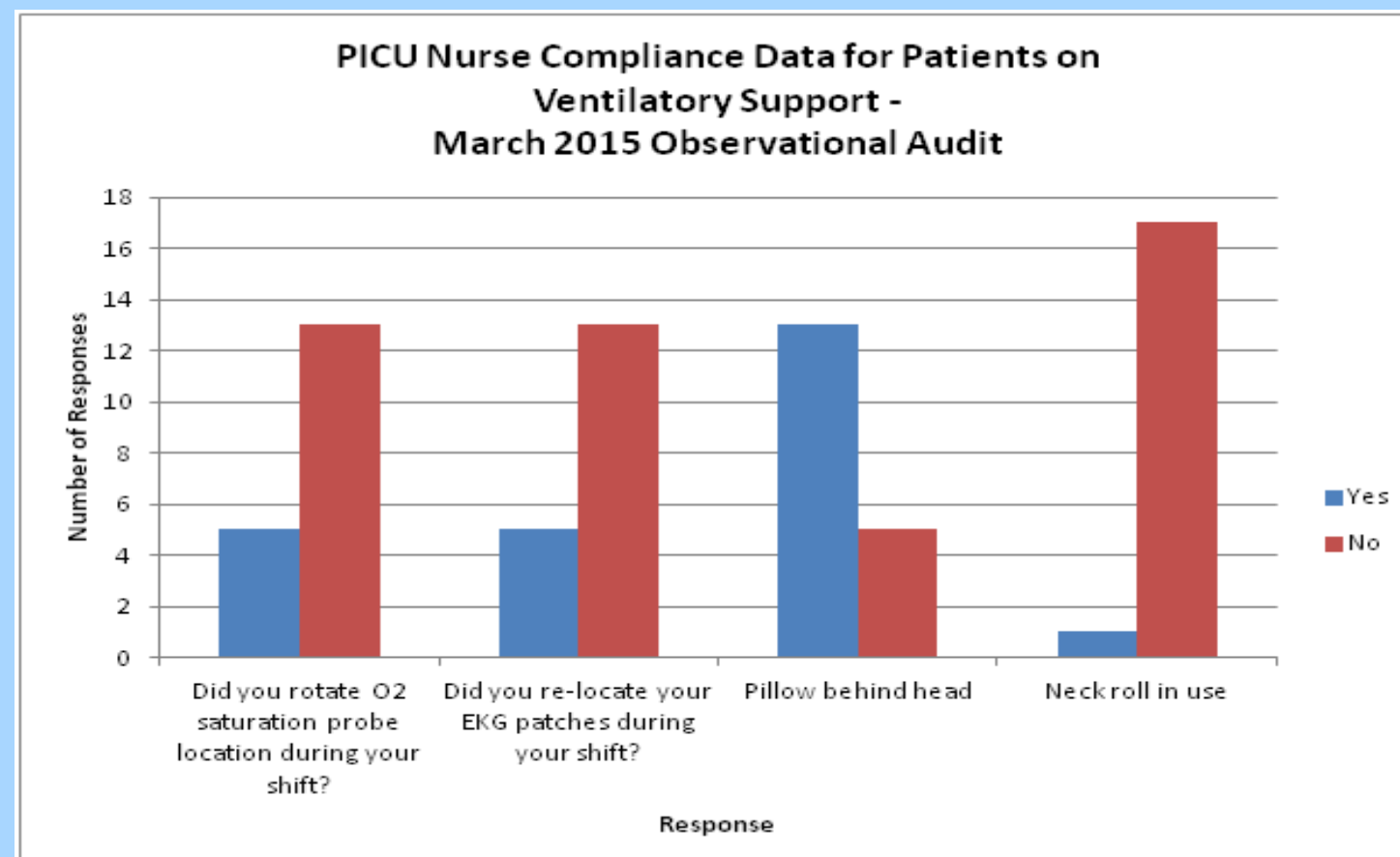
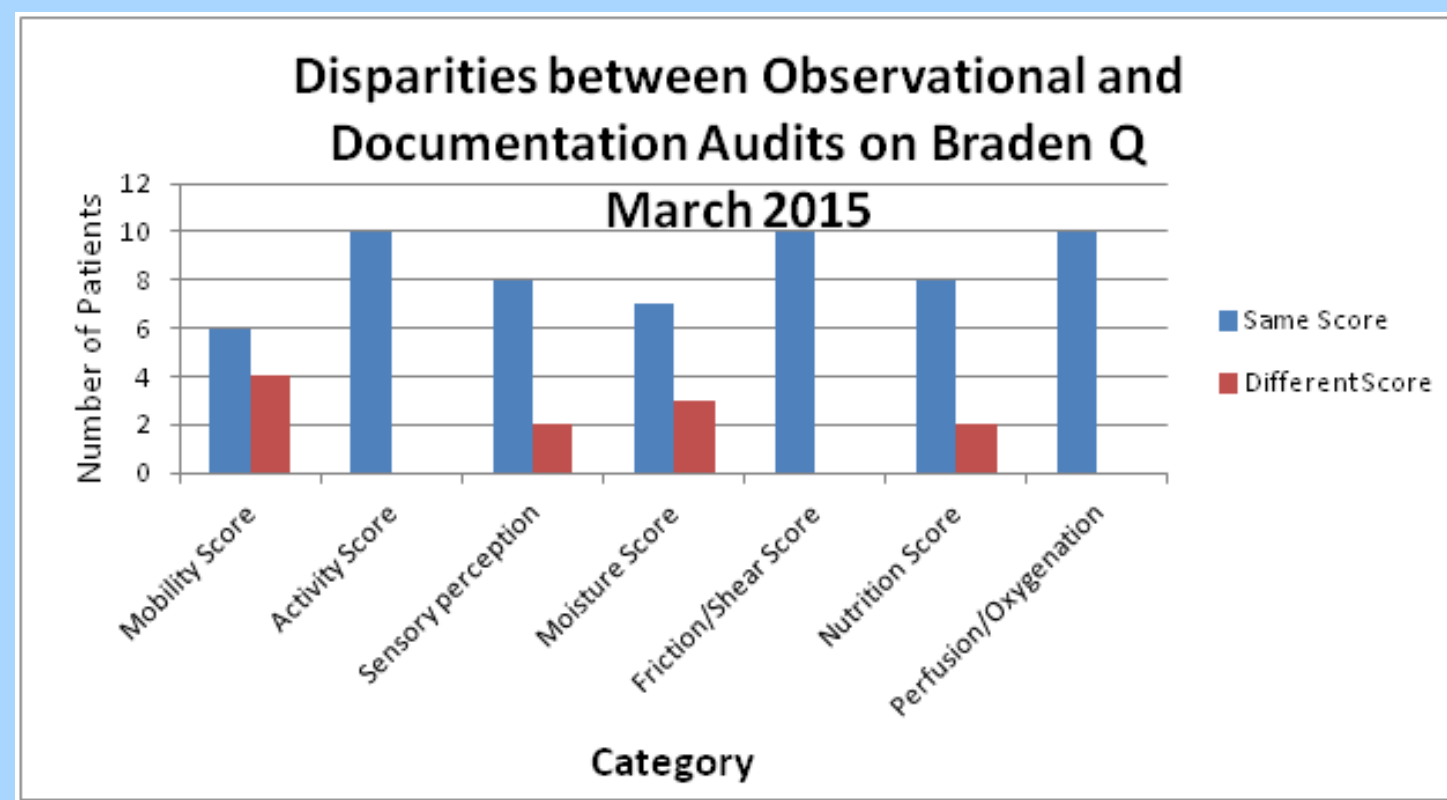
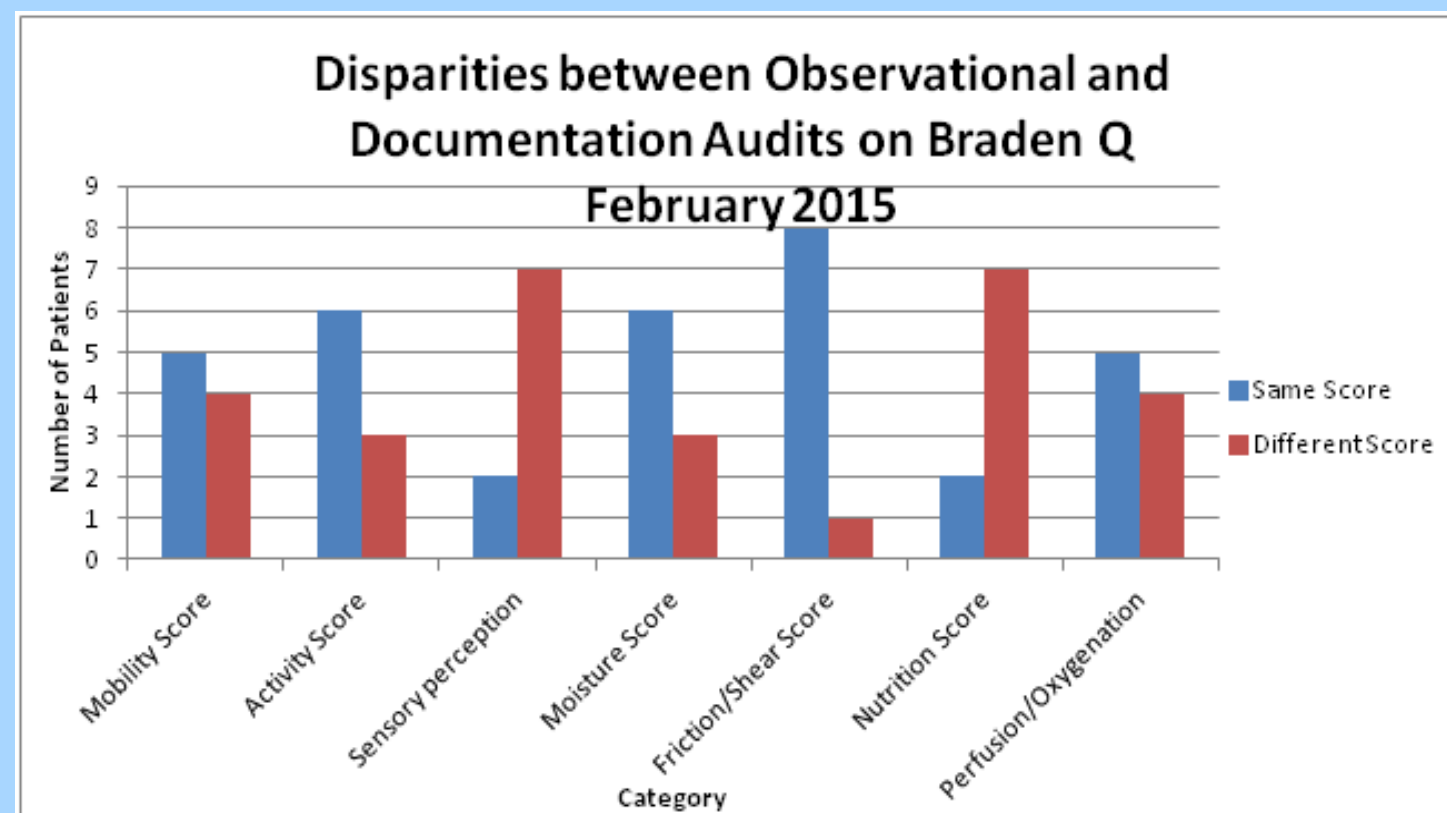
The Braden Q Scale				
	Intensity and Duration of Pressure			
Mobility The ability to change body position without assistance	1. Completely immobile. Cannot change body position without assistance.	2. Very limited. Can only move body or extremities passively. Cannot change body position without assistance.	3. Slightly limited. Can move body or extremities with some effort.	4. No limitations. Can move body or extremities without assistance.
Activity The degree of physical activity	1. Bedfast. Confined to bed.	2. Chair fast. Cannot bear own weight unless supported by another person or wheelchair.	3. Walks with assistance. Cannot bear own weight unless supported by another person or wheelchair.	4. Walks unassisted. Can bear own weight and walk independently.
Sensory The patient's response to a noxious stimulus. Sensory perception may be altered if the patient has a sensory deficit.	1. Completely limited. Unresponsive to pain and temperature. Cannot feel heat or cold.	2. Very limited. Responds only to painful stimuli. Cannot feel heat or cold.	3. Slightly limited. Responds to most stimuli. Cannot feel heat or cold.	4. No limitations. Responds to all stimuli. Can feel heat, cold, and pain.
Moisture Degree to which skin is exposed to moisture. Discomfort is observed every 2 hours.	1. Constantly moist. Skin is constantly wet.	2. Very moist. Skin is moist most of the time.	3. Slightly moist. Skin is moist some of the time.	4. No limitations. Skin is dry.
Friction/Shear Friction: occurs when one surface rubs against another. Shear: occurs when one surface pulls across another.	1. Significant problem. Friction or shear is present. Skin is red and irritated.	2. Problem. Friction or shear is present. Skin is red and irritated.	3. Potential problem. Friction or shear is present. Skin is red and irritated.	4. No apparent problem. Friction or shear is not present.
Nutrition Current food intake	1. Very poor. Not eating or drinking. Weight loss.	2. Poor. Not eating or drinking. Weight loss.	3. Adequate. Eating and drinking. No weight loss.	4. Excellent. Eating and drinking. No weight loss.
Theme Perception and Organization	1. Completely disorganized. Cannot follow directions.	2. Very disorganized. Cannot follow directions.	3. Slightly disorganized. Cannot follow directions.	4. No limitations. Can follow directions.

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 subjectivity 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.



Graph 4:
 * 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.

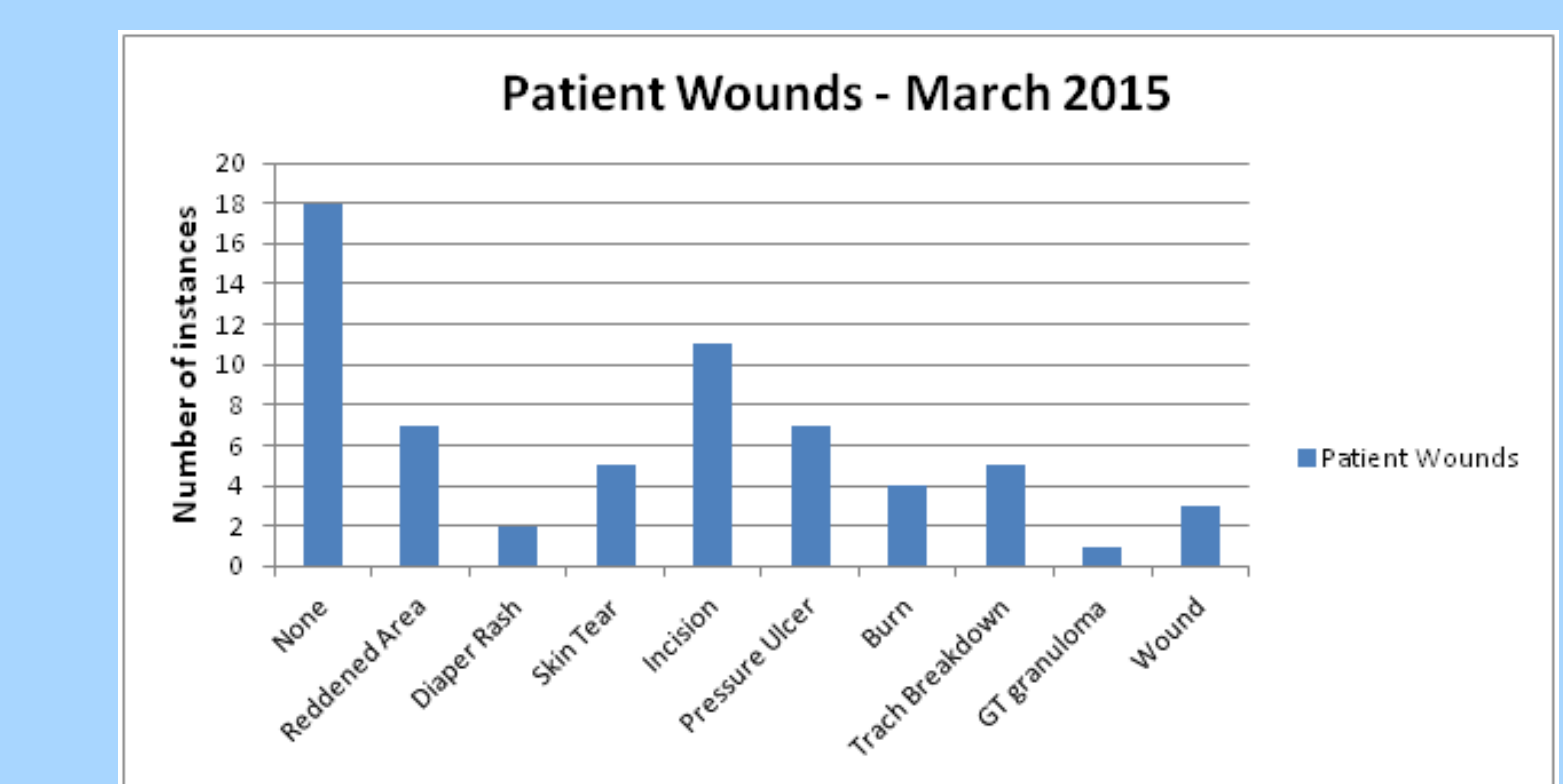
Therefore, the patient nurse and nurse practitioner disagreed 78% of the time in those categories. In the February audit, the nurse practitioner was blind to what the patient nurse had scored for the Braden Q, but in March the scores were reviewed before the observational audit and were compared. For March, the categories of activity, friction/shear, and perfusion were all scored the same. The largest difference in scoring was in the mobility score with 40% of the scores being different. Of the eleven differences noted in the graph, only two of the differences shown were responses from the nurse of a higher score than the nurse practitioner; therefore, most 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.

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

5 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.

6 References

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