

# A Multi-site Project to Compare the Predictive Accuracy of the Cubbin-Jackson and Braden Skin Risk Tool in Critical Care Patients

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## Background

- Hospital acquired pressure injuries (HAPIs) increase the risk of infection
- Cost to treat a pressure injury ranges from \$500 to \$100,000
- The National Pressure Ulcer Advisory Panel (NPUAP) (2014) shows that patients are five times more likely to acquire a pressure injury when admitted to a critical care setting.
- Nurses currently use the Braden Scale to determine a patient's risk for pressure injury.

## Purpose

- The purpose of this study was to examine the predictive accuracy of the Cubbin-Jackson skin risk assessment compared to the Braden scale score in HAPI occurrence in the critical care patient population.
- In 2016 the 5 participating ICUs had a total of 58 HAPIs.

## Skin Risk Assessment Tools

Cubbin-Jackson Categories	Braden Categories
Age	Sensory/Perception
Weight	Moisture
Mobility	Mobility
Mental Condition	Activity
Nutrition	Nutrition
Hemodynamics	Friction/Shear
Respiration	
General Skin Condition	
Incontinence	
Hygiene	

**Scoring:** Cubbin & Jackson At Risk 31-35, High 25-30, Very High  $\leq 2$ , Braden At Risk 15-18, Moderate 13-14

## Methodology/Intervention

- This study was approved by the Institutional Review Board (IRB).
- A retrospective correlational study of all patients (over the age of 18) admitted to the critical care unit (CCU).
- This was a multi-site evidence-based practice study across 5 of 12 Sentara hospitals.
- All skin care and treatment was based on the Braden skin risk score as per current hospital policy. The oncoming RN completed Braden while off-going RN completed Cubbin-Jackson scale. Assessments must have been completed within 1 hour of each other
- Inter-rater reliability audit completed by site primary investigators (PI).
- Weekly check-in's for site PIs.
- EHR data collected from October 2017-March 2018.

## Results

- There were 2081 of matched pairs of the Cubbin-Jackson skin risk assessment and Braden scale scores.
- Validity Analysis
  - There was a significant positive correlation between the Cubbin-Jackson and Braden scores,  $r = .806$ ,  $p < .001$  showing evidence of construct validity between the scales.

Braden Scale	HAPI		
	No	Yes	Total
Low Risk	1635 99.6%	6 0.4%	1639 100.0%
High Risk	431 97.5%	11 2.5%	442 100.0%
Total	2064 99.2%	17 0.8%	2081 100.0%

Table 1. Pearson Chi-square results for Braden Scale;  $\chi^2 = 19.36$ ,  $p < .001$ ;

Cubbin-Jackson Scale	HAPI		
	No	Yes	Total
Low Risk	1012 99.9%	1 0.1%	1013 100.0%
High risk	1052 98.5%	16 1.5%	1068 100.0%
Total	2064 91.3%	17 8.5%	2081 100.0%

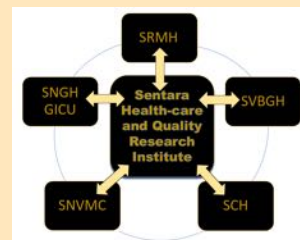
Table 2. Pearson Chi-square results for Cubbin-Jackson Scale;  $\chi^2 = 12.57$ ,  $p < .001$ ;

	Braden	Cubbin-Jackson
Sensitivity	64.71%	94.12%
Specificity	79.12%	49.03%
PPV	2.49%	1.50%
NPV	99.63%	99.90%

Table 3. Diagnostic test evaluation of Cubbin-Jackson and Braden tools.

## Discussion

- The Cubbin-Jackson and Braden tools were similar in their performance as risk assessment scales with the Cubbin-Jackson having better sensitivity in predicting skin changes over time.
- Informal clinician feedback favored the Cubbin-Jackson tool with RN's stating that it was more specific to the conditions encountered in the CCU.
- Early recognition of high risk patients could allow clinicians to intervene with preventative measures.



## Limitations

- Assessments not completed within 1 hour of each other
- Assessments not completed at all which limited use to only 29% (17 of 58) of the non-preexisting skin change events in the participating units.
- Missed documentation
- Holding non-critical care level patients
- Leadership changes
- Decrease in HAPI occurrence

## Contact Information

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References available upon request