

Infant and Neonatal Pressure Prediction Score: A Novel Way to Assess Breakdown Risk

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Introduction

- Neonatal pressure wounds (NPW) are challenging complications.
- Typically occurring in neonates with longer NICU stays, NPWs are commonly seen on the back of the head and buttocks.
- As many NICU patients have physiologically immature skin, as well as compromised healing abilities, they are at great risk for developing NPW.
- There currently is not a reliable score developed to assess the risk of NICU patients developing NPW.
- With new medical advancements, there is a need for an updated risk assessment score.
- Here, we describe a NEW Neonatal Pressure Scoring System termed Infant and Neonatal Pressure Prediction Score (INPPS). It accurately defines the extent and severity of NPWs so they can be staged and serially assessed throughout their treatment.

What is in use right now?

The current tool, the Neonatal Skin Risk Assessment Scale (NSRAS) (**Figure 1**) has inherent limitations:

- NSRAS primary focuses on neonatal skin condition and breakdown rather than the risk prediction of an actual NPW.
- In fact, NSRAS ignores important medical factors including modern treatment measures that directly impact the NPW-risk.
- Based on these pain points, factors were reorganized and re-worded.



Figure 1: Components of the NSRAS, the existing pressure breakdown score used

About the INPPS

Goals for the INPPS:

- Focus on objective assessment of the risks for NPW in a more practical, reliable, and reproducible manner
- Consolidate risk factors for NPW into an objective framework.
- Reduce subjectivity and potential user error.

Key Improvements INPPS vs NSRAS

- Objective Measures, Improved Categorization.
- Variables eliminate redundancy in INPPS reporting, thereby increasing reproducibility, & objectivity, & reducing subjectivity.
- Instead of linking blood pressure to mental status, the presence of pressors is used as an objective measure.
- Categories including activity & mobility are simplified for easier more reliable assessment.

Inclusion of High-Risk Factors:

In sharp contrast to the NSRAS, INPPS includes critical variables including ECMO status, and ventilator settings which present a high-risk factor for NPW, not considered in the NSRAS system. These additions reflect medical advancements especially the use of sophisticated medical devices that unfortunately could increase NPW risk.

	0 pts	1 pts	2 pts	3 pts
Gestational Age	<23 weeks	23-28 weeks	28-38 weeks	>38 weeks
Ventilator Status	ECMO	Oscillator/NO	Oscillator	Normal/Spontaneous breathing
CardioVascular Status	ECMO	IV Pressors	No Pressors	...
Edema/Skin	Pitting Edema/poor skin	No edema/Good skin
Shear Injury	Shear injury present	Thin skin	Normal Skin	...
Wounds/Incontinence	Incontinent/Open abdomen/Open wound draining	Small wound/minimal drainage	Normal Skin	...
Nutrition	Poor	Good	Excellent	...
Mobility	Unable/Difficult to reposition	Able to reposition	Sponateous motion	...
			TOTAL:	/17
Breakdown risk:	0-7 - Severe	8-12 - Moderate	13-16 - Mild	17 - Minimal

Figure 2: The INPPS, a newly created pressure breakdown score for neonates.

Conclusions:

- INPPS offers a more complete, inclusive & objective risk assessment tool for NPW. It can help identify risk factors earlier, and more comprehensively & prevent NPW.
- INPPS could improve neonatal safety, especially in the sickest most vulnerable at-risk, neonates.

References:

- Huffines B, Logsdon MC. The Neonatal Skin Risk Assessment Scale for predicting skin breakdown in neonates. *Issues Compr Pediatr Nurs*. 1997 Apr-Jun;20(2):103-14. doi: 10.3109/01460869709026881. PMID: 9423386.
- Broom M, Dunk AM, E Mohamed AL. Predicting Neonatal Skin Injury: The First Step to Reducing Skin Injuries in Neonates. *Health Serv Insights*. 2019 Jun 14;12:1178632919845630. doi: 10.1177/1178632919845630. PMID: 31236011; PMCID: PMC6572893.
- Visscher M, Taylor T. Pressure ulcers in the hospitalized neonate: rates and risk factors. *Sci Rep*. 2014 Dec 11;4:7429. doi: 10.1038/srep07429. PMID: 25502955; PMCID: PMC5377020.

