

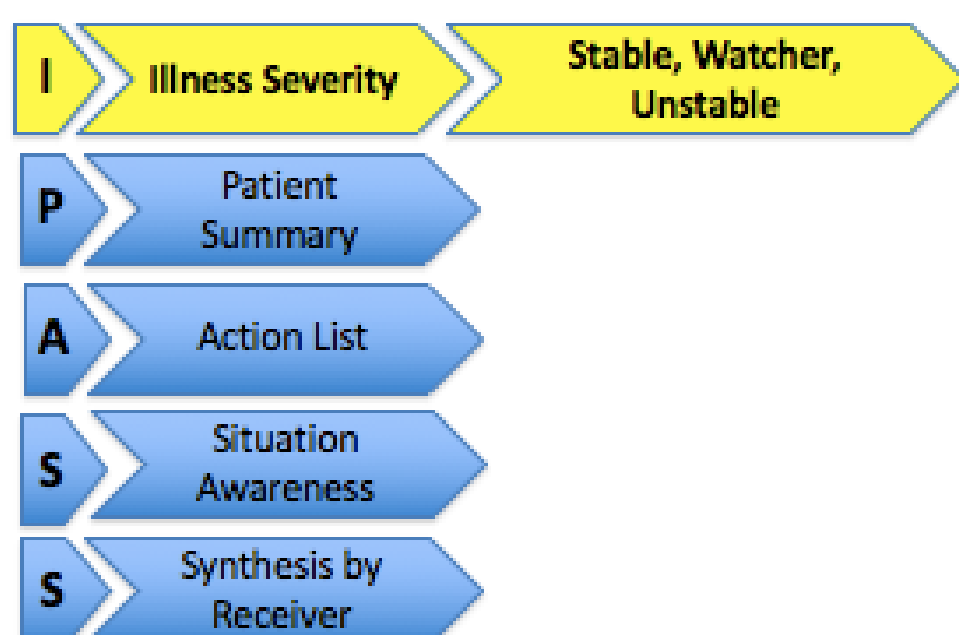
Comparison of I-PASS Illness Severity Classification versus the Hopkins Pediatric Early Warning Score in Prediction of Clinical Decompensation in Pediatric Inpatients in a Large Academic Children's Hospital

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BACKGROUND

- Structured communication tools promote patient safety at handoff
- I-PASS is a structured communication tool used for handoffs



- Hopkins Pediatric Early Warning Score (HPEWS) is an objective measurement tool differentiated based on pediatric age-stratified vital signs that was developed to identify early signs of clinical decompensation

AGE: 0-2 MONTHS

Patient Name: _____ Patient MRN: _____
 1st Nurse Name, Date, Unit: _____ 2nd Nurse Name, Date, Unit: _____
 3rd Nurse Name, Date, Unit: _____ 4th Nurse Name, Date, Unit: _____

	Green	Yellow	Red
Neuro	*Normal, or Crying, fussy, but consolable		Inconsolable, Lethargic, Confused, *Unresponsive, OR *Change from baseline mental status
Cardio-vascular	HR 91-169 at rest	HR 81-90 or 170-189 at rest	HR ≤ 80 or > 190 at rest New arrhythmia
Type of Active Cardiac Disease	SBP 51-99 Cap Refill < 2 sec	SBP 46-50 or 100-129 Cap Refill = 2-3 seconds Active Cardiac Disease	SBP ≤ 45 or ≥ 130 Cap Refill < 1 sec or > 4 sec Active Cardiac Disease plus Yellow or Red in Any Other System
Respiratory	RR 21-79 O2 sats > 94 WOB: Mild increased (e.g. 1 site accessory muscle use)	RR 16-20 or 80-89 O2 sats 91-93 (or < 3 below goal) WOB: Moderate increased (e.g. 2 sites accessory muscle use)	RR ≤ 15 or > 90 O2 sats < 90 (or > 5 below goal) WOB: Severe increased (e.g. grunting, head bobbing, unable to speak)
GI	Standard NC O ₂ flow < 2 L/min Or Baseline O ₂ Settings	Standard NC O ₂ flow = 2-4 L/min Or Increase Baseline O ₂	Standard NC O ₂ flow > 4 L/min > 60% FIO ₂ on face mask Initiation of HFNC
Other	Exams: Distended but soft, non-tender	Exams: Distended and tender	Exams: Rigid abdomen or peritoneal signs Bilious emesis

HPEWS: Hopkins Pediatric Early Warning Score v.12.7.17. * Denotes change from previous version

- Clinical decompensation events are defined as a rapid response call (RRT) or a transfer to the pediatric intensive care unit (PICU)
- Currently, during pediatric resident handoff, there is no objective classification method that predicts a patient's risk of clinical decompensation.

OBJECTIVE

To compare I-PASS illness severity to HPEWS in predicting clinical decompensation of pediatric inpatients

METHODS

- Design:** Retrospective, case-control study
 - Cases: All pediatric inpatients with RRT or PICU transfer
 - Control patients: matched by age, admitting service, and no clinical decompensation event during admission
- Dates:** February-September 2018
- Exclusion:** patients admitted to a surgical specialty or if illness severity was not recorded
- Data Collection:**
 - Illness severity status designated by resident & recorded via daily pages or via electronic medical record documentation
 - HPEWS scores (green, yellow, red) recorded by bedside nurses
 - Watcher or unstable illness severity and red HPEWS scores correlated to clinical decompensation
- Outcomes:** sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of both I-PASS illness severity and peak HPEWS scores within 24 hours of a clinical decompensation event

RESULTS

Figure 1: Preliminary patient inclusion for analysis

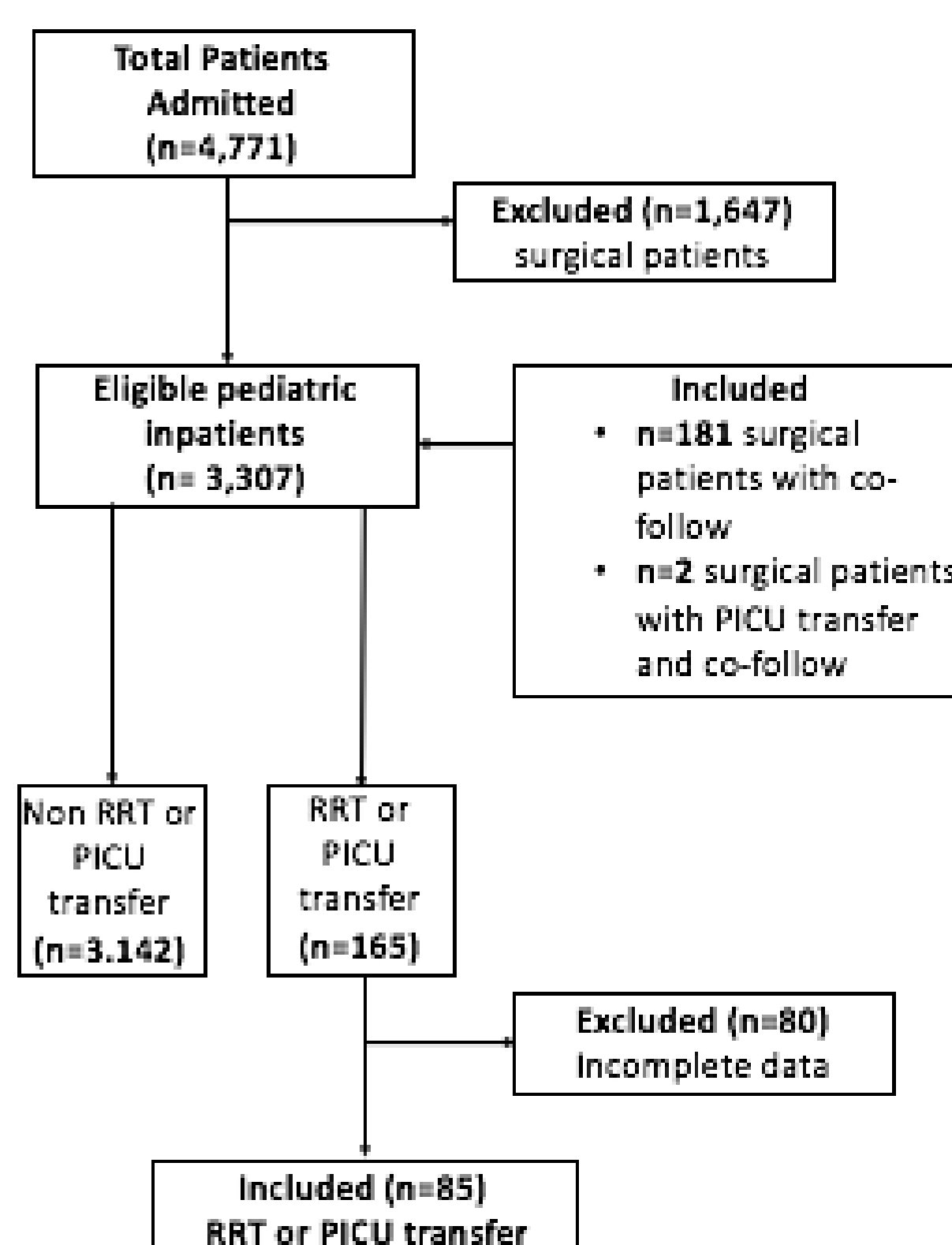


Figure 2: Patient Characteristics

Characteristic	All Patients N = 3,307	RRT N = 32	No RRT N = 26	PICU Transfer N = 57	No PICU Transfer N = 59
Age (years)	7.6 (6.9)	8 (6.9)	7 (7.1)	6.9 (6.9)	6.7 (6.7)
Gender					
Male	1,859	20	14	30	38
Female	1,448	12	12	27	21

RESULTS

Table 1: Preliminary Descriptive Statistics

	Sensitivity	Specificity	PPV	NPV
RRT				
IPASS	36%	100%	100%	40%
HPEWS	84%	85%	89%	79%
PICU Transfer				
IPASS	54%	100%	100%	68%
HPEWS	82%	85%	86%	81%

CONCLUSIONS

- HPEWS has higher sensitivity and I-PASS illness severity has higher specificity for predicting clinical decompensation
- The high sensitivity of HPEWS provides a more robust screening indicator for clinical deterioration than I-PASS illness severity
- Both tools had relatively high PPVs
- I-PASS illness severity had a lower NPV, suggesting the resident's subjective stable designation may not accurately reflect a patient's decompensation risk

CLINICAL IMPLICATIONS

- HPEWS offers an objective indication of decompensation risk and might be included in a structured communication tool such as I-PASS
- Future studies should include evaluation of HPEWS during handoff

REFERENCES

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Funding Source:

The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety



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