

Taking the Score to the Floor: Enhancing Respiratory Assessment in Real Time

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Background

- Respiratory distress is a leading cause of pediatric ED-UCC visits
- Our current Electronic Medical Record (EMR) respiratory scoring tool has not been validated for predicting patient disposition and has limitations in children with complex communication needs
- The Clinical Respiratory Score (CRS) assesses respiratory rate, auscultation, use of accessory muscles, mental status, oxygen saturation, and color to provide an objective severity score
- The Clinical Respiratory Score (CRS) is a validated tool shown to be reliable across pediatric populations
- This project compares CRS with the EMR tool to determine which better predicts pediatric disposition

PICO Statement

In pediatric patients with respiratory distress in the ED-UCC, including those with complex communication needs, does the implementation of an additional scoring tool named the Clinical Respiratory Score (CRS), result in more accurate and appropriate escalation of care and floor placement.

Literature Review & Evaluation

NUMBER OF ARTICLES: 4
DATABASES: PubMed & CINAHL
Inclusion Criteria:

- Pediatric respiratory scoring tools, complex communication needs, patient flow, acuity levels, hospital informatics tools
- Exclusion Criteria:**
- Adult population, in-patient studies only, studies older than 5 years

Level of Evidence	# of Studies	Overall Quality
I	0	N/A
II	2	Strong
III	2	Strong/Good
IV	0	N/A
V	0	N/A

Key Article Example (APA 7th):
McLaughlin, K., et al. (2022). Reliability of the Clinical Respiratory Score across multidisciplinary teams in pediatric care. *Pediatric Emergency Care*, 38(12), e1101–e1106. <https://doi.org/10.xxxx>

Results

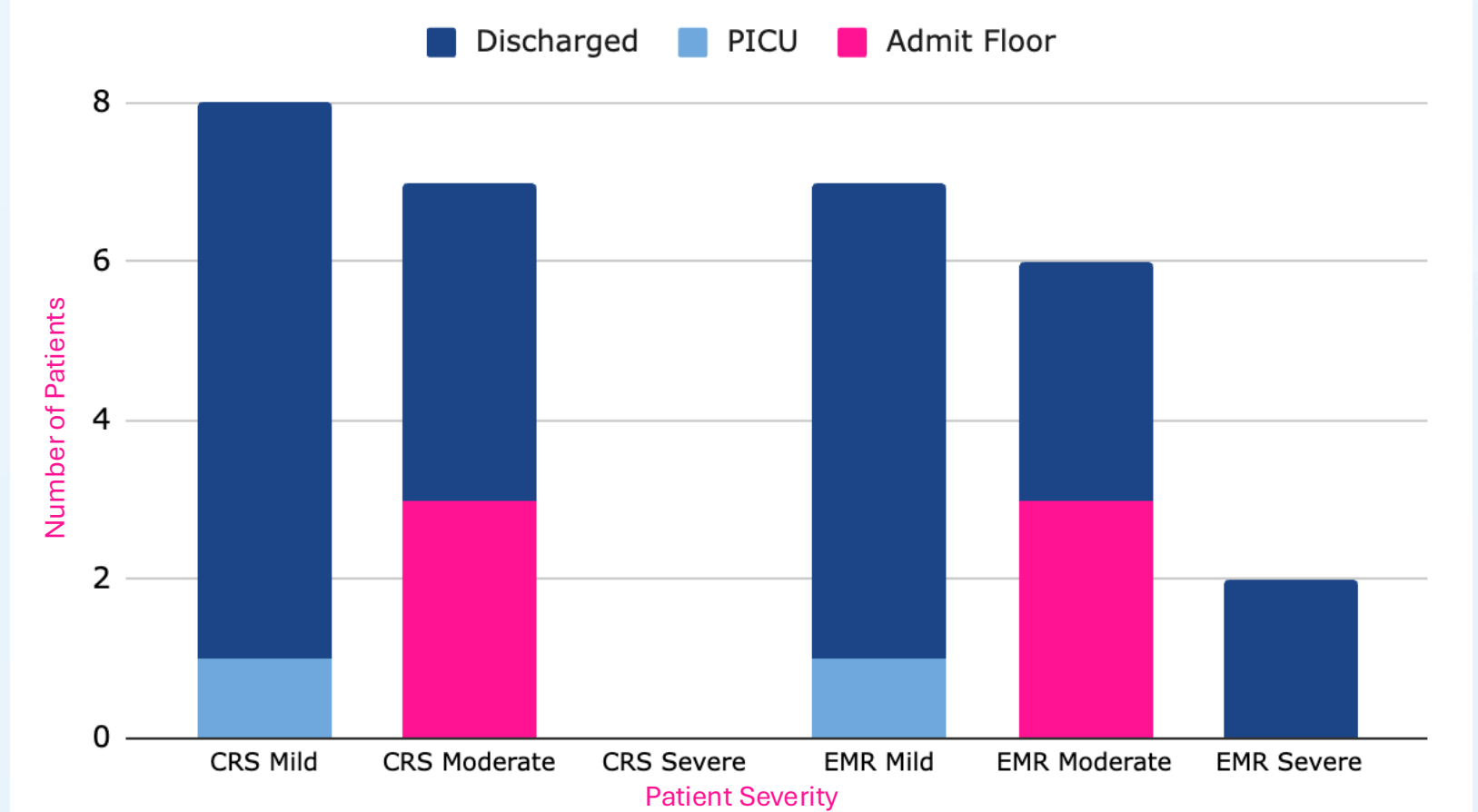
- A total of 15 patients were included (9 females, 6 males; ages 4months–7 years).
- Disposition:
 - Discharged = 11
 - Admitted to Floor = 3
 - PICU = 1
- CRS Severity Patterns:
 - 7 mild → discharged
 - 7 moderate → mixed (discharge + floor)
 - 0 severe
 - Outlier: 1 mild patient admitted to PICU
- EMR Severity Patterns:
 - 6 Mild → discharged
 - 6 moderate → mixed (discharge + floor)
 - 2 Severe → discharged
 - Outlier: 1 mild patient admitted to PICU

NOTE:
CRS provided clearer alignment with disposition; EMR inflated severity

Severity × Disposition: CRS vs EMR (Counts)

Severity	CRS Discharged	CRS Admit Floor	CRS PICU	EMR Discharged	EMR Admit Floor	EMR PICU
Mild	7	0	1	6	0	1
Moderate	4	3	0	3	3	0
Severe	0	0	0	2	0	0

CRS vs EMR — Side-by-Side Stacked Severity by Disposition



Methods/Implementation



CRS Tool

Score	Respiratory Rate	Auscultation	Use of Accessory Muscles	Mental Status	SpO2 Room Air	Color
Score 0	Age 1-5 years: >30 Age >5 years: >20	Good air movement, wheezing or scattered rales/stridor	Mild to no use of accessory muscles. Mild to no retractions or nasal flaring on inspiration	Normal to Mildly irritable	>95%	Normal
Score 1	Age 1-5 years: 30-40 Age >5 years: 20-30	Depressed air movement, respiratory and expiratory wheezes or rales/stridor	Moderate intercostal retractions; mild to moderate use of accessory muscles, nasal flaring	Irritable, agitated, restless	90-95%	Pale to Normal
Score 2	Age 1-5 years: <30 Age >5 years: <20	Diminished or absent breath sounds, severe wheezing or rales/stridor or marked prolonged expiration	Severe intercostal and subcostal retractions, nasal flaring	Lethargic	<90%	Cyanotic, dusky

EMR Tool

SCORES	0	1	2	3
Respiratory rate				
<2 months	< 60	61-80	> 80	> 70
3-12 months	< 50	51-59	> 60	> 40
1-2 years	< 40	41-44	> 40	> 40
3-5 years	< 30	31-39	> 30	> 36
6-12 years	< 24	25-30	> 30	> 31
>12 years	< 23	24-27	> 28	> 28
Retractions	None	Intercostal	Intercostal and subcostal	Intercostal, subcostal and suprasternal
Dyspnea	Normal feeding, vocalizations and activity	1 of the following: difficulty feeding, decreased vocalization or agitated	2 of the following: difficulty feeding, decreased vocalization or agitated	Stops feeding, no vocalization, drowsy or confused
0-2 years	Normal feeding, vocalizations and play	1 of the following: decreased appetite, increased coughing after play, hyperactivity	2 of the following: decreased appetite, increased coughing after play, hyperactivity	Stops eating or drinking, stops playing, OR drowsy and confused
2-4 years	Normal feeding, vocalizations and play	1 of the following: decreased appetite, increased coughing after play, hyperactivity	2 of the following: decreased appetite, increased coughing after play, hyperactivity	Stops eating or drinking, stops playing, OR drowsy and confused
5 years	Counts to 10 in one breath	Counts to 7-9 in one breath	Counts to 4-6 in one breath	Counts to 3 in one breath
Auscultation	Normal breathing, no wheezing present	End-expiratory wheezing only	Expiratory wheeze only (greater than end-expiratory wheeze)	Inspiratory and expiratory wheeze or diminished breath sound or both

Conclusion

- CRS severity levels mirrored disposition more reliably than EMR
- EMR overestimation created misalignment, especially in severe category
- Outlier case highlights importance of dual review
- No single tool was flawless; each offered complementary strengths
- CRS more consistent for clinical decision-making
- Findings support CRS as a stronger predictor of patient disposition

Practice Implications

- Pre-implementation:** Staff education via huddles/meeting + CRS quick-reference tools
- Dual scoring:** CRS and EMR respiratory tool completed simultaneously on paper for direct comparison
- Scoring tools:** CRS evaluates 6 parameters (0–2 each) vs EMR tool (4 parameters)
- Data collection:** Bedside nurses documented both scores; forms organized by clinical zone
- Outcome tracking:** Patient disposition (discharge, floor, PICU) obtained via Capacity Management
- Data collection period:** August 19 – September 18

- Consider CRS for standardizing respiratory assessment in pediatric ED-UCC
- Use CRS trends to guide discharge vs admission decisions
- Recognize CRS limitations (room air SpO₂, excludes <1 year)
- Retain EMR tool as a safety net; limited in complex communication needs
- Dual use of CRS + EMR supports balanced decision-making
- Future direction: validate in larger populations and integrate CRS into EMR