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The Role of Pediatric Early Warning Scores (PEWS) in Determining PICU Transfer Necessity and Length of Stay

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Abstract

Background: Early identification of clinical deterioration in hospitalized children remains a major challenge, particularly in determining the need for Pediatric Intensive Care Unit (PICU) transfer. Pediatric Early Warning Scores (PEWS) have been proposed as a tool to support clinical decision-making. This study aimed to evaluate the association between PEWS and PICU transfer, as well as patient outcomes in hospitalized children.

Methods: This cross-sectional study included all children hospitalized in the wards or referred to the emergency department of Aliasghar Hospital who required a PICU consultation from September 2023 to February 2024. A pediatrician independently completed the PEWS for each child before the PICU consultation. The outcomes measured were transfer to the PICU, length of stay (LOS) in the PICU, duration of ward hospitalization, and mortality. Statistical analyses included Pearson correlation, Chi-square test, and post hoc Least Significant Difference (LSD) test. Multivariate logistic regression models were constructed to assess the independent effect of PEWS on PICU transfer, with results expressed as odds ratios (ORs) and 95% confidence intervals (CIs). Model performance was evaluated using receiver operating characteristic (ROC) curve analysis.

Results: A total of 169 children were included (mean (SD) age: 5.00 (4.65) years; 103 [60.9%] male). The mean (SD) LOS was 4.42 (3.97) days in the ward and 8.54 (6.98) days in the PICU. The mean PEWS was 6.90 (2.22), with 112 (66.3%) patients classified as red and 9 (5.3%) as green. Nine patients (9/169, 5.3%), all in the red category, died during hospitalization. Higher PEWS scores were significantly associated with increased odds of PICU transfer (OR = 3.17, 95% CI: 1.79–5.63, $P < 0.001$). Transfer rates increased across PEWS categories, reaching 100% in the red group. Significant differences in PICU LOS were observed across PEWS severity groups, with patients in the red category having longer stays.

Conclusion: PEWS is a valuable tool for early detection of deterioration, but should not be used alone for PICU transfer decisions. Clinical context, underlying diagnoses, and ongoing assessment must be considered alongside PEWS scores for effective patient management.

Keywords: Pediatric Early Warning score, PEWS, Pediatric Intensive Care Unit, Pediatrics

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Key Messages:

↑What is "already known" in this topic:

PEWS helps identify clinical deterioration in hospitalized children by systematically assessing vital signs and clinical observations. It supports communication and escalation decisions; however, evidence regarding its ability to predict PICU transfer and outcomes in real-world settings remains limited.

→What this article adds:

This study demonstrates that PEWS assessed before PICU consultation is an independent predictor of PICU transfer. Higher scores were associated with increased transfer risk, and all deaths occurred in the red PEWS category. PEWS should complement, not replace, clinical judgment.

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Introduction

Assessing patient severity is a crucial component of clinical care, especially in the pediatric population, due to their distinct physiological and anatomical characteristics. Many pediatric conditions initially present with mild symptoms that may be easily overlooked by caregivers and healthcare providers. Failure to recognize these early signs can result in rapid clinical deterioration, potentially leading to severe complications such as respiratory failure, cardiac arrest, or death (1).

Since the introduction of the Pediatric Early Warning Score (PEWS) by Dr. Mary Monaghan and her multidisciplinary team at Great Ormond Street Hospital in London, many hospitals have adopted this system to more rapidly identify children at risk of critical clinical deterioration (2, 3). PEWS is a vital tool designed to detect early signs of rapid decline in pediatric patients, enabling timely intervention. By systematically assessing vital signs and clinical observations, PEWS can identify physiological changes that may precede severe events such as respiratory failure or cardiac arrest. Research has demonstrated that PEWS can provide more than 11 hours of advance warning before significant deterioration occurs, allowing healthcare teams to proactively adjust care plans and potentially prevent emergency calls to Rapid Response Teams (RRT) or code blue situations (4, 5).

The process of consulting for PICU admission poses several challenges within children's hospitals. Factors such as delayed recognition of clinical deterioration, insufficient staffing, and limited resources can impede timely intervention. Many healthcare providers struggle to accurately assess the severity of a child's condition, especially when symptoms are unclear or when patients are unable to communicate. Furthermore, variations in staff training and experience can result in inconsistencies in clinical judgment regarding the need for PICU transfer (6). These challenges can lead to increased morbidity and mortality among critically ill children. The implementation of PEWS helps address some of these issues by offering a standardized method to assess the risk of deterioration. By enabling early identification of at-risk patients, PEWS improves communication among healthcare teams and streamlines the decision-making process for PICU consultations, ultimately enhancing patient outcomes.

Current approaches to the early detection of clinical deterioration in children primarily rely on the PEWS, which involves periodic assessment of vital signs upon admission to the emergency department. However, there is limited data on the use of PEWS scores prior to adverse events that necessitate transfer to the Pediatric Intensive Care Unit (PICU). Therefore, this study aims to investigate the association between PEWS scores recorded before requesting a PICU consultation and subsequent ICU admission outcomes, as well as other related health outcomes in pediatric patients.

Methods

Study design and Setting

This cross-sectional study was conducted at Ali Asghar Children's Hospital, a university hospital affiliated with Iran University of Medical Sciences. The study received approval from the Iran University of Medical Sciences Ethics Committee (Approval ID: IR.IUMS.FMD.REC.1402.072).

Participants

All children (<18 years) hospitalized in the wards or referred to the emergency department who were candidates for PICU consultation were included from September 2023 to February 2024.

Eligibility criteria

Because PEWS is a universal bedside assessment tool applicable to all pediatric patients regardless of underlying disease, no specific exclusion criteria were applied. All patients who received a PICU consultation during the study period were included, and each patient was enrolled only once to prevent duplicate entries. Chronic, complex, or terminal illnesses were not excluded, as they represent real-world PICU consultation scenarios.

Data Collection Tool

The Pediatric Early Warning Score (PEWS) was used as the primary assessment tool. PEWS encompasses clinical manifestations that significantly impact patient outcomes and predict disease severity in pediatric patients, from infancy to adolescence. In this study, we employed the version developed by Agulnik Asya et al., a modified adaptation of the Boston Children's Hospital's original framework (7). This version includes five core parameters: Behavioral/Neurological, Cardiovascular, Respiratory, Staff Concern, and Family Concern. Each main parameter comprises several sub-parameters scored from 0 to 3, except for Staff Concern and Family Concern, which have a maximum score of 1. Higher total scores indicate a greater likelihood of patient deterioration. The total PEWS score is categorized based on a care escalation algorithm:

- 0–2: Low risk
- 3–4: Moderate risk
- 5–6: High risk
- 7 or higher: Critical risk

PEWS also uses a color-coded scale to classify severity, facilitating rapid assessment and intervention:

- ***Green:*** Low risk, stable condition
- ***Yellow:*** Moderate risk, early signs of deterioration requiring closer monitoring
- ***Orange:*** High risk, pronounced distress requiring immediate attention
- ***Red:*** Critical risk, significant deterioration requiring urgent intervention and potential PICU transfer

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Data Collection Procedures

PEWS assessments were performed by pediatricians before the PICU consultation, and assessors were blinded to the final PICU transfer decision, minimizing bias. For all children who were candidates for PICU consultation, a pediatrician completed the PEWS prior to the consultation. Additional data collected included age, diagnosis, and length of stay in both the ward and PICU. Study outcomes were transferring to the PICU, duration of PICU stay, length of ward stay, and mortality. PEWS scores were compared with these outcomes.

Statistical methods

Data were analyzed using SPSS version 24. Pearson correlation assessed the association between PEWS scores and PICU or ward length of stay. Differences in mean PICU hospitalization across PEWS severity categories were examined using a post hoc Least Significant Difference (LSD) test. The Chi-square test evaluated the relationship between ward of admission and PICU transfer. Sensitivity, specificity, PPV, and NPV of PEWS for predicting PICU transfer were calculated using the PICU physician's judgment as the gold standard. To assess the independent effect of PEWS on PICU transfer, multivariate logistic regression was performed. Three models were built: (1) Crude model including only total PEWS, (2) Model adjusted for ward of admission (ED as reference), and (3) Fully adjusted model including ward, age, sex, and oxygen saturation (SpO_2). Results are presented as odds ratios (ORs) with 95% confidence intervals. Predictive performance was further evaluated using the area under the ROC curve (AUC).

Results

Demographic and Clinical Characteristics of Participants

A total of 169 children participated in the study. The mean age was 5 years (SD = 4.65), and 103 patients (60.9%) were boys. Mean of SpO2 was 91.85 (SD= 6.43). The highest percentage of patients transferred to the Pediatric Intensive Care Unit (PICU) originated from the emergency department (57.1%), followed by the general ward (10.1%) (Appendix Table 1). Respiratory and neurological conditions were the most frequent etiologies for PICU admissions (Appendix Table 2).

PEWS Scores and Distribution

The mean PEWS was 6.90 (SD = 2.22). Detailed scores for various subgroups are provided in Table 1. Among participants, 158 patients (93.5%) were recommended for PICU transfer by their ward head nurse, and 147 patients (87%) had parental agreement with this recommendation. Based on PEWS classification, 66.3% of patients were categorized as red (critical risk), while only 5.3% were classified as green (low risk) (Table 2).

In the respiratory subgroup, total score distribution was: 15.38% scored 0, 21.90% scored 1, 31.36% scored 2, and 28.04% scored 3. For the cardiovascular subgroup, 9.47% scored 0, 14.2% scored 1, 36.7% scored 2, and 41.25% scored 3. In the behavioral subgroup, 47.9% scored 0, 8% scored 1, 20.7% scored 2, and 23.07% scored 3 (Appendix Table 3, 4, 5).

Comparison of Clinical Characteristics and PEWS in Transferred vs. Non-Transferred Patients

No significant differences were found in age ($P = 0.081$) or ward length of stay ($P = 0.252$) between patients transferred to the PICU and those who were not. However, total PEWS scores and specific PEWS subgroups differed significantly between the two groups ($P < 0.001$) (Table 1). Higher PEWS scores were associated with increased likelihood of PICU transfer, indicating a correlation between clinical severity and need for intensive care.

Transfer rates by gender showed that 61.8% of boys and 38.2% of girls were transferred, but this difference was not statistically significant ($P = 0.472$). There was a significant relationship between transfer rates and the hospital ward of admission ($P < 0.001$), with patients admitted through the emergency department more likely to be transferred (Appendix Table 6).

Significant differences in transfer rates were observed across PEWS classifications: all patients in the red category were transferred, compared to 22.2% in the green category and 58.8% in the yellow category ($P < 0.001$) (Table

Table 1. Comparison of Clinical Characteristics and PEWS Scores in Transferred vs. Non-Transferred Patients

Variables	Not Transferred to PICU		Transferred to PICU		Total		*P*-value
	Mean	SD	Mean	SD	Mean	SD	
Age (year)	3.59	3.19	5.16	4.77	5.00	4.65	0.081
LOS in Ward (day)	3.38	1.92	4.55	4.13	4.42	3.97	0.252
LOS in PICU (day)	0.00	0.00	8.91	6.92	8.54	6.98	<0.001
Behavior / Neuro score	0.24	0.56	1.31	1.28	1.20	1.27	<0.001
cardiovascular score	1.18	0.95	2.21	0.87	2.11	0.93	<0.001
Respiratory score	0.65	0.79	1.91	0.99	1.79	1.04	<0.001
Total	3.00	1.54	7.34	1.82	6.90	2.22	<0.001

Table 2. Comparison of Patient Transfer to PICU According to PEWS Color Classification

PEWS Color Category	Transferred N (%)	Not Transferred N (%)	Total N (%)	*P*-value
Green	2 (22.2)	7 (77.8)	9 (5.3)	<0.001
Yellow	10 (58.8)	7 (41.2)	17 (10.1)	
Orange	28 (90.3)	3 (9.7)	31 (18.3)	
RED	112 (100)	0	112 (66.3)	
Total	152 (89.9)	17 (10.1)	169 (100)	

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2).

A total of nine patients (n = 9) died during hospitalization. All nine non-survivors were classified within the red PEWS category, indicating that all cases of mortality occurred among high-risk patients. This information has been added to the results to address the reviewer's comment.

Correlation Between PEWS and Length of Stay

PEWS scores showed a moderate positive correlation with LOS in the PICU (r = 0.41) and a weaker but significant correlation with ward LOS (r = 0.19). ANOVA revealed significant differences in PICU LOS across PEWS severity subgroups ($P < 0.001$). Post hoc LSD analysis showed that patients in the red subgroup had significantly longer PICU stays than all other subgroups, with no significant differences among the remaining groups (Appendix Table 7).

Multivariate Logistic Regression Analysis for Predictors of PICU Transfer

Multivariate logistic regression showed that PEWS remained a strong and independent predictor of PICU transfer across all models.

- ***Model 1 (Crude):*** PEWS alone predicted PICU transfer (OR = 2.92; 95% CI: 1.92–4.44; p < 0.001).
- ***Model 2 (Adjusted for ward of admission):*** PEWS remained significant (OR = 3.15; 95% CI: 1.93–5.16; p < 0.001). Patients admitted through the Emergency Department had the greatest likelihood of PICU transfer. Compared with ED patients:
  - General/Internal wards: OR = 0.046; 95% CI: 0.004–0.434; $P = 0.007$
  - Surgery ward: OR = 0.012; 0.0006–0.242; $P = 0.004$
- ***Model 3 (fully adjusted for ward, age, gender, and SpO_2):*** PEWS remained an independent predictor (OR = 3.17; 95% CI: 1.79–5.63; $P < 0.001$), indicating that demographic and clinical variables did not alter its predictive effect (Table 3).

The predictive performance of the models was excellent, with AUC values of 0.96 (Model 1), 0.98 (Model 2), and 0.98 (Model 3) (Figure 1).

Overall, these results confirm that PEWS maintains high predictive validity for PICU transfer even after adjustment for potential confounders, and that the Emergency Department is the highest-risk source of PICU transfers.

Using a two-sided test at a significance level of 0.05, the post-hoc power to detect an AUC of 0.95 compared with a reference AUC of 0.85 was 94.9%, based on a total of n = 169 patients.

Table 3. Logistic Regression Analysis of Factors Associated with PICU Transfer

		Model 1		Model 2		Model 3	
		OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)	*P*
PWES Score		2.92 (1.92–4.44)	<0.001	3.15 (1.93–5.16)	<0.001	3.17 (1.79–5.63)	<0.001
Ward	Emergency Dep.			Ref		Ref	
	General and Internal Medicine Wards			0.046 (0.004–0.434)	0.007	0.038 (0.003–0.427)	0.008
	Surgery Ward			0.012 (0.0006–0.242)	0.004	0.013 (0.0005–0.359)	0.01
	Referred from other hops.			0.033 (0.00008–13.96)	0.269	0.047 (0.00007–32.80)	0.363
Age	Age					1.04 (0.83–1.31)	0.731
Gender	Gender (Male ref.)					0.36 (0.05–2.70)	0.324
SpO_2	SpO_2					0.94 (0.75–1.19)	0.621
Constant	Constant	0.033 (0.005–0.224)	<0.001	0.201 (0.017–2.32)	0.198	N/A	0.662

Model1: Crude,
Model 2: Adjusted for ward of referral
Model 3: Adjusted for ward of referral, age, gender, and SpO_2

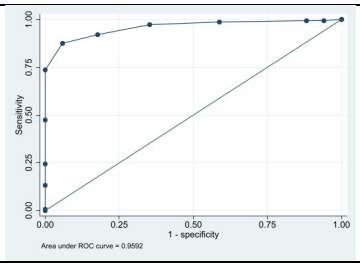
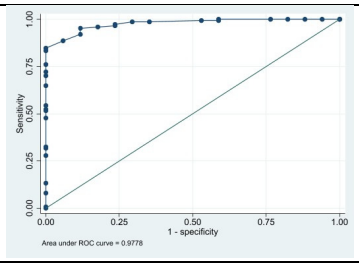
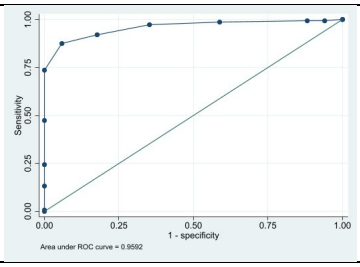
Models	Model 1 (Crude)	Model 2 (Adjusted)	Model 3 (Fully Adjusted)
			
AUC	0.96	0.98	0.98
95% CI	0.93 – 0.99	0.96 0.99	0.95 1.0000

Figure 1. Area Under the ROC Curve (AUC) for Crude, Adjusted, and Fully Adjusted Models

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Accuracy of Ward Head Nurses' and Families' Assessments for PICU Transfers

Using the PICU physician's evaluation as the gold standard, the ward head nurse's assessment demonstrated a sensitivity of 99.3%, specificity of 90.9%, positive predictive value (PPV) of 95.6%, and negative predictive value (NPV) of 58.8%. The family's assessment showed a sensitivity of 90.8%, specificity of 47.1%, PPV of 93.8%, and NPV of 63.6%. These results indicate that ward nurses' assessments align more closely with specialist evaluations regarding PICU transfer decisions than family assessments.

Discussion

PEWS are widely recognized as valuable tools for the early detection of clinical deterioration in hospitalized children, particularly in resource-limited and university hospital settings. In this study, we examined the relationship between PEWS and the rate of transfer to the PICU among children considered for PICU consultation.

Our findings demonstrated a significant association between total PEWS and its core parameters with PICU transfer rates: patients with higher PEWS scores were more likely to be transferred. This aligns with international literature, which generally supports the utility of PEWS for identifying children at risk of deterioration and facilitating timely intervention. For example, Lambert et al. conducted a meta-analysis of 90 studies, highlighting the widespread international adoption of PEWS in pediatric inpatient care and showing that it improves clinical and process outcomes by enhancing teamwork and multidisciplinary communication (8). Soeteman et al. focused on pediatric oncology patients, who are particularly vulnerable due to immunosuppression and treatment complications; their systematic review of nine studies found that PEWS had high sensitivity and specificity for detecting deterioration but also noted significant risk of bias due to heterogeneity in study designs (9). Chapman et al. recommended integrating PEWS into electronic health records (EHRs) to promote standardization and consistent use across clinical environments (10). Mortensen et al. observed that while PEWS is valuable in general pediatric populations, its application in neonatal care remains underdeveloped, highlighting the need for further research in this area (11). Although most studies support PEWS as an effective tool for assessing disease severity, Lee et al. reported that it is a poor predictor of PICU transfer (12).

Our study also observed that the majority of patients were classified in the red (critical risk) category, and all of these patients were transferred to the PICU. Notably, a substantial proportion of patients in the green and yellow categories were also transferred, often due to specific diagnoses such as diabetic ketoacidosis or poisoning, which require intensive monitoring regardless of initial PEWS categorization. This suggests that while PEWS is a useful screening tool, clinical judgment and consideration of underlying diagnoses remain essential in transfer decisions. Over-reliance on PEWS thresholds alone may risk overlooking patients in the low-risk categories, indicating that PEWS may underestimate risk in certain clinical contexts.

Excessive admissions to PICUs can lead to various complications and substantially increase healthcare costs. Although PICUs are designed to provide specialized care for critically ill children, unnecessary admissions may occur due to several factors. One major factor is the complexity of cases, as critically ill children often present with multi-organ dysfunction or severe conditions requiring input from multiple subspecialties. Other contributing factors include resident inexperience and uncertainty, inadequate initial assessments, misinterpretation of clinical severity, and systemic pressures to optimize resource utilization. Studies show that prolonged PICU stays can result in additional complications, especially for patients requiring invasive interventions such as mechanical ventilation, which is linked to a higher risk of functional impairment after discharge. Addressing excessive admissions requires a multifaceted approach, with early warning systems playing a crucial role in accurately assessing patient needs and ensuring the efficient allocation of healthcare resources (13-16).

Despite the widespread adoption and generally favorable performance of PEWS, several challenges persist. The lack of a universally accepted gold standard for pediatric early warning systems, coupled with the existence of multiple PEWS models with varying parameters and scoring algorithms, complicates efforts to standardize care and compare outcomes across institutions (17, 18). Furthermore, the accuracy and effectiveness of PEWS can be influenced by factors such as staff training, documentation practices, and the integration of PEWS into electronic health records.

Our hospital currently lacks a standardized system for early identification of at-risk pediatric patients, and our findings suggest that PICU consultations may be overutilized. Implementing PEWS as part of a comprehensive clinical assessment—supported by adequate training, standardized documentation, and integration with other monitoring tools—could empower clinicians to take timely action, streamline workflows, and reduce unnecessary resource use.

Conclusion

While PEWS is a reliable and standardized tool that enhances early detection of deterioration and supports timely intervention, it should not be used in isolation to decide PICU transfers. Clinical context, underlying diagnoses, and continuous patient assessment must be integrated with PEWS scores to guide appropriate and timely PICU admissions effectively.

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Conflict of Interests

The authors declare that they have no competing interests.

Authors' Contributions

N.A. study conceptualization, supervision, manuscript revision; M.A. data acquisition, manuscript revision

G.Gh. data acquisition; E.H. data acquisition, Manuscript Preparation; A.M. data acquisition & manuscript preparation; A.M. Study Design & Statistical Analysis, manuscript revision; and A.V. data acquisition.

Ethical Considerations

This study was obtained from the Research Ethics Committee of Iran University of Medical Sciences (IR.IUMS.FMD.REC.1402.072).

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None.

Data Availability

The data that support the findings of this study are available on request from the corresponding Author.

AI Use Statement

During the preparation of this manuscript, the authors used artificial intelligence (AI)-assisted tools only for language editing and improving clarity of the text. The authors reviewed and revised all AI-assisted outputs and take full responsibility for the accuracy, integrity, and originality of the manuscript.

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Appendix Table 1. Frequency of transfers from hospital wards to the PICU

Hospital Wards	N (%)
Emergency department	96 (57.1)
General ward	17 (10.1)
Infectious Disease Ward	13 (7.7)
Surgical Ward	12 (7.1)
Hematology & Oncology ward	11 (6.5)
Nephrology Ward	6 (3.6)
Endocrinology Ward	3 (1.8)
Neurology Ward	2 (1.2)
etc.	8 (4.8)

Appendix Table 2. Etiologies for PICU Admissions among Study Patients

Etiology	N (%)
Respiratory	70 (41.4)
Neurological	44 (26.0)
Infectious	29 (17.2)
Dehydration	22 (13.0)
GI	17 (10.1)
Malignancy	16 (9.5)
Endocrine	14 (8.3)
CVD	10 (5.9)
Nephrological	9 (5.3)
Mitochondrial/Genetic	5 (3.0)
Surgical	3 (1.8)

Appendix Table 3. PEWS Score Analysis in the Behavior Subgroup

Behavior	Frequency	Percent Within the score subgroup	Percent within total
playing/sleeping	35	43.2	
Alert at the patient's baseline	46	56.8	
Total	81	100.0	47.9
sleepy when not disturbed	13	100.0	
Total	13	100	8.0
increase in the patient's baseline seizure activity	1	2.9	
irritable, difficult to console or arouse	34	97.1	
Total	35	100.0	20.7
lethargic, Confused, flop	19	48.7	
reduced response to pain	2	5.1	
prolonged or frequent seizure	17	43.6	
Pupils asymmetric activity	1	2.6	
Total	39	100.0	23.07

Appendix Table 4. PEWS Score Analysis in the Cardiovascular Subgroup

Cardiovascular	Frequency	Percent Within the score subgroup	Percent within total
Normal heart rate for age	15	93.8	
capillary refill 2 seconds	1	6.3	
Total	16	100.0	9.47
HR>20 above normal range	22	91.7	
Pale	1	4.2	
capillary refill 3 seconds	1	4.2	
Total	24	100.0	14.2
R>20 above normal range	58	93.5	
capillary refill 4-5 seconds	4	6.5	
Total	62	100.0	36.69
HR>30 above NR	63	90.0	
Mottled	4	5.7	
CRT>5s	3	4.3	
Total	70	100.0	41.25

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Appendix Table 5. PEWS Score Analysis in the Respiratory Subgroup

Respiratory	Percent Within the score subgroup	Percent within total	Percent Within the score subgroup
Normal respiratory rate	26	100.0	15.38
RR>10 above N	35	94.6	
O2 therapy with mask<5 LIT	1	2.7	
Up to 1 L NC> patient's baseline need	1	2.7	
Total	37	100.0	21.90
RR>20 above N	38	71.7	
Moderate increased WOB (flaring, retracting)	2	3.8	
O2 therapy with mask>5 LIT&<10 LIT	9	17.0	
2 L NC> patient's baseline need	3	5.7	
apnea requiring repositioning or stimulation	1	1.9	
Total	53	100.0	31.36
severe tachypnea	7	14.6	
Severe increased WOB (head bobbing, paradoxical breathing)	8	16.7	
O2 therapy with mask>10 LIT or requires non-rebreathe	7	14.6	
>2L NC> patients baseline need	7	14.6	
Fio2>60	2	4.2	
Nebs even/30 min-1 hour	17	35.4	
Total	48	100.0	28.40

Appendix Table 6. Relationship between Hospitalization Departments with rate of Transfer to PICU

Ward	Transfer to PICU		Total
	No	Yes	
General	4 (23.5)	13 (8.6)	17 (10.1)
	1 (5.9)	1 (0.7)	2 (1.2)
Neurology	3 (17.6)	10 (6.6)	13 (7.7)
	4 (23.5)	8 (5.3)	12 (7.1)
Infectious	2 (11.8)	94 (62.3)	96 (57.1)
	0	11 (7.3)	11 (6.5)
Surgery	2 (11.8)	1 (0.7)	3 (1.8)
	0	6 (0.4)	6 (3.6)
Emergency	1 (5.9)	7 (4.6)	8 (4.8)
	17 (100)	151 (100)	168 (100)
Hematology	4 (23.5)	13 (8.6)	17 (10.1)
	1 (5.9)	1 (0.7)	2 (1.2)
Endocrinology	3 (17.6)	10 (6.6)	13 (7.7)
	4 (23.5)	8 (5.3)	12 (7.1)
Nephrology	2 (11.8)	94 (62.3)	96 (57.1)
	0	11 (7.3)	11 (6.5)
etc	2 (11.8)	1 (0.7)	3 (1.8)
	0	6 (0.4)	6 (3.6)
Total	1 (5.9)	7 (4.6)	8 (4.8)
P<0.001	17 (100)	151 (100)	168 (100)

Appendix Table 7. Association of ICU Length of Stay with PEWS Severity Categories

LOS in PICU (day)		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Green	Yellow	-0.42	3.28	0.899	-6.89	6.05
	Orange	-2.95	2.94	0.316	-8.76	2.85
	RED	-7.50450*	2.75	0.007	-12.93	-2.08
Yellow	Green	0.42	3.28	0.899	-6.05	6.89
	Orange	-2.54	2.25	0.261	-6.98	1.90
	RED	-7.08784*	1.99	0.000	-11.02	-3.16
Orange	Green	2.95	2.94	0.316	-2.85	8.76
	Yellow	2.54	2.25	0.261	-1.90	6.98
	RED	-4.55048*	1.37	0.001	-7.25	-1.85
RED	Green	7.50450*	2.75	0.007	2.08	12.93
	Yellow	7.08784*	1.99	0.000	3.16	11.02
	Orange	4.55048*	1.37	0.001	1.85	7.25

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