PEWS as a Risk Assessment Tool in Determining Admission Level of Care

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The Pediatric Early Warning Score (PEWS) was developed in Canada to quantify severity of illness in hospitalized children\(^1\).

It has not been studied as a risk assessment tool in determining admission level of care (LOC).
Objective

- To study the impact of the ED PEWS assessment of in-hospital level of care upgrades in patients admitted from our ED with respiratory complaints
# Color and Number Coding PEWS

**Pediatric Early Warning Score (PEWS)**

<table>
<thead>
<tr>
<th>Adapted from: Royal Alexandra Hospital for Sick Children, Brighton-Pediatric Early Warning Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavior</strong></td>
</tr>
<tr>
<td>Playing/Appropriate</td>
</tr>
<tr>
<td>Sleeping</td>
</tr>
<tr>
<td>Irritable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pink or Capillary refill 1-2 seconds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grey and mottled or capillary refill 5 seconds or above. OR Tachycardia of &gt;30 above normal rate</td>
</tr>
<tr>
<td>Pale or Capillary refill 3 seconds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grey or Capillary refill 4 seconds OR Tachycardia of &gt;20 above normal rate OR Bradycardia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respiratory</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within normal parameters, no retractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5 below normal Parameters with retractions and/or grunting. OR 60% FIO2 or 8+ liters/min.</td>
</tr>
<tr>
<td>&gt; 10 above Normal Parameters, using accessory muscles OR 30-40% FIO2 or 3+ liters/min.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; 20 above normal parameters retractions. OR 40% FIO2 or 6+ liters/min.</td>
</tr>
<tr>
<td>&gt; 20 above normal parameters retractions. OR 40% FIO2 or 6+ liters/min.</td>
<td></td>
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Score 2 extra for hourly nebulizers or persistent vomiting following surgery.

Green = 0-2 Score
Yellow = 3 Score
Orange = 4 Score
Red = 5 or > Score

1-31-06
The PEWS was instituted as a standard assessment after the attending emergency physician (EP) made a hospital admission decision for patients with respiratory complaints, though it was only applied when PEWS trained nurses were in the department.

A PEWS score of 3 or higher initiated a discussion between the PEWS nurse and the EP about admission LOC.
We retrospectively created a database of patients presenting with respiratory complaints the year before and the year after the institution of this policy. This created three cohorts: the Pre-PEWS group (PPG); the PEWS group (PG); and the No-PEWS group (NPG) (those in the PEWS era for whom PEWS was not assessed because the trained nurses were not available).
In each group, we analyzed the number of admissions, the admission LOC (floor, intermediate care unit, and pediatric intensive care unit) and the number of LOC “upgrades” after admission.
Results

PPG (2008 CY)

- 9,476 patients with respiratory complaints
- 8,021 discharged from ED
- 1,198 admitted patients
- 239 eloped/AMA/UTL
- 41 upgrades in care
  - Floor to IMC/PICU 33
  - IMC to PICU 8
- 3.4% chance of upgrade in care
Results

- Intervention period (2009 CY)
  - 14,691 patients with respiratory complaints
  - 12,723 discharged from ED
  - 1,476 admitted patients
  - 490 eloped/AMA/UTL
Results

- 2 groups: PG, NPG

PG
- 341 patients evaluated
- 3 upgrades in care (Floor to IMC/PICU)
- 0.88% chance of upgrade in care

NPG
- 1,135 respiratory patients not evaluated with PEWS
- 20 upgrades in care (Floor to IMC/PICU or IMC to PICU)
- 1.76% chance of upgrade in care