Irish Paediatric Early Warning System (PEWS)
Learning Outcomes

By the end of the session, you will be able to:

- Discuss the importance of clinical judgement and individualised assessment
- Discuss the use of PEWS in clinical practice
- Identify PEWS documentation
- Demonstrate effective use of PEWS charts
- Discuss the appropriate use of variance/modification within PEWS
Aim of PEWS

Assist recognition and response to deterioration

- Paediatric observation charts
- PEWS score
Why Children Die:
A Pilot Study 2006

May 2008
England (South West, North East & West Midlands),
Wales and Northern Ireland
DCU Systematic Review

- Systematic review of 11 clinical guidelines & 70 research articles
- Grey literature review & interviews
- Review of detection & response systems, implementation & economic impact
DCU Systematic Review

“positive directional trends in improving clinical based outcomes”

“there is no consensus and limited evidence about which PEW system is most useful or ‘optimal’ for paediatric contexts”
PEWS is...

Team work & Communication
Situation Awareness/Clinical Judgement
Decision aides
Family Involvement

PEWS chart & score
PEWS is not...

• PEWS does not replace:
  – Emergency response
  – Clinical concern
Paediatric Observation Charts

Escalation Guide
PEWS does not replace an emergency call

<table>
<thead>
<tr>
<th>Score</th>
<th>Minimum Observations</th>
<th>Minimum Alert</th>
<th>Minimum Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 hourly</td>
<td>Nurse In Charge</td>
<td>Any trigger should prompt increase in observation frequency as clinically appropriate</td>
</tr>
<tr>
<td>2</td>
<td>2 - 4 hourly</td>
<td>Nurse In Charge</td>
<td>Urgent medical review</td>
</tr>
<tr>
<td>3</td>
<td>1 hourly</td>
<td>Nurse In Charge + Doctor on call</td>
<td>Urgent review</td>
</tr>
<tr>
<td>4-6</td>
<td>30 minutes</td>
<td>Nurse In Charge + Doctor on call + Senior Doctor + Consultant</td>
<td>Urgent SENIOR medical review</td>
</tr>
<tr>
<td>7</td>
<td>Continuous</td>
<td>URGENT PEWS CALL</td>
<td>immediate local response team</td>
</tr>
</tbody>
</table>

*Pick score in any parameter unless review
PEWS does not replace clinical concern

ISBAR Communication Tool

Medical Escalation Suspension

<table>
<thead>
<tr>
<th>Date / Time</th>
<th>Suspension Conditions</th>
<th>Next Medical Review</th>
<th>Doctor Responsibility (if N/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Paediatric Sepsis 6

Recognition
2 or more of the following
- Core temperature ≥38.5°C or ≤35.5°C
- Inappropriate tachypnoea
- Inappropriate tachycardia
- Reduced peripheral perfusion
- Altered mental status
- Consider co-morbidities

Suspected or proven sepsis

Within 60 minutes

TAKE 3:
- IV or IO access and take blood samples
- Urine output measurement
- Early SENIOR input

GIVE 3:
- High flow oxygen
- IV/IO fluids & consider early inotropic support
- Broad spectrum IV/IO antibiotics
### Variance

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Parameters</td>
<td>6 Core Parameters</td>
</tr>
<tr>
<td>Additional Parameters</td>
<td>Total Score</td>
</tr>
</tbody>
</table>

**Decision Aides**

**Total PEWS Score**

**Addressograph**

**Ward**

**Consultant**
### Assessment of Respiratory Effort

<table>
<thead>
<tr>
<th>Airway</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stridor</td>
<td>Stridor at rest</td>
<td>Stridor at rest</td>
<td>Stridor at rest</td>
</tr>
<tr>
<td>Behaviour and feeding</td>
<td>Normal</td>
<td>Some/Intermittent irritability</td>
<td>Difficulty taking/trying Difficult breathing or eating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increased irritability and/or lethargy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Looks exhausted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unable to talk or cry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unable to feed or eat</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>Mildly increased</td>
<td>Respiratory rate in blue zone</td>
<td>Respiratory rate in pink zone Increased or markedly reduced respiratory rate as the child tires</td>
</tr>
<tr>
<td>Accessory muscle use</td>
<td>Mild intercostal and suprasternal recession</td>
<td>Moderate intercostal and suprasternal recession</td>
<td>Marked intercostal, suprasternal and sternal recession</td>
</tr>
<tr>
<td>Oxygen</td>
<td>No oxygen requirement</td>
<td>Mild hypoxemia corrected by oxygen</td>
<td>Hypoxemia may not be corrected by oxygen</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Gasping, grunting</td>
<td>Extreme pallor, cyanosis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Apnoss</td>
</tr>
</tbody>
</table>

**Event Record for PEWS score ≥6**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>PEWS</th>
<th>Nurse Initials</th>
<th>Alert</th>
</tr>
</thead>
</table>

**Addressograph**

**Ward**

**Consultant**

Aid to audit & handover

Respiratory assessment tool
## Triggers

<table>
<thead>
<tr>
<th>Core parameters</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nurse or family concerns</td>
<td>0,1,</td>
</tr>
<tr>
<td>2. Respiratory Rate</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>3. Respiratory Effort</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>4. Oxygen therapy (L+ pressure)</td>
<td>0,1,2 + 0,1</td>
</tr>
<tr>
<td>5. Heart Rate</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>6. AVPU</td>
<td>0,1,3</td>
</tr>
<tr>
<td><strong>Additional parameters</strong></td>
<td></td>
</tr>
<tr>
<td>7. SpO₂</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>8. Capillary refill time (central)</td>
<td>0,1</td>
</tr>
<tr>
<td>9. Blood Pressure (systolic)</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>10. Skin colour</td>
<td>No score</td>
</tr>
<tr>
<td>11. Temperature</td>
<td>No score</td>
</tr>
</tbody>
</table>
Using the PEWS chart

First time
- Addressograph x3
- Year
- Start date if present
- Planned frequency of observations
Using the PEWS chart

Every time

- Date, time of observations
- Nurse initials and NMBI PIN

As required

- Frequency of observations
- Event Record
Concern (clinical)

• What is concern?
• How should it be assessed?

Parental concern
If a family member expresses concern at the clinical condition of the child, this increases the weight of the total PEWS score. Significant family concern should merit appropriate consideration and escalation.

Ask...
- Does your child seem different to their normal self?
- Is it something you can see or feel?
- Is it something that your child is doing/not doing?

Do...
- S stop & listen
- U check your understanding
- N narrate your plan

• Dot if present, score 1
• Blank if not present, score 0
Airway + Breathing

- **Respiratory Rate** - RR
- **Respiratory Effort** – RE
- **Oxygen Therapy** – $O_2 T$ (mode, $O_2$, pressures)
- **Oxygen saturations** – $SpO_2$
Circulation

- Heart Rate – HR
- Central Capillary Refill Time – CRT
- Systolic Blood Pressure – BP
- Skin Colour (no score)

CCRT

Mean BP = x
Disability

- AVPU

<table>
<thead>
<tr>
<th>DISABILITY</th>
<th>AVPU</th>
<th>Alert</th>
<th>Voice</th>
<th>Pain</th>
<th>Unresponsive</th>
<th>AVPU Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Score '-' if not assessed and put a vertical line through column</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>If not Alert, consider GCS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
Exposure

- Temperature (no score)
- Urine output (no score)

Urine output notifiable to medical team if:
<1ml/kg/hr in <12 years or <0.5ml/kg/hr in >12 years of age
Recording the Observations

• Example column: ‘draw the dot, join the line’
• Baseline + trending essential in recognition
• Individual parameter score → total PEWS score

Consider
• Reassess within
Additional Information

- DNAR
- Blood/blood product transfusion
# Escalation Guide

**PEWS does not replace an emergency call**

<table>
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</tr>
<tr>
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<td>2-4 hourly</td>
<td>Nurse in charge</td>
<td>Nurse in charge review</td>
</tr>
<tr>
<td>3*</td>
<td>1 hourly</td>
<td>Nurse in charge + 1st Doctor on call</td>
<td>Urgent medical review</td>
</tr>
<tr>
<td>4-5</td>
<td>30 minutes</td>
<td>Nurse in charge + 1st Doctor on call</td>
<td>Urgent SENIOR medical review</td>
</tr>
<tr>
<td>6</td>
<td>Continuous</td>
<td>Nurse in charge + 1st Doctor on call + Senior Dr. +/- Consultant</td>
<td>Immediate local response team</td>
</tr>
<tr>
<td>≥7</td>
<td></td>
<td><strong>URGENT PEWS CALL</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Pink score in any parameter merits review

**PEWS does not replace clinical concern**
Urgent PEWS Call

- Response pathway to PEWS Score $\geq 7$
## Communication

<table>
<thead>
<tr>
<th>Identify</th>
<th>You</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Recipient of information</td>
</tr>
<tr>
<td></td>
<td>Patient</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Situation</th>
<th>“The situation is...“</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concerns, observations, PEWS score etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Background</th>
<th>“The background is...”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(age, reason for admission, relevant medical/surgical history, relevant current treatment/interventions)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment</th>
<th>“My assessment is...”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Give relevant ABCDE assessment information</td>
</tr>
<tr>
<td></td>
<td>What do you think the problem is?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>“My recommendation is...”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What do you need them to do?</td>
</tr>
<tr>
<td></td>
<td>Recipient should provide any necessary clinical instruction.</td>
</tr>
</tbody>
</table>
Documentation

- Management plans following review:
  - Impression
  - Plan for intervention
  - Plan for observations
  - Plan for review
  - Calling criteria
Variance

- Clinical judgement essential
- 3 levels
  - Special situations
  - Parameter amendments (chronic conditions)
  - Medical escalation suspension (agreement) (acute illness)
Special Situations

Special situations

• Transient, simple cause for PEW increase
• Nurse-led decision not to escalate
• Must be documented
• Must have reassessment within a short timeframe
Special Situations

Example...
Felix, age 6, admission post-tonsillectomy
• Observations 30mins following return to ward:
  o Felix crying that he is in pain
  o RR 34, HR 140, systolic BP 99
• Drug chart indicates paracetamol may be given

Total PEWS Score?
Reasonable action?
Amended Parameters

- **Senior** medical decision
- Pre-existing conditions
- Not for acute presentation
- Amended range scores 0
- Outliers trigger pink 3
Amended parameter example

<table>
<thead>
<tr>
<th>Parameter Amendment for Chronic Conditions</th>
<th>Date/Time</th>
<th>Clinical Parameters</th>
<th>New Acceptable Range</th>
<th>Next medical Review</th>
<th>Doctor Signature/Print name/MCRN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12·04·16</td>
<td>02 saturations</td>
<td>75-90%</td>
<td>1/52</td>
<td>Dr ###</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Medical Escalation Suspension/Agreement

- **Conditional**
- **Senior** medical decision
- Scoring due to current presentation/illness
- Wording: ‘**escalation not required if**’, ‘**no escalation provided**’ ... state **specific parameter ranges**
- Score appropriately – **continue trending and monitor for changes**
- Suspension of medical escalation only

- Caution in: cardiac conditions, newly admitted, newly discharged from PICU/ICU, on-call, non-respiratory parameters...
# Medical Escalation Suspension/Agreement

## Medical Escalation Suspension (agreement)

<table>
<thead>
<tr>
<th>Date / Time</th>
<th>State impression and specific parameter ranges that are acceptable</th>
<th>Next Medical Review</th>
<th>Doctor Signature/Print name/MCRN</th>
</tr>
</thead>
</table>
| Start date: 22/8 Start time: 03.30 | **Imp: acute asthma – new admission**  
**Escalation not required at PEWS 5-6 provided:**  
RR 25-45 RE Moderate (wheeze, I/C recession)  
SpO₂ ≥ 94%  
**Alert for change in condition** | 2 hrs (05.30) or sooner if any concerns | Dr ### |
| End date: 22/8 End time: 05.30 |                                                                                                                                  |                                                                                     |                                 |
| Start date: 22/8 Start time: 05.45 | **Imp: acute asthma – responding**  
No escalation required at PEWS 3-4 if:  
RR 15-35    RE Mild   No oxygen requirement  
SpO₂ ≥ 98% | 8 hours (14.45) or sooner if any concerns | Dr ### |
| End date: 22/8 End time: 14.45 |                                                                                                                                  |                                                                                     |                                 |
PEWS single 3 or ≥4 → Urgent medical review

Escalate concern as appropriate

PEWS Score ≤7 = Urgent PEWS pathway
Chart Completion – scenario 1

10 week old, poor feeding

RR 50
RE normal
No supplemental oxygen
HR 170
Mottled skin
Eye opening to mother’s voice, ‘flat’
Temp 39.5 °C

- What is the score so far?
- What needs to be done now?.............
Chart Completion – scenario 1

10 week old, poor feeding

Additional information:
SpO$_2$ 93%
Central CRT 3 seconds
BP 71/58
Chart Completion – scenario 2

8 year old with asthma

RR 55
RE moderate
Receiving O2 therapy of 2L/min (nasally)
SpO$_2$ 96%
HR 145
AVPU - agitated and uncooperative

Escalation suspension in place 3 hours ago, valid 1 more hour: RR 25-40, RE mod, SpO$_2$ >95
Chart Completion – scenario 3

13 year old with asthma

RR 35
RE mild wheeze + recession
no supplemental oxygen
SpO2 98%
HR 118
AVPU
Questions...
PEWS Key Points

• PEWS score is a tool, reliant on the human user
• Escalate clinical concern
• Escalation Guide, not protocol
• Use clinical judgement
The next slide is for Train the Trainer only
PEWS Training Tips

• - Who are you training?
• - Create schedule
• - Venue/ environment
• - AV requirements
• - Pre-course organisation