Recognising the deteriorating child:
The key to improving survival
• 7 year old girl with right hip / leg pain, fever, lethargy, vomiting
• 2 day history, gradually worsening
• Diagnosis of osteomyelitis, ? septic arthritis
• Admitted, bed blocked in ED
• Narcotic pain relief, 2 fluid boluses for tachycardia and hypotension
• Reviewed multiple times overnight and repeated documentation of “looks well”
• Escalation of care at AM ward round
• Decompensated septic shock
• Arrested on induction of anaesthesia
• Onto ECMO
• Survival
• Bilateral BKA for GAS necrotising fasciitis
Objectives

• Need to intervene early
• Recognition of deterioration as the central link in the “Chain of Prevention”
• Prevention of death AND morbidity
• Challenges specific to children
• Translation into practice
The Slippery Slope

"Between the Flags" intervention on the 'Slippery Slope' of patient deterioration.
Recognition of Deterioration

• National Standard 9 – ACSQHC 2012
• The Evidence
  • Adult and paediatric
  • EWS, MET
  • Prevention cardiac arrest rather than manage it
  • Improved outcomes in arrests
    • Identification in peri arrest period
    • Preparation of team and resources
    • Commencement during hypotensive bradycardia vs asystole
Recognising & responding to deterioration

Simple, yet surprisingly complex

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Early recognition and call for help
- to prevent cardiac arrest

Early CPR
- to buy time

Early Defibrillation
- to restart the heart

Post resuscitation care
- to restore quality of life
“Chain of Prevention”
Education

• Recognition of an acutely unwell / deteriorating child:
  • Standard healthcare professional education fails to adequately address this competency
  • Paediatric specific challenge
    • Difference in age translation of resuscitation skills vs recognition ability
  • Challenge of providing access to educational experience
Monitoring and Recognition
Recognition and Management of the Deteriorating Patient
A case study from an overseas coroner’s inquest

JD, a four-year-old boy with a past history of colostomy in the neonatal period for bowel perforation, attended a tertiary Children’s Hospital for elective colostomy reversal. The surgery and subsequent recovery from anaesthesia were uneventful, and the child returned to his surgical ward for routine post-operative care. Significantly, staff illness had resulted in only two registered nurses available to care for 24 patients overnight.

Figure. 3: Observation chart

<table>
<thead>
<tr>
<th>Time</th>
<th>Temp (°C)</th>
<th>Pulse</th>
<th>Respir</th>
<th>BP</th>
<th>O₂ U/min</th>
<th>S₉₀ (%)</th>
<th>Syringe Volume (mLs)</th>
<th>Infusion Rate mL/hr</th>
<th>NCAPCA Demands</th>
<th>Intravenous Bolus</th>
<th>Epidural Bromage Scale</th>
<th>Pain Score</th>
<th>Sedation Score</th>
<th>Comments / MAP</th>
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<tr>
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<td>37.2</td>
<td>114</td>
<td>23</td>
<td>99/55</td>
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<td>98</td>
<td>25</td>
<td>1</td>
<td>1510</td>
<td>1</td>
<td>46</td>
<td>0</td>
<td>52</td>
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<td>24</td>
<td>42/55</td>
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<td>27</td>
<td>1</td>
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<td>1800</td>
<td>1</td>
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<tr>
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<td>51</td>
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</tr>
</tbody>
</table>

Opioid Infusion Assessment Chart
Figure 4: Observations plotted on Children’s Early Warning Tool

The diagram shows various parameters such as respiratory rate, respiratory distress, temperature, heart rate, blood pressure, and capillary refill time. Each parameter is plotted over time, with specific values highlighted indicating observations. The CEWT Score section is also present, detailing actions based on the score ranges.
Cohort of 14014 hospitalised children (non ICU).

Across 2 hospitals: *Cincinnati Children’s & CHOP*


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Percentile curves for HR and RR in hospitalized children

## What is a Track and Trigger Chart?

Mandates a response once the patient's observations hit a designated zone.

<table>
<thead>
<tr>
<th>76</th>
<th>72</th>
<th>68</th>
<th>64</th>
<th>60</th>
<th>56</th>
<th>52</th>
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<th>44</th>
<th>40</th>
<th>36</th>
<th>32</th>
<th>28</th>
<th>24</th>
<th>20</th>
<th>16</th>
<th>12</th>
</tr>
</thead>
</table>

- **Mandated Emergency call**
- **Request medical review (30 mins)**
## Observation and Response

### Ox Saturation (%)
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: 93, 98, 97, 96, 94, 98, 97, 96
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:

### Respiratory Rate (breaths/min)
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: 22, 23, 24
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:

### Respiratory Distress (see legend over page)
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: No
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:

### Heart Rate (beats/min)
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: 100, 110, 120
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:

### Blood Pressure (mmHg)
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: 130/80, 120/70, 110/60
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:

### Temperature (°C)
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: 36.5, 36.5, 36.5
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:

### Level of Consciousness
- Date: 20/02, 03/02, 04/02, 05/02, 06/02, 07/02, 08/02
- Value: Alert, Normal
- Change: No
- Date of delivery: 2/2
- Device: Probes
- Signature:
Call for Help and Response
Summary

• Realising the benefits of early recognition of (paediatric) deterioration requires
  • Educated workforce
  • Supported by validated monitoring tools
  • Force function to trigger escalation of care
  • Systems in place to deliver escalated care
“It’s your ribs. I’m afraid they’re delicious.”