Kathy Duncan, RN, Director
Christine McMullan, MPA, Faculty
April 2011

These presenters have nothing to disclose

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Early Warning Scoring Systems

Kathy Duncan, RN, Director
Christine McMullan, MPA, Faculty
April 2011

These presenters have nothing to disclose
Kishwaukee Community Hospital

• Outcome of EWS testing:
  ─ Tool used: Modified Early Warning System (MEWS)
  ─ The MEWS was used by one nurse, during one shift on one unit.
  ─ The patient’s score was 3. This qualified as “yellow.”
  ─ This score recommended reassessment every 4 hours.

• Feedback from the nurse using the tool:
  ─ “The tool was quick and easy to use.”
  ─ The MEWS was used once during the shift.
  ─ The score adequately reflected the patient’s medical condition.

Saint Joseph’s Hospital, Atlanta Georgia

Outcome of EWS testing:

• Adult, Acute Care/step down, cardiac surgery, VAD, heart transplant
• Three nurses were solicited on two different day shifts.
  ─ Only one patient scored/compared from day one to day two.
  ─ All other patients scored on day two.
• Total of 10 patients scored
• What was the percentage of abnormal (e.g., yellow, orange, red) scores observed?
  ─ 5 green (50%)
  ─ 2 Yellow/Blue 20%
  ─ 2 Orange (20%) (one orange turned red the next day. This was scored on the second day, reflecting where the patient was on the first day, so we could compare)
  ─ 1 Red (10%) (pt orange day before) RN worried about patient all day and “RED validated that feeling. RN had the other orange patient and was pretty busy with 4 patient assignment
• Red patient was already being treated more aggressively when the nurse was asked to score the patient.
Saint Joseph’s Hospital, Atlanta Georgia

Feedback from nurse(s) using the tool:

- Yellow dot conflicted with our Falls precaution alert. Green, Blue, Orange and Red were used with blue replacing yellow.
- Tool very easy to use
- Staff identified the best place to visually display the dots so that everyone could view them, hence they loved the visual
- The score very adequately reflected the patient’s condition
- Frequency: One time use, but staff agreed that it could be done with vital sign frequency (every 4 hours)
- All agreed that a tech could document on the scale after they finish the vital sign gathering. LOC assessment may need to be stay with the RN. One tech surveyed and she agreed.
- Very positive view of proactive support from Rapid Response Team
- One major use identified:
  - Identifying which nurse/team had a more critically ill assignment
  - Visual validation of workload and possible justification to shuffle assignments or get more help from coworkers in the middle of shift.

Cardiac Stepdown Unit, Sparrow Hospital, Lansing, MI

Outcome of EWS testing:
1. Which tool did you test/adapt?
   - MEWS Code review
2. How was the tool tested? (e.g., one nurse, one shift, one unit)
   - 4 nurses, 1 unit, 1 shift
3. What was the percentage of abnormal (e.g., yellow, orange, red) scores observed?
   - 50%
4. What intervention was required as a result?
   - Physicians were already aware of patient condition. One patient will be getting a tracheostomy today for tumor obstruction. The second patient was a post rapid response patient from the previous day and she is being monitored with medication intervention.
Cardiac Stepdown Unit, Sparrow Hospital, Lansing, MI

Feedback from nurse(s) using the tool:
1. Was the tool easy to use?
   • All 4 nurse said very easy to use
2. What was the frequency of the assessment?
   • This assessment took less than 1 minute per patient
3. Did the score adequately reflect the patient’s medical condition?
   • The score was a good indicator of condition except in the area of level of consciousness. The tool does not factor in acute confusion or delirium. Patient can be alert but delirious and that may be a result of a serious medical change.

Feedback/Observations/Results of Testing

• Ease of use
• Frequency of assessment
• Intervention
  — Staff expertise
  — Medical treatment
• Patient outcome
One Size Does Not Fit All

- A tool working perfectly in another hospital may not work well in yours
- Modify the tool/process to fit your organizational culture/structure

Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

Data Speaks Volumes

- Patient outcomes
  - Mortality
  - RRTs/Code Blues
- Reliability
  - Using the tool correctly
  - Testing at frequency suggested

Questions
Early Warning Scoring Systems

IHI Expedition
Christiane Levine RN
Children’s Healthcare of Atlanta
Manager of Quality for Surgical Services

Who Are We?

- Our Hospitals:
  - Scottish Rite - Private
  - Egleston - Teaching
  - Hughes Spalding
- 520 Staffed beds
- Over 7,500 Employees
- In 2010 we had…
  - Over 74,800 Patient Visits
  - Over 195,000 Emergency Department Visits
  - Over 38,800 Surgical Procedures
Our EWSS Story

- 2007 Multiple deteriorations
- All with common causes: failure to recognize, escalate and treat.
- It got better, but One is not Zero
- Pilot of the PEWS

Our First Look

- Modifying the PEWS to capture a few of our ‘problem areas.’
- There are 7 areas with three points each.
- Tested it on charts of patients that we knew deteriorated.
- Kids will show signs of deterioration 6-8 hours before an event!

PEW score at 4 Hour Increments Prior to Significant Event

<table>
<thead>
<tr>
<th>Case</th>
<th>PEW Score 12 hours</th>
<th>PEW Score 8 hours</th>
<th>PEW Score 4 hours</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
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<td>C</td>
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<td>4</td>
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<td>E</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
</tbody>
</table>
### Pediatric Early Warning Score – PEWS

<table>
<thead>
<tr>
<th>Score</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavior</strong></td>
<td>• Lethargic, Confused, or Reduced Pain Response</td>
<td>• Irritable or Agitated and Not Consolable</td>
<td>• Sleeping, Irritable and Consolable</td>
<td>• Playing, Appropriate for pt.</td>
</tr>
<tr>
<td><strong>Cardiovascular</strong></td>
<td>• Grey or CRT 25 or Tachycardia 30 above OR Bradycardia for age</td>
<td>• CRT 4 seconds or Tachycardia of 20 above normal parameters</td>
<td>• Pale or CRT 3 Seconds</td>
<td>• Pink, CRT 1-2 Seconds</td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td>• 5 Below normal with retractions and/or ≥50% FiO2</td>
<td>• &gt;20 above normal, using accessory muscles or 40-49% FiO2 or ≥3 LPM</td>
<td>• &gt;10 above normal, Using accessory muscles or 24-40% FiO2 or ≤2 LPM Any initiation of O2</td>
<td>• WNL for Age No Retractions</td>
</tr>
</tbody>
</table>

* Add 2 points for frequent interventions (suction, positioning, O2 changes) or multiple IV attempts.

**Parental concern should be an automatic call to the Rapid Response Team**

**TOTAL**

**Most Critical**
- **Score ≥ 7 Assess q 30 mins.**

**Stable**
- **Score ≥ 6 Assess every 1 hour.**
- **Score 5 Assess every 1-2 hours.**
- **Score 0-4 Assess q 4 hours.**

### Physicians PEWS Survey

| **Playing/Appropriate (0)** | 0 |
| **Sleeping (1)** | 0 |
| **Irritable/Agitated (2)** | 2 2 2 2 2 2 2 2 9/13 2.31 |
| Lethargic/Confused OR Reduced response to pain (3) | 3 3 3 2 3/13 |
| Pink or Capillary refill 1-2 seconds (0) | 0 |
| Pale or Capillary refill 3 seconds (1) | 1 1 1 3/13 |
| Grey or Capillary refill 4 seconds OR Tachycardia of 20 above normal rate (2) | 2 2 2 2 2 2 2 8/13 1.92 |
| Grey or Capillary refill 5 seconds or above OR Tachycardia of 30 above normal rate OR Bradycardia (3) | 3 3 2/13 |
| Within normal parameters for age, no retractions (0) | 0 |
| >10 above normal parameters, using accessory muscles OR >50% FiO2 or ≥3 L/min (1) | 1 1 1 1 1 1 5/13 |
| >20 above normal parameters, retractions OR >40% FiO2 or 6-8 L/min (2) | 2 2 2 2 2 6/13 1.77 |
| 5 below normal parameters with retractions and/or >50% FiO2 (3) | 3 2/13 |

**Total PEWS Score**
- **8 5 5 7 7 5 7 5 8 4 6**
Was the Pilot Working?

![Escalations and Codes Graph]

Was It Working In the Long Run?

![Atlanta-Preventable Codes Outside the ICU Graph]
Putting the Competition Aside

- Inter-facility transfers—opportunity
- Reaching out to other hospitals
- Score of 6
- Do not need computerized documentation
- KISS and Commit

From this.....
PEWS Actions

<table>
<thead>
<tr>
<th>Score</th>
<th>Color</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>Green</td>
<td>Rescore with routine Vitals – notify for score of 3 in any single category</td>
</tr>
<tr>
<td>5</td>
<td>Pink</td>
<td>Notify, intervene and rescore Q2hr until improved</td>
</tr>
<tr>
<td>6</td>
<td>Red</td>
<td>Notify RRT, intervene and rescore Q1hr until improved</td>
</tr>
<tr>
<td>7 or more</td>
<td>Blue</td>
<td>Notify, intervene and rescore Q30 mins until improved</td>
</tr>
</tbody>
</table>

Children’s Healthcare of Atlanta at Hughes Spalding
Lessons Learned

- Vital sign ranges
  - 99.9% of the time…..
- Rapid Response Team incorporation
- Location and flow in Computerized Documentation
- Look at score!
- Look for ways to grow it: transport team, baseline for transfer from ICU or ER, pre and post procedure.

Questions?
Homework

- Using MEWS
  - Utilizing chosen tool and test tool on one nurse for the next two weeks and “unofficially” record results
  - Obtain feedback from nurse
    * was the tool easy to use?
    * how long did it take to assess the patient?
    * was score an accurate reflection of patient’s medical condition?
    * what medical intervention did the patient require?

<table>
<thead>
<tr>
<th>Patient #</th>
<th>Date</th>
<th>Time</th>
<th>Respiratory</th>
<th>Heart Rate</th>
<th>SBP</th>
<th>AVPU</th>
<th>Temp</th>
<th>Urine Output</th>
<th>EWSS</th>
<th>Intervention</th>
<th>Comments</th>
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