ACUTE HOSPITAL SYSTEM – AUDIT OF ADVERSE EVENTS

Acutely ill patient

REAL TIME INCIDENT MONITORING

POST HOC KEY PERFORMANCE INDICATORS
EFFECTIVE IMPLEMENTATION OF RAPID RESPONSE SYSTEMS

1. Triggering criteria
2. Response – 24/7 of at least one person with advanced resuscitation skills
3. Ownership and administration within a hospital
4. Education
   - Awareness – EVERYONE
   - Basic resuscitation – NURSES AND ON-SITE MEDICAL STAFF
   - Advanced resuscitation – MINIMUM 1 PERSON 24/7
5. Key performance Indicators (KPIs)
   - Measure problem
   - Track implementation and maintenance
   - Measure effectiveness

ALL IMPLEMENTED SIMULTANEOUSLY
MERIT STUDY

The MET system reduces mortality

RELATIONSHIP BETWEEN THE NUMBER OF MET CALLS AND THE RATES OF SERIOUS ADVERSE EVENTS

DOSE
- No. MET calls/1000 admissions

RESPONSE
- Deaths
  - Cardiac arrests
  - p<0.001

MET DOSE

• Definition = MET calls / 1000 admissions
• May take some time for “bedding in”

Courtesy of Rinaldo Bellomo & Daryl Jones
KEY PERFORMANCE INDICATORS

- Empower those running the system
- Inform those implementing the system
  - Universally accepted
  - Capture the “hearts and minds” of those who operate the system by feeding back relevant data in an aggregated and attractive form
  - Enables Hospital, Areas, Health Departments and Accreditation bodies to track the roll-out
  - Simple, inexpensive, intuitive, useful
  - Cultural drivers
KPIs
– MINIMUM STANDARDS

IMPLEMENTATION AND MAINTENANCE

• Number of emergency calls (DOSE) strongly correlates with deaths/cardiac arrests (RESPONSE)
• Number of calls/1000 admissions
KPI EFFECTIVENESS – MINIMUM STANDARDS

UNEXPECTED, POTENTIALLY PREVENTABLE DEATHS/1000 ADMISSIONS

- Unexpected – no DNR
- Potentially preventable – calling criteria within 24 h of death not responded to
EVIDENCE BASED / INTERNATIONALLY ACCEPTABLE and MINIMUM STANDARD KPIs

- Urgent calls/1000 admissions
- Deaths/1000 admissions
- Unexpected (without NFR order), potentially preventable (criteria not responded to) deaths/1000 admissions
- Cardiac arrests/1000 admissions
- Unexpected (without NFCPR order), potentially preventable (criteria not responded to) cardiac arrests/1000 admissions
OUTCOME INDICATORS

- Unexpected deaths
- Unexpected cardiorespiratory arrests
- Unanticipated admissions to ICU

+ PREVENTABILITY

IMPLEMENT CHANGE

Individual clinicians
Ward nurses
Departments
Hospital and Area committees
MET Calls for Liverpool Hospital

The MET is a team trained in advanced resuscitation. It can be activated according to predetermined criteria.

Table 1
Number of Hospital Admissions, MET Calls and MET Antecedents

<table>
<thead>
<tr>
<th>Clinical Category</th>
<th>Admissions</th>
<th>MET Calls</th>
<th>MET Criteria present in 24 hrs of event (MET Antecedents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>964</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>Medicine</td>
<td>2160</td>
<td>60</td>
<td>22</td>
</tr>
<tr>
<td>Womens and Childrens Health</td>
<td>957</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Mental Health</td>
<td>83</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Totals for Liverpool Hospital</td>
<td>4164</td>
<td>92</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 2
Number of MET Calls by outcomes

<table>
<thead>
<tr>
<th>Outcome of MET Calls by Clinical Category</th>
<th>Surgery</th>
<th>Medicine</th>
<th>Womens and Childrens Health</th>
<th>Mental Health</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unplanned ICU admission</td>
<td>6</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Death with no NFR</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Remained on Ward</td>
<td>16</td>
<td>42</td>
<td>2</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>Remained in Critical Care</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Total MET calls</td>
<td>29</td>
<td>60</td>
<td>2</td>
<td>1</td>
<td>92</td>
</tr>
</tbody>
</table>

Discussions

- May/Jun/Jul'01 and Jul/Aug'00 shows that the winter season results in higher MET Call activity.
- b
- c

Chart 1
Number of MET Calls for last 13 months

Chart 2
Reasons for MET Calls

Important Note: MET Antecedents means that MET Criteria was present within 24 hrs of event, BUT no MET was called or was not called in time.
OUTCOME OF MET PATIENTS

- In hospital mortality
  - Austin Hospital
    - One MET call (not NFR) $\rightarrow$ mortality = 16.6%
    - > One MET (not NFR) $\rightarrow$ mortality = 34.1%
    - Mortality of other patients
      - All ICU patients = 12%
      - All hospital patients < 4%

D. Jones, Austin Hospital
URGENT CALL DETAILS

- MRN
- Responder status
- Where call to?
- Why call?
- Intervention?
- Outcome?
- NFR status
DEATH

• NFR Yes/No
• Criteria within 24 hrs Yes/No
• Appropriate response Yes/No
23% of Medical Emergency Team calls over a 12 month period were appropriate for an NFR order

KPIs

• Inexpensive
• Easy to collect
• Meaningful
• Standardised
• Linked to other patient safety activities, eg death reviews

MUST BE AGGREGATED AND FED DOWN AS WELL AS UP

MOST IMPORTANT DRIVER OF SYSTEM
OTHER KPIs
EFFERENT LIMB FAILURE

- Medical Emergency Team Call
- Patient left on ward without NFR orders
- Cardiac arrest or death within 24 hours
PARTIAL EFFERENT LIMB FAILURE

- Medical Emergency Team call
- Patient left on ward without a NFR order
- Patient admitted to the Intensive Care Unit within 24 hours
DISPOSAL FAILURE

- Patient admitted to the general wards
- Medical Emergency Team call
- Cardiac arrest/dies and does not get admitted to the Intensive Care Unit within 24 hours.
PARTIAL DISPOSAL FAILURE

- Admitted to the general wards
- Medical Emergency Team call
- Admitted to the Intensive Care Unit
YOU WONT KNOW YOUR HOSPITAL HAS A PROBLEM UNLESS YOU MEASURE IT