Individualised rapid feedback reports lead to substantial improvements as part of a Trust-wide strategy to improve care of patients with Severe Sepsis

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The Problem
Severe sepsis has a high mortality and high healthcare costs. Rapid recognition by the Surviving Sepsis Campaign 1 led to initial work at Nottingham University Hospitals (NUH). Trust-wide audits in 2005 and 2010 2,3 showed significant deficiencies when compared with international guidelines, with 35% of cases receiving antibiotics in <1 hour and only 25% receiving basic pre-ICU interventions in a timely manner (See below).

By “time-lining” our response to severe sepsis (Figure 1), we identified system and process failures. Some system improvements (e.g. providing first-line antibiotics in acute areas) were straight-forward to tackle, but sepsis care remained reliant on individual clinician response. Equally, whilst dissemination of organisation level audit data raised the profile of sepsis, it appeared that individual clinicians did not view it as ‘their problem’.

The Intervention
Patients admitted to a critical care unit (58 beds, 4 units, 2 sites) with a primary admission diagnosis of infection were screened for severe sepsis. The pre-ICU care of patients who met criteria was then audited against the Surviving Sepsis Guidelines. Time zero is defined as when criteria for severe sepsis were first met.

Information on timings of key interventions (such as doctor review and request for critical care escalation) was also gathered. An individualised ‘traffic light’ report was then generated and emailed to the patient’s consultant and other stakeholders such as junior doctors or nurses involved in the patient’s care (Figure 2). We aimed to report cases back within 7 days of arrival to ensure the patient story was fresh in the clinician’s mind. A cumulative report is generated monthly to track organisation-wide performance.

The Results
Since November 2011, we have provided feedback on 300 severe sepsis cases. Antibiotic administration in <1 hour has risen from 40% to 75% (Figure 3), and ‘pre-ICU’ bundle compliance has risen from 25% to 60% (Figure 4). The number of reported sepsis related high level incidents has reduced. Since November 2012 all sepsis cases in our critical care units have been audited and fed back (30-35 cases/month).

The Outcome
This scheme has changed our audit concept from one of organisational statistic gathering to one that promotes personal accountability. Whilst we expected a mixed response to unsolicited feedback, the reality was actually very positive. By objectively highlighting poor and good practice, the system seems to be viewed as constructive rather than judgemental criticism.

By its nature, this initiative focuses on wards where sepsis is prevalent and has encouraged intense improvement efforts in A+E and Acute Medicine. Less acute areas have also engaged as even individual case reports can improve clinician behaviour.

Locally the concept of audit and individualised feedback is being adapted to other time dependent patient pathways. A system for time-lining care prior to emergency surgery is underway with an embedded feedback mechanism. We are also developing a similar reporting scheme for cardiac arrests. Nationally, evaluation of this initiative has been shared with Sepsis UK and we have already shared our audit proforma and reporting system with local healthcare providers.

In conclusion, individualised feedback on sepsis care has led to substantial improvements in guideline compliance.

Key Messages
- Rapid recognition and treatment of Severe Sepsis is highly reliant on individual clinician response.
- We aimed to change behaviour by developing a rapid audit and feedback mechanism at a large multisite UK teaching hospital.

Antibiotic administration in <1 hour has risen from 40% to 75% and ‘pre-ICU’ bundle compliance has risen from 25% to 60%

Figure 1: Timeline of care based on 2010 data (n=89)
It is recognised that individualised feedback can improve care, as pride and the competitive nature of healthcare workers drives improvement. This is especially true when adherence to recommended practice is low 4. We tried to change behaviour by creating a rapid audit/feedback mechanism that informed clinicians of their own response to the severely septic patient, from which they could learn and improve.

Figure 3: Compliance with antibiotics in <1hr

Figure 4: Compliance with Pre-ICU bundle

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Target Time (hrs)</th>
<th>Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Warning Score recorded and escalated</td>
<td>-</td>
<td>No CCOT referral</td>
</tr>
<tr>
<td>Doctor review</td>
<td>0.5</td>
<td>1 hr</td>
</tr>
<tr>
<td>Senior clinician review</td>
<td>2</td>
<td>1 hr</td>
</tr>
<tr>
<td>Blood cultures taken</td>
<td>1</td>
<td>1 hr</td>
</tr>
<tr>
<td>Broad spectrum antibiotics</td>
<td>1</td>
<td>3 hrs</td>
</tr>
<tr>
<td>Lactate measured</td>
<td>6</td>
<td>1.5 hrs</td>
</tr>
<tr>
<td>Adequate fluid resuscitation</td>
<td>6</td>
<td>1 hr</td>
</tr>
<tr>
<td>Escalation to critical care if patient fails to improve</td>
<td>6</td>
<td>6.5 hr</td>
</tr>
</tbody>
</table>

References