Improving the recognition and management of sepsis on the AMU

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Overview

Sepsis is a massive health problem, leading to 37,000 deaths annually in the UK. Ninewells AMU deals with approximately 20 cases of sepsis per week. It is recognised, through the work of the Surviving Sepsis Campaign and others, that globally, the quality of the recognition and management of sepsis is often poor and subject to large variation. In March 2012, as part of the Scottish Patient Safety Programme (SPSP), and under the direction of Tayside Sepsis Group (TSG) we implemented the Sepsis 6 resuscitation bundle, supported by a programme of education, daily consultant supervision, and real-time data collection and feedback, with the aim of reducing mortality from sepsis by 10% by December 2014. This has led to a sustained improvement in key indicators.

Methods

1. Bundle tool (final version below) tested using PDSA methodology then introduced on a grand scale.
   - Facilitates early recognition through “SEWS>4” and “suspected infection” triggers.
2. Formal teaching - doctors, medical students and nurses.
3. Data on 6 process measures, and time to first antibiotic. Initially collected retrospectively, then real-time.
4. Audit of missed cases (3 monthly), testing of doctor knowledge, and review of adverse events also used to facilitate improvement.
5. Feedback and encouragement provided directly on ward-rounds, and at daily multidisciplinary safety huddles.
6. TSG meetings and SPSP events provide further learning and support.

Results

1. Sustained improvement in key bundle elements and reduced variation. Antibiotic, fluid and oxygen compliance shown above.
2. Proportion of patients waiting > 2 hours for first antibiotic has fallen from 24% in first 6 months to 8% in last 6 months.
3. Improvement in cases of sepsis not triggering bundle from 50% to 20%. This improvement has been sustained.
4. Scenario-based survey showed that junior doctors were reliably applying SIRS criteria and clinical information to correctly identify sepsis.
5. Feedback from frontline staff has led to problem resolution and more intelligent use of the bundle. For example - obtaining adequate IV access, delivering amoxicillin by slow bolus rather than infusion bag, and prioritising “high impact” antibiotics such as gentamicin.
6. Balancing measures: (a) No increase in blood culture numbers or contamination rates. (b) 1 case of pulmonary oedema following fluid resuscitation. (c) 3 duplicate gentamicin prescriptions (1st dose given in Emergency Department) - highlighted at safety huddles and hospital wide risk alert issued.

Our Learning

We believe there are several critical success factors. (1) the bundle is a joint nursing/medical document and sepsis is recognised by all staff as a clinical priority; (2) the triggers for sepsis recognition are sensitive to “the deteriorating patient” and need for rescue; (3) the ward is adequately staffed and protocols exist that ensure all patients are seen in a timely fashion, and sick patients receive early senior review; (4) there is widespread senior clinical engagement at the coalface; (5) safety huddles have provided a local focus for learning and motivation; (6) TSG provides vital leadership and expertise and has raised the profile of sepsis across all acute settings in NHS Tayside.

Challenges Ahead

1. Improving antibiotic compliance will require a continued focus on simple measures such as communication, attention to IV access and antibiotic delivery methods and capturing new staff for education; though the greatest impact may come from higher nurse to patient ratios.
2. Acquiring good mortality data is difficult. Coding diagnoses are not accurate enough, therefore we have decided to use blood culture positivity (a good surrogate marker for sepsis) and will compare mortality rates before and after the intervention.
3. The greatest challenge perhaps is to ensure that we identify severe sepsis early and manage this high-mortality group effectively.
   An audit of patients with lactate > 4 on presentation is the first step to this goal. Getting the resuscitation bundle right is essential, but treating severe sepsis early using the sepsis management 6 and 24 hour bundles is equally important, if we want to make a real impact on sepsis-related mortality.

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