The Queensland Sepsis Collaborative - Improving sepsis recognition and treatment

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Background

- Sepsis is a global health priority associated with morbidity and mortality.
- The Surviving Sepsis Campaign (SSC) guidelines advocate time-based sepsis bundles to facilitate early recognition, and rapid initiation of treatment.
- Sepsis bundles have not been widely adopted because of variability in sepsis identification strategies, conflation of sepsis and septic shock and the potential for excess antimicrobial use.
- In Queensland, sepsis incidence was trending upwards and was represented in adverse events. Identification strategies were variable and there was no standardisation in sepsis treatment.
- The challenge is the timely and reliable adoption of this evidence into routine clinical practice.
- Queensland Health's **Could this be sepsis?** program used the Institute of Healthcare Improvement (IHI) Breakthrough Collaborative methodology to improve the speed of uptake, and reliability of sepsis bundles with the aim of reducing mortality associated with adult sepsis patient presentations to 14 public hospital Emergency Departments (ED).

Methodology

- **Study design**: Before and after study.
- **Study population**: All adult patients presenting to ED with symptoms and signs of sepsis suggestive of an infection, a positive blood culture, and with a sepsis ICD-10 code on admission were eligible for inclusion.
- **Intervention**: Introduction of a sepsis screening tool, treatment bundle and antibiotic (AB) guidelines (housed in an ED sepsis pathway).
- 1-hour septic shock and a 3-hour sepsis treatment bundle consisted of:
  - two sets of blood cultures with at least one collected prior to administration of ABs
  - lactate measured
  - administration of ABs
  - for those with shock, a fluid bolus, which was administered within an hour of recognition for hypotension.
- Resources provided, included education on the sepsis bundle and quality improvement (QI) methods.
- **Outcomes:** 1. process measures 2. clinical outcomes.

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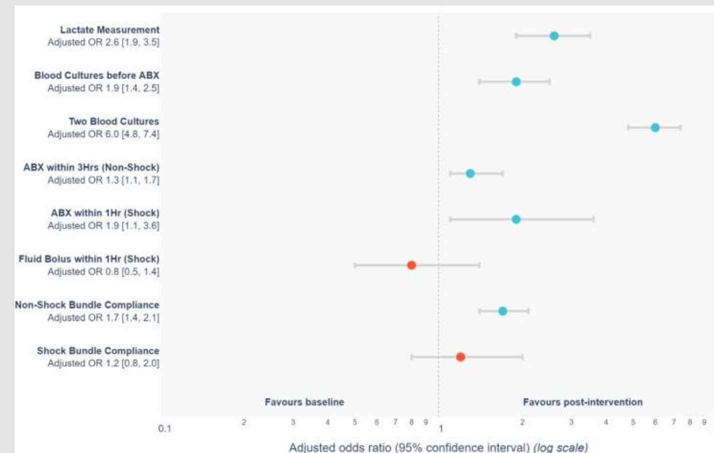
Results – Comparison to baseline

- Baseline phase was pre-intervention and compared with post-intervention
- Between 01 July 2017 to 31 March 2020, 1817 patients (739 baseline, 1078 post-intervention)
- **Process measures**: There was a significant improvement in the use of sepsis bundles in the post-intervention phase for lactate, blood cultures, AB administration within 3 hours of triage for sepsis and 1 hour of deterioration for septic shock and the three-hour bundle compliance in patients with sepsis.

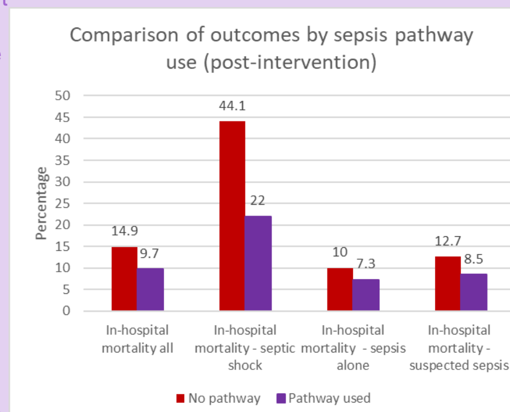


Results – Pathway use (ad hoc, post-intervention)

The ED sepsis pathway was present in the medical record and had documentation (as a proxy measure for pathway use) for 61.7% (651/1078) of the post-implementation population.

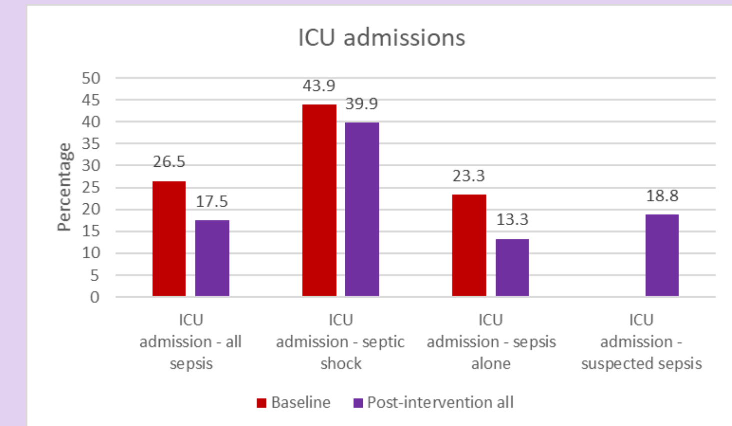
If the sepsis pathway was used, there was a:

- significant trend towards a greater compliance with the sepsis bundle
- significantly lower mortality rate in the overall cohort and in the subgroup of septic shock (9.6% vs 14.8%, OR 0.6, 95% CI 0.4 to 0.8).



Clinical outcomes: When compared to the baseline, there was:

- a significant reduction in Intensive Care Unit (ICU) admission rates (26.4% vs 17.3% (OR 0.5, [95%CI 0.4 to 0.7])
- a nonsignificant improvement in the proportions of appropriate antimicrobial prescription at baseline and post-intervention respectively were 55.4% vs 64.1%, (OR 1.4 [95%CI 0.9 to 2.1]). (nested cohort)
- no significant differences in-hospital and 30-day post discharge mortality between the two phases.



Conclusion

The Queensland Sepsis Collaborative resulted in improved uptake of a 1-hour septic shock and a 3-hour sepsis bundle and a reduced need for intensive care admission in patients presenting to the emergency department with bacteraemia and sepsis. There was no adverse impact on antimicrobial use.

Acknowledgements

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