Intensive and Critical Care Nursing (2015) 31, 100—105

Available online at www.sciencedirect.com

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journal homepage: www.elsevier.com/iccn

A national quality improvement initiative for reducing harm and death from sepsis in Wales

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Received 24 March 2014; received in revised form 14 November 2014; accepted 19 November 2014

KEYWORDS
Care bundles;
Critical Care Outreach;
NEWS;
Sepsis;
Sepsis 6;
Reliability

Summary
Aims: The Rapid Response to Acute Illness (RRAILS) Programme is a quality and service improvement initiative which is participated in by all Welsh healthcare organisations including the Welsh Ambulance Service Trust (WAST) and Velindre Cancer Centre. The aims of the programme were and are:

Implementing the National Early Warning Score (NEWS) as standard in all clinical areas in all 18 acute hospitals.

Quantifying the incidence of sepsis and acute deterioration in the non Critical Care setting.

Improving reliability of systems for identification, escalation and treatment of sepsis.

Demonstrably improving outcomes from sepsis and other causes of acute deterioration.

Methods: Clinical teams participated in learning sets at which they were trained in service improvement and human factors principles and then supported to implement 'bundles' of best evidence whilst measuring both processes and outcomes.

Findings: All organisations have implemented standardised tools and operating procedures including NEWS, sepsis screening tools, Patient Status at A Glance (PSAG) boards, sepsis response bags and an antibiotic formulary.

All organisations have demonstrated improvements in the reliability of detection and escalation of acute deterioration whilst many have started to demonstrate local improvements in outcomes.

Conclusion: The collaborative learning set is an effective method for improving quality of sepsis care throughout a single healthcare economy.
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http://dx.doi.org/10.1016/j.iccn.2014.11.004
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Implications for clinical practice

- Effective sepsis treatment requires reliability in systems for identification and escalation of acute illness.
- High reliability in clinical systems can be achieved by using human factors principles to improve communication and situational awareness.
- Rapid feedback of 'good enough' measures can positively affect behaviours.

Introduction

Wales is a principality within the UK which operates as a discrete healthcare economy serving a population of approximately 3 million people. This population is concentrated on the north and south coastal areas where there are 18 acute and tertiary hospitals with more geographically disparate areas being supported by community hospitals and large nursing care homes. Sepsis and severe sepsis have been appreciated as major causes of harm and death within Welsh healthcare for some time but historically, have been mainly seen as the preserve of Critical Care Units and therefore, poorly understood and addressed in the acute clinical area.

The Rapid Response to Acute Illness (RRAILS) programme was launched in 2010 as part of the Welsh 1000 lives patient safety and quality improvement campaign, with the intention of improving the recognition of and response to acute deterioration and sepsis by spreading and implementing quality improvement methodologies and applying the principles of 'critical care without walls'. The programme facilitated collaboration between Critical Care Outreach Teams (CCOTs), resuscitation officers, acute care physicians and clinical nurses and doctors at an all-Wales level and, supported clinical teams to improve services locally.

The designation by Welsh Government of sepsis as a Tier 1 priority for NHS Wales in 2013 mandated actions on the part of the eight Health Boards and Trusts in Wales, accelerated the pace of the programme and expanded the scope of the project to include primary and community care settings.

Sepsis is a time critical, potentially fatal condition resulting from an overwhelming inflammatory response to infection. A large European study found mortality from sepsis to be 36% (Vincent et al., 2006) whilst in the UK sepsis is estimated to cause the deaths of 36,800 people annually at cost to the National Health Service of £2.5 billion (Daniels, 2011). These figures are derived from Critical Care data and are therefore likely to be markedly underestimated but nevertheless sepsis is responsible for more deaths in the UK than any single cancer and more than from bowel and breast cancer combined.

Sepsis accounts for a large number of bed days and is a major cause of death on the Intensive Care Unit (ICU) (Vincent et al., 2006) and this has led to the view that sepsis is the concern primarily of Critical Care. However, collaborative work carried out under the auspices of the Surviving Sepsis Campaign (Levy et al., 2010) has demonstrated that mortality and adverse sequelae can be profoundly reduced by the early identification and treatment of sepsis in the pre ICU environment.

The Surviving Sepsis Campaign advocates the delivery of antibiotics within one hour of recognising sepsis (Dellinger et al., 2013). In the UK, this aspirational target on antibiotic delivery has been collated with the administration of oxygen, Intravenous (IV) fluids, taking of blood for culture and lactate measurement and urine output monitoring and labelled as the 'sepsis 6'. The reliable delivery of the sepsis six within one hour has been shown to have a significant effect upon mortality (Daniels et al., 2011). It is accepted as the standard immediate treatment protocol for sepsis in all Welsh hospitals.

However, reliance on this one intervention is not enough. A recent UK Parliamentary and Health Service Ombudsman report 'Time to act' (2013) detailed the significant delays and unreliable delivery of care within patients' pathways. This echoes the findings of The National Confidential Enquiry Into Patient Outcome and Death report 'Time to intervene' (NCEPOD, 2012) which identified significant failings in the reliability of recognition of acute deterioration, escalation to the appropriate level of response and rapid treatment in patients who went on to suffer cardiopulmonary arrest (NCEPOD, 2012).

Therefore, in order to tackle sepsis in the clinical environment it is necessary to ensure the reliability not just of the delivery of the 'sepsis 6' but also of the systems for identifying when a patient is in the early stages of deterioration, communicate this to other members of the team and initiate a comprehensive and multidisciplinary response. A fundamental first step in achieving this reliability in Welsh systems was seen as the implementation of a common Early Warning Score (EWS) and, as the National Early Warning Score (NEWS) has been evaluated as superior to other EWSs in predicting death within 24 hours (Prytherch et al., 2010; Kellett and Kim, 2012), it was chosen.

The decision to standardise NEWS in Wales was taken by the Welsh Medical Director and Chief Nursing Officer following consultation with the all Wales Medical Directors and Directors of Nursing groups and implemented through the RRAILS programme.

The four main aims of this programme have therefore been:

- Implementation of NEWS in all acute hospitals
- Quantifying the incidence of sepsis and acute deterioration in the non Critical Care setting
- Improving reliability of systems for identification, escalation and treatment of sepsis
- Demonstrably improving outcomes from sepsis and other causes of acute deterioration.

Methods

A national steering group was established to coordinate, advise and guide the programme. It was chaired by an acute physician with all Welsh healthcare organisations

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