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## Critical Care Response Team

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### Background

Ontario's 12.54 million residents constitute 38.9 % of Canada's population (Statistics Canada 2005). The province is one of 10 Canadian provinces responsible to deliver federally mandated healthcare. Three Canadian territories receive federally managed health services. The Ministry of Health in Ontario (MOH) funds acute care hospitals across the province ranging from small community sites to large multi-site and Academic Health Science Centres (AHSC). Critical care resources and expertise are accessed, when required, through organised referral and transfer systems.

The tipping point for Ontario's much needed critical care transformation was reached in 2003 through the convergence of key factors: the crisis of severe acute respiratory syndrome (SARS), and the advancing demographic wave of 'boomers'. The result was the creation of a provincially funded Critical Care Strategy.

#### Critical Care Response Teams

Critical Care Response Teams (CCRTs) in Ontario are a major component of Ontario's critical care strategy. Currently, there are 3 distinct branches of the critical care response team initiatives. The first and largest branch is intensivist-led teams at select adult acute care hospitals. The second is a paediatric CCRT demonstration project and the third is a demonstration of three distinct alternative model CCRTs, with variable funding and responder processes.

#### Intensivist-Led CCRTs

Ontario's intensivist led critical care response team structure is a hybrid of successful rapid response system models from the UK and Australia. The CCRT incorporates the outreach and education functions of many UK teams and the rapid response function of Australian medical emergency teams. The Ministry of Health and Long Term Care engaged clinical experts who had been involved in the pilot projects as well as many other clinical initiatives. This resulted in a project plan and budget for a four site demonstration project, which within a year was expanded to a 23 site roll out of critical care response teams which has now expanded to a total of 27 intensivist led teams across Ontario.

The first focus of CCRTs was on the hospitals that served as provincial critical care resources. This decision was consistent with the critical care strategy's focus on access, quality and having the resources work as a system as opposed to a collection of independent entities with mutually exclusive responsibilities.

The ICUs needed to be:

• Closed and intensivist managed

• Composing 12 or more beds capable of supporting mechanical ventilation

• Offer 2 ICU based services: (1) A designated trauma centre, neuro-critical care or transplant centre (2) Have advanced ventilation capacity, large ICU (> 19 beds, ICU based renal replacement therapy

• Have strong clinical leadership

• Have enough nurses to operate the ICU and a CCRT

• Be open to CritiCall, the agency that locates resources (speciality, physician, diagnostics, bed) for critical care patients who require transfer

The intensivist led teams in Ontario are funded to provide the staffing compliment to successfully implement a Rapid Response System within participating hospitals. An awarded CCRT funds a physician leader, a Co-Lead, 4 – 5 full time CCRT responders and the availability of a 24/7 intensivist. In addition, the MOH commissioned the Canadian Resuscitation Institute to develop and deliver a two-day CCRT course for CCRT responders (ICU RN's or Registered Respiratory Therapists (RRT's). The course provided review and practice of the assessment and resuscitation skills as well as crisis resource management skills, which are likely to be needed in dealing with a deteriorating patient on the ward.

The implementation of the teams across the newly funded sites attempted to balance structure with flexibility, and central control with local application. A phased implementation was mandated. The first six months (Phase I), were devoted to team selection, CCRT responder education, physician engagement, and hospital-wide education and marketing.

Phase II was a twelve-week preceptorship period where an intensivist was funded to provide service and focus on assessment and resuscitation skills of the team in the ward setting; funding for three of the CCRT responders to work with the intensivist each day was put in place to optimise individual and group learning opportunities. The CCRT service was available weekdays from Monday through Friday. The CCRT during this period responded to consults, followed patients discharged from the ICU and continued to in-service ward staff. Phase III was the start of 24/7 service.

Throughout the first year regular biweekly teleconferences were held to provide a forum for sites to learn about and discuss many issues and decisions related to their CCRTs. Although there were clear expectations for the team it was also acknowledged that this was and remains a new service model in Ontario. The rapid response of critical care experts to the bedside is believed to be a model of teamwork and mutual education; and this may impact how other hospital care teams function. CCRT's also put patient safety initiatives at the fore for each hospital and impacted many hospital services and activities.

The effectiveness and success of many patient safety initiatives, including CCRT's, require a change in culture. Sharing strategies and techniques, continued engagement of stakeholders, data analysis and feedback are integral to shift culture. All sites were required to submit baseline data of their cardiac arrest rates (defined as the provision of CPR), mortality rates, ICU Length of Stay (LOS) rates and 48-hour readmission to the ICU rates. Once service began, every patient visit required a small data set be entered on a provincial web based Critical Care Information System. Data analysis and report development are an ongoing process and will lead to development of benchmarks.

**Results**

Uptake of service, which is the number of consults per 1000 inpatient admissions, averaged over 30 consults per month from the beginning of 24/7 service. This is an important key indicator. What has been consistent in the literature regarding Rapid Response Services is that the teams must be utilised in order to have an impact.

Although not all sites that began full service February 2007 have had changes in key indicators (cardiac arrest, mortality, 48-hour readmit, ICU LOS), most sites have had changes in at least one indicator. Deeper review and understanding as to what the data is telling us about the project overall and about specific sites will be undertaken iteratively and in discussion with sites. In addition, sites have begun to do data analysis of their own data linked with other internal data around issues and found a variety of benefits they believe are attributable to the CCRT.

**Paediatric CCRTs (PCCRTs)**

Ontario has five paediatric AHSC's, four of which are in their second year of a demonstration project. The implementation, education, practice and intensivist leadership mirror the adult CCRTs.

Early review of the initiative led to the development of an extramural PCCRT service component outside of their immediate hospital. The CCRT intensivist receives calls, from community hospital physicians seeking management and transport advice regarding critically ill children. The extramural PCCRT service processes have been developed and refined in partnership with CritiCall and ORNGE. CritiCall is Ontario's service that supports physicians to access urgent and emergent care and is reached through a toll free telephone number. ORNGE provides transport for critically ill people in Ontario.

In addition to ensuring that no emergency room physician is left without consultant support when caring for an urgent or emergent critically ill child, the evaluation of the service will provide opportunity for quality improvement and critical incident review to further strengthen processes.

**Alternative Model CCRTs**

The essential ingredients of a rapid response system are: increase early recognition of deterioration; develop processes for alerting a responder, and designation of skilled responder.

A demonstration model is underway to test the feasibility of three different ways to provide critical care response services. The goal of the alternative model demonstration project is to develop service models that will improve patient outcomes through the timely access to critical care expertise and provide the ministry with a clear understanding of the cost for each model and what deliverables can be expected.

Five community hospitals with varying ICU resources are working with the ministry:

• Three hospitals are implementing a nurse education model

• One hospital is implementing a hospitalist led response model

• One hospital is implementing an ICU MD model.

All models have a site lead physician and a site colead nurse or respiratory therapist. The sites are working closely with the ministry to develop evaluations particular to their alternative model.

**Conclusion**

The rapid uptake of CCRT services at all hospitals within the project and the universally positive feedback from providers and users supports the belief that the introduction of these teams meets a significant need in hospital wards. The commitment of stakeholders in Ontario is to stay the course while we await evidence of long-term clinical improvements. At the same time we will work to continuously strengthen the quality and sustainability of the service through collaborative development, quantitative and qualitative evaluation.

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