Critical care response teams: potential roles for emergency physicians

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Objective

To outline, with specific reference to a newly announced Ontario initiative, the potential roles for emergency physicians in the formation and implementation of critical care response teams in Canadian hospitals.

Background

Critical care response teams (CCRTs), also known as medical emergency teams, have been described in the medical literature since 1995 and promote a hospital-wide approach to preventive strategies aimed at patients at risk for unexpected death, cardiac arrest and unplanned intensive care unit (ICU) admissions.[1] Such teams are typically composed of intensive care physicians, nurses and respiratory therapists who are available 24/7 to bring critical care expertise to the bedside of patients outside of ICUs. The purpose of CCRTs is to improve the early care of critically ill or deteriorating patients in order to improve outcomes and potentially reduce the rate of, or shorten the duration of, ICU admissions.

Introduction of critical care response teams to Ontario

On Jan. 30, 2006, the Ontario Health Minister announced the provincial government's intention to create CCRTs in 26 Ontario hospitals, as part of a new "Critical Care Strategy."[2] The Ontario government intends to invest $29.4 million into this initiative. The Minister stated that the creation of CCRTs in Ontario "demonstrates the government's willingness and commitment to ensuring that not only Ontarians receive the critical care they deserve, but that they receive it in the most timely manner possible."[2]

Pilot programs in 4 Ontario hospitals cite a 30% decrease in in-patient cardiac arrests, a reduction of average ICU length of stay from 7 to 2 days, and a reduction in mortality from 14% to 8% due to CCRTs.[3]

The Ontario CCRT program stipulates that intensive care physicians act as team leaders in hospitals with critical care programs. However, in hospitals without enough intensive care physician availability to meet the manpower needs of this stipulation, innovative solutions may include the use of other physicians with critical care expertise as team members or leaders, including emergency physicians (EPs). This represents a new and exciting opportunity for EPs to contribute their critical care skills and teamworking abilities with intensive care colleagues in a new care context.

Have CCRTs worked elsewhere?

The literature on the successes of CCRT implementation programs is sparse and varied. A review of recent publications reveals a mix of study designs and varied success at reducing in-hospital cardiac arrests, unplanned ICU admissions and unexpected deaths.[4,5] Despite mixed clinical

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benefits and numerous operational issues, CCRT programs present opportunities to break down cultural barriers and empower health care providers to identify deteriorating patients and optimize patient care. When EPs initiate life-saving therapies in the ED, early transfer of care to CCRT intensivists might ensure that critically ill patients are appropriately managed while other patients are attended to.

A proven success story: sepsis care

The pioneering work of Rivers and colleagues in early goal-directed therapy (EGDT) for sepsis[6] is an excellent example of integrated ED-ICU management that has been successfully implemented outside of the original study location.[7,8] EGDT protocol implementation has been promoted in the "Surviving Sepsis Campaign" guidelines[9] and the emergency medicine literature.[10–14] However, even unmistakably successful interventions like EGDT can be slow to be adopted, as Rivers described at the Henry Ford Hospital EGDT study site, where there was nearly a 2-year delay before widespread or hospital-wide "buy-in" occurred.[15]

What are the future roles for EPs in CCRTs?

There is an abundance of opportunities for EPs, particularly those with critical care interest or certification,[16] to take on leadership roles as CCRTs are developed and implemented. Some potential opportunities include:

1. ***Participation in external validation studies of proven or novel therapies in different environments or models***. The implementation of CCRTs permits observational "before–after" studies to examine the effectiveness of the various interventions administered. Confirmation of the universal benefit of therapies also conveys greater generalizability of the intervention involved. EPs who participate in such research can become institutional leaders in promoting advanced critical care and gain the opportunity to publish their success stories. Examples of such successes in sepsis care were presented at the 2005 American College of Emergency Physicians Scientific Assembly.[17,18]

2. ***Educational opportunities and research for ED staff***. Implementation of CCRTs with emergency medicine leaders creates opportunities for knowledge translation activities that are developed and taught by emergency medicine leaders, and targeted for EPs. Subsequent practice audits or other educational research activities can then measure the success of such interventions as a component of continuous quality improvement.

3. ***Continuous quality improvement (CQI).*** The implementation of CCRTs provides an excellent opportunity to study care processes that affect CCRT-designated patients. A recently published guideline for uniform reporting standards of data for CCRTs merits review by developers of upcoming and newly developed programs.[19] The Surviving Sepsis Campaign provides no-charge technical support to participating institutions in order to implement information database systems for tracking sepsis bundle quality indicators.[20] In addition, the tools used to track quality indicators for these programs can be expanded to capture other quality assurance data that accrediting bodies use to assess ED performance.[21] The participation of emergency medicine leaders in creating such databases for maintaining high-quality data input, and scheduling routine data analyses are key components of ED CQI activities and individual physician continuing medical education.

4. ***Team-building within the hospital and academic community.*** The previously discussed studies highlight the successes of EGDT as a pathway to improved collaborative and collegial activities in patient care and interdepartmental relationships. Bacause emergency medicine is a relatively young specialty in Canada, CCRT participation provides an opportunity for emergency medicine leaders to be further recognized as specialist peers. It is no longer acceptable for EPs to be ignored in academic research involving the ED or ED patients, as outlined in a position paper by Worster and coworkers.[22] In both clinical and academic environments, EP participation in CCRT leadership roles benefits the credibility profile of emergency medicine both within institutions and as a whole.

What CCRT models work best for emergency medicine participants?

One question that persists is this: How can a busy, shift-working EP participate as a CCRT leader? There are a number of models that may be feasible:

1. ***CCRT "On Call"*** — The physician leader is "on call" for a predetermined period of time (e.g., 24 h), during which time the leader responds to pages triggered by activation protocols, comes to the patient bedside in the hospital, and initiates appropriate critical therapies.

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This model may be attractive, assuming activation protocols are approved and a funding model is established. For example, to be on call for 24 hours, physicians usually require a stipend, plus an extra fee if they actually come to the hospital and provide services. Any such arrangements require advance agreement by the involved institutions and all interested parties.

2. ***CCRT "Service"*** — Once a patient is appropriately resuscitated, he or she may not require ICU admission, but will still need ongoing intensive care on a ward. One model of care involves a CCRT "attending" physician for a week, who rounds with team members throughout the hospital and responds to day calls, and then turns over call duties to the CCRT "on call" physician at night. With minor variations this practice is consistent with models already in place in many academic or other closed ICU institutions. Whether or not EPs would or could commit to such a role would depend on scheduling issues in the ED, remuneration agreements, and their personal comfort level in providing ongoing "critical" care over several days. This is a model that has been successful for the trauma services at many tertiary care hospitals and may be adaptable to a CCRT service.

These are just 2 potential models in which EPs can adopt leadership roles. Undoubtedly other such models can be created. The important underlying principle is for EPs to participate in CCRTs in as many ways as they can, both for the optimization of patient care and to enhance the profile of emergency medicine among our colleagues. A recent letter by Brindley and associates[23] called for the seamless cooperation of EPs with their ICU counterparts in critical care situations, and called for greater leadership and funding to support these activities.

Conclusions

CCRTs are a new interface of critical care for hospital patients, based upon the concept of "roving" resuscitation teams that respond to impending critical care situations outside of the ICU environment, and intervene to reverse the patient's deterioration in hope of improving outcomes and avoiding or shortening an ICU admission. Although CCRTs are traditionally led by ICU intensivist physicians, as more of such teams are established in Canadian hospitals, manpower shortfalls in the intensivist physician group may require innovative solutions and recruiting of other critical care providers to fill these shortfalls. In this capacity, EPs now have a unique opportunity to participate in, and obtain the many benefits from, these activities. The ongoing implementation of CCRT programs in Ontario hospitals is an exciting precedent for what may become a series of provincial programs. Such programs present an opportunity to explore the translation of best evidence into clinical practice, to expand the collegial interface of emergency medicine with other critical specialties, and to raise the academic and clinical stature of emergency medicine as a whole. As more hospitals and government jurisdictions embrace the CCRT model, it behooves us, as emergency medicine leaders, to be involved in the development, implementation, and evaluation phases of CCRT programs, so that our voices and priorities are heard. In this manner, ED and other hospital patients will be optimally cared for in best evidence-based practices, and the professional respect and profile of emergency medicine among our peers will be enhanced.

Competing interests: None declared.

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