

Meeting report

Second International Conference on Rapid Response System and Medical Emergency Team, 28–30 June 2006, Pittsburgh, PA, USA

Francesca Rubulotta¹ and Michael R Pinsky²

¹Department of Intensive Care, Policlinico Hospital University of Catania, Italy

²Professor of Critical Care Medicine, Bioengineering and Anesthesiology, University of Pittsburgh, Pittsburgh, PA 15261, USA

Corresponding author: Michael R Pinsky, pinskymr@upmc.edu

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The Second International Conference on Rapid Response System (RRS) and Medical Emergency Team (MET) took place at the Pittsburgh Convention Center in June 2006. The conference was attended by more than 450 people from seven different countries. The majority of the participants were Americans, but the US attendees came from 32 different states. Michael DeVita, MD, from the University of Pittsburgh was the Program Chairman, with Dr Rinaldo Bellomo from Melbourne and Dr Ken Hillman from Sydney as the course co-directors. The program included numerous oral presentations, workshops, pro-con debates, tutorials, panel discussion and poster presentations. In attendance were patient safety officers, hospitalists and hospital-based physicians, critical care medicine physicians, hospital administrators, nursing directors, critical care nurses, general ward nursing staff, respiratory care directors, therapists and, finally, resuscitation and clinical outcomes researchers.

The conference focused mainly on the four components of a RRS and how they foster a safer hospital. Patient safety and quality improvement were the highlights and backdrops for all the presentations. Experts from around the world emphasized that safety is a component of the broader concept of 'quality', which includes care that is effective, efficient, patient-centered, timely and equitable [1].

The target

The opening lecture from Prof. DeVita was entitled 'Sick hospitals or sick patients?' This lecture considered whether hospitals are optimally designed for sick patients. It was suggested that many hospital systems do not prevent errors and that their infrastructures do not compensate for errors made. Moreover, hospital managers may hide or not recognize errors instead of learning from them. It is intuitively not possible to prevent further mistakes without under-

standing previous inaccuracies. Presently, the state of the art often is that patients who die in general wards have often received delayed or inadequate care. The intent of a RRS is to prevent harm and death in patients acutely deteriorating in the hospital. A RRS is an organized structure composed of several elements including an afferent arm and an efferent arm.

The response or efferent arm is called the MET or rapid response team. A MET is composed of a trained group of healthcare practitioners who respond to crises outside the emergency department or the intensive care unit. The purpose of the MET is to improve patient outcome. This goal is achieved using several strategies including early transfer to the intensive care unit, thereby reducing adverse effects. METs are rapidly gaining acceptance in the United States, Australia and Europe.

The afferent arm is patient-in-crisis detection and the response triggering component. This capability is needed to reliably provide needed critical care resources to a patient who is suddenly critically ill in a location without the resources. The biggest obstacle to providing a comprehensive afferent arm of the RRS is the ability to recognize patients in need swiftly and reliably.

The conference gave special emphasis to logistics, specifically how to design a system for each hospital, how to train hospital staff and how to change hospital culture. Essentially, the internalization of system change may require a lengthy time frame to succeed, and this requirement translates into significant costs. Furthermore, a major problem when introducing a RRS in a hospital is that no positive large, prospective, randomized controlled trials have been published. A number of peer-reviewed reports support the efficacy of this system, while the only large randomized

MET = medical emergency team; RRS = rapid response system.

controlled trial available, the Medical Early Response Intervention and Therapy study, did not show a detrimental change in morbidity [2]. The implementation of a RRS is complex. A hospital-wide system change is required, involving re-education of clinical staff. Most of the studies available have considered the end result of a RRS over a time frame of 1–2 years. By comparison, the introduction of complex interventions such as a trauma system have taken up to 10 years before any impact on mortality was measured [3,4]. Whether the RRS can generate major improvements in the outcome of critically ill patients over time is a matter of assumption. The need for implementing a RRS is dictated by the evidence that hospital safety is a leading element to improve hospital quality.

Rapid response system components

During the First International Conference on RRS and MET in May 2005, experts established that RRS should include four components: event recognition and response trigger (afferent arm), provision of personnel and equipment resources (efferent arm), *post hoc* process improvement activities, and an administration infrastructure to support the entire system. All those components are important and interrelated. The Second International Conference on RRS and MET emphasized each component, giving more weight to the afferent arm and to needed infrastructures to support nationwide growth of a RRS.

Afferent limb: recognition and response

An afferent (response trigger) limb is needed to detect patients with physiologic deterioration that places life at risk and to trigger a response. The Second International Conference on RRS and MET disseminated to healthcare professionals and institutions the concept of planning systems to find patients in crisis and to prevent demise. This patient safety intervention is garnering support from a variety of healthcare organizations and is likely to become a powerful addition to the tools hospitals use to protect patients. The future might be automated crisis detection systems.

Provision of personnel and equipment

The response arm is represented by the METs, which are preplanned groups of healthcare practitioners who respond to acute clinical deteriorations in hospitalized patients. These METs are equal to hospital 'code teams', with the exception that they respond prior to patients developing cardio-respiratory arrest. This recovery response has been shown to decrease unexpected hospital mortality by as much as 30% in hospitals in the United States, Canada, Australia and Great Britain. Even though the system has been reported since 1995, few hospitals have knowledge of or experience with METs. The efferent limb improves personnel and equipment resources needed to restore resource mismatch that may occur for the management of suddenly critically ill patients outside the intensive care unit.

Post hoc process improvement

Process improvement requires data, which need to be collected, analyzed and used to provide feedback to caregivers and process redesign teams both to create a better response and, hopefully, to prevent future events. The goal is to use MET events to identify situations where patients may deteriorate or may lack suddenly needed critical care resources. The conference noted that there needs to be both training and simulators for careers in process improvement.

Administrative structure

The conference reviewed the impact of METs on patient safety. Special emphasis was placed on logistics. How to design the RRS needs to be individualized based on the hospital size and the provider mix. Furthermore, debate occurred on how to measure the impact of intervention; how to train staff, how to change culture and, finally, how to sell it. An administrative limb should coordinate and help mobilize resources to allow the RRS to start and grow. The resources may be financial, but equally important is the ability to foster the new culture that a RRS requires and creates. During the Second International Conference on RRS and MET, national experiences from hospitals in the United States, Canada, the United Kingdom, Scandinavia and Italy were presented, documenting success in this area and suggesting specific strategies useful in developing these structures.

Competing interests

The authors declare that they have no competing interests.

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