AHRQ Final Report

Title of Project: METs: Preventing Patient Crisies; Protecting Patients in Crisis

AHRQ grant: 1 R13 HS 15757-01

Awarded May, 2005.
Dates of project: May 2005-May 2006.
Date of Conference: June 25 and 26, 2005.

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Abstract

Purpose: Host a conference on Medical Emergency Teams (MET) intended to provide participants the knowledge to justify and create a rapid response system in their hospital.

Scope: Most in-hospital cardiac arrests follow hours of deterioration that is undertreated. International reports show mortality reduction after introduction of METs. The METs, once triggered, respond quickly to attend to patients in a medical crisis. Unexpected mortality rates decline by up to 30%. Leaders of these efforts reported their findings at the First International Meeting for Medical Emergency Teams.

Methods: Planning was multidisciplinary and geographically diverse. We collaborated with national and international critical care organizations to promote the meeting. Both large- and small-group sessions were held to promote a diversity of learning opportunities. Speakers from the United States, Australia, New Zealand, China, United Kingdom, Canada, and Italy were invited. The meeting was held June 25 & 26, 2005, in the David L. Lawrence Convention Center in Pittsburgh, Pennsylvania.

Results: Over 400 individuals from 14 countries and 39 states attended. Course evaluations showed that attendees rated the conference highly. The conference was video recorded and posted at www.METconference.com. The courses are indexed for easy viewing. The conference was so successful that it has continued annually.

Key words: Rapid Response Systems, Medical Emergency Team, Rapid Response Team; Cardiac Arrest, Patient safety, resuscitation

Purpose: The primary purposes of the conference are:

1) **to review impact on patient safety of implementing hospital systems to identify and respond to patient deteriorations outside the ICU;**
2) **to disseminate to healthcare professionals the concept of, benefits from, and alternatives to implementation of organized medical response teams—often called a Medical Emergency Team (MET)—to patients in a medical crisis.**

Scope: Medical Emergency Teams (MET) are groups of healthcare professionals who may be assembled emergently in response to grave clinical deterioration and who may enable hospitals to respond more effectively to inpatient crises.[i,ii,iii] METs are distinct from traditional "code" or "cardiac arrest" teams, because the intent is to respond to acute patient deterioration *before* a cardiopulmonary arrest occurs.[iv,v,vi,vii,viii] This is important because a number of authors have now identified that important and outcome-altering patient deteriorations occur frequently in hospitalized patients, and they are often undertreated. Delayed crisis treatment, even if very aggressively applied, may not improve outcome.[ix,x] Patients in crisis have been defined by several authors as patients who meet any one of a set of abnormal physiologic parameters.[iii,xi] Using such criteria, Hillman conservatively estimates that some 130,000 crisis events per year occur in Australia alone (personal communication). In the United States, 10 times that amount could occur. If data from MET trials[xii,xiii] are an indication of the potential for outcome benefit, then about 30% of those deaths may be preventable!

METs have been reported to have two major and distinct effects on improving hospitalized patient safety: 1) the MET response can prevent a patient in crisis from developing major morbidity or dying through rapid deployment of equipment and personnel to that patient's bedside[xii,xiii]; and 2) review of crisis cases can reveal errors and sequences of events in a patient care process that permitted or caused the crisis to occur.[xiv,xv]

The support for the use of MET responses is based on retrospective studies from hospitals in numerous healthcare settings and countries showing that more than half of all cardiopulmonary arrests are preceded by aberrations in vital signs or other clinical indices during a prolonged period prior to the arrest.[xvi,xvii,xviii,xix,xx,xxi] These studies suggest that interrupting the physiological processes preceding cardiopulmonary arrests through rapid, appropriate, and earlier treatments have greater efficacy than providing resuscitative care after a cardiac or respiratory arrest.[xxii,xxiii,xxiv] The types of crises interrupted are varied: Bellomo and Foraida have described similar "emergency criteria"; the events that may trigger a MET include both objective (large deviations from normal vital signs, new neurologic signs) and subjective (patient complaints of severe dyspnea or chest pain, or bedside caregiver concern that a patient will arrest soon) criteria.

MET responses can be an effective component of a hospital patient safety/quality improvement program. Recent reports reviewed by the Institute of Medicine in their publication To Err is Human have estimated that up to 98,000 preventable deaths occur annually in the United States because of medical errors.[xxv] Medical errors that are particularly harmful may lead to life-threatening clinical deterioration or death. At our institution, episodes of life-threatening clinical deterioration or sudden death trigger a response by a MET. We have now recognized that MET responses provide a fruitful case-finding technique. Analyzing METs identifies those medical errors that are particularly harmful because they alone or in combination led to a patient crisis event.[xxi] Because the crisis event often elucidates the impact of an error and motivates change, we introduced a quality improvement initiative that mandated a chart review after every MET response.[xxvi]

We believe that there is enough clinical data on the dual benefits of MET responses to warrant broader application and investigation. Indeed, the Institute for Healthcare Improvement (IHI) and Joint Commission Resources (JCR) are both fostering METs as an important patient safety intervention. Nevertheless, few institutions implement them.

Barriers to implementation of METs

Of course there are many barriers to the dissemination of this practice.

1. Lack of awareness of the practice of using METs. Even though The Joint Commission has fostered use of METs in a web-based conference,[xxvii] the intervention has been described repeatedly in peer review literature, and MET presentations have been delivered at national and international medical conferences,[xxviii,xxix] the practice remains relatively unknown.

Even among centers that have considered the practice, there may remain other barriers.

2. Skepticism that the use of METs can improve outcome. Data reported in the literature arises predominantly from trials at single institutions, albeit in a variety of settings.
3. Concern that the resource expenditure for METs is beyond the capacity of their institution to support. This is an especially powerful concern in smaller or community hospitals, where there may be only one doctor (or none) in house at night. Adding an emergency response may be perceived to be beyond the capability of the institution to support it.
4. Inadequate knowledge on how to organize and implement a MET response program. There are a number of potential models for METs. Confusion may exist regarding what exactly constitutes a MET, what the team requires in terms of personnel and equipment, and what the MET responsibilities are.

5. Political issues like "who 'owns' the patient in crisis?" and "who is responsible for providing the service" can be a fundamental barrier to implementation even if the institution otherwise supports the intervention.

The conference organizers felt an international conference would lead to improved collaborations to move the field ahead and provide important knowledge needed to allow neophytes to begin work in this area.

Methods:

Planning process. A group of experts in patient safety and medical emergency teams put together a program for the conference. The conference was planned with the help of the University of Pittsburgh Center for Continuing Education in the Health Sciences (CCEHS). The program was marketed with strategic partnerships with the Institute for Healthcare Improvement, the Society for Critical Care Medicine, the Robert Wood Johnson Foundation, the American Heart Assocition, and Joint Commission Resources.

Conference. The conference was held June 25 & 26 at the David L. Lawrence Convention Center in Pittsburgh, Pennsylvania. The conference was video recorded with funding from another source.

Post conference. Evaluations were collected by the CCEHS. A website was planned to house conference related materials after the event.

Results. Over 400 participants from 14 nations and 39 states were involved. The Budget was balanced. The CCEHS collected evaluations from attendees at the conference. They demonstrated nearly universal high satisfaction with the conference. The conference videos and slides were placed on a website (www.METconference.com), which has had almost 100,000 hits to date. It is still accessible, and we request that the AHRQ reviewer view the conference proceedings.

List of publications and products. The most important product of the international meeting is the website content noted above. Almost every lecture was recorded and has been posted to enable those who could not attend the conference, so they would still be able to obtain benefit. There have been almost 100,000 hits to date. The conference was so successful that there were multiple requests for follow-up conferences, which are now occurring annually.

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