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Effects of Outreach: An Alternative View

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Outreach should improve the outcome of ward patients whose conditions deteriorate. The introduction of any outreach team includes ward staff education, definition of calling criteria, and availability of the team at least in daytime. Studies and reviews do not give clear definite information, so at present we remain unsure as to how to educate ward staff and how much ICU workload will be required to front ward calls.

Patients admitted to the hospital may develop clinical deterioration and/or present serious adverse events while in the ward. Many things are required to face those situations: a) ward staff should rapidly identify the patient at risk, and alert staff with experience in emergency medicine (afferent limb); b) alerted staff should promptly arrive at the patient bedside, and institute the life-saving treatments required (efferent limb) (De Vita et al. 2006). Ideally, such a Rapid Response System (RRS) consisting of early recognition and rapid intervention should allow better outcome. The recent first consensus conference on Medical Emergency Teams (De Vita et al. 2006) has categorised the three most common reported terms to describe the efferent limb of RRS:

- Critical Care Outreach (CCO), generally staffed by Intensive Care Unit (ICU) trained nurses and introduced in the UK according to the Comprehensive Critical Care paper by the Department of Health (2000);
- Medical Emergency Team (MET), which includes a physician expert in emergency medicine and a ICU nurse, and allows instituting immediately life saving intensive treatments and prescribing diagnostic tests;
- Rapid Response Team, recently promoted in the USA, usually being nurse-led.

Whichever name is used, RRS should improve the outcome of the patients treated. If this occurs, the introduction of RRS in all hospitals will become compelling, and an economic analysis necessary. Therefore, the first step is to demonstrate whether RRS improves patient outcomes. Despite some good results published in scientific literature (Ball et al. 2003, Bellomo et al. 2003, Bellomo et al. 2004, Buist et al. 2002, Priestley et al. 2004), recent systematic reviews (Åneman and Parr 2006, Esmonde et al. 2006, McGaughey et al. 2007, Winters et al. 2007) stressed that evidence was insufficient to conclusive demonstration of the efficacy of RRS, due to methodological problems. One of the studies evaluated in the Cochrane review, (McGaughey et al. 2007) was performed by Priestley and colleagues (2004) in 16 wards, where the ward staff received training in the care of the acutely ill patient and the CCO nurse visited every patient admitted within 24 hours. The mortality in general hospital wards was reduced, but the design of the study did not focus on the specific effects of having the CCO nurse visit at the time of initial assessment, staff education, and calling (trigger) criteria.

The design of a MET system could be more effective than CCO, due to the ability of MET staff to institute intensive treatments and to prescribe diagnostic tests and therapy. We may hypothesise that it should be the best candidate for lowering incidences of outcome measures, such as in-hospital unexpected deaths, cardiac arrests and unplanned ICU admissions. In one of the before-after studies, the rate of unexpected cardiac arrests significantly decreased (Buist et al. 2002), but the increased number of Do-Not-Resuscitate orders after the introduction of MET, a trend towards a reduced incidence of cardiac arrests already present and the different case mix may have influenced the result (Smith and Nolan 2002). Also another before-after study, comparing two 4-month periods, separated by 12 months devoted to education and 2 months to run-in, reported that the number of both unexpected cardiac arrests and inpatient deaths were reduced (Bellomo et al. 2003). Interestingly, in a reply to a letter (Tibballs and Kinney 2004), Bellomo and colleagues (2004) demonstrated that the number of cardiac arrests had already dropped during the education period.

A concurrent study where the MET system was introduced in one hospital, leaving two hospitals as control, did not find any statistically

significant difference in cardiac arrest or death rates after case mix adjustment, but reported a significantly reduced number of unplanned ICU admissions at the MET intervention hospital over the 6-month period of the study (Bristow 2000). This lack of efficacy of the MET may have been related to lack of sensitivity of calling criteria (too late identification) or MET underutilisation, because no special efforts regarding staff education in the study period were made.

Finally, the MERIT study, a Randomised Controlled Trial performed in Australia, evaluated the effects of MET system which was implemented in 12 hospitals, leaving other 11 allocated to control (Hillman et al. 2005). The MERIT study showed that the MET system did not affect the incidence of serious clinical events. Moreover, the fact that nearly half of the calls in the control hospitals were made without cardiac arrest or unexpected death provides evidence that factors other than MET, possibly ICU staff, effectively attended the patient at risk in control hospitals. Furthermore, the high number of calls recorded in the MERIT study, despite the low sensitivity of calling criteria, may be the result of increased awareness, and increased awareness may be the result of ward staffing education, which was maintained in the control hospitals.

The conclusions of studies and reviews raise new concerns because the introduction of any RRS must include at least the following things:

- Ward staff education;
- Definition of calling or trigger criteria;
- Availability of the team.

Considering that the number of RRS calls is higher in day than in night time (Galhotra et al. 2006), the economical burden may be limited. Nevertheless, we have yet to determine which RRS is optimal, how education should be organised, and which trigger criteria are suitable. It is possible that the effects of staff education are attributed to the efferent limb of the RRS (CCO or MET). In fact, training on signs of clinical deterioration may improve staff ability in early detection of patients at risk, making definite calling criteria less useful, as demonstrated by the high number of calls due to staff concerns in the MERIT study. Accordingly, a detailed program of education, feedback and decision support for nursing and medical staff before, during and after implementation of a MET system increased the number of monthly MET calls from 25 to 79 over 3.5 years (Jones D et al. 2006).

If these findings are confirmed, the new issues will be how to educate ward staff and how much ICU workload will be required to front ward calls. The Italian Regional Health Agency of Emilia-Romagna has recently funded a project (General Hospital mortality & Education Sepsis-Targeted, acronym GHEST) to show the pure effect of staff education to early detection and treatment of sepsis on the outcome of hospital patients. We also expect information about the calls to the intensivists teams and the clinical severity of the patients attended, and, additionally, about the clinical outcome of unplanned ICU admissions from ward or emergency department, with and without severe sepsis.

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