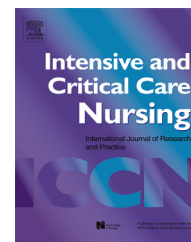




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ORIGINAL ARTICLE

# The effectiveness of a patient at risk team comprised of predominantly ward experienced nurses: A before and after study



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## KEYWORDS

Cardiac arrests;  
Critical care outreach;  
Medical emergency team;  
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## Summary

**Introduction:** Improving care to deteriorating ward patients require systems to trigger a response and a response team. This paper describes the effectiveness of a Patient at Risk team (PART) comprised predominantly of experienced ward nurses.

**Method:** The study used a single site before and after historical control design. The number of medical emergency team (MET) calls, cardiac arrest calls and hospital admissions occurring prior to the establishment of the PART (January–December 2008 inclusive) were compared to those occurring after the team was established (January 2011–December 2012 inclusive). Primary outcome was the number of MET and cardiac arrest calls per 1000 hospital admissions.

**Results:** The introduction of the PART resulted in a significant reduction in ward cardiac arrests per 1000 admissions (MD=0.9, 95% CI: 0.3–1.5,  $p=0.009$ ), hospital length of stay per 1000 admissions (MD=294.4, 95% CI: 260.9–328.7,  $p\leq 0.001$ ) and direct ward admissions to ICU (95% CI: 0.7–5.2) but no change in the number of MET calls per 1000 admissions (MD=1.3, 95% CI: –2.3–4.9,  $p=0.46$ ).

**Conclusion:** A PART comprising of experienced ward nurses was associated with reduced ward cardiac arrests but no change in the number of MET calls. This suggests this team composition may be effective in providing care to the deteriorating patient.

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### Implications for Clinical Practice

- Utilising ward experienced nurses within a patient at risk team may be effective in providing care to the ward deteriorating patient.
- Education, training and leadership are necessary components to develop the team.
- This team composition contributed to a reduction in ward cardiac arrests, hospital length of stay and ward admissions to ICU.

## Introduction

Failure to recognise and rescue the deteriorating ward patient has led to systems aimed at identifying these patients early and providing a timely response by appropriately trained staff (Jones et al., 2011; Tee et al., 2008). A number of systems are used internationally such as the medical emergency team (MET) system developed in Australia. This system uses a single vital sign trigger whereby a MET call may be triggered when a single physiological value exceeds a certain threshold (Psirides et al., 2013). Others, such as the early warning scoring system (EWSS) developed in the United Kingdom (UK), use scores allocated to multiple vital sign parameters to trigger an alert (Psirides et al., 2013). Jones et al. (2012) argue the MET model is reactive as it requires a patient to deteriorate significantly before it can be activated. They call for a more proactive and pre-emptive approach to improve recognising and responding to the at risk patient (Jones et al., 2012). Critical care outreach (CCO), also developed in the UK (Pirret, 2008), provides a more proactive approach which may include responding to early warning score (EWS) triggers, follow-up of patients discharging from the intensive care unit (ICU) and sharing knowledge with the ward interdisciplinary team (McNeill and Bryden, 2013; Story et al., 2004). Various hospitals incorporate a combined approach using a combination of a MET, EWSS (Goldhill et al., 2005; Psirides et al., 2013) and/or CCO (McNeill and Bryden, 2013).

A systematic review of trigger (afferent limb) and response (efferent limb) systems, demonstrated both aggregate scoring using multiple vital sign parameters to trigger a response and MET teams reduce hospital cardiac arrests and unplanned ICU admissions and increase hospital survival (McNeill and Bryden, 2013). CCO was shown to reduce readmissions to ICU (McNeill and Bryden, 2013). In an Australian study the combination of a MET and nurse-led CCO reduced cardiac arrests and increased the number of MET calls (Buist et al., 2007).

All of these rapid response systems, whether they be MET or CCO, generally include doctors in training (such as ICU registrars) or nurse practitioners and nurses trained in critical care (Subbe and Welch, 2013). These response teams ensure staff with the knowledge and clinical expertise are able to rapidly deliver care anywhere in the hospital within minutes (Tee et al., 2008).

This paper describes the effectiveness of a Patient at Risk team (PART) comprised of predominantly ward experienced nurses. This model using experienced ward nurses differs from other CCO models described in the literature which utilise ICU nursing staff (Subbe and Welch, 2013). We hypothesised that the PART team would reduce the number

of ward MET and cardiac arrest calls. The primary outcome was the number of MET and cardiac arrest calls per 1000 hospital admissions.

## Method

The single site study used a before and after historical control design. Data collected prior to the establishment of the PART (January–December 2008 inclusive) were compared to that collected after the team was established (January 2011–December 2012 inclusive). Data collected included the number of medical emergency team (MET) calls, cardiac arrest calls, hospital admissions and ward patients admitted directly to ICU and hospital length of stay (LOS). Primary outcomes were the number of MET and cardiac arrest calls per 1000 hospital admissions. A cardiac arrest was defined as a cessation of cardiac function requiring commencement of cardiopulmonary resuscitation. A hospital admission was defined as a patient accepted by the inpatient medical team to an inpatient ward for ongoing care; it excluded Emergency Care, ICU/HDU and outpatient admissions.

## Ethical approval

The study was registered with the hospital research office but as the study met the definition of audit, we received formal notification that the study did not require ethical approval.

## Setting

The study was undertaken in a New Zealand tertiary metropolitan hospital. In 2008 the hospital had 750 inpatient beds that increased to 990 beds in 2010 with the opening of purpose built wards. Prior to July 2008, the ICU had seven beds. In July 2008 a purpose built ICU increased the bed numbers to 12 and in March 2009, a purpose built HDU increased the bed numbers to 18. Both the ICU and HDU form the Critical Care Complex (CCC).

An EWSS was introduced to the hospital in 2007, which resulted in a 156% increase in MET calls, however, cardiac arrests and unplanned admissions to ICU remained unchanged (Robb and Seddon, 2010). This EWSS was supported by dedicated non-ICU clinical nurse specialists and clinical resource nurses (Robb and Seddon, 2010); they did not received specific training in assessing and managing the physiologically unstable ward patient. These nurses were from two different teams but between the two teams, covered the hospital 24 hours per day, seven days per week (24/7). They were alerted when the EWS increased to two,

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