

Factors associated with clinical deterioration in the first 72 hours of emergency admission: a retrospective case control study

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Background Over recent years there has been increased interest in the interface between EDs and inpatient wards as performance targets aiming for reduced ED length of stay (LOS) have been implemented. One of the primary concerns about time-driven performance indicators is whether shorter ED LOS will result in increased numbers of physiologically unstable patients in general wards, leading in turn, to increased cardiac arrests and Medical Emergency Team (MET) activations during the early stages of hospital admission.¹ Patients requiring MET review have an in-hospital mortality up to 34%,²⁻⁴ and almost one-quarter of MET or cardiac arrest team (CAT) activations occur within 48 hour of hospital admission.⁵

Aim: to examine: i) the relationship between physiological status in the ED and MET or CAT call within 72 hours of emergency admission; and ii) whether the requirement for MET or CAT activation was associated with an increased subsequent risk of ICU admission and in-hospital mortality.

Method: A retrospective case-control study was conducted at three hospitals in Melbourne, Australia. Cases were adult patients (≥ 18 years), admitted via the ED to non-monitored medical or surgical wards during 2012 who had a MET or CAT activation within 72 hours of admission. Controls *did not* have a MET or CAT activation within 72 hours of admission. Two controls were matched for each case by age (± 5 years), gender, triage category, place of usual residence, and admitting unit.

Results: Cases were more likely to have ≥ 1 physiological abnormalities fulfilling their hospital's MET activation criteria documented during their ED care (29.1% vs 19.3%, $p < 0.001$). The risk-adjusted odds of MET or CAT activation within 24 hours of emergency admission was highest in patients with tachypnoea fulfilling MET activation criteria during ED care (OR=2.69, 95% CI: 1.78 - 4.07). The risk-adjusted odds of MET or CAT activation within 72 hours of emergency admission was highest in patients with tachypnoea (OR=2.69, 95% CI: 1.78 - 4.07) or hypotension (OR=1.43, 95% CI: 1.00 - 2.03) fulfilling MET activation criteria during ED care. Cases had more in-hospital deaths (16.5% vs 3.6%, $p < 0.001$), unexpected in-hospital deaths (2.05 vs 0.2%, $p < 0.001$), ICU admissions (11.8% vs 0.7%, $p < 0.001$) and longer hospital length of stay (Mdn = 8 days vs 5 days, $p < 0.001$).

Conclusions: Factors associated with CAT/MET activation on the wards are identifiable when patients are in the ED. CAT/MET activations within 72 hours of emergency admission are associated with higher mortality and increased LOS. Further studies are required to validate these findings more widely and determine whether early identification and intervention in patients at risk of MET or CAT activations can improve their eventual outcomes.

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