

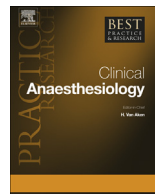


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How to avoid catastrophic events on the ward



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The number and disease severity of hospitalized patients have risen steadily. At the same time, the length of stay in the hospital has decreased and there is an increasing shortage of nursing staff and physicians. In order to enable a timely treatment of serious in-house emergencies (i.e., cardiac arrest and cardiopulmonary resuscitation) and to decrease the risk of unexpected deaths, early detection and treatment of critically ill patients are of paramount importance. Therefore, patients should be monitored according to their disease severity in order to detect a critical change in vital signs. Early critical incident warning systems may play a role in this context. Currently, different rapid warning systems have been established, but data that allow a choice for a certain system are still lacking. Alarm criteria based on a single variable (single-parameter system) are a simple, but less sensitive alternative to indicate a serious adverse event. Scoring systems enable early detection of critically ill patients and may trigger early treatment by staff specially trained to handle emergency situations.

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Introduction

In 2013, 84.7 million people were treated on wards in hospitals throughout Europe, and this number is in fact increasing [1]. Unfortunately, medical care in the hospital is not devoid of complications and serious adverse events, which roughly occur in 10–20% of all patients [2]. In a large observational study performed in Europe enrolling some 46,000 patients after surgery, the mortality was 4%, with large differences between countries [3]. The most alarming finding from this study, however, was the high proportion of ‘failure to rescue’, as 73% of patients who died were not admitted to critical care at any stage after surgery. Adverse events are partly caused by malpractice; the majority, however, is due to a deterioration of the underlying disease. In most cases, life-threatening events are heralded by a deterioration of vital signs already hours or even days before the catastrophic event occurs and thus may be preventable [2]. If these patients are not adequately monitored in the hospital, the life-threatening situation may be noticed too late, and an increase of in-house cardiopulmonary resuscitation (CPR) and unexpected deaths may follow [4]. This development will even accelerate due to increasing workload in the hospitals and increasing co-morbidities of patients.

The European Resuscitation Council (ERC) is aware of this problem and has issued recommendations for prevention of in-house emergencies. According to the current ERC guidelines on cardiopulmonary resuscitation, the following steps for the prevention of unexpected hospital deaths should be taken [5]:

- Monitoring patients according to disease severity
- Establishing an early warning system for unexpected emergencies
- Implementing a medical emergency team (MET)
- Continuously training all staff members in basic life support (BLS)
- Establishing an effective quality management system for in-house emergency management.

Monitoring patients according to disease severity

In hospitals, emergencies only rarely occur unexpectedly [6]. Therefore, it is reasonable to monitor patients in the hospital according to the severity of their underlying disease and their co-morbidities. In this context, a differentiation between general ward, intermediate care (IMC), and intensive care unit (ICU) seems reasonable (Table 1) [7].

Upon admission to the hospital, proper patient allocation to the adequate level of care should be performed based on a diagnostic workup and therapeutic interventions where necessary. Recording and analysing individual vital parameters according to an established scoring system may be helpful.

All patients must be monitored in the hospital according to disease severity.

If there is no deviation of vital parameters, a diagnostic assessment every 12 h is sufficient and the patient may be admitted to a general ward. If significant changes of vital parameters are noticed, additional monitoring (e.g., electrocardiographic (ECG) monitoring) should be established, and during hospital stay, a change between the above-listed levels of care must be possible at any time. For each patient, a defined strategy for the treatment of emergency situations (e.g., a do-not-resuscitate order) should exist and be documented in the patient's chart.

Table 1

Level of care in the hospital.

Level	Ward	Disease severity	Vital parameter	Monitoring	Example
Level 1	General ward	Minor	Normal range	Occasionally (2–6 × daily)	Cholecystitis
Level 2	Intermediate care unit	Serious	Compensated	Regularly (hourly)	Pneumonia
Level 3	Intensive care unit	Life threatening	Decompensated/supported	Continuously (online)	Pulmonary embolism

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