

# Martha's rule: applying a behaviour change framework to understand the potential of complementary roles of clinicians and patients in improving safety of patients deteriorating in hospital

## Abstract

**Aims/Background** Martha's rule stipulates the right of patients and their families to escalate care as a way to improve safety while in hospital. This article analyses the possible impact of the proposed policy through the lens of a behaviour change framework and explores new opportunities presented by the implementation of Martha's rule..

**Methods** A descriptive analysis was undertaken of interactions between patients, family, friends and clinicians during clinical deterioration in hospital. The capability–opportunity–motivation behaviour change framework was applied to understand reasons for failure to respond to deterioration.

**Results** Care of deteriorating patients requires recording of vital signs, recognition of abnormalities, reporting through escalation and response by a competent clinician. Regarding the care of patients who deteriorate in hospital, healthcare professionals have capability and motivation to provide safe, high-quality care, but often lack the physical and social opportunity to report or respond through lack of time and peer pressure. Patients and family members have motivation and might have time to support safety systems. Martha's rule or similar arrangements allow healthcare organisations to create opportunities for patients and families to report and escalate care to experts in critical care when they recognise deterioration.

**Conclusions** The capability–opportunity–motivation behaviour change framework provides insights into the causes of failure to rescue in deteriorating patients and an argument for opportunities through escalation by patients and families through Martha's rule. This might reduce the number of system failures and enable safer care.

**Key words:** Adverse events; Behaviour change; Failure to rescue; Motivation; Patient safety; Personal health records

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Christian P Subbe<sup>1</sup>

Siri H Steinmo<sup>2</sup>

Helen Haskell<sup>3</sup>

Paul Barach<sup>4,5,6</sup>

Author details can be found at the end of this article

**Correspondence to:**  
Christian P Subbe;  
c.subbe@bangor.ac.uk

## Introduction

The death of teenager Martha Mills in a leading hospital in London has led to renewed discussion about patient safety (Curtis and Wood, 2023). Martha had a bicycle accident while on holiday in north Wales. This injured her pancreas and she was transferred to one of the leading specialist units for pancreatic injury at King's College Hospital in London. Over a weekend Martha's condition deteriorated. Her mother tried to raise the alarm, but the paediatric team had been instructed not to escalate to intensive care. Martha went into cardiac arrest, was transferred to intensive care and subsequently died.

As in many previous cases, Martha's parents sensed the impending catastrophe but had no means to escalate care to intensive care specialists past their reluctant primary team. Unlike previous cases, Martha's parents have been able to translate the problem statement into a policy initiative that has received broad backing across the political spectrum.

Affecting sustained improvement in the safety of healthcare delivery requires a deep understanding of human factors driving behaviour change. Michie et al's (2011) behaviour-change wheel has at its centre the capability–opportunity–motivation theory of behaviour

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change (COM-B). It synthesises 19 frameworks of behaviour change from a broad range of policy interventions into nine intervention functions aimed at addressing deficits in either capability, opportunity or motivation:

- Capability is addressed through skills and knowledge
- Opportunity is addressed through the characteristics of the social and physical environment
- Motivation is addressed through beliefs, attitudes, identity and habits.

The framework can be easily used to inform health policy interventions in areas as diverse as digital health (Beleigoli et al, 2019), medication adherence (Jackson et al, 2014; Iwelunmor et al, 2019) and management of sepsis in hospital (Steinmo et al, 2016).

This article discusses the application of the capability–opportunity–motivation behaviour framework to understand the events that contributed to Martha’s death and explore how Martha’s rule might enable changes in behaviour in the context of a deteriorating patient.

## Methods

Physiological deterioration is a common pathway in many adverse events with a diverse range of aetiologies. This has resulted in policy initiatives being developed in many countries to try to reduce the rate of predictable and preventable cardiac arrests and critical care admissions. In the case of patients who are deteriorating while in hospital, safety depends on timely recording of vital signs, recognition of abnormalities and reporting to a competent responder, such as a rapid response or critical care outreach team (Subbe and Welch, 2013) (Figure 1).

In Martha’s case, clinical signs were recorded and abnormalities were recognised by her parents, but not escalated by the nursing and junior medical team. As a result, Martha had a cardiac arrest and died.

The authors suggest that to induce the behaviour change in question, ie timely recognition and escalation of deteriorating patients, all three of the conditions, ie capability, opportunity and motivation, must be fulfilled, whereas only one of the conditions needs to be denied to increase the risk of patient harm. This article applies these principles to the safety of deteriorating patients like Martha, describing capability, opportunity and motivation of clinicians, patients and interactions between the two groups, and describing the opportunities created by policy initiatives such as Martha’s rule.

## Results

### What are the capabilities, opportunities and motivations for safe care in clinicians?

The assumption is that clinical teams have the capability, motivation and opportunity to deliver care safely. However, the reality may be different.

Capability is often restricted by the individual’s physical or psychological ability to undertake the activity in question. Even outside a pandemic-level crisis, individual clinicians and their teams are often overworked and lack the technology and facilities to deliver against a myriad of clinical standards. Safety-critical steps of a process are fragmented and often owned by different members of the team, eg healthcare assistants might be taking vital signs, nurses interpreting them and doctors treating any identified abnormalities.



Figure 1. Chain of survival.

Opportunities for safe care may be limited by outdated infrastructure or facilities and an inability to dedicate the right amount of time to follow a pathway with a patient from start to finish. This is often worsened by the fragmentation of modern healthcare provision and its information systems. Clinicians often lack the time to perform according to the protocol and hence choose shortcuts and workarounds to get the procedures or work done and deliver patient care. Standard operating procedures are often highly complex in their layout and buried in organisational websites with outdated search engines. Beyond having the right clinical skills, clinicians require the mental stamina to maintain a high cognitive load and to keep abreast of long lists of tasks and decision processes, while fatigued, resulting in cognitive overload and errors (Debono et al, 2013).

Healthcare staff are assumed to be high achievers and highly motivated, seeing their profession as a vocation. However, motivation to follow certain pathways and protocols might be affected by beliefs in the evidence to support them, previous experience with an intervention in the same or a different context and the practitioner's own capabilities. Professional roles come with belief systems, and non-reflective motivation through established routines and habits can get in the way of safe care (or enable it). Importantly, beliefs about consequences of not complying with clinical pathways might deeply affect the motivation to act.

In Martha's case, staff recorded abnormalities but physical opportunities for senior input were reduced over a long weekend. Social opportunities for nurses and junior doctors to escalate Martha for treatment in intensive care were seriously limited as poor working relations between her primary team and the intensive care team meant that escalation had been discouraged.

### How do capability, opportunities and motivation apply to deteriorating patients and their families?

A significant proportion of patients are capable of recording safety-critical data such as functional capacity, blood glucose levels or quality and volume of urine output (Subbe, 2015). Safety-critical vital signs can be reliably acquired by patients: blood pressure in patients with hypertension, blood glucose level in people with diabetes, oxygen saturations in patients with chronic obstructive pulmonary disease, stool charts for patients with inflammatory bowel disease and fluid input for patients with renal or heart failure. That is in addition to parameters that can be monitored by patients themselves through wearable devices or mHealth applications (Hamza et al, 2021). COVID-19 has forced further changes in patients' capability with the distribution of monitoring equipment for successful measurement of oxygen saturations.

Those closest to a patient can provide unique perspectives about the patient's baseline ('normal') related to general bodily symptoms, mobility, state of mind, frailty, changes over time and general emotional behaviour status. This is particularly important in children, frail and older patients, or those with chronic conditions. Given that most doctors and nurses work shifts, it is rare that clinicians follow the same patient continuously or for longer period of times. This can mean that intuition about the normal status of an individual system (Kahneman's 'system 1' thinking) can be erroneous and partially disabled (Kahneman, 2012).

Opportunities arise every time that the healthcare needs of deteriorating patients become explicit, and patients interact with healthcare in a formal or informal setting. Unlike clinicians, patients are observers at the scene of interest at all times. Armed with the right tools, patients and families could be key and informed witnesses to most events.

There is a growing body of evidence suggesting that patients hold knowledge about their condition that enables them to make decisions with a safety impact in the context of their own care once the opportunity arises. These opportunities range from 999 calls (exclusively sent by lay people) to expert patient programmes to the effective use of personal health records (Subbe and Royce, 2019).

Few would doubt the motivation of a patient to receive and contribute to safe care. Arguably, self-preservation is the key driver supporting safety in high-reliability industries such as aviation safety for flying personnel (Barach and Small, 2000). In settings outside of healthcare, it would be unusual to exclude the person with the greatest interest in safety outcomes from accessing safety-critical information.

In Martha’s case, her parents’ knowledge about her normal behaviour and wellbeing were central to recognising deterioration. They were motivated to help, asked repeatedly for help but lacked the opportunity to escalate to the right caregiver themselves.

**Martha’s rule: sharing capability, motivation and opportunity for safer care across professional boundaries**

Clinicians and patients might have the motivation to deliver safe care, but while clinicians have access to tools and knowledge, they may lack the time and oversight of the whole fragmented care system. Patients and their loved ones, on the other hand, might have time and oversight but often have limited access to tools and knowledge.

Patient-activated rapid response teams support safety of care in some centres in the UK, USA and Australia. These demonstrate that, given the capability, lay people will use the opportunity to actively support their loved one’s safety even in hospital (Subbe et al, 2019). The process of reliable escalation in addressing deteriorating patients can be mapped against the complementary capability, motivation and opportunities without (Figure 2a) and with patients and family members (Figure 2b). In order to prevent deterioration, patients can record vital signs, recognise abnormalities and report to a responder who is able to change treatments.

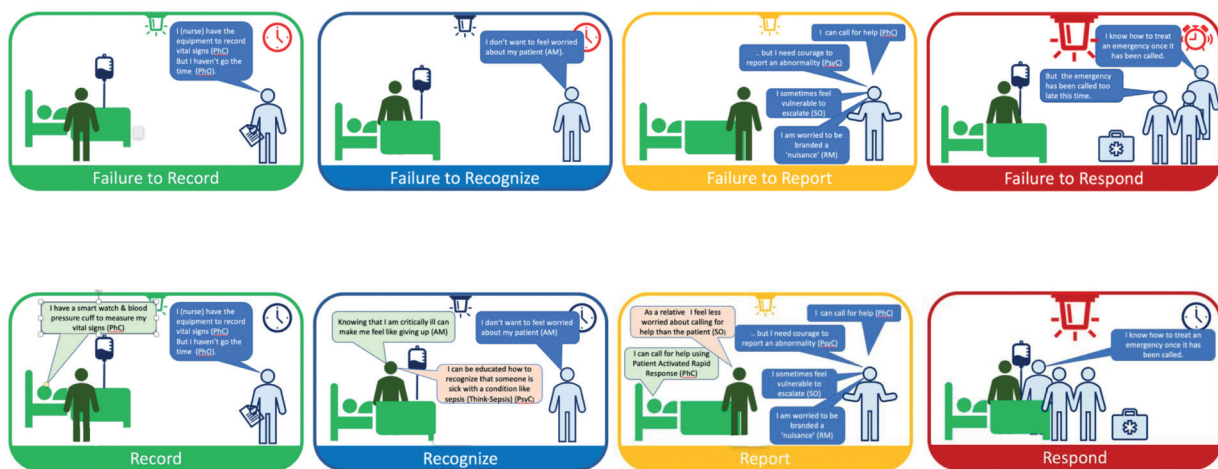
Martha’s rule is a version of patient-activated rapid response. It would have given her parents the capability and opportunity to escalate care even if the clinical team missed or misinterpreted the signs of her deterioration.

**Discussion**

It is assumed that healthcare professionals have the physical capability to record, report signs of deterioration and promptly respond to them. Patients who are seriously ill might not be able to co-produce their own care and physically call for help or ring a bell, but family members or friends might still be able to do so. It can therefore be helpful to describe the acutely unwell patient and their family as a single functional unit.

Patients and their families might have knowledge about acute physiology through campaigns in the media (ie the Think Sepsis campaign <https://www.e-lfh.org.uk/programmes/sepsis/>). Simple knowledge about vital signs can be taught, with evidence indicating that patients’ assessment of feeling better or not has an impact on clinical outcomes (Opio et al, 2017). Educational interventions aimed at patients and their carers (Health Innovation Wessex, 2024) might further strengthen recording and recognition of vital signs.

Reporting abnormalities requires access to an alert mechanism, an emergency buzzer (often attached next to patients’ beds) or a specific telephone number to call. These phone



**Figure 2.** a. Scenario without patient assistance: failure to record safety-critical information in a timely manner, failure to recognise abnormalities, failure to report to responder, failure to respond. b. Scenario with patient assistance: ability of patients to support recording, recognition, reporting of deterioration to allow timely response. AM = automatic motivation; PhC = physical capability; PhO = physical opportunity; PsyC = psychological capability; RM = reflective motivation; SO = social opportunity.

## Key points

- Patients and families might recognise deterioration in hospital in some cases where clinicians do not.
- Capability, opportunity and motivation drive decisions to escalate care of patients deteriorating in hospital.
- Clinicians might struggle with a lack of opportunities, ie social support and physical time to escalate.
- Martha's rule will create social opportunities for patients and families to escalate care to critical care outreach teams.

numbers are often limited to healthcare professionals but in hospitals engaged with the 'Call-4-Concern' programmes (Odell, 2019) can be made available to patients and family members. The response to a call triggers further actions such as giving medication or repeating observations, which continue to be the prerogative of healthcare professionals.

Social opportunity is the opportunity afforded by interpersonal influences, social cues and cultural norms that influence the way we think about things. Cultural norms for healthcare professionals might mean that reporting abnormalities is seen as a weakness or nuisance. Cultural norms for patients and family members might prevent them addressing a team, doctor or operator directly; the patient might feel vulnerable, but family members might feel less vulnerable than the patient.

For patients the recording, recognition, reporting and response to deterioration is personal and could be a matter of life and death. This motivation for self-care is at the heart of shared decision making (Elwyn et al, 2010) but its impact has not yet been systematically explored in hospital care.

NHS patients in England, Scotland and Wales currently have the right to a second opinion (NHS 111 Wales, 2022; Citizens Advice Scotland, 2024). For hospital appointments, patients can ask for a second opinion, but this has to be done via the GP, hence incurring significant delay.

Martha's rule illustrates the potential for improved safety of care by allowing patients to ask for help in real time, using the complementary nature of capability, opportunity and motivation of enabled and empowered patients, families and healthcare professionals.

## Conclusions

Failures in the care of Martha Mills illustrate the compelling need to optimise and share capability, opportunity and motivation at system level to improve safety of care. Shared access to safety-critical information could be pivotal for efforts to align the capability, opportunity and motivation opportunity, with patients being able to fill in the information gaps for clinicians and vice versa, with the hope of safer care for individuals, teams and organisations. The effect of this more holistic approach to patient safety needs to be examined in more detail, especially in groups of patients who are usually excluded from healthcare.

### Author details

<sup>1</sup>School of Medical Sciences, Bangor University, Bangor, UK

<sup>2</sup>inform\_us Health Informatics Critical Care, University College London Hospitals NHS Foundation Trust, London, UK

<sup>3</sup>Mothers Against Medical Error, Columbia, SC, USA

<sup>4</sup>Children's Hospital of Michigan, Wayne State University School of Medicine, Detroit, MI, USA

<sup>5</sup>Jefferson College of Population Health, Philadelphia, PA, USA

<sup>6</sup>Interdisciplinary Research Institute for Health Law and Science, Sigmund Freud University, Vienna, Austria

### Conflicts of interest

The authors declare that there are no conflicts of interest.

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