A strategy to maintain safety in clinical incidents

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Clinical incidents and emergencies require quick responses from health professionals, and it is important that any leader retains an overall awareness of the situation to ensure team members are responding appropriately and making the correct decision or intervention. Unfortunately, team leaders are also often required to become centrally involved in responding to the incident, making it difficult for them to maintain situational awareness.

Situational awareness, leadership, team working and decision making are key human factors or non-technical skills that influence patient safety and clinical management. In 2010, a total of 1,139,774 clinical incidents were reported in the health service (National Patient Safety Agency, 2011); human error is likely to have been part of the error chain in 70% of these (NHS Institute for Innovation and Improvement, 2010).

It is only in recent years that the health service has started to review and adopt many of the principles that have been tried and tested in other high-risk industries.

In the late 1970s, aviation researchers discovered that human error contributed to more than 85% of aircraft accidents. In To Err is Human (Kohn et al, 2000), the Institute of Medicine in the US highlighted the need to initiate training around human factors within the health system, in a similar way as had been done in other high-risk industries, to reduce harmful incidents.

In 2009, a how-to guide to implementing human factors in healthcare (Patient Safety First, 2009) used a number of incidents involving harm to patients to highlight how human errors can occur even when extremely experienced clinicians are involved – sometimes with devastating or fatal consequences. These have included the case of Elaine Bromiley, who died as a result of hypoxic brain injury following a series of errors in managing her airway before routine surgery. Reason (2000) has said that: “Great doctors are not the ones that never make errors, rather they are people who expect errors to happen and have strategies in place to cope with them before these adverse events cause harm to a patient.”

Strategy to address human factors

In 2007, Mrs Bromiley’s husband, who is an airline pilot trainer, set up the Clinical Human Factors Group, a coalition of health professionals, managers, service users and experts in human factors from healthcare...
and other high-risk industries. The group campaigns for change in the NHS, and has done much to increase awareness of how human factors affect patient safety.

Nurses and allied health professionals are increasingly taking the lead in clinical situations, and many administrative decisions that have a direct influence on patient care are often taken by non-clinical staff. For this reason it is crucial that all staff involved in patient management are aware of human factors and their influences – not only on the patient directly, but also indirectly on staff morale, job satisfaction and the working environment.

The “inner and outer circles” strategy, which is used in other sectors of healthcare and the emergency services, could be adopted to improve patient care in hospitals or other clinical environments.

In pre-hospital emergency work, especially while dealing with motor vehicle accidents, fire service and ambulance personnel are taught about “inner and outer action circles” (National Directorate for Fire and Emergency Management, 2009). The purpose of this strategy is to ensure that situational awareness is maximised at all times, and that a focus remains on treatment and management of the patient while simultaneously the overall scene management is optimised. Only personnel directly dealing with a casualty or vehicle enter the inner circle; all others remain within the outer action circle, waiting to be given a task or acting as observers for danger.

**Human factors in the NHS**
Within the health service, non-technical skill characteristics are usually grouped under teamwork, decision making, leadership and situational awareness.

The NHS Institute for Innovation and Improvement’s scoping study on human factor training in the NHS said that non-technical training had tended to be developed and delivered within the context of critical care, theatres and acute settings (NHS III, 2010). However, even in these areas, human factors training had so far tended to emphasise person-level human factors rather than those at system level.

Health Education England has reinforced the need to increase training around human factors, including an awareness of cognitive behavioural patterns, for all grades of staff and all specialties (NHS England, 2013). Many royal colleges have developed their own specialised courses around this subject, while internationally recognised courses, such as advanced life support, advanced paediatric life support and the European trauma course, all now use the concept of leadership, delegation and situational awareness in their training.

**Analysis of simulated-treatment scenarios**
The Lancashire Simulation Centre has developed video analysis software and integrated it into its video and audio capture system. This enables real-time video analysis of a simulated scenario, which is used in the debrief following the session.

During live observation and analysis of scenarios, it is quite easy to identify clinical procedures being undertaken, such as the insertion of a urinary catheter or an intravenous line. However, while we can identify and note when team members make decisions, we are not sure whether they arrived at them from their observational perspective or as a result of events or experiential influences. This becomes a point of discussion in the debrief to give students an opportunity to rationalise their thought processes.

**Video analysis enables individuals’ movements in the simulation room to be mapped.** Team leaders should remain in their team’s outer circle, gaining an overview of what is happening within the inner circle and maintaining their situational awareness. When we see team leaders moving into the inner circle, we can note the movement and retrospectively analyse the rationale behind the decision as part of the debrief. We can also note when the leader moves back to the outer circle to regain control of the whole situation.

**Loss of situational awareness**
As a result of observational experiences over the past five years, both in the simulation rooms and in clinical practice, we believe the concept of “inner and outer circles” should be discussed as a potential coping strategy when dealing with acute situations with limited team resources.

For example, picture a busy medical ward at 2.30am when a patient’s condition is deteriorating. While recognition that the patient is deteriorating and summoning help are crucial, the ward team leader may be the only person immediately available with the skills to treat the patient; this makes it difficult for the leader to maintain situational awareness.

In human factors training in acute clinical situations, discussions around teamwork and situational awareness frequently look at teams of four to six personnel. However, in reality, team numbers may be smaller, and team leaders need to be aware that the risk of actively treating a patient while leading a team may lead them to lose situational awareness.

**Using the strategy in a medical ward**
In situations like the one in the medical ward described above, the team leader may be the only person with the skills to treat the deteriorating patient until the crash team arrives, such as the ability to establish intravenous access, attain an arterial blood gas reading or insert a chest drain. If that is the case, the team leader should move into the inner circle to perform the necessary tasks, as illustrated in the top row of Fig 1, where the team leader (blue shirt) has stepped into the inner circle.

However, as soon as possible (once the task is complete or as more team members arrive), the leader should move to the outer circle (Fig 1, bottom row) to re-establish...
overall control of the scene. This maximises situational awareness, making decision making easier and facilitating a better situation to deliver a structured handover while maintaining patient-centred care. During the period, that the leader is in the inner circle, another member of the team should be asked to move to the outer circle to maintain overall control of the situation.

From numerous simulation sessions and feedback from doctors, nurses, midwives and allied health professionals, there is a consensus that leading from the outer circle heightens team leaders’ situational awareness.

Limiting the amount of physical activity in the inner circle also minimises the effort required of working memory. On average, the human brain can compute a maximum of 7-9 things simultaneously; once the working memory is “saturated”, any additional demands made on the thought processes may result in overload, and increases the risk of error. Team leaders who are drawn into a clinical situation to perform what may be a difficult task can easily become overloaded.

Minimising hands-on interventions will help leaders by keeping the focus on overall decision-making, leadership and teamworking. If the team leader is drawn into the inner circle, it should therefore be for as short a time as necessary, with the caveat of delegating another team member to step into the outer circle to maintain overall situational awareness (if staffing levels suffice).

**Using the strategy in a reception area**

Another example of how inner and outer circles may be used is in the hospital reception area, where receptionists are busy dealing with patients and relatives attending for appointments, and one patient is becoming increasingly agitated.

The reception manager notices the patient’s body language and can see that all staff are busy. Moving to the inner circle, the manager attends to the patient before the situation escalates then, once the situation has been dealt with, moves back to a supervisory role, allowing staff to continue to work.

**Conclusion**

The concept of inner and outer circles is proven to work in industry and the prehospital environment, and can be adopted in any health service setting to deal with any clinical or non-clinical situation.

It can help to improve overall situational and patient safety, while empowering staff to use their skills and strengths while empowering others, encouraging teamwork and fostering increased overall situational awareness skills.

Medical, nursing and administrative staff should be encouraged as part of a lifelong learning experience to reflect upon and review situations they have dealt with or may be called upon to deal with in the future. They may wish to consider and reflect on the inner and outer circles concept and consider how its application could have helped in the past or may help in the future.

**References**


