Standardising for reliability: the contribution of tools and checklists


Abstract
This article describes two initiatives from the National Patient Safety Agency, which were developed to address important areas of harm to patients. This harm stems from failing to recognise or respond appropriately to deteriorating patients and errors in pre-operative and peri-operative care of surgical patients. Both initiatives used principles of standardisation, reliability and human factors to develop tools and checklists to improve patient safety, with a common approach to supporting implementation. The article describes further advances and developments aimed at increasing and sustaining improvement, including the use of technology to reduce human error.

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interventions identified for the Patient Safety First campaign introduced in 2008, sponsored by the NPSA, NHS Institute for Innovation and Improvement, and the Health Foundation. The Patient Safety First campaign supported the development and sharing of tools to help staff address important patient safety issues and make the safety of patients everyone’s highest priority.

Recognising early signs of deterioration

In 2007, the NPSA commissioned a programme of work to explore why patient deterioration continues to go unrecognised or acted on. The report Recognising and Responding Appropriately to Early Signs of Deterioration in Hospitalised Patients (NPSA 2007) highlighted the main failures of care and the contributory factors to those failures. The main failures identified were:

- Not taking complete sets of patient observations – observation and fluid charts are frequently not completed fully and when observations have been taken they are often not recorded or are difficult to read. Staff may become complacent about routine observations, simply because they are routine and patients are not expected to become unwell. Staff rarely carry out routine observations during the night, which means that observations are not taken for approximately eight hours, sometimes in patients who are very unwell.
- Not making basic visual observations, for example levels of consciousness.
- Calculating early warning scores incorrectly – early warning scores are also sometimes not completed. Calculating the scores increases in difficulty with an increase in patient acuity.
- Not recording observations – the frequency of patient observations may not be reviewed and therefore patients’ vital signs may not be recorded according to need. Paradoxically, sometimes observations are carried out too often and patients who do not need close monitoring are disturbed frequently.
- Not recognising that observations are a cause for concern – taking observations is often perceived as a basic task with a low priority. The task is generally delegated to untrained or junior staff who may have insufficient training in interpreting vital signs.
- Not communicating previous observations and clinical history at handover or at transfer between wards and/or departments.
- Not communicating concerns effectively to other staff – poor teamwork can mean that junior nursing staff are often not confident to call their medical colleagues because of fear of doing the wrong thing and are discouraged from escalating future concerns if they have previously been made to look foolish by the responder. Hierarchy is often a barrier to effective communication in professional groups.
- Failure of staff to respond with appropriate urgency – imprecise communication prevents appropriate prioritisation, particularly when staff have competing priorities.

The NPSA work was undertaken at the same time as work by the National Institute for Health and Clinical Excellence (NICE), which resulted in publication of the document, Acutely Ill Patients in Hospital: Recognition of and Response to Acute Illness in Adults in Hospital (NICE 2007). In effect, NICE (2007) set out the standards required to reduce harm to patients as a result of deterioration in their condition and the NPSA (2007, 2010) work highlighted the factors that needed to be addressed to achieve this.

Increasing and sustaining the use of tools to reduce harm

When Recognising and Responding Appropriately to Early Signs of Deterioration in Hospitalised Patients (NPSA 2007) was incorporated into the Patient Safety First (2008) ‘How to guide’, recommendations were made in six key areas:

- Physiological observations should be recorded for all adult patients in acute hospital settings.
- Physiological observations should be recorded and acted on by staff who have been trained to undertake these procedures and understand their clinical relevance.
- Physiological track and trigger systems should be used.
- A graded response strategy should be in place.
- An escalation protocol should be in place.
- A communication tool should be used.

The ‘How to Guide’ for Reducing Harm from Deterioration (Patient Safety First 2008) was the most frequently downloaded intervention guide in the campaign (Patient Safety First 2011).

Several tools can be used to improve the consistency and accuracy of taking and recording physiological observations. Early warning scoring systems are widely used and coloured charts help to simplify recognition of abnormal observations. A sophisticated, standardised scoring system called ViEWS (VitalPAC Early Warning Score) has been developed to improve recognition of and response to deteriorating patients (The Learning Clinic 2012). Based on extensive evidence, and now widely used in the NHS, it is the system on which the new National Early Warning System (NEWS) is based (Pryerth and et al 2010).
NEWS is still under consultation, but is expected to be made available later this year.

In addition, once a patient has been identified as deteriorating, a protocol setting out agreed escalation procedures is required. To support communication between healthcare professionals, standardised communication tools such as SBAR (Situation, Background, Assessment, Recommendation) have been widely promoted (NHS Institute for Innovation and Improvement 2008c). The NPSA (2012) launched the 10 for 2010 initiative after the Patient Safety First campaign. It aimed to reduce levels of harm in ten high-risk patient areas, for example patient deterioration, falls, insulin administration, anticoagulation and pressure ulcers. The initiative sought to increase sustainability and use of these tools to reduce harm, and encouraged regular audit and improvement initiatives where weaknesses were identified.

Many of the tools highlighted here have since been adopted in the NHS. However, in common with other early warning scoring systems they require human action and, as such, have only a medium level of efficacy. The goal is to make the right thing the easiest thing to do.

Technological solutions offer an increased level of reliability, by making it easier to get it right, through prompts when observations are due, calculations of early warning scores, alerting the right clinician about sick patients and allowing continuous real time audit. Trusts using this type of technology have been able to demonstrate significant improvement in reliability and outcome for patients. Figure 1 shows reduction in mortality at one trust that used VitalPAC, an information technology solution to support staff to recognise and respond quickly to signs of deterioration (Moore 2011).

**Five steps for safer surgery**

In July 2008, the World Health Organization (WHO) launched the initiative Safe Surgery Saves Lives: The Second Global Patient Safety Challenge to reduce the number of surgical fatalities worldwide. The ultimate goal of the initiative is to help ensure that surgical teams consistently follow critical safety standards and thereby minimise the most common and avoidable risks endangering the lives and wellbeing of surgical patients. These standards include improving anaesthetic safety practices, ensuring surgery is undertaken on the correct part of the body, preventing surgical site infections, and improving communication and teamwork. A core set of safety checks, to be initiated at critical time points within a patient’s care pathway, have been identified from these standards and included in the WHO (2008) Surgical Safety Checklist for use in any operating theatre environment. The checklist can be adapted to fit local practices and used as a tool to initiate meaningful and purposeful conversation and teamwork between relevant members of the clinical team to improve the safety of surgery. It is not designed as a tick box exercise.

In January 2009, the NPSA adapted the WHO Surgical Safety Checklist for use in England and Wales, with the requirement that by February 1 2010 all organisations in England and Wales must ensure that:

- An executive and a clinical lead are identified to implement the surgical safety checklist within the organisation.
- The checklist is completed for every patient undergoing a surgical procedure (including local anaesthesia).
- The use of the checklist is entered in the clinical notes or electronic record by a registered member of the team, such as the surgeon, anaesthetist, nurse or operating department practitioner.

Following the launch of Safe Surgery Saves Lives (WHO 2008), Patient Safety First incorporated the WHO Surgical Safety Checklist into its peri-operative care guidance (Patient Safety First 2009). The Patient Safety First campaign team used the Institute for Healthcare Improvement’s model of improvement (Langley et al 2009) to bring about planned, sustained and reliable change and

**FIGURE 1**

Example data from one NHS trust using VitalPAC showing a reduction in mortality from April 2006 to April 2010

<table>
<thead>
<tr>
<th>VitalPAC observations</th>
<th>% deaths before VitalPAC</th>
<th>% deaths after VitalPAC</th>
<th>Trend in deaths before VitalPAC</th>
<th>Trend in deaths after VitalPAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 06</td>
<td>28%</td>
<td>22%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Apr 06</td>
<td>28%</td>
<td>22%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Apr 07</td>
<td>28%</td>
<td>22%</td>
<td>4%</td>
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</tbody>
</table>

(Unpublished data from The Learning Clinic)
advocated the addition of surgery pre-list briefings and debriefings. On release of the \textit{WHO Surgical Safety Checklist} for England (NPSA 2009), staff from Patient Safety First provided support for its implementation. Similarly, staff working on the 1000 Lives Plus campaign (NHS Wales 2008) in Wales agreed to incorporate the requirements of the NPSA alert into the \textit{Reducing Surgical Complications} intervention (NHS Wales 2010).

Many of the disruptions to workflow that occur during procedures in operating theatres are a result of problems with communication and teamwork (Christian et al., 2006, Wiegmann et al., 2007). There is growing evidence that the use of briefings and checklists in surgical settings improves teamwork and communication, and results in widespread benefits such as timely administration of antibiotics and improvements in the availability of equipment (Lingard et al., 2008, Henrickson et al., 2009, Einav et al., 2010). Team briefings and checklists provide a structure to share practical issues that may affect workflow in theatre. Information exchange and problem identification have improved and the number of ‘near misses’ has reduced (Lingard et al., 2006).

It has become clear, from experience and feedback, that the addition of team briefing and debriefing sessions at the beginning and end of theatre lists are key to achieving the change in culture required to promote better patient safety in theatres, and are now supported by the NPSA as a vital adjunct to the \textit{WHO Surgical Safety Checklist} (NPSA 2009). A five-step process to improve the safety of surgery is advocated by the NPSA (2010):

- Step 1: briefing.
- Step 2: sign in.
- Step 3: time out.
- Step 4: sign out.
- Step 5: debriefing.

Clinical staff have reported benefits of using these five steps, including improved teamwork and safety, more near miss incidents being captured, smoother, quicker procedures and improved staff morale. In addition, some trusts have reported improved theatre list start and finish times, as well as reduced patient turnaround times (NHS Evidence 2011).

While all acute hospitals in England have implemented the NPSA alert, feedback received by Patient Safety First (2010) suggests that only 32% of trusts were using the checklist with a briefing and 33% were using it with a briefing and debriefing. Trusts are still facing a variety of challenges in implementing the checklist. The two most frequently reported challenges are the tendency to

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National Institute for Health and Clinical Excellence (2007) \textit{Acutely Ill Patients in Hospital: Recognition of and Response to Acute Illness in Adults in Hospital}. Clinical Guideline No 50. NICE, London. & \\
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\end{table}
use the checklist as a tick box exercise rather than a tool to improve communication and teamwork, and a lack of clinical engagement (Patient Safety First 2010). These challenges are reflected in a recent review of surgical ‘never events’ (Clinical Human Factors Group 2012). Other challenges include the lack of support by leaders, use of the checklist not being considered a priority and finding the right time to undertake step four (sign out) of the five-step process (NHS Evidence 2011).

Various resources are available to support practitioners and clinicians in implementing the five steps to safer surgery on the NPSA and Patient Safety First websites. One of these resources is a video, Five Steps to Safer Surgery Film (http://tinyurl.com/7egpGy), which demonstrates all five steps in a real clinical situation. Others include an updated version of the peri-operative care guide (http://tinyurl.com/c80oomx), originally produced as part of the Patient Safety First campaign, and quick guides to briefing and debriefing (http://tinyurl.com/6q9nhkd).

The NPSA has worked closely with the Royal College of Obstetricians and Gynaecologists, Royal College of Midwives and Royal College of Radiologists to develop specialty-specific checklists, which provide a national standardised approach to the management of specific risk in these specialties.

**Conclusion**

This article has described two national initiatives designed to introduce tools and/or checklists to improve patient safety with a common approach to supporting implementation. Early results of their uptake and effect have been encouraging.

Continued successful implementation of these initiatives will, in part, be dependent on the ability to demonstrate an improvement in outcomes. Some of this work is being undertaken on a national basis, for example the Surgical Checklist Implementation Project led by Imperial College and Imperial College Healthcare Trust, London (Imperial College London 2012) and annual reports on never events published by the NPSA and subsequently the Department of Health. However, many of the indicators for improvement will need to continue to be determined locally.

Success will also be measured by the cultural changes within the clinical environment, improved communication within the team and the ultimate answer to the question ‘Is the right patient receiving the right care at the right time?’

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**References**

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