

EDITORIAL

WHO cares? Safety checklists in echocardiography

Clare Quarterman MBChB BSc FRCA¹, Nick Fletcher MBBS FRCA FFICM^{2,*}
and Vishal Sharma MD FRCP FESC^{3,*}

¹Department of Anaesthesia, Liverpool Heart and Chest Hospital NHS Foundation Trust, Liverpool, UK

²St Georges University Hospital NHS Foundation Trust, London SW17 0QT, UK

³Royal Liverpool and Broadgreen University Hospitals NHS Trust, Prescot Street, Liverpool, L7 8XP, UK

* (N Fletcher and V Sharma contributed equally to this work)

Correspondence
should be addressed
to V Sharma
Email
Vishal.sharma@rlbuht.nhs.uk

Abstract

The number of potentially preventable medical errors that occur has been steadily increasing. These are a significant cause of patient morbidity, can lead to life-threatening complications and may result in a significant financial burden on health care. Effective communication and team working reduce errors and serious incidents. In particular the implementation of the World Health Organisation (WHO) Safe Surgery Checklist has been shown to reduce in-hospital mortality, postoperative complications and the incidence of surgical site infection. However an increasing number of complex medical procedures and interventions are being performed outside of the theatre environment. The lessons learnt from the surgical setting are relevant to other procedures performed in other areas. For the echocardiographer, transoesophageal echocardiography (TOE) is one such procedure in which there is the potential for medical errors that may result in patient harm. This risk is increased if patient sedation is being administered. The British Society of Echocardiography and the Association of Cardiothoracic Anaesthetists have developed a procedure specific checklist to facilitate the use of checklists into routine practice. In this article we discuss the evolution of the WHO safety checklist and explore its relevance to TOE.

Key Words

- ▶ safety
- ▶ checklist
- ▶ World Health Organisation

Editorial

In recent years the incidence of potentially preventable medical errors has increased in line with the rising complexity of medical care (1). These errors result in an increased burden in terms of patient morbidity and mortality and on healthcare finances. Consequently there has been a significant drive to reduce avoidable errors. It has been well recognised that a high standard of communication within a team results in improved patient outcomes and can significantly reduce the rate of adverse events (2). In recognition of this, in 2008 the World Health Organisation (WHO) published guidelines outlining a series of recommendations developed to improve the

safety of patients undergoing surgical procedures worldwide (3). The WHO Safer Surgery Checklist was developed from this and forms an integral part of their Safe Surgery Saves Lives Programme. Consisting of a 19-point checklist performed at fixed perioperative time points, it encourages the team to pause and communicate as a group at three stages; before induction of anaesthesia, before commencement of surgery and before transfer to the recovery area.

Whilst the use of checklists is often criticised as encouraging 'tick box medicine', they ensure teams work consistently, completing all essential steps even in emergency situations by introducing a series of routine checks at critical time points (4). The benefit of these

checklists has been significant. In a large study (2) involving nearly 8000 patients undergoing non-cardiac surgery, there was a significant reduction in the rates of in-hospital mortality from 1.5% to 0.8% across centres in both the developed and developing world. In addition the incidence of major post-operative complications, in particular surgical site infection and unplanned re-operation, were reduced from 11% to 7% (2). Following introduction of these checklists, a significant reduction in complication rates was also demonstrated in centres where there was already a high standard of care (5). Whilst the primary goal is to improve patient safety, the potential financial savings resulting from reduced complication rates cannot be ignored.

The WHO Safer Surgery Checklist was adopted throughout the UK in 2010 and is now a fundamental component of the theatre journey of all patients undergoing surgery in the UK. However an increasing number of medical procedures are being performed outside the theatre environment. Many of the lessons learnt from the surgical setting are equally applicable outside the theatre environment, where an increasing number of patients undergo potentially harmful procedures and interventions.

Completion of the WHO surgical checklist is broken down into three sections – the ‘sign in’, the ‘time out’ and the ‘sign out’. The ‘sign in’ occurs prior to induction of anaesthesia or sedation and begins with oral confirmation by members of the theatre team of the name of the patient, the surgical site and procedure and ensuring that there is a signed valid consent form. There is team-wide recognition of potential adverse factors relating to the case. Finally the anaesthetist confirms that all equipments and monitoring have been checked and are ready for use. There may be team members present who have no prior knowledge of the patient or what the investigation expects to find (6). The checklist ensures sharing of pertinent information. In some institutions the ‘sign in’ is partly completed at the start of the day during a morning team briefing where each patient is briefly reviewed by the entire surgical and anaesthesia team, any problems are highlighted and plans are discussed (7). Pre-operative briefings alone have been shown to significantly reduce interruptions to surgical flow and incidents of miscommunication by 50% (8).

Before skin incision the ‘time out’ provides a focal point for the start of surgery and ensures all personnel have been introduced by name and role to facilitate effective teamwork. The identity of the patient and planned procedure are confirmed again, and surgeon,

anaesthetist and nursing teams raise issues of specific concern or any unexpected steps that may present a deviation from routine practice. Factors to reduce the risk of surgical site infection are considered and sterility of instruments and relevant equipments is confirmed. Finally the operator confirms that all essential imaging pertaining to the patient and the procedure are available (8).

Upon completion of surgery and before the patient leaves the operating theatre, the ‘sign out’ comprises team wide confirmation that the name of the procedure has been recorded, instrument and swab counts have been performed and are complete and there is a documented plan in place for the recovery and on-going care of the patient (8). Whilst checklist completion may appear a lengthy process, the median time required to complete the ‘time out’ and ‘sign out’ is just 60 seconds each (9).

Completion of the checklist is intended to create a collective awareness within the team about potential safety issues. There are numerous challenges to the successful implementation of any new checklist and cultural changes on the part of the organisation and the individual are essential for this (2). In order to achieve optimum benefit there must be a high degree of compliance. van Klei *et al.* (7) assessed the impact of the WHO Surgical Safety Checklist in their institution. Although they demonstrated a reduction in overall in-hospital mortality following checklist introduction, this reduction was significantly greater in those patients with completed checklists.

An organisational culture of safety sends a clear message to all staff about the use of a checklist that focuses the attention of the theatre team on safety, communication and empowerment of junior team members to raise awareness of safety issues. There must be engagement of all members of the team in order to ensure the change of team practices. The appointment of departmental champions can produce an initial group of enthusiasts to encourage and support the ongoing implementation (10). Consistent and universal use for ‘every patient and every time’ integrates the checklist into routine practice (11). Checklists need to be concise and user friendly, whilst covering all potential issues that could precipitate an adverse event or critical incident (6). To gain credibility it should be evaluated and proven to be practicable. Regular audit of use and compliance is essential.

There are several barriers to successful checklist adoption by departments, the majority of which can be overcome

through strong leadership at all levels. Perceived duplication, concerns surrounding delays and poor completion with apathy may be encountered. Interruptions and incomplete, dismissive or hurried replies with a perceived irrelevance of the checklist are other obstacles that must be negotiated. Initial resistance to checklist introduction should be anticipated. Disengagement with the process reduces this to a tick box exercise and can actually jeopardise patient safety and high quality care (9, 10). The potential benefits and the relevance of checklist components must be emphasised (2, 8, 9, 10). Where there are compliance issues, departments should encourage feedback and, where appropriate, be open to making adaptations.

This is particularly important when considering the use of checklists outside the theatre environment. The principles behind the WHO Safer Surgery checklist remain valid outside theatre, and the impact of human factors on patient outcomes is relevant in all areas where complex procedures are performed, particularly those that involve patient sedation. However many of the individual items within the WHO checklist are specific to surgery and not applicable outside theatre. Consequently adapted versions of the WHO checklist are being used outside the theatre environment. In addition endoscopy departments, interventional radiology suites and catheter labs are introducing specialty and procedure specific checklists (6, 11).

In this issue, the BSE and ACTA have developed a specific checklist for transoesophageal echocardiography (TOE) (12). This is relevant as TOE involves the use of sedation and there is the potential for harm to the patient. There is the risk of small errors during the procedure which in isolation may be seen as inconsequential but a series of small errors may combine and result in a the development of a major adverse event (6). The Department of Health has named a series of 'Never Events'; a group of serious but potentially 'preventable patient safety incidents that should not occur if the available preventative measures have been implemented by healthcare providers' (13). The 'Never Events' that are relevant to TOE lists include overdose of midazolam during conscious sedation, failure to monitor and respond to oxygen saturations during conscious sedation for a healthcare procedure and patient misidentification.

A TOE checklist could introduce an additional safety check in order to reduce the incidence of such events. The safety checklist produced by the BSE and ACTA follows the 'sign in', 'time out' and 'sign out' processes that underpinned the success of the WHO Safer Surgery Checklist but has been adapted to be more relevant to

TOE (12). The WHO actively encourages the adaptation of the checklist they produced in order to retain relevance for the context in which it will be used. Therefore the development of this checklist by the BSE and ACTA is a welcome development. It is hoped that incorporation of this checklist into routine practice prior to TOE can reduce the risk of adverse events.

Declaration of interest

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of this editorial.

Funding

This editorial did not receive any specific grant from any funding agency in the public, commercial or not-for-profit sector.

References

- 1 Panesar SS, Cleary K, Sheikh A & Donaldson L 2009 The WHO checklist: a global tool to prevent errors in surgery. *Patient Safety in Surgery* **3** 9. (doi:10.1186/1754-9493-3-9)
- 2 Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, Herbosa T, Joseph S, Kibatala PL, Lapitan MC *et al.* 2009 A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine* **360** 491–499. (doi:10.1056/NEJMsa0810119)
- 3 World Health Organisation. World Alliance for Patient Safety, WHO guidelines for safe surgery. 2008: http://www.who.int/patientsafety/information_centre/reports/Alliance_Forward_Programme_2008.pdf.
- 4 Wilson I & Walker I 2009 The WHO Surgical Safety Checklist: the evidence. *Journal of Perioperative Practice* **19** 362–364.
- 5 de Vries EN, Prins HA, Crolla RM, den Outer AJ, van Anel G, van Helden SH, Schlack WS, van Putten MA, Gouma DJ, Dijkgraaf MG *et al.* 2010 Effect of a comprehensive surgical safety system on patient outcomes. *New England Journal of Medicine* **363** 1928–1937. (doi:10.1056/NEJMsa0911535)
- 6 Matharoo M, Thomas-Gibson S, Haycock A & Sevdalis N 2014 Implementation of an endoscopy safety checklist. *Frontline Gastroenterology* **5** 260–265. (doi:10.1136/flgastro-2013-100393)
- 7 van Klei WA, Hoff RG, van Aarnhem EE, Simmermacher RK, Regli LP, Kappen TH, van Wolfswinkel L, Kalkman CJ, Buhre WF & Peelen LM 2012 Effects of the introduction of the WHO "Surgical Safety Checklist" on in-hospital mortality: a cohort study. *Annals of Surgery* **255** 44–49. (doi:10.1097/SLA.0b013e31823779ae.)
- 8 Clark SC, Dunning J, Alfieri OR, Elia S, Hamilton LR, Kappetein AP, Lockowandt U, Sarris GE, Kolh PH & Clinical Guidelines Committee of the European Association for Cardio-Thoracic Surgery 2012 EACTS guidelines for the use of patient safety checklists. *European Journal of Cardio-Thoracic Surgery* **41** 993–1004. (doi:10.1093/ejcts/ezs009)
- 9 Pickering SP, Robertson ER, Griffin D, Hadi M, Morgan LJ, Catchpole KC, New S, Collins G & McCulloch P 2013 Compliance and use of the World Health Organization checklist in UK operating theatres. *British Journal of Surgery* **100** 1664–1670. (doi:10.1002/bjs.9305)
- 10 Mahajan RP 2011 The WHO surgical checklist. *Best Practice & Research. Clinical Anaesthesiology* **25** 161–168. (doi:10.1016/j.bpa.2011.02.002)

- 11 Cahill TJ, Clarke SC, Simpson IA & Stables RH 2015 A patient safety checklist for the cardiac catheterisation laboratory. *Heart* **101** 91–93. (doi:10.1136/heartjnl-2014-306927)
- 12 Sharma V, Alderton S, McNamara H, Steeds R, Bradlow W, Chenzbraun A, Oxborough D, Matthew T, Jones R, Wheeler R *et al.* 2015 A safety checklist for transoesophageal echocardiography from the British Society of Echocardiography and the Association of Cardiothoracic Anaesthetists. *Echo Research and Practice* **2** G25–G27. (doi:10.1530/ERP-15-0035)
- 13 NHS England, Patient Safety Domain Team 2013 The never events list; 2013/14 update; <https://www.england.nhs.uk/wp-content/uploads/2013/12/nev-ev-list-1314-clar.pdf>

Received in final form 29 November 2015

Accepted 1 December 2015