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A Safety Checklist For Transoesophageal Echocardiography From the British Society of Echocardiography and the Association of Cardiothoracic Anaesthetists.

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Abstract

The World Health Organisation (WHO) launched the Surgical Safety Checklist in 2008. The introduction of this checklist resulted in a significant reduction in the incidence of complications and death in patients undergoing surgery. Consequently the WHO Surgical Safety checklist is recommended for use by the National Patient Safety Agency for all patients undergoing surgery. However many invasive or interventional procedures occur outside the theatre setting and there are increasing requirements for a safety checklist to be used prior to such procedures.

Transoesophageal echocardiography (TOE) is an invasive procedure and although generally considered to be safe, it carries the risk of serious and potentially life threatening complications. Strict adherence to a safety checklist may reduce the rate of significant complications during TOE. However the standard WHO Surgical Safety Checklist is not designed for procedures outside the theatre environment and therefore this document is designed to be a procedure specific safety checklist for TOE. It has been endorsed for use by the British Society of Echocardiography and the Association of Cardiothoracic Anaesthetists.

Key words

Transoesophageal echocardiography, Safety Checklist

Running Head

Safety checklist for transoesophageal echocardiography

Word count

937

Introduction

The number of surgical procedures being performed worldwide continues to increase. However despite the introduction of more advanced surgical techniques, there remains a significant risk of complications and death from surgical procedures.[1] Previous studies have shown that over 50% of surgical complications are avoidable.[2] In addition the importance of effective teamwork has been established and been shown to improve outcome.[3] Consequently the World Health Organisation (WHO) developed the Surgical Safety Checklist in 2008. Following the introduction of the WHO surgical Safety checklist, a large global multicentre study demonstrated a 40% reduction in complications and death following surgery.[4] The use of this checklist is now recommended for all patients undergoing surgery in the UK by the National Patient Safety Agency.

The rationale for a safety checklist in Transoesophageal echocardiography

A large number of invasive and interventional procedures are now performed outside the theatre environment. Many of the factors contributing to surgical complications and serious untoward incidents are present when performing invasive procedures and/or administering sedation in other environments. Consequently there is an increasing requirement to utilise safety checklists for all invasive procedures. The indications, guidelines and protocols for transoesophageal echocardiography are well established [5, 6, 7]. Transoesophageal echocardiography is generally considered to be low risk but is occasionally associated with serious complications including

oesophageal perforation, transmission of infection and death (<0.01%). [8]. Adherence to the British Society of Echocardiography (BSE) guidance on TOE probe cleaning and disinfection (9) is important to reduce the risk of transmission of infection between patients. In addition the BSE has produced guidance on the use of safe sedation during TOE (10). The incidence of complications may be further reduced by implementation and adherence to a safety checklist together with effective team working. The current WHO Surgical safety checklist was designed for use within the theatre environment and hence is not directly relevant for use in TOE. This document produced by the British Society of Echocardiography and the Association of Cardiothoracic Anaesthetists aims to outline a procedure specific safety checklist for TOE.

How to use the checklist

The form is designed to be printed on a double sided A4 page and can be filed in the patient medical records once it has been completed. However the form can be adapted for use locally or converted into an electronic format for use in an electronic patient record if necessary. In keeping with the format of the WHO safety checklist, the procedure has been broken down into 3 phases, corresponding to patient checks, immediately pre-procedure and post procedure checks. There is also an appendix to be completed if the TOE is being performed under general anaesthesia.

In order to complete the checklist effectively it is important that one member of the team assumes responsibility for completion of each stage of the checklist. This can be any member of the team. At the start, it is important that the patient verbally confirms their identity and the intended procedure in their own words. During the 'Time Out'

phase, all team members should be present and should confirm their name and role. If the same team is unchanged during a list this stage can be performed at the start of the list but does not need repetition for each patient. Immediately pre-procedure the team should reconfirm that the correct patient is about to undergo the correct procedure and outline any anticipated difficulties for each patient. Once the procedure has been completed appropriate handover to the recovery team and any specific instructions should be given and all documentation completed.

Conclusion

It is anticipated that the use of this checklist will ensure a consistent process is followed when performing TOE. This will minimize the risk of avoidable complications that may occur during TOE.

References

1. Healey, M.A., S.R. Shackford, T.M. Osler, F.B. Rogers, and E. Burns, Complications in surgical patients. *Arch Surg*, 2002. 137(5): p. 611-7; discussion 617-8.
2. Gawande, A.A., E.J. Thomas, M.J. Zinner, and T.A. Brennan, The incidence and nature of surgical adverse events in Colorado and Utah in 1992. *Surgery*, 1999. 126(1): p. 66-75.
3. Mazzocco, K., D.B. Petitti, K.T. Fong, D. Bonacum, J. Brookey, S. Graham, R.E. Lasky, J.B. Sexton, and E.J. Thomas, Surgical team behaviors and patient outcomes. *Am J Surg*, 2009. 197(5): p. 678-85.
4. Haynes, A.B., T.G. Weiser, W.R. Berry, S.R. Lipsitz, A.H. Breizat, E.P. Dellinger, T. Herbosa, S. Joseph, P.L. Kibatala, M.C. Lapitan, et al., A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med*, 2009. 360(5): p. 491-9.
5. Hahn, R.T., T. Abraham, M.S. Adams, C.J. Bruce, K.E. Glas, R.M. Lang, S.T. Reeves, J.S. Shanewise, S.C. Siu, W. Stewart, et al., Guidelines for performing a comprehensive transesophageal echocardiographic examination: recommendations from the American Society of Echocardiography and the Society of Cardiovascular Anesthesiologists. *J Am Soc Echocardiogr*, 2013. 26(9): p. 921-64.
6. Flachskampf, F.A., L. Badano, W.G. Daniel, R.O. Feneck, K.F. Fox, A.G. Fraser, A. Pasquet, M. Pepi, L. Perez de Isla, J.L. Zamorano, et al., Recommendations for transoesophageal echocardiography: update 2010. *Eur J Echocardiogr*, 2010. 11(7): p. 557-76.

7. Wheeler R, Steeds RP, Rana B, Wharton G, Smith N, Allen J, Chambers J, Jones R, Lloyd G, O’Gallagher K and Sharma V. A Minimum Dataset For A Standard Transoesophageal Echocardiogram: A Guideline Protocol From The British Society Of Echocardiography. Echo Research and Practice xxxxxx
8. Hilberath, J.N., D.A. Oakes, S.K. Shernan, B.E. Bulwer, M.N. D’Ambra, and H.K. Eltzschig, Safety of transesophageal echocardiography. J Am Soc Echocardiogr, 2010. 23(11): p. 1115-27; quiz 1220-1.
9. Kanagala P, Bradley C, Hoffman P, Steeds RP. Guidelines for Transoesophageal Echocardiography Probe Cleaning and Disinfection from the British Society of Echocardiography 2011. <http://www.bsecho.org/probe-decontamination/>
10. Wheeler R, Steeds RP, Wharton G, Rana B, Smith N, Oxborough D, Brewerton H, Allen J, Chambers J, Sandoval J et al. Recommendations for Safe Practice in Sedation during Transoesophageal Echocardiography: A Report from the Education Committee of the British Society of Echocardiography. <http://www.bsecho.org/recommendations-for-safe-practice-in-sedation/>

Transoesophageal Echocardiogram Safety Checklist

Sign In: Patient Checks

Patient verbally confirms procedure

TOE consent form completed

Clinical records available

Transport arrangements

Indication/previous imaging reviewed

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Patient c

	Yes	No	Details
Known Allergies	<input type="checkbox"/>	<input type="checkbox"/>
Previous problems with sedation	<input type="checkbox"/>	<input type="checkbox"/>
Relative contraindications (active GI bleeding, dysphagia, surgery, liver disease, anticoagulation, dental)	<input type="checkbox"/>	<input type="checkbox"/>
Patient fasted (>6 hours) (Clear fluids can be taken up to 2 hours prior)	<input type="checkbox"/>	<input type="checkbox"/>
Attach monitoring	<input type="checkbox"/>	<input type="checkbox"/>
Equipment functioning normally (ECG, Sats, BP, Echo)	<input type="checkbox"/>	<input type="checkbox"/>
IV access established and checked	<input type="checkbox"/>	<input type="checkbox"/>
Medication available (sedation/reversal)	<input type="checkbox"/>	<input type="checkbox"/>
TOE probe clean and ready for use	<input type="checkbox"/>	<input type="checkbox"/>

Decontamination patient's notes stickers to be attached below if applicable:

Time Out: Immediately Pre-Procedure

	Yes	No	Details
All members confirm name and role	<input type="checkbox"/>	<input type="checkbox"/>
Verbally confirm patient and procedure	<input type="checkbox"/>	<input type="checkbox"/>
Any anticipated difficulties	<input type="checkbox"/>	<input type="checkbox"/>
TOE operator: any sedation or patient issues	<input type="checkbox"/>	<input type="checkbox"/>
Sonographer: any equipment issues	<input type="checkbox"/>	<input type="checkbox"/>

Nursing team: any equipment issues

Sign Out: Post Procedure

	Yes	No	Details
Procedure note documented	<input type="checkbox"/>	<input type="checkbox"/>
All images acquired and stored	<input type="checkbox"/>	<input type="checkbox"/>
Any complications	<input type="checkbox"/>	<input type="checkbox"/>
Probe intact	<input type="checkbox"/>	<input type="checkbox"/>
Post procedure observations satisfactory	<input type="checkbox"/>	<input type="checkbox"/>
Any equipment problems to be addressed	<input type="checkbox"/>	<input type="checkbox"/>
Specific instructions to recovery team	<input type="checkbox"/>	<input type="checkbox"/>

Drugs administered

Midazolam	<input type="checkbox"/>	Dose	.....	Given by	.....
Xylocaine	<input type="checkbox"/>	Dose	.....	Given by	.....
Flumazenil	<input type="checkbox"/>	Dose	.....	Given by	.....
Other	<input type="checkbox"/>	Dose	.....	Given by	.....

Team Members

TOE operator

Lead sonographer

Assistant

Nurse

Other

General Anaesthesia Appendix

	Yes	No
Is the anaesthetic equipment check complete	<input type="checkbox"/>	<input type="checkbox"/>
Is there a difficult airway/risk of aspiration	<input type="checkbox"/>	<input type="checkbox"/>
Notes		
What is the patients ASA grade		
Any specific anaesthetic concerns	<input type="checkbox"/>	<input type="checkbox"/>
Notes		
Is the correct monitoring available	<input type="checkbox"/>	<input type="checkbox"/>
Resuscitation equipment available	<input type="checkbox"/>	<input type="checkbox"/>
Additional questions		

Checklist completed by signed date.....

