UNIWERSYTET MEDYCZNY W ŁODZI

How to increase Safety in Operation Theatre – anesthesiologist perspective

Tomasz Gaszynski

Department of Anesthesiology and Intensive Therapy
Medical University of Lodz

The European Society for Perioperative Care of the Obese Patient
ESPCOP
www.espcop.org

European Society of Anaesthesiology recommendations

Helsinki Declaration on Patient Safety in Anaesthesiology - Full Declaration

http://www.euroanesthesia.org/sitecore/content/Publications/Helsinki%20Declaration.aspx

Helsinki Declaration

- Anaesthesiology shares responsibility for quality and safety in Anaesthesia, Intensive Care, Emergency Medicine and Pain Medicine, including the whole perioperative process,

- Anaesthesiology is the key specialty in medicine to take up responsibility for achieving the goals listed below which will notably improve Patient Safety in Europe.

Established in Helsinki on 14 June 2010

- Patients have a right to expect to be safe and protected from harm during their medical care and anaesthesiology has a key role to play improving patient safety perioperatively.
- Patients have an important role to play in their safe care which they should be educated about and given opportunities to provide feedback to further improve the process for others.

Helsinki Declaration

- The funders of healthcare have a right to expect that perioperative anaesthesia care will be delivered safely and therefore they must provide appropriate resources.
- Human factors play a large part in the delivery of safe care to patients, and we will work with our surgical, nursing and other clinical partners to reliably provide this.

Heads of Agreement

- No ethical, legal or regulatory requirement should reduce or eliminate any of the protections for safe care set forth in this Declaration.

Principal requirements

- the European Board of Anaesthesiology (EBA) with European Commision aims for improving Patient Safety in Europe in cooperation between European organisations.

Requirements for patient`s safety in OR by UEMS EBA and ESA

1. All institutions providing perioperative anaesthesia care to patients (in Europe) should comply with the minimum standards of monitoring recommended by the EBA both in operating theatres and in recovery areas.
2. All such institutions should have protocols and the necessary facilities for managing the following:

Required standards and protocols:

- Preoperative assessment and preparation
- Checking Equipment and drugs
- Syringe labelling
- Difficult/failed intubation
- Malignant hyperpyrexia
- Anaphylaxis
- Local anaesthetic toxicity
- Massive haemorrhage
- Infection control
- Postoperative care including pain relief

Standards requirements:

- All institutions should support the WHO Safe Surgery Saves Lives initiative and Checklist.
- All departments of anaesthesiology in Europe must be able to produce an annual report of measures taken and results obtained in improving patient safety locally.

Standards requirements:

- All institutions providing anaesthesiological care to patients must collect the required data to be able to produce an annual report on patient morbidity and mortality.
- All institutions providing anaesthesiological care to patients must contribute to the recognised national or other major audits of safe practice and critical incident reporting systems.

Causes of severe adverse events during anesthesia

- Exaggerated pharmacological effect, e.g., hypotension during extradural anesthesia or with propofol; bradycardia and hypotension after opiates
- Anaphylaxis to one of the i.v. NMBAs or anesthetic drugs
- Adverse reaction to another administered drug e.g., drug with premedication; antibiotic with induction; analgesic, e.g., NSAID rectally or opiate intraoperatively
- Latex rubber allergy

Causes of severe adverse events during anesthesia

- Reaction to intravenous infusion, for example colloid, blood, plasma
- Allergy to other substance given, e.g., chlorhexidine or a diagnostic dye
- Problem with anesthetic technique, for example intubation
- Autonomic parasympathetic effects, e.g., during laparoscopy, peritoneal traction, arthroscopy, squint surgery, dental surgery.
- Medical (non-allergic) cause, for example septicaemia; cardiac; severe asthma, pneumothorax; air embolus
- Malignant hyperthermia

Example of protocol for management of sever adverse event

A E R

Editor-in-Chief :
Mohamad Said Maani Takrouri
(KSA)

Open Access
HTML Format

For entire Editorial Board visit : http://www.aeronline.org/editorialboard.asp

Anesthesia: Essays and Researches

Review Article

Anaphylaxis during the perioperative period

Shrikant Mali

Anaphylaxis in OR

- The incidence of anaphylaxis during anesthesia has been reported to range from 1 in 4000 to 1 in 25,000.
- Anaphylaxis during anesthesia can present as cardiovascular collapse, airway obstruction, and/or skin manifestation.
- It can be difficult to differentiate between immune and nonimmune mast cell-mediated reactions and pharmacologic effects from the variety of medications administered during general anesthesia.

Management of patient with suspected anaphylaxis during anesthesia

1. Stop administration of all agents likely to have caused the anaphylaxis.
2. Call for help.
3. Maintain airway, give 100% oxygen and lie patient flat with legs elevated.
4. Give epinephrine (adrenaline). This may be given intramuscularly in a dose of 0.5 mg to 1 mg. Alternatively, 50 to 100 µg intravenously (0.5 to 1 mL of 1:10,000) over 1 min

Management of patient with suspected anaphylaxis during anesthesia

- Second step therapy

1. Give corticosteroids (100 to 500 mg hydrocortisone slowly iv).
2. Bronchodilators may be required for persistent bronchospasm.

Example of protocol for management of sever adverse event

BJA

British Journal of Anaesthesia, 115 (6): 827–48 (2015)

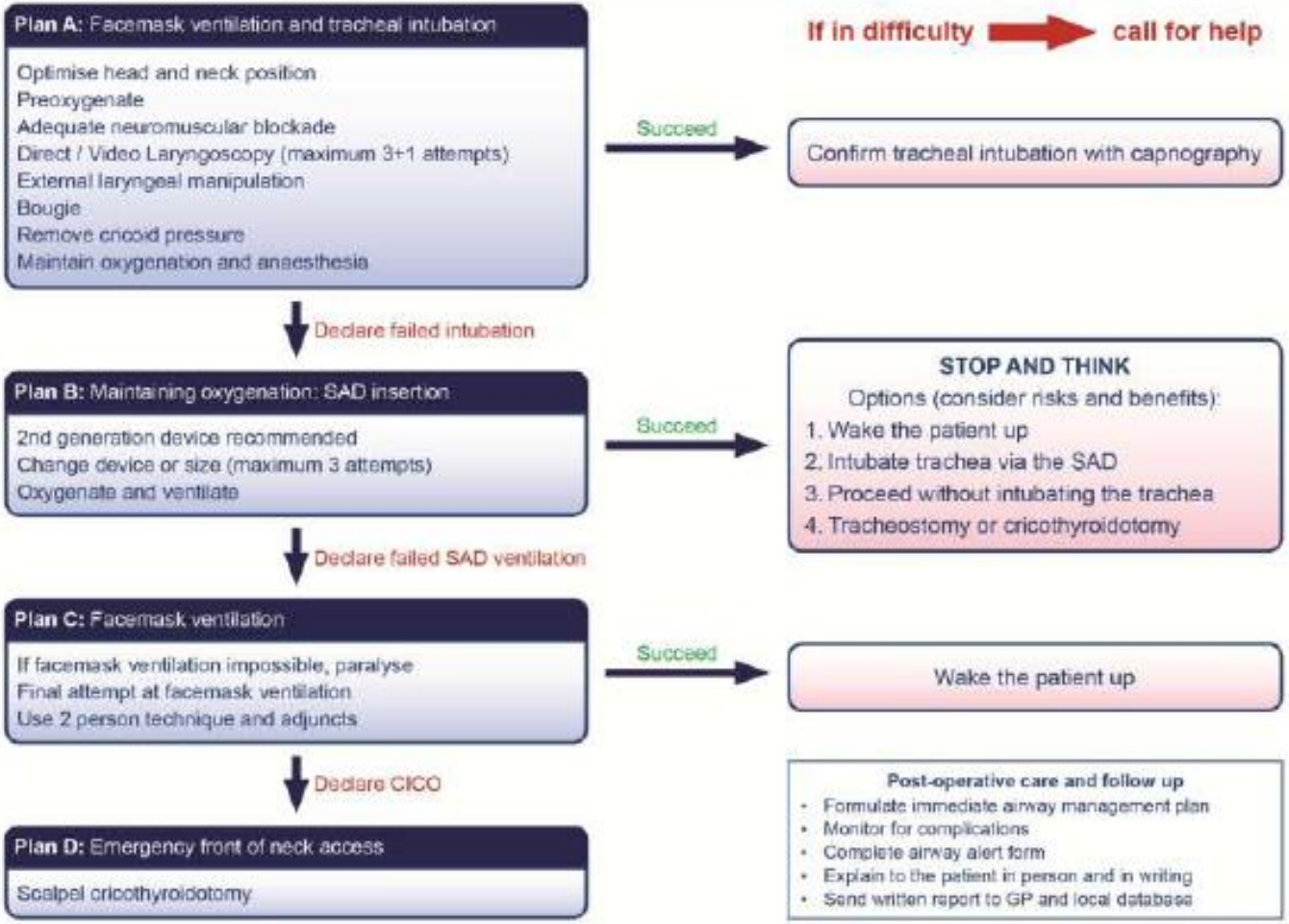
doi: 10.1093/bja/aev371
Advance Access Publication Date: 10 November 2015
Special Article

SPECIAL ARTICLE

Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults†

Management of unanticipated difficult tracheal intubation in adults

2015



This flowchart forms part of the DAS Guidelines for unanticipated difficult intubation in adults 2015 and should be used in conjunction with the text.

Example of protocol for management of sever adverse event

EJA

Eur J Anaesthesiol 2017; **34:**332–395

GUIDELINES

Management of severe perioperative bleeding: guidelines from the European Society of Anaesthesiology

PLOS ONE

RESEARCH ARTICLE

Implementation of a Surgical Safety Checklist: Interventions to Optimize the Process and Hints to Increase Compliance

Gerald Sendlhofer[1,2]*, Nina Mosbacher[2], Leitgeb Karina[1], Brigitte Kober[1], Lydia Jantscher[1], Andrea Berghold[3], Gudrun Pregartner[3], Gernot Brunner[4], Lars Peter Kamolz[2]

- A surgical safety checklist (SSC) is an inexpensive tool capable of shifting the hierarchical culture in the operating room and fostering patient safety attitudes,

PLOS ONE

RESEARCH ARTICLE

Implementation of a Surgical Safety Checklist: Interventions to Optimize the Process and Hints to Increase Compliance

Gerald Sendlhofer[1,2*], Nina Mosbacher[2], Leitgeb Karina[1], Brigitte Kober[1], Lydia Jantscher[1], Andrea Berghold[3], Gudrun Pregartner[3], Gernot Brunner[4], Lars Peter Kamolz[2]

- Approximately 234 million operations are performed annually and with regard to surgical procedures the WHO SSC has shown the potential to be effective at reducing complication and mortality rates.
- Furthermore, positive effects on communication procedures can also be expected from using a structured tool such as the SSC,

PLOS | ONE

RESEARCH ARTICLE

Implementation of a Surgical Safety Checklist: Interventions to Optimize the Process and Hints to Increase Compliance

Gerald Sendlhofer[1,2*], Nina Mosbacher[2], Leitgeb Karina[1], Brigitte Kober[1], Lydia Jantscher[1], Andrea Berghold[3], Gudrun Pregartner[3], Gernot Brunner[4], Lars Peter Kamolz[2]

- The functioning of a checklist requires people to make one salient change in their routine procedures; in particular, the operating theater team has to pause during the team time out (TTO) and sign out (SO) phases before continuing.

PLOS ONE

RESEARCH ARTICLE

Implementation of a Surgical Safety Checklist: Interventions to Optimize the Process and Hints to Increase Compliance

Gerald Sendlhofer[1,2*], Nina Mosbacher[2], Leitgeb Karina[1], Brigitte Kober[1], Lydia Jantscher[1], Andrea Berghold[3], Gudrun Pregartner[3], Gernot Brunner[4], Lars Peter Kamolz[2]

- Multiple barriers such as misuse, nonuse or incomplete execution are reported and reduce chances for the best possible outcomes.
- Reasons for this can lie in a lack of positive role models or less than enthusiastic team members, hierarchical barriers, limited knowledge of correct usage and inappropriate implementation procedures.

PLOS ONE

RESEARCH ARTICLE

Implementation of a Surgical Safety Checklist: Interventions to Optimize the Process and Hints to Increase Compliance

Gerald Sendlhofer[1,2*], Nina Mosbacher[2], Leitgeb Karina[1], Brigitte Kober[1], Lydia Jantscher[1], Andrea Berghold[3], Gudrun Pregartner[3], Gernot Brunner[4], Lars Peter Kamolz[2]

- Thereby, active involvement in the implementation phase as well as continuous evaluation and training is presumed to greatly impact the compliance and acceptance by all team members.

World Health Organization Surgical Safety Checklist

- Adverse events in surgery are an important problem globally. Many are preventable.
- The WHO Surgical Safety Checklist has been shown to reduce surgical complications and improve communication and teamwork in the operating theatre.

World Health Organization Surgical Safety Checklist

- Key components to successful implementation of the checklist include senior administrative support, surgical buy-in, ensuring underlying processes of care are in place and the use of local champions.
- Modification to suit local practice, training, stepwise implementation and real time feedback on performance improves uptake.

Examples of near miss because of lack of checklist compliance

- *An 18yr old girl, Ms X came to theatre for an urgent appendicectomy. When the operating staff called to the ward for Ms X, her nurse was busy with another patient. Another nurse helpfully gathered the notes and brought Ms X to the operating area. An anaesthetist, Dr A, had assessed Ms X on the previous shift and had given a brief handover to the current anaesthetist, Dr B. Dr B was approaching the end of a busy 12-hour shift, with emergency cases on the priority list. Having anaesthetised Ms X, Dr B was about to give antibiotics and noticed that the allergy box on the anaesthetic chart was left blank. She went to check the drug chart and saw Ms X had a severe penicillin allergy. The nurse was unaware of this allergy, Ms X did not mention it before induction and Dr A had forgotten to hand it over to Dr B. This was a near miss and could have been avoided if the allergies had been checked before induction of anaesthesia during the 'sign in' part of the surgical safety checklist.*

ATOTW 325 – WHO Surgical Safety Checklist (5th Feb 2016)

Examples of near miss because of lack of checklist compliance

- *An 18yr old girl, Ms X came to theatre for an urgent appendicectomy. When the operating staff called to the ward for Ms X, her nurse was busy with another patient. Another nurse helpfully gathered the notes and brought Ms X to the operating area. An anaesthetist, Dr A, had assessed Ms X on t… current anaesthe… our shift, with eme… Ms X, Dr B was abou… the anaesthe… rt and saw Ms X had… his allergy, Ms X did… to hand it over to D… if the allergies had been checked before induction of anaesthesia during the 'sign in' part of the surgical safety checklist.*

I had very similar situation in my practice

ATOTW 325 – WHO Surgical Safety Checklist (5th Feb 2016)

Implementation of SSC

- A systematic review including over 74 000 patient records found a median incidence of in-hospital adverse events of 9.2% with approximately half of those events being operation or drug-related, and 43% deemed preventable,
- The aim of this ‘WHO checklist’ was to give teams a simple, efficient set of priority checks to improve effective teamwork and communication and encourage active consideration of patient safety for every operation performed.

Constituent parts of the checklist

Sign in – *before induction of anaesthesia, ideally with surgeon present, but not essential*

Verbally verify, review with the patient when possible:

a. Patient identity

b. Procedure and site

c. Consent for surgery

d. Operative site is marked if appropriate (involving left or right distinction)

e. Pulse oximeter is on the patient and functioning

Constituent parts of the checklist

Review between anaesthetist and checklist coordinator:

f. Patient's risk of blood loss. If >500ml in adults or >7ml/kg in children, it is recommended to have at least 2 large bore intravenous lines or a central line before surgical incision and fluids or blood available

g. Airway difficulty or aspiration risk. Where a potentially high-risk airway is identified, at a minimum the approach to anaesthesia should be adjusted accordingly, emergency equipment must be accessible and a capable assistant should be physically present during induction. Symptomatic active reflux or a full stomach should also be handled with a modified plan,

Constituent parts of the checklist

Review between anaesthetist and checklist coordinator:

h. Known allergies - all members of team need to be aware

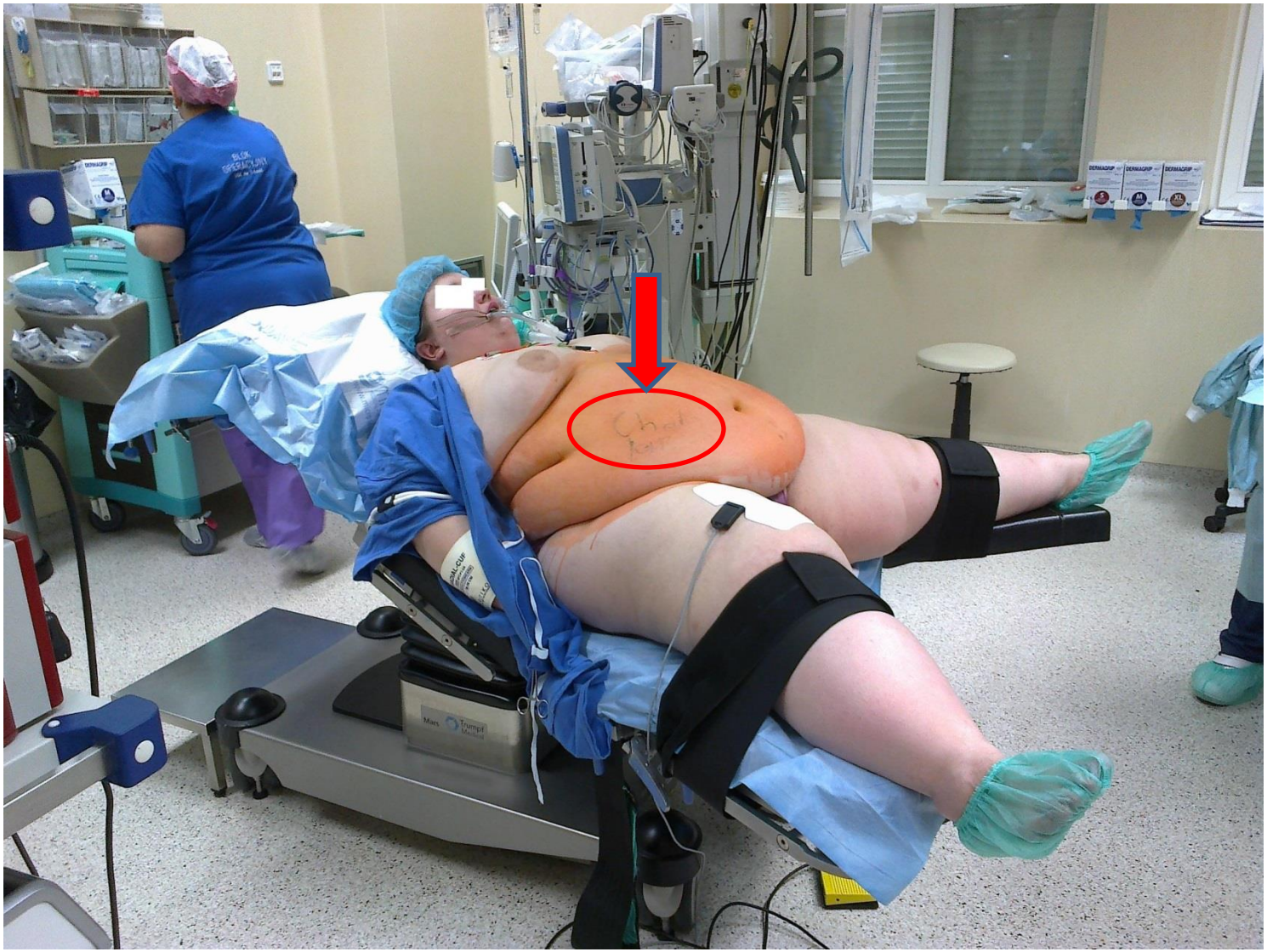
i. Anaesthesia safety checks complete (equipment, medications, emergency medications, patient's anaesthetic risk)

Time out – *after induction and before surgical incision, entire team*

a. Each team member introduces him/herself by name and role

b. Pause to confirm correct operation for correct patient on correct site. Anaesthetist, nurse and surgeon should all individually confirm agreement, plus the patient if awake

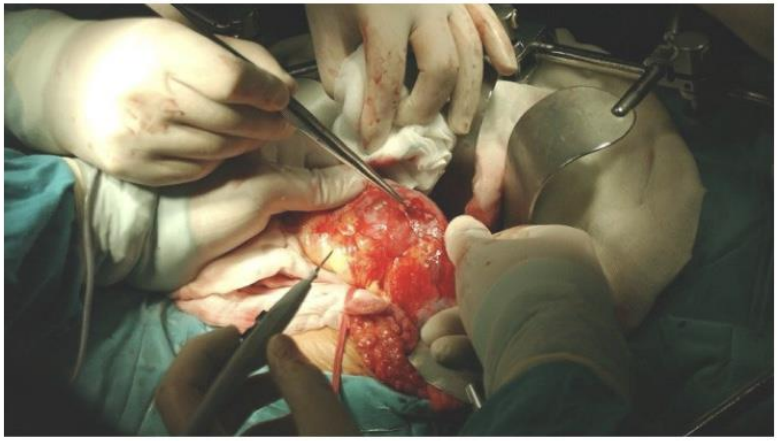
Example of avoiding mistakes: mark the patient for operation



Tragiczna pomyłka w szpitalu przy Borowskiej. Wycięli pacjentowi zdrową nerkę. Szpital: to był błąd

WERONIKA SKUPIN

14 maja 2015 • Zaktualizowano 16 maja 2015, 15:46



fot. Archiwum Polska Press

Podczas operacji w Uniwersyteckim Szpitalu Klinicznym przy ul. Borowskiej we Wrocławiu lekarze usunęli pacjentowi zdrową nerkę, zamiast chorej. Szpital przyznaje się do błędu,

Time out – *after induction and before surgical incision, entire team*

c. Review anticipated critical events

i. Surgical critical/unexpected steps, operative duration, anticipated blood loss

ii. Anaesthetic patient specific concerns, for example, intention to use blood products, co-morbidities

iii. Nurses confirm sterility of instruments and discuss equipment issues/concerns

Time out – *after induction and before surgical incision, entire team*

d. Confirm prophylactic antibiotics where required, was given within the 60 minutes prior to skin incision. If not given and required, administer prior to incision. If >60 minutes, consider re-dosing the patient

e. Essential imaging displayed as appropriate

Sign out – *during or immediately after wound closure, before moving the patient out of the operating room, whilst surgeon still present*

a. Confirm operation performed and recorded

b. Check instrument, sponge/swab and needle counts are complete. Where numbers do not reconcile the team should be alerted and take steps to investigate

c. Check surgical specimens labelled correctly

d. Highlight equipment issues

e. Verbalize plans or concerns for recovery and postoperatively, especially any specific risks

Konin: lekarze zaszyli w brzuchu kobiety narzędzie chirurgiczne. Pacjentka nie żyje

werksi

2019-09-17 11:16

Surgical Safety Checklist

World Health Organization | Patient Safety
A World Alliance for Safer Health Care

Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?
- ☐ Yes

Is the site marked?
- ☐ Yes
- ☐ Not applicable

Is the anaesthesia machine and medication check complete?
- ☐ Yes

Is the pulse oximeter on the patient and functioning?
- ☐ Yes

Does the patient have a:

Known allergy?
- ☐ No
- ☐ Yes

Difficult airway or aspiration risk?
- ☐ No
- ☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?
- ☐ No
- ☐ Yes, and two IVs/central access and fluids planned

Before skin incision

(with nurse, anaesthetist and surgeon)

- ☐ **Confirm all team members have introduced themselves by name and role.**
- ☐ **Confirm the patient's name, procedure, and where the incision will be made.**

Has antibiotic prophylaxis been given within the last 60 minutes?
- ☐ Yes
- ☐ Not applicable

Anticipated Critical Events

To Surgeon:
- ☐ What are the critical or non-routine steps?
- ☐ How long will the case take?
- ☐ What is the anticipated blood loss?

To Anaesthetist:
- ☐ Are there any patient-specific concerns?

To Nursing Team:
- ☐ Has sterility (including indicator results) been confirmed?
- ☐ Are there equipment issues or any concerns?

Is essential imaging displayed?
- ☐ Yes
- ☐ Not applicable

Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:
- ☐ The name of the procedure
- ☐ Completion of instrument, sponge and needle counts
- ☐ Specimen labelling (read specimen labels aloud, including patient name)
- ☐ Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- ☐ What are the key concerns for recovery and management of this patient?

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

Revised 1 / 2009

© WHO, 2009

World Health Organization Surgical Safety Checklist

- A single person should be responsible for checking the boxes on the list and this can be any healthcare professional in the operating team, often the circulating nurse.
- That nominated coordinator should prevent the team moving forward before each step has been addressed. Initially this could lead to tensions and resistance within the team, but only through consistently following the safety steps will the most common and avoidable risks be minimized.

Five Steps to Safer Surgery

Barriers to implementation of the WHO checklist

Pragmatic challenges	Attitudes
• Duplication with existing checklists leading to irritation and 'checklist fatigue' • Time consuming, inconvenient • Inappropriate timing • Poor communication • Unfamiliarity, confusion, who should prompt the items • Absence of key team members • Using the checklist as a 'tick box exercise'	• Denial that routine tasks can be forgotten • Dismissive attitudes, lack of engagement • Hierarchy in the operating theatre discouraging open communication • Embarrassment about introductions • Lack of support from leaders or managers
Resources	**Underlying processes of care**
• Lack of resources such as marker pens, antibiotics and pulse oximeters	• Lack of antibiotic policies, protocols • No routine swab, needle or instrument counts

Top tips for successful implementation of the WHO Checklist

- Leaders in surgery, anaesthesia and nursing are very influential. It is important for leaders to embrace patient safety as a priority and to use the surgical safety checklist for their own cases.
- It is helpful to establish a local implementation team, with representatives from anaesthesia, surgery and nursing. This team should meet on a regular basis to plan introduction of the checklist.

Top tips for successful implementation of the WHO Checklist

- The implementation team should lead staff training,
- Training should be multi-professional, incorporating the whole team.
- The implementation team should consider whether to implement the checklist in one area first or to introduce the checklist unit-wide.

Top tips for successful implementation of the WHO Checklist

- Retained swabs, needles or instruments are the most commonly reported serious adverse events in surgery.
- A surgical instrument count should be based on standardised pack or formal instrument list.

Top tips for successful implementation of the WHO Checklist

- Timely administration of antibiotics at least 15 but not more than 60 minutes before knife to skin (including in caesarean section) is an effective intervention to reduce surgical site infection, and anaesthetists can make an important contribution to reducing this complication.
- It is important to establish local antibiotic protocols and to make sure that these are adhered to.

Top tips for successful implementation of the WHO Checklist

- It is useful to encourage teams to communicate clearly.
- Staff need to free themselves up from distracting tasks when the checks are being completed, ideally asking for ‘a surgical pause’ or ‘a moment of silence’ to gather everyone’s attention.
- The the sign out can be completed whilst the surgeon is closing the wound,

Surgeons and anesthesiologists: Need to communicate?

After a series of confidential interviews with surgeons, Gawande *et al.* found 43% adverse events as a result of communication failure.[1] Lingard *et al.* found 30% such events among the various errors reported over a 3-month study period in OR personnel, indicating a lack of standardization and team integration.[2]

How to cite this article: Goyal R. Surgeons and anesthesiologists: Need to communicate?. J Anaesthesiol Clin Pharmacol 2013;29:297-8.

5 key ways to strengthen the surgeon-anesthesiologist relationship

Written by Anuja Vaidya, September 12, 2014

1. **Communicate.**
2. **Have mutual respect.**
3. **Explain potential issues.**
4. **Get to know each other.**
5. **Don't forget the goal.**

Top tips for successful implementation of the WHO Checklist

- Routine pre-anaesthesia safety checks is the part of the WHO Standards for Safe Surgery, also the WFSA International Standards for the Safe Practice of Anaesthesia 2010,

Guidelines

Checking Anaesthetic Equipment 2012

Association of Anaesthetists of Great Britain and Ireland

- A pre-use check to ensure the correct functioning of anaesthetic equipment is essential to patient safety.

Checklist for Anaesthetic Equipment 2012

AAGBI Safety Guideline

Checks at the start of every operating session
Do not use this equipment unless you have been trained

Check self-inflating bag available	
Perform manufacturer's (automatic) machine check	
Power supply	• Plugged in • Switched on • Back-up battery charged
Gas supplies and suction	• Gas and vacuum pipelines – 'tug test' • Cylinders filled and turned off • Flowmeters working (if applicable) • Hypoxic guard working • Oxygen flush working • Suction clean and working
Breathing system	• Whole system patent and leak free using 'two-bag' test • Vaporisers – fitted correctly, filled, leak free, plugged in (if necessary) • Soda lime – colour checked • Alternative systems (Bain, T-piece) – checked • Correct gas outlet selected
Ventilator	• Working and configured correctly
Scavenging	• Working and configured correctly
Monitors	• Working and configured correctly • Alarms limits and volumes set
Airway equipment	• Full range required, working, with spares
RECORD THIS CHECK IN THE PATIENT RECORD	
Don't Forget!	• Self-inflating bag • Common gas outlet • Difficult airway equipment • Resuscitation equipment • TIVA and/or other infusion equipment

This guideline is not a standard of medical care. The ultimate judgement with regard to a particular clinical procedure or treatment plan must be made by the clinician in the light of the clinical data presented and the diagnostic and treatment options available.

© The Association of Anaesthetists of Great Britain & Ireland 2012

CHECKS BEFORE EACH CASE

Breathing system	Whole system patent and leak free using 'two-bag' test Vaporisers – fitted correctly, filled, leak free, plugged in (if necessary) Alternative systems (Bain, T-piece) – checked Correct gas outlet selected
Ventilator	Working and configured correctly
Airway equipment	Full range required, working, with spares
Suction	Clean and working

THE TWO-BAG TEST

A two-bag test should be performed after the breathing system, vaporisers and ventilator have been checked individually

i. Attach the patient end of the breathing system (including angle piece and filter) to a test lung or bag.

ii. Set the fresh gas flow to 5 $l.min^{-1}$ and ventilate manually. Check the whole breathing system is patent and the unidirectional valves are moving. Check the function of the APL valve by squeezing both bags.

iii. Turn on the ventilator to ventilate the test lung. Turn off the fresh gas flow, or reduce to a minimum. Open and close each vaporiser in turn. There should be no loss of volume in the system.

This checklist is an abbreviated version of the publication by the Association of Anaesthetists of Great Britain and Ireland 'Checking Anaesthesia Equipment 2012'.

(Endorsed by the Chief Medical Officers)

Summary

- Preventable harm occurs daily during surgery across the world.
- The WHO checklist was introduced as one means of reducing harm and improving patient safety in the operating theatre.

Summary

- The key factors that enable successful use of the checklist are: senior multidisciplinary support, surgical buy-in, ensuring underlying processes of care are in place, and using local champions to enthuse and encourage staff.

UNIWERSYTET MEDYCZNY W ŁODZI

Thank you for your attention

Tomasz Gaszynski

Department of Anesthesiology and Intensive Therapy
Medical University of Lodz

The European Society for Perioperative Care of the Obese Patient
ESPCOP
www.espcop.org