The First Challenge: Clean Care is Safer Care
The Second Challenge: Safe Surgery Saves Lives

A WHO Initiative
Supported by The Association of Surgeons of India
The material presented in this concise, easy to use booklet was compiled from exhaustive WHO resources by Dr Doris Mugrditchian, Regional Adviser for Patient Safety & Health Technology, WHO South East Regional Office & a team from the Department of Surgery, All India Institute of Medical Sciences, New Delhi (on behalf of the Association of Surgeons of India) consisting of Dr. Arvind Kumar, Professor, Dr Sandeep Guleria, Additional Professor and Dr Tarun Jindal, Resident.
World Alliance for Patient Safety
Global Patient Safety Challenges

Clean Care is Safer Care
Safe Surgery Saves Lives

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Supported by

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The Association of Surgeons of India would like to gratefully acknowledge the tremendous support received from Dr Doris Mugrditchian, Regional Adviser for Patient Safety & Health Technology, WHO South East Regional Office, and Dr Akhil K. Sangal, C.E.O., Indian Confederation for Healthcare Accreditation (ICHA) in the preparation of this publication.

We are extremely grateful for the financial support provided by WHO in the printing of this publication.
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In October 2004 the World Health Organization (WHO) launched the World Alliance for Patient Safety to pay the closest possible attention to the problem of patient safety. The Alliance raises awareness and political commitment to improve the safety of care and supports Member States to develop patient safety policy and practice.

A core element of the work of the Alliance is the formulation of Global Patient Safety Challenges. Every two years, a Challenge is formulated to galvanize global commitment and action on a patient safety issue which addresses a significant area of risk for all WHO Member States.

The first Challenge “Clean Care is Safer Care” focuses on the prevention of health care-associated infection while the second Challenge “Safe Surgery Saves Lives” focuses on the prevention of complications resulting from surgery. The third Challenge, to be launched next year, will focus on “Tackling Antimicrobial Resistance”.

For the benefit and ready reference of our esteemed members, we present herein the relevant aspects of the first two Challenges.
The First Global Patient Safety Challenge: 
Clean Care is Safer Care

The first Global Patient Safety Challenge Clean Care is Safer Care was launched in 2005. Its aim is to galvanize international focus and action on the critical patient safety issue of healthcare-associated infections (HAI). While the first Challenge embraces other well established WHO strategies to prevent HAI, it focuses on the central role that hand hygiene compliance by health-care workers (HCW) plays in reducing such infections.

HAI greatly undermine the quality of care and place a serious disease and economic burden on health-care systems throughout the world. At any given time, it is estimated that 1.4 million people worldwide are suffering from an HAI. HAI not only increase the cost of care due to antibiotic and other medicine usage and prolonged hospital stay, but also cause serious complications which are a source of significant morbidity and also contribute to increased mortality. Good hand hygiene, the simple task of cleaning hands at the right times and in the right way, can save lives.

The advanced draft of the WHO Guidelines on Hand Hygiene in Health Care (May 2009) reviews the scientific data which form the basis for the WHO consensus recommendations. It is available for download at http://www.who.int/gpsc/5may/en/now available as well as at the ASI website www.asiindia.org/safe-surgery-practice.php

Healthcare workers’ hands: a key source of transmission of HAI pathogens

Contact between a healthcare worker (HCW) and a patient during patient care results in cross-transmission of microorganisms from the patient to the HCW’s hands. In the absence appropriate

1 Blood transfusion safety, injection safety, clinical procedures safety, safe water, basic sanitation and waste management.
handwashing, the HCW’s hands will remain contaminated. When this HCW touches the next patient, cross-contamination is likely to occur. Within-patient cross-contamination may occur when a HCW moves his hands from a contaminated part or device on the patient’s body to another part or device on the patient’s body. Examples of cross-contamination are illustrated in figures 1.1 and 1.2 below.

Fig. 1.1 Failure to clean hands results in between-patient cross transmission
Clean hands save lives

‘Prevention is better than cure’. Nowhere is this saying truer than in the setting of HAI. Few extra moments of care, some effort, simple precautions and a little additional investment in hand hygiene practices can translate into shorter hospital stay, reduced costs of care and avoidance of serious and occasionally life threatening complications by reducing the HAI.

• What to use for routine hand antisepsis?

Use soap and water (handwashing) for routine hand antisepsis if hands are visibly dirty or visibly soiled with blood or other body fluids or after using the toilet. Otherwise use alcohol-based handrub (handrubbing).

At present, alcohol-based handrubs are the only known means for rapidly and effectively inactivating a wide array of potentially harmful microorganisms on hand. WHO recommends alcohol-based handrubs based on the following factors:

1. Evidence-based, intrinsic advantages of fast-acting and broad-spectrum microbicidal activity with a minimal risk of generating resistance to antimicrobial agents;
2. Suitability for use in resource-limited or remote areas with lack of accessibility to sinks or other facilities for hand hygiene including clean water, towels, etc.

3. Capacity to promote improved compliance with hand hygiene by making the process faster and more convenient.

4. Economic benefit by reducing annual costs for hand hygiene, representing approximately 1% of extra costs due to HAI.

5. Minimization of risks from adverse events because of increased safety associated with better acceptability and tolerance than other products.

For optimal compliance with hand hygiene, handrubs should be readily available, either through dispensers close to the point of care or in small bottles for on-person carriage.

• **When to clean your hands?**

WHO recommends the “My 5 Moments for Hand Hygiene” approach as key to protect the patient, the healthcare worker (HCW) and the healthcare environment against the spread of pathogens and thus reduce HAI (Fig 1.3). This approach encourages healthcare workers to clean their hands (1) before touching a patient, (2) before clean/aseptic procedures, (3) after body fluid exposure/risk, (4) after touching a patient and (5) after touching patient surroundings.

**Moment 1: Before touching a patient**

It occurs between the last hand-to-surface contact with an object belonging to the healthcare area and the first within the patient zone. Hand hygiene at this moment will mainly prevent colonization of the patient with health care-associated microorganisms, resulting from the transfer of organisms from the environment to the patient through unclean hands, and exogenous infections in some cases.

**Moment 2: Before a clean/aseptic procedure**

Once within the patient zone, the HCW may engage in a clean/aseptic procedure on a critical site with infectious risk for the patient, such as opening a venous access line, giving an injection, or performing wound care. In line with the predominantly endogenous origin of these infections, hand hygiene is taking place between the last exposure to a surface, even within the patient zone and immediately before access to a critical site with infectious risk for the patient or a critical site with combined infectious risk.

**Moment 3: After body fluid exposure risk**

After a care task associated with a risk to expose hands to body fluids, hand hygiene is required instantly and must take place before any next hand-to-surface exposure, even within the same patient zone.

Disposable gloves are meant to be used as a “second skin” to prevent exposure of hands to body fluids. However, hands are not sufficiently protected by gloves, and hand hygiene is strongly recommended after glove removal.

**Moment 4: After touching a patient**

When leaving the patient zone, before touching an object in the area outside the patient zone and before a subsequent hand exposure to any surface in the health-care area, hand hygiene minimizes the risk of dissemination to the health-care environment, substantially reduces contamination of HCWs hands with the flora from patient, and protects the HCWs themselves.
Moment 5: After touching patient surroundings

It occurs after hand exposure to any surface in the patient zone, and before a subsequent hand exposure to any surface in the health-care area, but without touching the patient. This typically extends to objects contaminated by the patient flora that are extracted from the patient zone to be decontaminated or discarded. Because hand exposure to patient objects, but without physical contact with the patients, is associated with hand contamination, hand hygiene is still required.
• How to clean your hands?

How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

Duration of the entire procedure: 20-30 seconds

1a  1b  2
Apply a palmful of the product in a cupped hand, covering all surfaces;
Rub hands palm to palm;

3  4  5
Right palm over left dorsum with
interlaced fingers and vice versa;
Palm to palm with fingers interlaced;
Backs of fingers to opposing palms
with fingers interlocked;

6  7  8
Rotational rubbing of left thumb
clasped in right palm and vice versa;
Rotational rubbing, backwards and
forwards with clasped fingers of right
hand in left palm and vice versa;
Once dry, your hands are safe.
How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDBRUB

Duration of the entire procedure: 40-60 seconds

1. Wet hands with water;
2. Apply enough soap to cover all hand surfaces;
3. Rub hands palm to palm;
4. Right palm over left dorsum with interlaced fingers and vice versa;
5. Palm to palm with fingers interlaced;
6. Backs of fingers to opposing palms with fingers interlocked;
7. Rotational rubbing of left thumb clasped in right palm and vice versa;
8. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
9. Rinse hands with water;
10. Dry hands thoroughly with a single use towel;
11. Use towel to turn off faucet;

Your hands are now safe.
• **How about surgical hand preparation?**

Surgical hand preparation should reduce the release of skin bacteria from the hands of the surgical team for the duration of the procedure in case of an unnoticed puncture of the surgical glove releasing bacteria to the open wound. It should also eliminate the transient and significantly reduce the resident flora. It should also inhibit the growth of bacteria under the gloved hand.

While both surgical handscrub with medicated soap and surgical hand preparation with alcohol-based are suitable methods for prevention of Surgical Site Infections (SSI), preference should be given to alcohol-based formulations, the antibacterial efficacy of which far surpasses that of any medicated soap presently available. In addition, the initial reduction of the resident flora is so rapid and effective that bacterial regrowth to baseline on the gloved hand takes more than six hours.

Steps before starting surgical hand preparation

<table>
<thead>
<tr>
<th>Key steps</th>
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<tbody>
<tr>
<td>- Keep nails short and pay attention to them when washing your hands - most microbes on hands come from beneath the fingernails.</td>
</tr>
<tr>
<td>- Do not wear artificial nails or nail polish.</td>
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<tr>
<td>- Remove all jewellery (rings, watches, bracelets) before entering the operating theatre.</td>
</tr>
<tr>
<td>- Wash hands and arms with a non-medicated soap before entering the operating theatre area or if hands are visibly soiled.</td>
</tr>
<tr>
<td>- Clean subungual areas with a nail file. Nailbrushes should not be used as they may damage the skin and encourage shedding of cells. If used, nailbrushes must be sterile, once only (single use). Reusable autoclavable nail brushes are on the market.</td>
</tr>
</tbody>
</table>

Protocol for surgical scrub with a medicated soap

<table>
<thead>
<tr>
<th>Procedural steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Start timing. Scrub each side of each finger, between the fingers, and the back and front of the hand for 2 minutes.</td>
</tr>
<tr>
<td>- Proceed to scrub the arms, keeping the hand higher than the arm at all times. This helps to avoid recontamination of the hands by water from the elbows and prevents bacteria-laden soap and water from contaminating the hands.</td>
</tr>
<tr>
<td>- Wash each side of the arm from wrist to the elbow for 1 minute.</td>
</tr>
<tr>
<td>- Repeat the process on the other hand and arm, keeping hands above elbows at all times. If the hand touches anything at any time, the scrub must be lengthened by 1 minute for the area that has been contaminated.</td>
</tr>
<tr>
<td>- Rinse hands and arms by passing them through the water in one direction only, from fingertips to elbow. Do not move the arm back and forth through the water.</td>
</tr>
<tr>
<td>- Proceed to the operating theater holding hands above elbows.</td>
</tr>
<tr>
<td>- At all times during the scrub procedure, care should be taken not to splash water onto surgical attire.</td>
</tr>
<tr>
<td>- Once in the operating theatre, hands and arms should be dried using a sterile towel and aseptic technique before donning gown and gloves.</td>
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</tbody>
</table>
The handrubbing technique for surgical hand preparation must be performed on perfectly clean, dry hands. On arrival in the operating theatre and after having donned the theatre clothing (cap/hat/bonnet and mask), hands must be washed with soap and water. After the operation when removing gloves, hands must be rubbed with an alcohol based formulation or washed with soap and water if any residual talc or biological fluids are present (e.g. the glove is punctured).

Surgical procedures may be carried out one after the other without the need for handwashing, provided that the handrubbing technique for the surgical hand preparation is followed (Images 1 to 17).

1. Put approximately 5ml (3 doses) of alcohol based handrub in the palm of your left hand, using the elbow of your other arm to operate the dispenser.

2. Dip the fingertips of your right hand in the handrub to decontaminate under the nails (5 seconds).

3. Images 3-7: Smear the handrub on the right forearm up to the elbow. Ensure that the whole skin area is covered using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds).

4. See legends for image 3

5. See legends for image 3

6. See legends for image 3

7. See legends for image 3

8. Put approximately 5ml (3 doses) of alcohol based handrub in the palm of your right hand, using the elbow of your other arm to operate the dispenser

9. Dip the fingertips of your left hand in the handrub to decontaminate under the nails (5 seconds)
10
Smear the handrub on the left forearm up to the left elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)

11
Put approximately 5ml (3 doses) of alcohol based handrub in the palm of your left hand, using the elbow of your other arm to operate the dispenser. Rub both hands at the same time up to the wrist and ensure that all the steps represented in images 12-17 are followed (20-30 seconds)

12
Cover the whole surface of the hands up to the wrist with alcohol-based handrub, rubbing palm against palm with a rotating movement

13
Rub the back of the left hand, including the wrist, moving the right palm back and forth, and vice-versa

14
Rub palm against palm back and forth with fingers interlinked

15
Rub the back of the fingers by holding them in the palm of the other hand with a sideways back and forth movement

16
Rub the thumb of the left hand by rotating it in the clasped palm of the right hand and vice versa

17
When the hands are dry, sterile surgical clothing and gloves can be donned

Repeat the above-illustrated sequence (average duration, 60 sec) according to the number of times corresponding to the total duration recommended by the manufacturer for surgical hand preparation with the alcohol based handrub.
Safe surgery is a public health priority

An estimated 234 million major operations (see box 1) are performed around the world each year, corresponding to one operation for every 25 people alive. Lack of access to high quality surgical care remains a significant problem in much of the world despite the fact that surgical interventions can be cost effective in terms of lives saved and disability averted.

Surgery is often the only therapy that can alleviate disabilities and reduce the risk of death from common conditions. Each year an estimated 63 million people undergo surgical treatment due to traumatic injuries, another 10 million operations are performed for pregnancy-related complications and 31 million more are undertaken to treat malignancies.

**Box 1: Definition of major surgery**

Major surgery includes any procedure conducted in the operating room involving the incision, excision, manipulation or suturing of tissue which usually requires regional or general anesthesia or profound sedation to control pain.

While surgical procedures are intended to save lives, unsafe surgical care can cause substantial harm. Given the ubiquity of surgery, this has significant implications for public health. In industrialized countries, studies suggest that major complications are reported to occur in 3–16% of inpatient surgical procedures, with permanent disability or death rates in approximately 0.4–0.8%. In developing countries studies suggest a death rate of 5–10% during major surgery.

Mortality from general anesthesia alone is reported to be as high as one in 150 in parts of sub-Saharan Africa. Infections and other postoperative morbidities are also a serious concern around the
world. At a minimum, seven million surgical patients could be harmed by surgical complications each year including at least one million patients who could die during or immediately following a procedure.

The second Global Patient Safety Challenge Safe Surgery Saves Lives was launched in 2007 to improve the safety of surgical care around the world. It has four thematic areas: prevention of surgical site infections (SSI), safe anaesthesia, safe surgical teams, and the basic surgical surveillance. While efforts are underway to strengthen surgical ‘vital statistics’ and to develop and promote low-cost pulse oximetry solutions in operating rooms worldwide, the main focus of the second Challenge has been the development and implementation of the WHO Surgical Safety Checklist (Fig. 2.1)

The WHO Surgical Safety Checklist

The Checklist is a simple, practical tool that any surgical team in the world can use to ensure that the preoperative, intraoperative and postoperative steps that have been shown to benefit patients are undertaken in a timely and efficient way. The aim of the Checklist is to reinforce accepted safety practices and foster better communication and teamwork between members of the health care team in order to maximize the likelihood of the best outcome for patients without placing an undue burden on the system and the providers. It is understood that, in nearly all settings, the standards will represent a change in routines. However, the standards were included on the basis of sound evidence or expert consensus that they could produce tangible, life-saving improvements in care in all environments, from the richest to the poorest.

The Checklist was developed based on a set of ten essential objectives (or standards) for safe surgery that should be met by every surgical team (see. Box 2). These standards were identified by the Alliance in consultation with surgeons, anaesthesiologists, nurses, patient safety experts and patients around the world.

The evidence supporting each of these standards can be found in the WHO Guidelines for Safe Surgery (First Edition) which can be downloaded at http://www.who.int/patientsafety/safesurgery/knowledge_base/WHO_Guidelines_Safe_Surgery_finalJun08.pdf

Implementation of the Checklist was shown to lower the incidence of surgery-related deaths and complications by one third in a pilot study that included eight sites across all six WHO regions including St Stephen’s Hospital in New Delhi, India. The results of the pilot study were published in the January 29th issue of the New England Journal of Medicine (Vol. 360: pp 491-99) and can be downloaded at: http://content.nejm.org/cgi/content/full/NEJMsa0810119
This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.
# SAFETY CHECKLIST (FIRST EDITION)

## Before skin incision

<table>
<thead>
<tr>
<th>TIME OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE</td>
</tr>
<tr>
<td>□ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM</td>
</tr>
<tr>
<td>• PATIENT</td>
</tr>
<tr>
<td>• SITE</td>
</tr>
<tr>
<td>• PROCEDURE</td>
</tr>
</tbody>
</table>

## ANTICIPATED CRITICAL EVENTS

| □ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS? |
| □ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS? |

| NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS? |

| □ HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES? |
| □ YES |
| □ NOT APPLICABLE |

| □ IS ESSENTIAL IMAGING DISPLAYED? |
| □ YES |
| □ NOT APPLICABLE |

## Before patient leaves operating room

<table>
<thead>
<tr>
<th>SIGN OUT</th>
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</thead>
</table>

| NURSE VERBALLY CONFIRMS WITH THE TEAM: |

| □ THE NAME OF THE PROCEDURE RECORDED |

| □ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE) |

| □ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME) |

| □ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED |

| □ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT |

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**Box 2: Ten essential objectives for safe surgery**

Objective 1. The team will operate on the correct patient at the correct site.

Objective 2. The team will use methods known to prevent harm from anaesthetic administration, while protecting the patient from pain.

Objective 3. The team will recognize and effectively prepare for life-threatening loss of airway or respiratory function.

Objective 4. The team will recognize and effectively prepare for risk of high blood loss.

Objective 5. The team will avoid inducing an allergic or adverse drug reaction known to be a significant risk to the patient.

Objective 6. The team will consistently use methods known to minimize risk of surgical site infection.

Objective 7. The team will prevent inadvertent retention of sponges or instruments in surgical wounds.

Objective 8. The team will secure and accurately identify all surgical specimens.

Objective 9. The team will effectively communicate and exchange critical patient information for the safe conduct of the operation.

Objective 10. Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.
Introducing the WHO Surgical Safety Checklist into the operating room

It will take some practice for teams to learn to use the Checklist effectively. Some individuals will consider it an imposition or even a waste of time. The goal is not rote recitation or to frustrate workflow. The Checklist is intended to give teams a simple, efficient set of priority checks for improving effective teamwork and communication and to encourage active consideration of the safety of patients in every operation performed. Many of the steps on the Checklist are already followed in operating rooms around the world; few, however, follow all of them reliably. The Checklist has two purposes: ensuring consistency in patient safety and introducing (or maintaining) a culture that values achieving it.

Successful implementation requires adapting the Checklist to local routines and expectations. This will not be possible without sincere commitment by hospital leaders. For the Checklist to succeed, the chiefs of surgery, anaesthesia and nursing departments must publicly embrace the belief that safety is a priority and that the use of the WHO Surgical Safety Checklist can help make it a reality. To demonstrate this, they should use the Checklist in their own cases and regularly ask others how implementation is proceeding. If there is no demonstrable leadership, instituting a checklist of this sort may breed discontent and antagonism.

Checklists have been useful in many different environments, including patient care settings. This WHO Surgical Safety Checklist has been used successfully in a diverse range of healthcare facilities with a range of resource constraints. Experience shows that with education, practice and leadership, barriers to implementation can be overcome. With proper planning and commitment the Checklist steps are easily accomplished and can make a profound difference in the safety of surgical care.

In this chapter, we provide suggestions for implementing the Checklist with the understanding that different practice settings will adapt it to their own context and circumstances. Each surgical
department is requested to practice with the Checklist and examine how to sensibly integrate these essential safety steps into its normal operative workflow. Many of the steps are already accepted as routine practice although they are rarely followed in their entirety. The ultimate goal of the WHO Surgical Safety Checklist is to help ensure that teams consistently follow a few critical safety steps and thereby minimize the most common and avoidable risks endangering the lives and well-being of surgical patients.

The operating team

As in the aviation industry, the “operating team” is composed of all persons involved, each of whom plays a role in ensuring the safety and success of an operation. In our setting, it includes surgeons, anaesthesia professionals, nurses, technicians and other operating room personnel involved in surgery.

Much as an airplane pilot must rely on the ground crew, flight personnel and air traffic controllers for a safe and successful flight, a surgeon is an essential but not solitary member of the team responsible for patient care.

The Checklist Coordinator

In order to implement the Checklist during surgery, a single person must be made responsible for checking the boxes on the list. This designated Checklist coordinator will often be a circulating nurse, but it can be any clinician or healthcare professional participating in the operation.

Having a single person lead the Checklist process is essential for its success. In the complex setting of an operating room, any of the steps may be overlooked during the fast-paced preoperative, intraoperative, or postoperative preparations. Designating a single person to confirm completion of each step of the Checklist can ensure that safety steps are not omitted in the rush to move forward with the next phase of the operation. Until team members are familiar with the steps involved, the Checklist coordinator will likely have to guide the team through this Checklist process.

A possible disadvantage of having a single person lead the Checklist is that an antagonistic relationship might be established with other operating team members. The Checklist coordinator can and should prevent the team from progressing to the next phase of the operation until each step is satisfactorily addressed, but in doing so may alienate or irritate other team members. Therefore, hospitals must carefully consider which staff member is most suitable for this role. As mentioned, for many institutions this will be a circulating nurse, but any health professional can coordinate the Checklist process.

The three phases of the Checklist: “Sign In”, “Time Out” and “Sign Out”

The Checklist divides the operation into three phases, each corresponding to a specific time period in the normal flow of a procedure—the period before induction of anaesthesia (Sign In), the period after induction and before surgical incision (Time Out), and the period during or immediately after wound closure but before removing the patient from the operating room (Sign Out).

In each phase, the Checklist coordinator must be permitted to confirm that the team has completed its tasks before it proceeds further. As
operating teams become familiar with the steps of the Checklist, they can integrate the checks into their familiar work patterns and verbalize their completion of each step without the explicit intervention of the Checklist coordinator. Each team should seek to incorporate use of the Checklist into its work with maximum efficiency and minimum disruption, while aiming to accomplish the steps effectively.

Nearly all the steps will be checked verbally with the appropriate personnel to ensure that the key actions have been performed. Therefore, during “Sign In” before induction of anaesthesia, the person coordinating the Checklist will verbally review with the patient (when possible) that his or her identity has been confirmed, that the procedure and site are correct and that consent for surgery has been given. The coordinator will visually confirm that the operative site has been marked (if appropriate) and that a pulse oximeter is on the patient and functioning. The coordinator will also verbally review with the anaesthesia professional the patient’s risk of blood loss, airway difficulty and allergic reaction and whether a full anaesthesia safety check has been completed. Ideally the surgeon will be present for “Sign In”, as the surgeon may have a clearer idea of anticipated blood loss, allergies, or other complicating patient factors. However, the surgeon’s presence is not essential for completing this part of the Checklist.

For “Time Out”, each team member will introduce him or herself by name and role. If already partway through the operative day together, the team can simply confirm that everyone in the room is known to each other. The team will pause immediately prior to the skin incision to confirm out loud that they are performing the correct operation on the correct patient and site and then verbally review with one another, in turn, the critical elements of their plans for the operation using the Checklist questions for guidance. They will also confirm that prophylactic antibiotics have been administered within the previous 60 minutes and that essential imaging is displayed, as appropriate.

For the “Sign Out”, the team will review together the operation that was performed, completion of sponge and instrument counts and the labeling of any surgical specimens obtained. It will also review any equipment malfunctions or issues that need to be addressed. Finally, the team will review key plans and concerns regarding postoperative management and recovery before moving the patient from the operating room.

Modifying the Checklist

The Checklist can be modified to account for differences among facilities with respect to their processes, the culture of their operating rooms and the degree of familiarity each team member has with each other. However, removing safety steps because they cannot be accomplished in the existing environment or circumstances is strongly discouraged. The safety steps should inspire effective change that will bring an operating team to comply with each and every element of the Checklist.

In order to ensure brevity, the WHO Surgical Safety Checklist was not intended to be comprehensive. Facilities may wish to add safety steps to the Checklist. Teams should consider adding other safety checks for specific procedures, particularly if they are part of a routine process established in the facility. Each phase should be used as an opportunity to verify that critical safety steps are consistently completed. Additional steps might include confirmation of venous
thromboembolism prophylaxis by mechanical means (such as sequential compression boots and stockings) and/or medical means (such as heparin or warfarin) when indicated, the availability of essential implants (such as mesh or a prosthetic), other equipment needs or critical preoperative biopsy results, laboratory results or blood type. Each locale is encouraged to reformat, reorder or revise the Checklist to accommodate local practice while ensuring completion of the critical safety steps in an efficient manner. Facilities and individuals are cautioned, however, against making the Checklist unmanageably complex.
How to run the Checklist

This chapter describes in detail how each phase of the WHO Surgical Safety Checklist should be run.

“Sign In”

The “Sign In” is to be completed before induction of anaesthesia in order to confirm the safety of proceeding.

The “Sign In” requires the presence of the anaesthesia professional and nursing personnel at the very least. The Checklist coordinator may complete this section all at once or sequentially, depending on the flow of preparation for anaesthesia. The details for each of the boxes in the “Sign In” are as follows:

☐ PATIENT HAS CONFIRMED IDENTITY, SITE, PROCEDURE AND CONSENT

The coordinator verbally confirms with the patient his or her identity, the type of procedure planned, the site of surgery and that consent for surgery has been given. While it may seem repetitive, this step is essential for ensuring that the team does not operate on the wrong patient or site or perform the wrong procedure. When confirmation by the patient is impossible, such as in the case of children or incapacitated patients, a guardian or family member can assume this role. If a guardian or family member is not available and this step is skipped, such as in an emergency, the box should be left unchecked.

☐ SITE MARKED/NOT APPLICABLE

The Checklist coordinator should confirm that the surgeon performing the operation has marked the site of surgery (usually with a permanent felt-tip marker) in cases involving laterality (a left or right distinction) or multiple structures or levels (e.g. a particular finger, toe, skin lesion, vertebra). Sitemarking for midline structures
(e.g. thyroid) or single structures (e.g. spleen) will follow local practice. Some hospitals do not require site marking because of the extreme rarity of wrong-site surgery in these instances. Consistent site marking in all cases does, however, provide a backup check confirming the correct site and procedure.

**ANAESTHESIA SAFETY CHECK COMPLETED**

The coordinator completes this next step by asking the anaesthesia professional to verify completion of an anaesthesia safety check, understood to be a formal inspection of the anaesthetic equipment, medications and patient’s anaesthetic risk before each case. A helpful mnemonic is that, in addition to confirming that the patient is fit for surgery, the anaesthesia team should complete the ABCDEs – an examination of the Airway equipment, Breathing system (including oxygen and inhalational agents), suction, Drugs and devices and Emergency medications, Equipment and assistance to confirm their availability and functioning.

**PULSE OXIMETER ON PATIENT AND FUNCTIONING**

The Checklist coordinator verifies that a pulse oximeter has been placed on the patient and is functioning correctly before induction of anaesthesia. Ideally, the pulse oximetry reading should be visible to the operating team. An audible system should be used when possible to alert the team to the patient’s pulse rate and oxygen saturation. Pulse oximetry has been highly recommended as a necessary component of safe anaesthesia care by WHO. If no functioning pulse oximeter is available, the surgeon and anaesthesia professional must evaluate the acuity of the patient’s condition and consider postponing surgery until appropriate steps are taken to secure one. In urgent circumstances, to save life or limb, this requirement may be waived, but in such circumstances the box should be left unchecked.

**DOES THE PATIENT HAVE A KNOWN ALLERGY?**

The Checklist coordinator should direct this and the next two questions to the anaesthesia professional. First, the coordinator should ask whether the patient has a known allergy and, if so, what it is. This should be done even if he or she knows the answer in order to confirm that the anaesthesia professional is aware of any allergies that pose a risk to the patient. The appropriate box is then filled in. If the coordinator knows of an allergy that the anaesthesia professional is not aware of, this information should be communicated.

**DOES THE PATIENT HAVE A DIFFICULT AIRWAY/ASPIRATION RISK?**

The coordinator should verbally confirm that the anaesthesia team has objectively assessed whether the patient has a difficult airway. There are a number of ways to grade the airway (such as the Mallampati score, Thyromental distance, and Bellhouse-Doré score). An objective evaluation of the airway using a valid method is more important than the choice of method itself. Death from airway loss during anaesthesia is still a common disaster globally but is preventable with appropriate planning. If the airway evaluation indicates a high risk for a difficult airway (such as a Mallampati score of 3 or 4), the anaesthesia team must prepare against an airway disaster. This will include, at a minimum, adjusting the approach to anaesthesia (for example, using a regional
The risk of aspiration should also be evaluated as part of the airway assessment. If the patient has symptomatic active reflux or a full stomach, the anaesthesia professional must prepare for the possibility of aspiration. The risk can be reduced by modifying the anaesthesia plan, for example using rapid induction techniques and enlisting the help of an assistant to provide cricoid pressure during induction. For a patient recognized as having a difficult airway or being at risk for aspiration, the box should be marked (and induction of anaesthesia begun) only after the anaesthesia professional confirms that he or she has adequate equipment and assistance present at the bedside.

☐ DOES THE PATIENT HAVE A RISK OF >500 ML BLOOD LOSS (7 ML/KG IN CHILDREN)?

In this safety step, the coordinator asks the anaesthesia team whether the patient risks losing more than half a litre of blood during surgery in order to ensure recognition of and preparation for this critical event. Large volume blood loss is among the most common and important dangers for surgical patients, with risk of hypovolaemic shock escalating when blood loss exceeds 500 ml (7 ml/kg in children). Adequate preparation and resuscitation can mitigate the consequences considerably. Surgeons may not consistently communicate the risk of blood loss to anaesthesia and nursing staff. Therefore, if the anaesthesia professional does not know what the risk of major blood loss is for the case, he or she should stop to discuss the risk with the surgeon before induction of anaesthesia. If there is a significant risk of a greater than 500 ml blood loss, it is highly recommended that at least two large bore intravenous lines or a central venous catheter be placed prior to skin incision. In addition, the team should confirm the availability of fluids or blood for resuscitation. (Note that the expected blood loss will be reviewed again by the surgeon during the “Time Out”. This will provide a second safety check for the anaesthesia professional and nursing staff.)

AT THIS POINT THE SIGN IN IS COMPLETED AND THE TEAM MAY PROCEED WITH ANESTHETIC INDUCTION.

“Time Out”

The “Time Out” is a momentary pause taken by the team just before skin incision in order to confirm that several essential safety checks are undertaken and involves everyone on the team.

☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE

Operating team members may change frequently. Effective management of high risk situations requires that all team members understand who each member is and their roles and capabilities. A simple introduction will achieve this. The coordinator will ask each person in the room to introduce him or herself by name and role.
Teams already familiar with each other can confirm that everyone has been introduced, but new members or staff that have rotated into the operating room since the last operation should introduce themselves, including students or other personnel.

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM PATIENT, SITE AND PROCEDURE**

This step is the standard “Time Out” or “surgical pause” and meets the standards of many national and international regulatory agencies. Just before the surgeon makes the skin incision, the person coordinating the Checklist or another team member will ask everyone in the operating room to stop and verbally confirm the name of the patient, the surgery to be performed, the site of surgery and, where appropriate, the positioning of the patient in order to avoid operating on the wrong patient or the wrong site. For example, the circulating nurse might announce, “Let’s take our Time Out,” and then continue, “Does everyone agree that this is patient X, undergoing a right inguinal hernia repair?” This box should not be checked until the anaesthesia professional, surgeon and circulating nurse explicitly and individually confirm agreement. If the patient is not sedated, it is helpful for him or her to confirm the same as well.

☐ **ANTICIPATED CRITICAL EVENTS**

Effective team communication is a critical component of safe surgery, efficient teamwork and the prevention of major complications. To ensure communication of critical patient issues, during the “Time Out” the Checklist coordinator leads a swift discussion among the surgeon, anaesthesia staff and nursing staff of critical dangers and operative plans. This can be done by simply asking each team member the specified question out loud. The order of discussion does not matter, but each box should be checked only after each clinical discipline has provided its information. During routine procedures or those with which the entire team is familiar, the surgeon can simply state, “This is a routine case of X duration” and then ask the anaesthesia professional and nurse if they have any special concerns.

☐ **SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?**

A discussion of “critical or unexpected steps” is intended, at a minimum, to inform all team members of any steps that put the patient at risk for rapid blood loss, injury or other major morbidity. This is also a chance to review steps that might require special equipment, implants or preparations.

☐ **ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?**

In patients at risk for major blood loss, haemodynamic instability or other major morbidity due to the procedure, a member of the anaesthesia team should review out loud the specific plans and concerns for resuscitation—in particular, the intention to use blood products and any complicating patient characteristics or comorbidities (such as cardiac or pulmonary disease, arrhythmias, blood disorders, etc). It is understood that many operations do not entail particularly critical risks or concerns that must
be shared with the team. In such cases, the anaesthesia professional can simply say, “I have no special concern regarding this case.”

☐ **NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?**

The scrub nurse or technologist who sets out the equipment for the case should verbally confirm that sterilization was performed and that, for heat sterilized instruments, a sterility indicator has verified successful sterilization. Any discrepancy between the expected and the actual sterility indicator results should be reported to all team members and addressed before incision. This is also an opportunity to discuss any problems with equipment and other preparations for surgery or any safety concerns the scrub or circulating nurse may have, particularly ones not addressed by the surgeon and anaesthesia team. If there are no particular concerns, however, the scrub nurse or technologist can simply say, “Sterility was verified. I have no special concerns.”

☐ **HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?**

Despite strong evidence and wide consensus that antibiotic prophylaxis against wound infections is most effective if serum and/or tissue levels of antibiotic are achieved, surgical teams are inconsistent about administering antibiotics within one hour prior to incision. To reduce surgical infection risk, the coordinator will ask out loud during the “Time Out” whether prophylactic antibiotics were given during the previous 60 minutes. The team member responsible for administering antibiotics (usually the anaesthesia professional) should provide verbal confirmation. If prophylactic antibiotics have not been administered, they should be administered now, prior to incision. If prophylactic antibiotics have been administered longer than 60 minutes before, the team should consider re-dosing the patient; the box should be left blank if no additional dose is given. If prophylactic antibiotics are not considered appropriate (e.g. cases without a skin incision, contaminated cases in which antibiotics are given for treatment), the “not applicable” box may be checked once the team verbally confirms this.

☐ **IS ESSENTIAL IMAGING DISPLAYED?**

Imaging is critical to ensure proper planning and conduct of many operations, including orthopaedic, spinal and thoracic procedures and many tumour resections. During the “Time Out”, the coordinator should ask the surgeon if imaging is needed for the case. If so, the coordinator should verbally confirm that the essential imaging is in the room and prominently displayed for use during the operation. Only then should the box be checked. If imaging is needed but not available, it should be obtained. The surgeon will decide whether to proceed without the imaging if it is necessary but unavailable. In such circumstances, however, the box should be left unchecked. If imaging is not necessary, the “not applicable” box should be checked.
AT THIS POINT THE TIME OUT IS COMPLETED AND THE TEAM MAY PROCEED WITH THE OPERATION

“Sign Out”

The “Sign Out” should be completed before removing the patient from the operating room. The aim is to facilitate the transfer of important information to the care teams responsible for the care of the patient after surgery.

The “Sign Out” can be initiated by the circulating nurse, surgeon or anaesthesia professional and should be accomplished before the surgeon has left the room. It can coincide, for example, with wound closure. Again, each box should be checked only after the coordinator has confirmed that each item has been addressed by the team.

**NURSE VERBALLY CONFIRMS WITH THE TEAM:**

- **THE NAME OF THE PROCEDURE RECORDED**

Since the procedure may have changed or expanded during the course of an operation, the Checklist coordinator should confirm with the surgeon and the team exactly what procedure was done. This can be done as a question, “What procedure was performed?” or as a confirmation, “We performed X procedure, correct?”

- **THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)**

Retained instruments, sponges and needles are uncommon but persistent and potentially calamitous errors. The scrub or circulating nurse should therefore verbally confirm the completeness of final sponge and needle counts. In cases with an open cavity, instrument counts should also be confirmed to be complete. If counts are not appropriately reconciled, the team should be alerted so that appropriate steps can be taken (such as examining the drapes, garbage and wound or, if need be, obtaining radiographic images).

- **HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)**

Incorrect labeling of pathological specimens is potentially disastrous for a patient and has been shown to be a frequent source of laboratory error. The circulator should confirm the correct labeling of any pathological specimen obtained during the procedure by reading out loud the patient’s name, the specimen description and any orienting marks.

- **ARE THERE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED?**

Equipment problems are universal in operating rooms. Accurately identifying the sources of failure and instruments or equipment that have malfunctioned is important in preventing devices from being recycled back into the room before the problem has been addressed. The coordinator should ensure that equipment problems arising during a case are identified by the team.
The surgeon, anesthesia professional and nurse should review the postoperative recovery and management plan, focusing in particular on Intraoperative or anesthetic issues that might affect the patient. Events that present a specific risk to the patient during recovery and that may not be evident to all involved are especially pertinent. The aim of this step is the efficient and appropriate transfer of critical information to the entire team.

WITH THIS FINAL STEP, THE SAFETY CHECKLIST IS COMPLETED.

IF DESIRED, THE CHECKLIST CAN BE PLACED IN THE PATIENT RECORD OR RETAINED FOR QUALITY ASSURANCE REVIEW
Resources:


The When and How Hand Hygiene brochure can be downloaded at http://www.who.int/gpsc/5may/Hand_Hygiene_When_and_How_Leaflet.pdf

The Guide to the Implementation of the Multimodal Hand Hygiene Improvement Strategy can be downloaded at http://www.who.int/gpsc/5may/Guide_to_Implementation.pdf


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An Appeal

Dear colleague, ensuring patient safety in surgical disciplines needs special and focused attention as even minor errors can have disastrous consequences. WHO has been playing a pivotal role in this field by identifying the areas needing special attention and subsequently developing evidence based resources to suggest corrective interventions for the same.

Clean Care is Safer Care and Safe Surgery Saves Lives initiatives are a prime example of WHO's commitment to patient safety.

The Association of Surgeons of India strongly supports these initiatives and appeals to the health care professionals across various Surgical specialities, Anaesthesists, Gynecologists, Orthopedicians, Otorhinolaryngologists, Ophthalmologists, Physicians and Intensivists, the nursing and paramedical personnel and above all, the health administrators and policy planners to please make a commitment to join hands and incorporate these patient safety initiatives into their work.

We owe it to our Patients!
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