



Surgical Safety

Department of Pediatric Surgery
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Learning objective

The objective of this topic is to understand the main causes of adverse events in surgical care and how they can be reduced



Knowledge requirements

- * the main types of adverse events associated with surgical care
- * the verification processes for improving surgical care



Hippocratic oath



I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone.

Surgical Safety

Magnitude of Problem

- *Approx. 1 surgery annually for every 25 human being alive¹

- *Major complications 3-22%²

- *Death 0.4-0.8%

- *Nearly half events determined to be preventable

1. Weiser TG, et al. An estimation of the global volume of surgery. *Lancet*, 2008,372:139-144.

2. Kable AK, Gibberd RW, Spigelman AD. Adverse events in surgical patients in Australia. *International Journal of Quality in Health Care*, 2002, 14:269-76.

Surgical safety

- * Prime concern of the treating surgeon
- * Does not only mean safety during surgery
- * Process begins from first interaction with the patient in the OPD
- * Continues till the patient is discharged

Safety- Before Surgery

- * Proper history including drug, previous treatment history and any known allergies
- * Examination should be complete
- * Records should be accurate and every information noted on the OPD record/ case sheet
- * It is imperative to make a proper diagnosis and treatment plan
- * If doubts consult seniors, colleagues and literature
- * Evaluation by anaesthetist and blood donation if needed

Safety- Before Surgery

- * All treatment options should be explained to the patients even if any of those is not available in the health care facility.
- * Only when patient agrees for the modality offered, further management should be continues
- * Post admission work up- 2nd chance to identify and correct errors in diagnosis and plan
- * Scheduling and rescheduling in the OT list

Safety- Before Surgery

Preop orders

- * NPO
- * IV fluids
- * Consent
- * Antibiotics
- * Other medications and special instructions
- * Blood arrange

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PRE-OPERATIVE ORDERS

Name: _____ Age: _____ Sex: _____
C.R. No.: _____ Diagnosis: _____
Proposed Procedure: _____

1 NPO from _____
2 Parent / Guardian consent to be taken _____ If yes, IV orders (with time)
IV Fluid - Yes/No _____
3 Follow preanesthetic medication advice written in PAT Sheet
a) Symp Phentolan
by _____

Antibiotics:
e) Amikacin - Sensitivity Test (AST)
i) Cloxacillin - Sensitive / Non Sensitive
ii) Cefuroxime - Sensitive / Non Sensitive
iii) _____
iv) _____

4 Shift to OI with OI clothes _____
5 Special Orders _____
6 Others (Blood Arranged, Investigations to send etc.) _____

Done by
Name: _____
Time: _____
Sign: _____

Doctor's Signature: _____

Safety- Before Surgery

Marking

- * at or next to the operative site
- * non-operative sites should not be marked;
- * unambiguous, clearly visible
- * made preferably with a marker so as to withstand preop prep
- * patient is alert and awake



Safety- Before Surgery



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CNBC/ANESTH08/

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PRE OPERATIVE CHECK LIST

1. Child in OT dress, proper identification band.
2. Nail polish, jewellery removed, long hair tied.
3. Remove the prosthesis and loose teeth.
4. Consent - anaesthesia
- surgery
5. Preparation of part
6. Drug sensitivity
7. Nil per orally
8. All the relevant investigations and special reports should accompany the patient.
9. Labelling of intravenous cannula
10. Blood to be arranged.

Safe Surgery Save Lives

- (1) **The team** will operate on the correct patient at the correct site.
- (2) **The team** will use methods known to prevent harm from administration of anaesthetics, while protecting the patient from pain.
- (3) **The team** will recognize and effectively prepare for life threatening loss of airway or respiratory function.
- (4) **The team** will recognize and effectively prepare for risk of high blood loss.
- (5) **The team** will avoid inducing an allergic or adverse drug reaction for which the patient is known to be at significant risk.
- (6) **The team** will consistently use methods known to minimize the risk for surgical site infection.
- (7) **The team** will prevent inadvertent retention of instruments and sponges in surgical wounds.
- (8) **The team** will secure and accurately identify all surgical specimens.
- (9) **The team** will effectively communicate and exchange critical information for the safe conduct of the operation.
- (10) Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.

TEAM EFFORT

Safe Surgery Save Lives

Surgical Safety Checklist



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?

Sign in form

- * Before induction of anaesthesia
- * Patient confirms identity, site, consent, procedure
- * Site marked
- * Anaesthesia safety check
- * Surgical instrument and implant ready

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SIGN IN FORM
(BEFORE INDUCTION OF ANAESTHESIA)

PATIENT NAME:..... AGE/SEX..... C.R. NO:..... DATE:.....

- 1) PATIENT HAS CONFIRMED
 - a) IDENTITY CONFIRMED YES/NO
 - b) SURGICAL SITE (RIGHT/LEFT)
 - c) PROCEDURE (FULL NAME)
 - d) CONSENT :- ANESTHESIA : YES /NO , SURGICAL : YES/NO
 - e) LAST MEAL TIME :
- 2) SITE MARKED
 - a) YES/NO
 - b) NOT APPLICABLE
- 3) ANAESTHESIA SAFETY CHECK COMPLETED
 - a) YES
 - b) NO
- 4) ANAESTHESIA EQUIPMENTS/ PULSEOXIMETER FUNCTIONING :
 - a) YES
 - b) NO
- 5) KNOWN ALLERGY
 - a) YES
 - b) NO
- 6) DIFFICULT AIRWAY/ASPIRATION RISK
 - a) NO
 - b) YES , EQUIPMENT & ASSISTANCE AVAILABLE/ NOT AVAILABLE
- 7) RISK OF BLOOD LOSS >10% OF BLOOD VOLUME(APPROXIMATE 8ml/kg)
 - a) NO
 - b) YES , ADEQUATE INTRAVENOUS ACCESS & FLUID PLANNED/NOT
- 8) SURGICAL INSTRUMENTS/ IMPLANTS READY
 - a) YES
 - b) NO

[SIGNATURE OF ANAESTHETIST]

FULL NAME OF ANAESTHETIST

DATE & TIME :

Time out form and Sign out form

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TIME OUT FORM
(BEFORE SKIN INCISION)

PATIENT NAME: _____ AGE/SEX: _____ C.R. NO: _____

1) CONFIRMED ALL TEAM MEMBERS BY NAME AND ROLE
a) YES
b) NO

2) SURGEONS, ANAESTHETIST, NURSE & TECHNICIAN CONFIRM:
RIGHT PATIENT
RIGHT SITE
RIGHT PROCEDURE

3) ANTIBIOTIC, PROPHYLAXIS HAS BEEN GIVEN WITHIN LAST 60 MINUTES
a) YES
b) NOT APPLICABLE

4) ANTICIPATED CRITICAL EVENTS:
SURGEON REVIEWS: _____
ANAESTHESIA TEAM REVIEWS: _____
NURSING TEAM REVIEWS: STERILITY CONFIRMED/NOT

5) ESSENTIAL IMAGING DISPLAYED
a) YES
b) NOT APPLICABLE

6) SIGNATURE OF ANESTHETIST: _____ (SIGN. OF SURGEON) (SIGN OF FLOOR NURSE)

SIGN OUT FORM
(BEFORE PATIENT LEAVE OPERATING ROOM)

7) PATIENT NAME & PROCEDURE RECORDED
a) YES
b) NO

8) INSTRUMENTS, SPONGE, GAUZE PIECES & NEEDLE COUNT
a) CORRECT & COMPLETE
b) NO, SPECIFY: _____

9) SPECIMEN LABELLED
a) YES
b) NO

10) WHETHER THERE ARE ANY EQUIPMENT PROBLEM TO BE ADDRESSED
a) YES
b) NO, SPECIFY: _____

(SIGNATURE OF SURGEON) _____ (SIGNATURE OF SCRUB NURSE) _____

FULL NAME: _____ S/N NAME: _____

DATE & TIME: _____ DATE & TIME: _____

Time out form

- * Before skin incision
- * All team members confirmed
- * All confirm patient, site, procedure
- * Antibiotic prophylaxis
- * Anticipated critical events
- * Essential imaging

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TIME OUT FORM
(BEFORE SKIN INCISION)

PATIENT NAME: AGE/SEX: C.R. NO: SITE:

CONFIRMED ALL TEAM MEMBERS BY NAME AND ROLE
YES
 NO

SURGEONS, ANAESTHETIST, NURSE & TECHNICIAN CONFIRM
RIGHT PATIENT
RIGHT SITE
RIGHT PROCEDURE

ANTIBIOTIC, PROPHYLAXIS HAS BEEN GIVEN WITHIN LAST 60 MINUTES.
YES
 NOT APPLICABLE

ANTICIPATED CRITICAL EVENTS:
1. SURGEON REVIEWS:

2. ANAESTHESIA TEAM REVIEWS:

3. NURSING TEAM REVIEWS: STERILITY CONFIRMED/NOT

ESSENTIAL IMAGING DISPLAYED
YES
 NOT APPL CABLE

(SIGN. OF ANESTHETIST) (SIGN. OF SURGEON) (SIGN OF FLOOR NURSES)

Sign out form

- * Before patients leaves operating room
- * Patient name and procedure recorded
- * Specimen labelled
- * Any equipment problem

SIGN OUT FORM
(BEFORE PATIENT LEAVE OPERATING ROOM)

6) PATIENT NAME & PROCEDURE RECORDED
1) YES
2) NO

7) INSTRUMENTS, SPONGE, GAUZE PIECES & NEEDLE COUNT
1) CORRECT & COMPLETE
2) NO, SPECIFY.....

8) SPECIMEN LABELLED
1) YES
2) NO

9) WHETHER THERE ARE ANY EQUIPMENT PROBLEM TO BE ADDRESSED
1) NO
2) YES, SPECIFY.....

(SIGNATURE OF SURGEON) _____ (SIGNATURE OF SCRUB NURSE) _____
FULL NAME: _____, S/N NAME: _____
DATE & TIME: _____, DATE & TIME: _____

OT White Board

PATIENT'S NAME: HARSH	DATE 18/06/11
AGE/SEX: 7.04Y/M	SPONGES - Nil
CR NUMBER: 49892	GAUZE PIECES - 10
PROCEDURE: URETHROPLASTY + GA	PEANUTS - Nil.
SURGEON'S DR. Vishesh Jain DR. Abhishek	INSTRUMENT COUNT 31
ANAESTHESIOLOGIST'S DR. Sapna	NPO: - 9 pm (17/6/11)
SCRIB NURSE Renu	WT: - 14 kg
FLOOR NURSE Anita	BLOOD LOSS: N/O - Gauri
TECHNICIAN Sachin/wasim	BLOOD GROUP
TIME IN 9:15 Am	
TIME OUT 9:30 Am	

Safe Surgery Save lives

Correct Patient Correct Site

Days to hours before surgery



✓ Step 1: Consent Form

The consent form must include:

- patient's full name
- procedure site
- name of procedure
- reason for procedure



✓ Step 2: Mark Site

The operative site must be marked by a physician or other privileged provider who is a member of the operating team



✗ **Do NOT mark non-operative sites**



Just before entering OR



✓ Step 3: Patient Identification

OR staff shall ask the patient to state (NOT confirm):

- their full name
- full SSN or date of birth
- site for the procedure



✗ Check responses against the marked site, ID band, consent form and other documents

Immediately prior to surgery



✓ Step 4: "Time Out"

Within the OR when the patient is present and prior to beginning procedure, OR staff must verbally confirm through a "time out":

- presence of the correct patient
- marking of the correct site
- procedure to be performed
- availability of the correct implant



✓ Step 5: Imaging Data

If imaging data is used to confirm the surgical site, two or more members of the OR team must confirm the images are correct and properly labeled



Safe Surgery Save Lives

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

Prevention

- * Correct known coagulopathy

Readiness

- * The team should be aware of possibility of major blood loss and be prepared
- * If loss $> 7\text{ml/kg}$ then two large bore iv line or central venous line



Safe Surgery Save Lives

The team will consistently use methods known to minimize the risk for surgical site infection.

- * Identify risk factors
- * Preop preparation
- * Operating room environment
 - * Ventilation
 - * Cleanliness in OT
 - * Surgical attire
 - * Sterile instruments and drapes
- * Proper scrubbing
- * Presurgical skin disinfection
- * Antibiotic prophylaxis
- * Aseptic surgical technique

Safe Surgery Save Lives

The team will prevent inadvertent retention of instruments and sponges in surgical wounds

Methodical wound exploration before closure

Counting

- *When
- *By whom
- *What items
- *Documentation



Safe Surgery Save Lives

Counting

When

- * General rule with few/ no exceptions
- * Beginning, closure of a cavity, first layer of wound closure, changeover

What items

- * Sponge
- * Sharps
- * Instrument
- * Miscellaneous



Safe Surgery Save Lives

Counting

By whom

- * Two person
- * Scrub nurse and circulating nurse

Documentation

- * Preprinted count sheets
- * White board

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Pre Closure Checklist for OT

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Patient Name: CR No. _____

Name of Procedure: Department: _____

Date: Time: _____

No.	Items	Pre-Operative	Additional	No. Pre-Closure	Remark
1	Sponges				
2	Peanuts				
3	Gauze Pieces				
4	Artery forceps				
5	Needle				
6	Scissors				
7	Needle Holder				
8	Dissecting Forceps				
9	Towel Clip				
10	Others				

Scrub Nurse: _____ Circulation Nurse: _____

Attending Anesthesiologist: _____ Surgeon: _____

In a study of retained surgical instruments it was noted that in 88% of cases of retained sponges and instruments in which counts were performed, the final count was erroneously believed to be correct

Gawande AA, et al. Risk factors for retained instruments and sponges after surgery. *New England Journal of Medicine*, 2003,348:229–35.

Safe Surgery Save Lives

The team will secure and accurately identify all surgical specimens

Key issues

- * inadequate or wrong labelling
- * missing or inadequate information
- * 'lost' specimens

Errors occur in 3.7 per 1000 specimens from operating rooms

Makary MA, et al. Surgical specimen identification errors: a new measure of quality in surgical care. Surgery, 2007;141:450-5.

Safe Surgery Save Lives

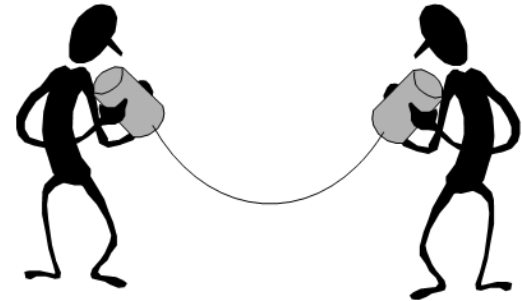
How to avoid errors

- * Patient from whom each surgical specimen is taken should be identified with at least two identifiers (e.g. name, hospital number).
- * The nurse should review the specimen details with the surgeon by reading aloud the name of the patient listed and the name of the specimen, including the site of origin and any orienting markings.
- * Surgeon should complete a requisition form labelled with the same identifiers as the specimen container.
- * This requisition form should be cross-checked against the specimen before it is sent to the pathology department.

Safe Surgery Save Lives

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

- * Constructive team culture
 - * Structure
 - * Perception of role
 - * Attitude to safety issues
- * Ability of team members to raise concern



Surgical Safety Check List

- * Study performed in 8 hospitals in 8 cities around the world including New Delhi.
- * Complication rate studied after introduction of WHO safety check list in 3955 patients
- * 3733 patients as control.
- * Death rate declined from 1.5% to 0.8%
- * Complications declined from 11% to 7%

Haynes AB, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *New England Journal of Medicine*, 2009; 360:491-9

Safety- After Surgery

- * All standard precautions should be followed to prevent hospital acquired infections
- * Surgical site infections should be looked and managed accordingly. Reasons thereof should be analyzed and corrective actions taken
- * Antibiotic policy of the hospital should be followed
- * Medication errors should be avoided
- * Care of catheters should be done properly

Postoperative care of the patient

- * Patient safety should be assured
- * Fall from bed, bed sores etc should be avoided
- * Restraint policy should be in place
- * Abduction of the neonates and infants from wards/ICU should be prevented by following standard policy
- * Patient safety measures should be tailored according the type of patients cared for by the health facility

Postoperative (discharge)

- * Discharge policy should address the care of the patients in the postoperative period
- * All necessary information should be given in the discharge card and explained to the patient
- * Follow up advise should be explained clearly
- * Contact number to be called for emergency requirement should be provided

Case Scenarios

- * A 5yr old child with Right inguinal hernia
- * During surgery (Right herniotomy), inferior epigastric vessels inadvertently gets damaged.
- * What should be done to ensure patient safety



Case Scenarios

TEAM EFFORT

Surgeon

- Informs the team of situation and blood loss
- Attempts to control bleeding
- Packing if bleeding cannot be controlled

Anaesthetist and Technician

- Ensures appropriate iv access
- Helps in collecting sample for cross match
- Maintains hemodynamic stability
- Helps surgeon in making decisions

Nursing Staff

- Provides necessary instruments and materials to surgeon
- Co-ordinates with blood bank for fast delivery and processing of sample

Case scenarios

- * A 4 yr old male child with Right Wilms tumor undergoing Exploratory Laparotomy for Right radical nephrectomy
- * Sponge count is incorrect one sponge is missing
- * What to do?



Case scenarios

Team effort

Nursing staff

- Informs the team
- Recount
- If recount also mismatch look in floor, garbage and linen

Surgeon

- Look meticulously for the missing item
- Order X ray if needed

Anaesthesia and Technician

- May need to prolong anaesthesia

If discrepancy persists document carefully in case sheet and keep close watch in postop period



THANK YOU