PATIENT SAFETY IN THE OPERATING ROOM

By Prof Soliman Hassan
The objective of this lecture is to identify **hazards** present in operating rooms and to list the **safety actions** that can be taken to minimize these hazards.
Safety Actions are directed to:

- Patient safety
- Staff safety
- Your own safety
- Equipments safety.

Do no harm!
Safety Actions?

why?

- Anesthesia & surgery are dangerous
- Legal aspect: Surgeon’s responsibility
- Threat of communicable diseases
- Social, legal and financial aspects
Surgeon to patient (always):

“You must accept risk of bleeding, perforation, and infection ➔ things that are not totally under our control.”
CONSENT Includes Always and "Never"

- Surgeon to patient (Never):
  - “I promise you that I will not do the wrong operation, start a fire, or leave something behind unintentionally → things that are under our control.”

- Surgeon to patient (Never):
  - I will never:
  - Do the wrong operation → 34 times/yr. in USA
  - Start a fire or burn the patient. → 131 times/yr. in USA
  - Leave anything harmful → 98 times/yr. in USA
**At-risk Team Behaviors in the OR**

1. Not checking the equipments before surgery
2. Surgeon entering after induction and drape of patient
3. Surgeon running between 2 ORs
4. Relying on memory about the pathology of the case and the steps of operation (Scientifically not updated?)
5. Has **NO clear solutions** on back table in case of unexpected situations
6. Using Bovie (diathermy) in O2-rich environment: (Leaking oxygen from the tube system)
To Avoid These Risks

- O.R. Team Should Be?
- Patient-focused; BUT NOT?
  - Not surgeon-focused
  - Not workflow-focused
  - Not specialty-focused
  - Not budget-focused
  - Not break-focused
PATIENT SAFETY

- **Starts since:**
- Admission & Assessment.
- Documents & Consent.
- Positioning & Connections.
- Pre-Op preparation & Marking for surgery.
- It’s a Multi - personal Check system.
Patient’s safety:

- **Starts** with history taking and consenting the patient
- **Finishes** when patient is fully recovered in the recovery room.
- **In O.R.;** *Surgeons* legal role starts with induction of anaesthesia and finishes with extubation
Preoperative Notes before transportation to the OR

The note summarizes:

- 1- Full name and hospital number
- 2- Informed consent has been obtained including the indication for the operation proposed, and including that there has been a discussion between surgeon and patient about the possible complications and risks of the operation.
- 3- The file of the patient includes all investigations and radiology done for the patient
- 4- Marking the side of the operation
- 5- Check that the patient is fasting for at least 6 hours
- 6- Dentures and rings are removed
- Documentation of Drug allergies, sensitivities, history of skin reactions after injection, or after local use
Preop preparations done by the team:

1- Order of patients in the list: children and diabetics are put first in the list
2- Special needs on the back table: implants, synthetic grafts, special catheters, etc
3- Cross matched blood, fresh frozen plasma, platelets conc.
4- Investigations and radiology present in the OR facing the surgeon.
5- Tools for biopsy samples
In the operating room and after induction of anaesthesia:

1- The patient is catheterized
2- The patient is securely held on the operating table and in the best position for surgery, not touching any earthed metal objects
3- The diathermy plate is put under the patient body muscles
4- Apply a tourniquet when indicated.
### Surgical Standards Adopted in OR:

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Infection control in the OR

It involves:

- Surgical hand scrubbing with long acting antiseptic (Chlorhexidine Gluconate 1% and Ethyl Alcohol 61%): Waterless scrubbing
- Hands dried with sterile towels
- Sterile field
- Sterile gown & mask
- Sterile gloves
- Sterile supplies
- Skin preparation for surgery (shaving and antiseptic solution)
- A fully equipped operating room
Infection control in OR

- Keep **clean**, **dirty**, and **sterile** items separate:
- Put **sterile items** in a sterile towel on table, open packed sets, without contaminating them.
- **Sterile Supplies on table include:**
  - **Sterile instruments, gowns, sterile cup, antiseptic betadine, cotton, sterile forceps, catheters, Sterile gloves, etc.**
- Have **a garbage container** nearby and pass off all contaminated items without returning them to the sterile field.

- Follow **a sterile precautions** between procedures (wash hands with the accepted antiseptic sol for 3 min, and wear sterile gowns and gloves).

- **Wet items** are considered contaminated.
Infection control in OR

- Be Aware of handling Sharp instruments
- Avoid missing towels and instruments in the wound
- Ensure wound dressing is appropriate
- Care in dealing with contaminated wastes and during cleaning rooms after operations
WHO’s 10 Objectives for Safe Surgery
WHO’s 10 Objectives for Safe Surgery

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 anesthetics, while protecting the patient from pain.

3- The team will recognize and effectively prepare for life-threatening loss of airway or respiratory function.
WHO’s 10 Objectives for Safe Surgery

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 have a 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 or sponges in surgical wounds.
WHO’s 10 Objectives for Safe Surgery

8- The team will secure and accurately identify all surgical specimens, for bacteriological or histological examination.

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 outcomes.
A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population


WHO 2009
Surgical Safety Checklist

Before induction of anaesthesia
(with at least nurse and anaesthetist)

- Has the patient confirmed his/her identity, site, procedure, and consent?
  - Yes
  - Not applicable

- 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.
1- Surgeon errors:
Wrong Patient, or Wrong Operation side
- Inadequate history (repeat appendectomy) or operating on right side for left hernial swelling
- Wrong x rays
- Scheduled for wrong surgery (not indicated).
- Confirming information in the patient’s file is not available / not used
- Patient name misidentified (Ms. Thomas/Thompson)
- Patient’s understanding to his operation is wrong
O.R. Adverse Events and Errors

2- Anaesthesia Errors:

- Anaesthesia blocks wrong side
- Patient recovery before time out
- Wrong size of endotracheal tubes
- Failure to supply the patient with the proper amount of O2 or anaesthetic drugs
- Failure of recovery after surgery
O.R. Adverse Events and Errors

3- Medication Errors

- Problems with orders to prepare specific medications in OR (Antiarrythmic, antihypertensive, inotropic drugs, antishock drugs)
- Problems with intra-operative use of medications
- Lack of some iv fluids and drugs on the back table:
  - The back table should contain fluids & drugs used in emergency situations for patient’s resuscitation & recovery.
4. Adverse Events during preparation of the Operative Site:

- Betadine or iodine burns
- Alcohol swabs catching fire with the use of diathermy
- Skin injuries from adhesives or towel clips
  
  (Towel clips into earlobe, eyelid, nose, lip, nipple, etc.)
5- Fires and Burns

- Diathermy fires and burns occur in the following situations:
  - Alcohol-based skin preps
  - $O_2$ tenting around head and neck—Tracheostomy
  - Activation of diathermy probe on drapes
  - Improperly secured Diathermy Pad beneath the body of the patient
6- Unintended Lacerations:

- Skin lacerations with bandage scissors or adhesive tapes.
- Accidental urinary tract or gastrointestinal injuries during hysterectomy
- Newborn lacerations with C-section
O.R. Adverse Events and Errors

7- Retained Foreign Bodies

- Inappropriately counts of sponges and instruments when surgeon & nurse are distracted, in long operations
- Unmarked "blue towels" or sponges into body cavity
- Using Small needles
- Endovascular guide wires
O.R. Adverse Events and Errors

8- Tubes and Wires:
- Unsecured endotracheal tubes
- Chest tubes not secured or false passage of urethral catheter, etc
OR Hazardous materials

- Hazards present in the OR may include:
  - Blood/body fluid exposures from injury by sharp instruments
  - Exposure to released particulates
  - Exposures to anesthetic gases
  - Possible exposures to chemical cleaning agents
  - Slips/trips/fall hazards
  - Exposures to lasers
  - Hitting heads on OR lights
  - Electrical shock hazards
  - Fires
50% of our sharps injuries occur during use.

Procedures with the most sharps injuries:

- Suturing
- Blood sampling
- Intradermal injections (lidocaine)
- Cut wounds (scalpel injuries)
- Inserting peripheral I.V. line
Cont.:
- Withdrawing needle from patient
- During clean up and wound dressing
- During disposal of waste products
- Overfilled sharps container, with protruding needles
- Stuck by needle left in trash, laundry, beds, & on floor
What can you do to prevent these exposures and injuries?

◦ Utilize safe zone during each surgical procedure
◦ Account for all sharps used.
◦ Dispose of sharp in sharps container immediately after use.

When emptying suction bottles, always pour carefully and wear eye/face protection
Other actions:

- Using personal protective equipment (PPE): gloves, mask
- Consider wearing combination visor-mask (Transparent) to help prevent eye exposures
Should an exposure occurs, what to do?

For eye exposures:
◦ Use an eyewash solution and rinse for about 15 minutes

For a needle stick in your finger:
◦ Express blood from stick, wash with soap/water or use betadine and Report exposures immediately to University Health Service
2– Particulate Releases

- From cauterizing blood vessels, or using lasers)
- These particulates can have viable organisms present that can cause infections
- Preventive actions:
  - Use suction close to the point of generation
  - Wear medical mask with eye protection.
  - Circulating peoples can wear tight fitting safety goggles
Releases of anesthetic gases into the OR can result in loss of small motor skills, slowing of reflexes, mental confusion and tiredness.

**Actions** by the anesthesiologist to minimize these exposures:

- Check all connections before use for leaks
- Pack endotracheal tube to prevent leaks
- Have anesthetic equipments checked periodically
Those who are using the concentrated cleaning agents have the greatest potential of exposure.

**Before use:**
- Obtain instructions for proper use
- Read the product label about the hazards of use

Wear the **personal protective equipment (PPE)** before use
5 – Slips/Trips/Falls

- The walking surface of OR locations can be slippery, causing an injury
- Take the appropriate precautions:
  - Wear slip resistant foot wear
  - Report water/fluids on floor for clean up
- Place a “CAUTION – WET FLOOR” sign on floor until cleaned
Recommendations for OR locations which utilize lasers:

The Laser Nurse/Technician must prepare the OR for use as follows:

- Place any needed eye protection (glasses) at the entries
- Some applications may require covering windows and other reflective surfaces

Maintain a protocol of laser use
OR lights are adjustable away from the heads.

Use these simple rules:

Keep light up, out of the way until needed

Once ending of its use, move the light up, out of the way
Shocks are usually the result of faulty equipment

Take the following actions:

- **Unplug power cords** by holding the plug, Never pull the cord
- Never operate an equipment if the ground plug is missing - Take the unit out of service for repairs by Medical Engineering
Alert on fires in the OR requires well trained personnel:
- Be trained on the use of fire equipment
- Know methods for rescue & escape
- Know location of medical gases shut-offs and electrical controls
- Know location and activation of fire alarm system
Ignition sources

- Electro surgical equipments account for 68% of fires
- Fiber-optic headlights or endoscopes
- Lasers account for 13% of fires
- O2 enriched atmospheres was a contributing factor in 74% of the cases
- You have to Know O2 shut off locations
Essentially, firemen put out fire by taking away one or more elements of the fire triangle.
QUALITY ASSURANCE
Improving Patient Safety

- **General Priorities for Improvements**

  1. **Quality control** (Strict follow up of the working system)
  2. **Automation of the system** (The work is completed in an easy way)
  3. **Standardization** (Hospital standards to be firmly applied)
  4. **Checklists** (Documentation of every step before, during and after operation)
5- Apply Rules of quality controls and management
6- Health Education to the operative team
6- Information available to the person who is responsible for the organization and to the patient and his family
THANK YOU