Ethics, errors and education in surgical operating room

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Citation: Shekhar S. Gill KS. Ethics, errors and education in surgical operating room. Int J Eth Trauma Victimology 2015; 1(2):32-37. doi: 10.18099/ijetv.v1i2.6815

Abstract
Patient safety errors in OR may originate from: surgeon on account of forgetfulness, inattention, poor motivation, carelessness, negligence and recklessness; hospital system due to understaffing, inadequate equipment, fatigue, time pressure and inexperience. Quality surgical training is crucial for creation of surgical workforce for health care delivery. The surgical trainees during ‘Junior Residency’ need training in both ‘Surgical’ and ‘Communication’ OR skill. The surgical skill learnt in OR is: competence in ‘basic surgical techniques’; skill of ‘assistance and minor surgeries’: hernia repair, appendectomy, skin grafting and laparoscopic skills. During ‘Senior Residency’ independent surgical judgment and performance of advanced surgical procedures to gain extensive operating experience. The non-surgical skill that promotes patient safety in OR are ‘communication skill’ and ‘team skill’. The supervised progressive responsibility model of surgical training has elements embedded for patient safety. Surgical trainer promotes trainee’s skill and ensures patient safety as well the highest quality of surgery, through gradual decreasing levels of supervision in OR, namely Direct Supervision where the trainer is physically present; Indirect supervision where the trainer becomes available within few minutes; oversight where after the surgery review is provided with feedback and progress monitoring where progress is monitored and supervision is done only in complex surgeries. Supervised surgical training helps creation of skilled practicing surgeon and ensures patient safety.

Keywords: Operating room ethics, never events of error and trauma, elements of patient safety, post graduate surgical training, supervised progressive responsibility.

Introduction
“Safe Surgery Saves Lives” and “Patient Safety First” are the corner stone of surgical care. Surgical ethics related to OR follows the same values as that of the resident of the society and community. The Never Events in OR is patient safety incidents, which are serious and largely preventable. Quality surgical training is crucial for creation of surgical workforce for health care delivery. The surgical trainees need training in both ‘Surgical’ and ‘Communication’ OR skill. There are Elements for patient safety embedded in the surgical training program in the form of increasing progressive
responsibility' to the surgical trainee and 'multi-level supervision' in OR by the teacher trainer.

This study is about ethical issues, issues related to human errors in OR and elements of patient safety through supervision in surgical training program. This presentation is an experience narration based on personal experience of a surgical teacher trainer, along with opinion of contemporary surgical colleagues and also through review of literature. This presentation aims at studying the elements of patient safety in the operating room from both trainer and trainees perspective.

I. Ethical issues in OR
The surgical ethics applicable in OR are sensitive & important and not different from the common values and ethical principles of the society (1),(2). Written laws about medical ethics in OR does not exist. However the surgical consultant needs to ensure for the follow-up of OR ethical guidelines, especially regarding female patients, by all medical personnel; and the nurse in charge of OR should regulate the entry of required persons during part preparation, draping & surgery. In OR the issues of ethical concern may relate to: exposure of body, dress of patient and OR team, loitering in OR complex, noise, gossip, behaviour and patient queries(3),(4).

1. Exposure of body: Normally body parts need to be kept covered, along with head cover or face cover as per the custom of the resident society. Patient should not be exposed unnecessarily or inappropriately. In men exposure from umbilicus to knees is forbidden; and in ladies exposure of any or all body part is forbidden. In matters of exposure of body part the religious and cultural belief should be followed (3),(4).
   a) However in OR some body parts where operation is to be done needs to be exposed. For example: preparation for anaesthesia, chest auscultation & inspection, insertion of Foley's urinary catheters etc.
   b) Patients' dignity needs to be preserved during all phases of transportation and during shifting from trolley to operation table and during part preparation and draping.
   c) Exposure if necessary should be for the shortest period of time and overexposure be avoided and be limited to needed parts of the body only.
   d) During patient positioning & preparation only presence of personnel absolutely necessary be permitted. Too many people or health personnel needs to be curbed (2).

2. Dress: Patient dress should ideally be made of two parts to allow selected exposure of the required body part. When OR patient dress is a single piece it neither exposes selected body part, nor covers well behind. Lady patients dress ideally should cover all body and look decent; undergarment needs to be removed in all cases to avoid the problems of uncleanliness, metal parts and nylon etc. A disposable underwear may be provided(2),(3),(4).

3. Persons loitering: In OR complex or in receiving the loitering public create hindrance to patients and other staff and this needs to be regulated by security personnel (2).

4. Noise: Noise free environment inside operation room has soothing effect on patient and the surgical team. Hence noise must be kept to the minimum (2),(3),(4).

5. Comments & Behaviour: Jokes & laughing loudly in front of patients, before anaesthesia, during local or spinal anaesthesia, or during surgical procedure needs to be avoided (2). No undesirable statement or comment should be made regarding patient's body, figure, shape, obesity or leanness. A curtain between patient and instrument table will obstruct the incidental viewing by patient of instruments like scissors, drills, scopes and saws etc. before anaesthesia and prevent patients panic reaction (2),(3),(4).

6. Clinical evaluation of patient for operation: Sometimes the chief surgeon or anaesthetist needs to re-evaluate the patient waiting to be operated. This should be done with privacy and within confines of operation theatre closet, any examination of patient in passage or outside operating room, in wide glare of attendants and patient relatives needs to be avoided (2),(3),(4).

7. Honesty: In teaching hospitals patients and their relatives want to know as to who did his or her surgery. It is required that patient be empathically told that all surgeries are performed under supervision of chief surgeon.
by members of his team and quality of surgery is always ensured. While teaching on medicos and trainee surgeons the highest standards are maintained. In cases of unexpected, tell the truth as to what went wrong along with clear explanation with expected outcome (2),(3),(4).

8. **Consent:** It should be taken in ward and must be avoided in passage or in OR.

### II. Errors, never events and incidental patient trauma in OR

1. *The Never Events in OR* are patient safety incidents, which are serious and largely preventable. They broadly include: (a) **Wrong site surgery** e.g. Surgery on the wrong patient, wrong part of body, wrong limb, wrong organ. (b) **Wrong implant/prosthesis** e.g. During surgery placement of wrong prosthesis or implant, other than what was planned specifically suitable in the particular patient and (c) **Retained foreign objects post operation** e.g. unintended retention of instruments, swabs, screws or guide wires in abdomen. *Mishaps in OR* related to **anaesthesia** are explosion due to anaesthetic agent. *Mishaps in OR* related to **surgery** are massive bleed, injury to vital organs like Aorta, Vena cava; and *mishaps related to nursing* may be patient falling from OR table etc. (5),(6),(7).

2. The causes behind the never events in OR could be mistakes or human error.
   - **Human mistakes in ORs** where the plan itself is inadequate to achieve its objective and it could be of two types: 'failure of expertise' and 'lack of expertise' (6),(7),(8).
   - **Human errors in OR** is slips and lapses, where the action does not go according to plan and could have two sources of origin: 'the surgeon' and 'the hospital organization' (6),(7),(8).

   - **Problem in Surgeon** – It can be error in the particular surgeon in the form of abnormal mental state e.g. forgetfulness, lack of attention, lack of motivation, lack of carelessness, negligence and recklessness, which may lead to errors and wrong steps in surgical procedure. The effect of this type of error is direct but short lived. Measures like disciplinary action, litigation, retraining, naming-blaming-shaming and campaign poster in OR complex may help in motivation for improvement (6),(7),(8).

   - **Problem in Hospital System** – Here the fault has its origin in the hospital system or organization and here errors are consequences rather than causes. The basic cause remains hidden for long as it includes defects made in decisions by experts who designed, constructed or wrote the steps of the procedure and often they involve the top management persons. The stress here goes on piling up and provokes 'latent conditions' for error e.g. Time constrain, inadequate staffing, lack of proper and enough instruments, excessive tiredness and lack of expertise of the surgical team. Here the effect is long lasting. Here the corrective measures could be: changing the condition under which surgeon’s work, through defences, barriers and safe guards which may bring improvement (6),(7),(8).

### III. ‘Education of quality surgical skill’ through ‘progressive OR responsibility’ and ‘multi-level OR supervision’ model ensures ‘patient safety’.

‘Quality surgical training’ (QST) during post graduate surgical training is essential to enable the creation of competent surgical manpower. The goal of QST is to promote acquisition of sound surgical knowledge and ensure development of surgical skill with adequate surgical judgment and professionalism and best practices in the surgical trainee. The surgical trainee needs to become competent in knowledge base, operative skill and vocational skill alongside personal development to be able to practice independently as surgical consultant. Currently this is implemented through ‘Supervised increasing progressive responsibility model of surgical training’ (7),(8),(9).

1. **The skill required for surgeon in training are:**
   - Surgical Skill for operative procedures
   - Communication Skill for working as a team
   - A surgical trainee needs the gradually increasing opportunity of doing surgery in operating room to build on his surgical OR skill (8).

2. **The safety requirement for patient in OR is:**
   - that he should be operated by a qualified...
and skilled surgeon. As surgery involves human life, the risk to patient remains when it is performed by trainee surgeons.

3. The trainer’s perspective for patient safety in OR is: to ensure patient safety through multilevelled supervision during training. The trainer practices the gradual decreasing levels of supervision as the surgical trainee shows progress in attainment of surgical skill. This protects the patient and helps in growth and development of surgical judgment of trainee resident surgeon (7),(10),(11).

The progressive responsibility model of Post graduate surgical training

1. In the current five year surgical training programme, during first three years the trainee progressively develops surgical maturity of transition from Resident to Practicing Surgeon.
   (a) In 1st year the surgical trainee in OR develops procedural competence in Basic Surgical Techniques of central venous access placement, arterial catheterization and tube thoracotomy (7),(10),(11).
   (b) In 2nd year the surgical trainee in OR gains additional valuable experience both as assistant and as primary surgeon on uncomplicated minor surgeries e.g. abscess drainage, suturing the wound, plaster of Paris cast placement, scrotal hydrocele surgery, excision of subcutaneous lipoma, cyst etc(7),(10),(11).
   (c) In 3rd year the surgical trainee in operating room is involved more and more with technical aspect of surgery. He masters the basic surgical techniques, as well as some more advanced techniques like inguinal hernia repair, appendectomy, laparoscopic skill and skin grafting etc(7),(10),(11).
   (d) In Senior residency during 4th and 5th year, the surgical trainee in operating room is encouraged to exercise independent surgical judgment, perform more advanced surgical procedure and gain extensive operating experience while working as team leader in the position of Chief Resident (7),(12).

2. Operating room team skill and Parameters for measurement

(a) OR Team skill: The team skill in operating room, where surgeon, anaesthetist and nurses form the operating team, has four dimensions: leadership and management (LM), teamwork and cooperation, problem solving and decision making and situation awareness (12).

(b) Measurement parameter for team skill: teamwork skill outcome can be measured through three parameters: operating time - where surgical and anaesthetic team LM has opposite relationship; operating time increases when anaesthetic LM is high, decreases when surgical LM is high and errors in surgical technique or situation awareness (12).

1. The communication skill and evidence based intervention skills in OR: The skill of communication in OR in members of surgery team is important for patient safety and can be attained through ‘Briefing’ by sharing vital info about patient for surgery; sign in ‘by discussion about site and type of surgery between patient, anaesthetist and surgical team and ‘Debriefing’ means at the end of theatre list reviewing any issue that occurred, to prevent them happening again’(11),(13),(14).

The model of multiple levels of supervision in OR has strong element of patient safety:

Supervision model is the principle adopted at all levels of surgical training to ensure patient safety and fostering growth of manual surgical skill, as well as surgical decision making skill in trainee in OR. Here surgical resident are trained through four levels of Supervision.

Level 1: Direct Supervision - the surgical resident is physically present with the trainee resident and patient in OR during critical portion of each surgical procedure. This is used during Junior as well as senior residency.

Level 2: Indirect Supervision - the surgical trainer is either physically present in OR complex or available on phone and becomes available within few minutes for direct supervision. This is used during Junior as well as senior residency.

Level 3: Oversight - the surgical trainer is available to provide review of procedure
with feedback after the surgery is over. This is used only during senior residency.

**Level 4: Progress Monitoring** - the surgical trainer supervisor is the attending consultant and mostly monitors the progress of the Sr; and provides direct supervision only during complex surgical procedures. This is used only during senior residency (11),(12).

**Conclusion**

The ethics related to OR needs to be based on the same values as that of the resident of the society and community. The ethical issues of concern in OR relates to exposure of body parts, patients as well surgical teams dress, persons loitering, noise, comments and behavior, clinical evaluation around OR, honesty and consent.

The errors in OR are patient safety incidents, which are serious and largely preventable. Patient safety errors in OR may originate from: Surgeon or the Hospital System.

The education of quality surgical skill, crucial for creation of surgical workforce includes both ‘surgical’ and ‘communication’ OR skill. The surgical skill learnt in OR is: competence in ‘basic surgical techniques’; skill of ‘assistance and minor surgeries’. During ‘Senior Residency’ independent surgical judgment and performance of advanced surgical procedures to gain extensive operating experience. The non-surgical skills that promote patient safety in OR are ‘communication skill’ and ‘team skill.’

The education of surgical OR skill through ‘supervised progressive responsibility model of surgical training’ has elements embedded for patient safety. Surgical trainer promotes trainee’s skill and ensures patient safety as well the highest quality of surgery, through gradual decreasing levels of supervision in OR, namely direct supervision, indirect, oversight and progress monitoring. Supervised surgical training helps creation of skilled practicing surgeon and also ensures patient safety.

**Conflict of Interest**

None

**References**

