

OPINION

PERIOPERATIVE MEDICINE

Patient friendly operating room complexes: What can be done?

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Abstract

Primary objective of operating room complex (ORC) is to provide safe care, comfort and maximum benefit to the surgical patient. Stressful OR environment enhances the patient's anxiety level. Preoperative patients need emotional support as they have fear of unknown. ORC needs to be designed to offer a pleasant and friendly environment. Patient's safety should be given priority. Improving cost effectiveness along with providing best quality of care is a difficult task. Anesthesiologists and OR nurses play a major role in successful outcome and implementation of WHO surgical safety checklist. Stress will have more psychological impact on patients undergoing surgery under regional anesthesia. Pediatric patients will need distraction techniques in order to reduce preoperative anxiety and behavioral changes. Anesthesiologists and OR staff have a major responsibility to make the OR environment patient friendly by showing respect and empathy to every patient, maintenance of patient privacy, ambient OR temperature, strict aseptic measures, and avoiding unnecessary delays and postponement of cases.

Key words: Operating room; Operating room complex; Stress; Work environment; Anesthesiologist; OR nurse; WHO surgical safety checklist; Psychological; Pediatric patient; Distraction techniques; aseptic measures

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1. Introduction

Within a healthcare institution, an operating room complex (ORC) is really a complex system. An ORC is the heart of hospital and the center point of OR being the "patient". The primary objective of an ORC is to provide comfort and the best possible management to the surgical patients in a humane way.¹ Exposure of sick patients to stressful operating room (OR) environment, seeing unknown OR staff and other patients with different surgical conditions can have a negative impact on the patient's minds.²

1.1. OR—A mysterious place – Fear of unknown

For a large majority of the patients, arrival in the OR is the most stressful part. OR environment i.e. dark room, overhead lights, narrow table, beeps and noise of monitors and their alarms, needles, anesthesia equipment, surgical instruments and cold temperature all contribute to the patient's anxiety.³

1.2. Factors causing preoperative anxiety

In order to make OR environment patient friendly, it's important to know the factors which contribute to the patient's stress in the OR.

Patients may have fear of physical harm and loss of control, they may be anxious about anesthetic technique and postoperative pain. They may get agitated due to prolonged thirst and hunger. Having to expose in front of people is another big fear, especially in case of children and female patients. Some patients might have had any previous bad OR experience. Prolonged waiting time and a large number of people during induction of anesthesia also evoke anxiety.²

1.3. Preoperative concerns of patients

Preoperatively almost every patient needs some degree of emotional support as they have fear of unknown. In addition to the environmental factors, some of them may be afraid of anesthesia that they might not wake up after the surgery, or they may wake up during the surgical

procedure. Patients are concerned regarding pain of procedures and surgery. Preoperative fasting enhances the stress level.⁴

1.4. Postoperative concerns

Common postoperative issues include acute postsurgical pain, nausea, vomiting and emergence delirium which can lead to dissatisfaction of the patient and the attendants.⁴

2. ORC design

Ideal ORC is designed in such a way to create pleasant, quiet and patient friendly environment. Patient's safety should be given priority. There must be preoperative education area, preoperative check in area, waiting room, proper changing room in order to maintain privacy of patient, washrooms for patients, separate induction rooms and well equipped recovery room.

In an ideal ORC, waiting room must be designed for patients where procedures like intravenous cannulation and catheterization can be performed. Monitors, defibrillator, crash cart as well as oxygen ports and suction lines must be available.

Proper lighting, slip resistant floors, adequate number of staff, appropriate equipment, use of strict aseptic measures and maintenance of ambient room temperature & humidity all improve patient's outcome.

Anesthetists should be involved in the planning of ORC from the start.¹

2.1. Optimizing OR environment

Optimizing the operating room environment has major impact on patient's outcome.^{5,6}

OR activities should be optimized in order to improve cost effectiveness. Improving cost effectiveness along with providing excellent quality of care is a difficult task.⁵ Standardization of equipment in OR can reduce cost of procedures.⁷

2.2. OR temperature, humidity and ventilation

Warm and humid environment provides comfort to the patient as large surface area of their skin is exposed. Adequate temperature, humidity, airflow and proper ventilation is required for patient's wellbeing.⁸

OR temperature should be kept around 20 to 23° C and humidity around 50%.^{1,8}

Hypothermia increases morbidity and mortality especially in paediatric patients and in prolonged surgeries. Hypothermia is associated with delayed recovery, increased risk of infection, increased blood loss, coagulopathy, reduced oxygen delivery, altered mental status as well as cardiac arrhythmias.^{8,9} Patients undergoing surgeries under neuraxial anesthesia are prone to develop hypothermia due to redistribution of

heat from center to peripheries and it reduces threshold of shivering and vasoconstriction.¹⁰

One method to prevent hypothermia is to increase ambient OR temperature but that can affect the performance of OR staff. Other strategies to prevent hypothermia is to use forced air warming blankets or warmers, warm intravenous fluids, warm irrigation fluids and humidified gases.⁸

While designing ORC, it should be kept in mind that adequate ventilation can control both temperature and humidity. Direction of airflow should be from OR to entrance door.¹

Traffic of people in OR and frequent opening and closing of doors can lead to air turbulence which causes dispersion of airborne particles to surgical field thus increasing risk of infection.⁸

2.3. Safety first

Patient safety during preoperative, perioperative and postoperative phases of surgery is a great challenge for health care workers. Do no harm to the patient should be the aim.⁷

In order to provide safe care processes in the OR, use of World Health Organization (WHO) surgical safety checklist should be promoted.¹¹ In the hospital, OR is the commonest site of adverse events i.e. medication error, surgical error and anesthetic complications. OR errors can be avoided by the implementation of surgical safety checklist, documentation of anesthesia record and surgical instrument count.¹²

Miscommunication and information loss during shift change in prolonged surgeries can have negative impact on patient's outcome. Other factors that contribute to poor patient's outcome include less staff, long operative time, fatigue & lack of experience of OR staff, poor design of OR and less than adequate equipment. In order to provide safe care to patients division of workload among surgeons, anesthesia personnels and nursing staff is essential.

A prospective observational study concluded miscommunication and loss of information along with increased workload among OR personnels are the commonest factors that can compromise patient's safety in OR.¹³

3. Role of anesthesiologist

OR work is a teamwork, primary goal is to provide safe care to patient. Preoperative education of patient is necessary to alleviate anxiety. It is very important to prepare the patient psychologically. Anesthetist does preoperative assessment and optimization of patient and provides anesthesia related information. Patients have fear regarding anesthetic technique, have concerns regarding intraoperative and postoperative pain. Proper

preoperative assessment and optimization of patient before surgery reduces patient's stress, prevents medical errors and reduces unnecessary delays and postponement of procedures.¹⁴ Aims of preoperative visit by anesthesiologist or patient's arrival to anesthesia clinic are to know about patient's physical status, preoperative preparation and optimization, to provide information about fasting hours and discussion of anesthetic technique.¹⁵ Sedative premedication chosen by the anesthetist provides anxiolytic effect.²

Anesthetist care even when the patient is not aware. Starting from preoperative education, careful patient positioning, monitoring, smooth induction maintenance and recovery, management of intraoperative and postoperative pain and safe transfer of patient from OR to recovery, anesthesiologist play major role in successful outcome of operation.

3.1. Separate Anesthesia induction room

Use of separate anesthesia induction rooms can decrease total OR time thus increased number of cases can be performed per day. In a previous study conducted on orthopedic patients, separate anesthesia induction rooms were used which decreased time by 45.6% and number of cases per day increased.¹⁶

3.2. Anesthetic technique of patient's choice

Preoperative fear can complicate intraoperative and postoperative anesthesia management. Patient's refusal is an absolute contraindication for regional anesthesia. Patients have the right to choose anesthetic technique. During preoperative anesthesia visit, anesthesiologist must discuss plan of anesthesia with patient and give options to choose.¹⁷

4. Role of staff/nurses

Nurses are a part of OR team and they play role in providing safe care to patients during preoperative, intraoperative and postoperative period. They have assigned different roles including those of head nurse, nurse anesthetist, scrub nurse and circulating nurse.¹⁸

OR nurses have different roles. When patient arrives in OR, most commonly first person to meet patient is OT nurse, they should greet the patient and create relaxed & friendly atmosphere. To prevent anxiety, scrub nurse should prepare equipment before patient's arrival. OR nurse is key person in implementation of WHO surgical safety checklist. Maintenance of sterilization, controlling traffic of people in the OR, reducing waiting time and prevention of surgical errors are the responsibilities of OR staff.¹⁹

In order to provide maximum benefit to patient there must be adequate number of staff.⁷

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5. Regional anesthesia; conscious patients

Most of our ORs are designed in such a way that they are concerned in the care of sedated patients.^{3, 20} Stressful environment of OR has psychological impact on conscious patient.

In a survey Matthey et al. found that 27% of patients were concerned with postoperative pain or paralysis and 26% were afraid of being awake or having a needle placed in their back for neuraxial anesthesia. Nijkamp et al. concluded that conscious patients were apprehensive while lying under sterile sheet or shivering in cold OR temperature.³

Improving OR environment, communicating with patients and explaining procedures before proceeding can eliminate their stress while undergoing surgery under local anesthesia.³

6. Pediatric cases

Control of preoperative anxiety in children is anesthesiologist's nightmare. Not only child is fearful but parents are afraid too. Stress points in children include separation anxiety, hunger thirst, fear of pain, fear of injections, attachment of monitors, intravenous cannulation and placement of mask. Arrival at the OR is most difficult.² Child's perception of OR environment adds to preoperative anxiety.²¹ Preoperative anxiety in children not only has behavioral and psychological effects but also causes metabolic derangements, may result in emergence delirium, delayed recovery, postoperative delayed wound healing, infection, immunosuppression and nightmares.² In order to avoid behavioral changes in kids, distraction techniques i.e. behavioral and cognitive should be used.⁴ Colorful OR environment can relieve child's stress.²¹ Fasting guidelines should be strictly followed, avoid prolonged fasting hours. Younger patients should be scheduled earlier in the list.⁴ During induction of anesthesia, presence of parents improves patient's satisfaction. However there are concerns regarding sterilization and increased time to induction.²² A study concluded that kids more than 4 years of age benefit from the presence of parents.²³ Another study proved that presence of parents enhances the effect of sedative premedication.²⁴

So, OR environment can be stressful for anyone. Providing comfort, safe care and maximum benefit to the patient should be the aim.

7. Current setbacks

In our setups, following practices are not patient friendly at all:

Prolonged NPO hours, lack of preoperative preparation and counselling, unnecessary investigations and consultations are advised before anesthesia & surgery, poor OR design, lack of appropriate equipment, less than adequate staff, procedural delays, long operative times, postponement of cases due to shortage of OR time, not taking consent before exposing patients, not explaining procedures to patients, cold OR temperature, miscommunication and loss of information during shift change. No distraction techniques are practiced to reduce preoperative anxiety in pediatric patients. Surgical safety checklist is not discussed between anesthetist, surgical team and scrub nurse in all cases. There is increased rate of postoperative wound infections which results in delayed recovery. There is increased workload on OR staff.

8. Recommendations

Preoperative fasting hours should be strictly followed as per guidelines. Allow clear fluids 2 hours before surgery in order to reduce apprehension, stress and dehydration. Preoperative education is must, prepare the patient psychologically. Anesthetist should avoid unnecessary investigations and consultations preoperatively. Leaflet about choice of anesthetic technique should be handed over at the time of preanesthesia visit. In order to prevent recall or awareness during surgery it is important to maintain adequate depth of anesthesia. Patient's safety should be given priority while designing the OR. We should create awareness among OR staff regarding patient's care and prevention of errors. When patient is on OR table, in order to relieve patient's stress and divert patient's attention anesthesia nurse/ technician can add some humor. A simple gesture of placing hand on patient's shoulder can provide comfort to the patient.

We should respect each and every patient. Maintain dignity while exposing patients as exposure in front of people is a big fear. If patient is anesthetized take care of patient's privacy too. Explaining procedures to patients before proceeding can reduce stress response. Surgical safety checklist should be discussed between anesthetist, surgical team and scrub nurse before each case in order to prevent surgical errors.

For pediatric cases avoid upsetting the child before surgery, distraction techniques should be implemented. In pediatric operation theatre, OR staff should be encouraged to wear colorful and printed caps and masks. Female staff should be allowed to wear colorful OR dresses as colors can be stress relieving factor. To control patient's fear, walls and ceilings can be suitably modified. One method to distract kids is to paint cartoon characters on OR walls.

OR time can be reduced by avoiding delays in activities of anesthetists and surgeons. Separate anesthesia

induction room can reduce OR time and can increase number of cases per day. With preoperative optimization of patients, postponement of cases can be reduced. In prolonged surgeries, information should be conveyed properly among OR team during shift change. It's important to provide comfort to patient by maintenance of OR temperature and humidity. Methods to prevent hypothermia should be implemented.

Emphasis should be made on smooth induction, maintenance and recovery, pain management, safe transfer of patient from preoperative area to OR and then from OR to recovery area. Careful patient positioning is mandatory to avoid injuries and strict aseptic measures should be adopted to reduced infection rate.

9. Conclusion

In order to create pleasant, comfortable and friendly environment of operating room complex for patients, OR personnel should work as a team. Factors contributing to patient's preoperative anxiety should be avoided. Patient's safety should be given priority.

10. Conflict of Interest

None to declare

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12. Author contribution

Ayesha Kiran is the sole author of this manuscript.

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