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SURGEONS & ANESTHESIA



Foreword
Sam C Bose

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Chapter 3

Surgical Team

CHAPTER OUTLINE

- ❖ Members of Surgical Team and their Job Descriptions
- ❖ Unskilled Personnel Working Inside the Operating Room
- ❖ Coordinator of the Team

"A surgical procedure should be planned so that the patient, with the least possible risk and loss of time, will receive the greatest possible benefit."

— Charles H Mayo

Safe Surgical Teams

In the operating room, where tension may be high and lives are at stake, teamwork is an essential component of safe practice. The quality of team work depends on the culture of the team and its communication patterns, as well as the clinical skills and situational awareness of the team member. Improving team characteristics should aid communication and reduce patient harm. (*Safe Surgery Saves Life—A WHO initiative 2009*)

Members of Surgical Team

Surgery is never considered and described as an individual's job, but is always an example of a team work.

Anyone working in an operating suite or operating room must know about the details of the other members working in that atmosphere. More important is to know their designations and more precisely their job descriptions (responsibilities). This is essential for achieving certain goals in the working environment:

- To accomplish good interpersonal relationship
- To extend excellent coordination during team work
- To avoid intrusion into others work and causing inconvenience to them
- To be watchful to render helping hand in others work, if asked for or in case of necessities
- The most important point is to prevent misunderstandings among the team-mates.

Various countries propose different number of essential Technical Members of Surgical Team which may include Electrician, Biomedical Engineer and so on. But in our country, the following members are considered essential, without whom

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the surgical work may suffer to varying degrees. So, we shall consider the essential members and their responsibilities in the team work in a little detail.

The team consists of many people with varying capabilities to put their efforts together in the best possible way to achieve the best outcome of the work, which means efficient and safe surgery. Though the number of persons involved in the team may be more than ten in the sophisticated centers, we have to note that the basic minimum of persons is five.

Every member must be able to contribute his best for the purpose of ultimate successful outcome of surgery.

Schematic representation of all members of the surgical team and the unskilled personnel working inside the operating room is shown in (Fig. 3.1).

The members of the team are:

1. The surgeon and his assistant
2. The anesthesiologist
3. An efficient, well trained nurse to assist the surgeon
4. An anesthetic technician
5. A nursing assistant.

   Without the efficient contribution from all these people the surgical work may be incomplete and inefficient.

Hence it is essential to know the "*job description"* of each one of the members that makes one realize how the contribution from each member is highly significant towards the outcome.

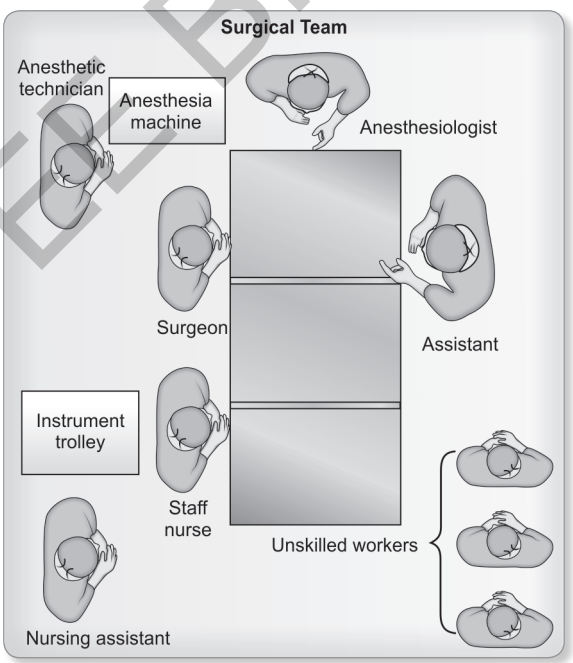

Fig. 3.1: Operating room with the members of surgical team

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Job Descriptions—(Responsibilities)

Surgeon and his Assistant

- The Surgeon shall examine the patient in the outpatient department, make a clinical diagnosis of the surgical disease, and order for relevant investigations needed for the confirmation of the diagnosis.
- After confirming the diagnosis, he discusses with the patient and his relatives regarding the surgery to be performed and advises accordingly after explaining the degree of risk involved. He shall explain the probable outcome of surgery and the chances of recurrence of the surgical problem if any, etc. if the surgery is elective.
- If the surgery is to be done as an emergency procedure, he may explain to them the need for the emergency surgery and the possible consequences if it is not done immediately and advise them suitably.
- Before the surgery, if the patient has any correctable problems like respiratory infection, dehydration or any such medical conditions, he may institute necessary treatment so that the patient may be presented for the proposed surgery in a more fit condition to stand the stress of anesthesia and surgery.
- At this time he refers the patient to the anesthesiologist with a clear note about the surgical problem and the proposed surgery for assessment for the fitness for anesthesia.
- After getting this clearance, he may fix up the date for surgery and post him on the list on that day.
- On the day of surgery he brings the patient to the operating theater with adequate preparations and under proper anesthesia he operates on the patient and takes care of him in the postoperative period till the time of discharge from the hospital.
- The assistant surgeon would assist the surgeon in all these jobs from the beginning till the time of discharge, so that he knows full details about the patient.

Anesthesiologist

The Anesthesiologist shall examine the patient referred by the surgeon very carefully for any undetected medical diseases like *hypertension, respiratory problems,* etc. and if detected gives suitable advises for the correction of those problems.

Once these problems are corrected, he shall reassess the patient at a later date for the appropriate anesthetic procedure for undergoing the proposed surgery. Any special instruction if needed and a clear note about the premedicant drugs, their doses and the time of administration are written in the assessment note.

If considerable and significant blood loss is expected during surgery, he may order for reservation of adequate number of units of compatible blood.

On the day of surgery he shall examine the patient again, administer the preanesthetic medication in the right time, take up the patient, and administer anesthesia, takes care of him throughout by continuous monitoring of his vital signs.

After the conclusion of surgery he shall reverse the patient from the anesthesia carefully, assess his status by keeping in the recovery room (PACU) for sufficient length of time.

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He would give this care as long as needed, till his recovery criteria are normal and then transfer him to the postoperative ward.

He shall visit the patient in the postoperative ward to ensure that the patient continues to maintain normal vital parameters and everything is well.

In case of necessities he shall support the surgeon in giving postoperative care of the patient such as cardio vascular support, ventilatory support, etc.

Assisting Nurse (Scrub Nurse)

The adjectives such as 'well trained' 'skillful' 'dedicated' are used while mentioning about them. Each adjective has its significance in the patient care and overall best outcome.

This nurse shall prepare adequate number of sterile trolleys with appropriate instruments needed for the various surgeries in the operation list for that day.

Ideally, for every operation it is advised to prepare a sterile instrument trolley for each surgery just before starting.

The scrub nurse is responsible for selecting, checking and arranging instruments required on the table.

When a patient is anesthetized and ready for a particular surgery, she brings the instrument trolley near the operating table and be ready for assisting the surgeon. She will assist the surgeon for preparing the operation site by painting with antiseptics, draping the patient for surgery and during surgery by handing over the appropriate instrument for the need.

It is her duty to prepare the ligatures and sutures, having them ready immediately when required.

A good scrub nurse will learn to anticipate the needs of the surgeon, often having an instrument ready before it is asked for.

Sometimes it may be necessary for the nurse to act as surgeon's assistant in the absence of a house surgeon or assistant surgeon.

She is also responsible for accounting for all instruments, needles and swabs or sponges at any stage of the operation, especially before any cavity (abdomen or thorax) is closed, and must inform the surgeon that these items are correct, even if the surgeon did not ask.

If the accounts are not tallying, she should warn the surgeon to recheck and find out the missing item before closing and until then she shall not hand over the sutures for closure to the surgeon.

This nurse has to be *well trained* as well as *very efficient* as the speed of surgery as well as the efficiency of the surgeon could be greatly enhanced by the best assistance given by her.

It has been universally well recognized that when dedicated and efficient nurses assist the surgeon, even the most difficult operations could be successfully completed faster with less strain. Their contribution to the outcome of surgery is measureless.

Anesthetic Technician (Theater Assistant or Theater Technician)

Theater assistant is a paramedical personnel working in the operating room who is coming under the category of *Skilled Personnel.* This means that he must have

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certain prescribed training in a suitable atmosphere to acquire the necessary skills for the job.

Many authorities have prescribed their job description as follows.

Job Descriptions of Anesthetic Technician

The Anesthesia Technician (Theater assistant) works under the control of the Anesthesiologist at all times.

He is a specially trained person with the technical knowledge about the working of the machines and the other accessories and monitors that are used in the operation theater.

He shall keep all the equipments in good working order at all times.

Basically, he is responsible for the maintenance of all the anesthetic machines and the accessories in the theater.

He shall keep the anesthetic machine's work top very clean and tidy.

He shall see and verify that essential equipments such as laryngoscope, endotracheal tube, connector and catheter mount, malleable endotracheal tube introducer (stylet), etc. are chosen properly and kept in order on the machine's worktop.

He shall see that the necessary emergency drugs such as atropine, vasopressors, adrenaline, bronchodilator and corticosteroids only are kept on it.

Any other drug specifically wanted by the anesthesiologist for the particular case must be kept in addition.

He shall see that only objects related to anesthetic work are permitted to be placed on the anesthetic machine.

Unwanted things like watches, cell phones and such other things should never be allowed on it as these items occupy the space otherwise meant for other essential life saving equipments and drugs. This may cause havoc during the times of crisis.

He shall keep ready all the equipments on the anesthetic machine that are needed for anesthetizing the particular patient in concurrence with the anesthesiologist and assist the anesthesiologist starting from the time of induction onwards to the conclusion of anesthesia.

His assistance is specially needed during the time of induction to assist intubation, securing the endotracheal tube, positioning the patient, etc. and particularly during reversal of the patient from anesthesia for assisting in applying oropharyngeal suction, extubation, etc.

Actually induction and recovery are the two common situations in anesthesia where dangers are imminent as in the case of take off and landing of an aircraft.

Virtually he shall be there by the side of the anesthesiologist throughout the procedure to hand over the necessary drugs and equipments as and when required.

Efficient and skilled assistance by an Anesthesia Technician (Theater assistant) makes the conduct of anesthesia very comfortable and safe.

The anesthetic machine must be handled with adequate care and maintained carefully so that at all times it functions perfectly. *A malfunctioning machine means disaster.*

Though it is the primary responsibility of the anesthesiologist to maintain the anesthetic machine well, in places where many machines are used, for the sake of convenience one or two machines are left to the responsibility of the theater technician for maintenance supervised by the anesthesiologist.

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He has to do the following;

- Everyday he must check the functioning of the machine with a protocol based check list
- Check the laryngoscope and accessories such as spare blades and bulbs
- Check the endotracheal tube and their connections
- Check the breathing systems for integrity of the components and check for leaks particularly the reservoir bags
- Check the contents of the cylinders attached to the machine
- Check and ensure that there is adequate store of gases in the manifold room of the central pipeline supply.

Nursing Assistant

This assistant's job is taking care of the surgical instruments and assisting the Nursing staff who is assisting the surgery.

In the course of any surgery, if the assisting nurse wants an additional instrument, he shall take it from the sterile store of instruments (Bin) and hand it over to the nurse and shall keep an account of that for final counting at the time of completion of surgery.

When the day's work is over he shall clean and decontaminate all the instruments and pack them in bins and send them to the Central Sterilization Department for autoclaving, get them back for the next days work.

These five people are the skilled members of the team, meaning thereby each one has a special job to do, utilizing their skill fully for the best outcome of the work.

Two more nursing staff will be usually present in bigger centers where the workload is higher and multiple operating rooms work in one complex. They are:

1. The circulating nurse
2. The nursing supervisor

Circulating Nurse

Apart from the assisting nurse *scrub nurse* there will be one or two nurses in the operating theater.

They are also known as *theater runners*. One stays in the operating theater, watching the scrub nurse and ready to bring anything she requires during surgery.

The first circulating nurse also ties up gowns of washed up surgeons and nurses, being careful to avoid touching any part of the gown other than the tapes.

He or she replenishes sterile warm or cold water in the lotion bowls and checks the swabs, displaying them on counting rack in the required order. (Godfrey, 1983; Shaw, 1984).

She will be dispensing articles from sterile bags or packs, she replenishes sterile gowns and gloves on a sterile trolley or worktop reserved for the purpose.

The main duties of the second circulating nurse are:

- To see that the instruments and trolleys are ready for the next case
- Should help in placing the patient on the table, if a stretcher bearer or technician is not available

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- She should also help the scrub nurse if the first circulating nurse has to leave the theater
- On no account, the theater must be left without at least one circulating nurse
- The duties will of course, depend on the layout and system of particular operating department
- She must keep all the notes and X-rays relating to the patient available and it is her duty to ensure that these are easily at hand for reference.

In some institutions, one or two anesthesia technicians or operating department assistants (ODA) are posted to act as circulators to help the scrub nurse.

Nursing Supervisor

These are senior nurses belonging to the category of nursing tutors or supervisors.

- One such person will be in charge of the supervising work done by the theater nurses of two to three operating rooms preferably situated in the same complex or at least on the same floor.
- She makes regular visits to all theaters under her control in the morning before starting the day's work, organize the work pattern depending upon the availability of the personnel.
- She gets into the operating room where there is some deficiency, or a better help is needed for a major difficult surgery and stays on until the problems are solved.

The most important aspect to be remembered at this juncture is, if one member in one category is to be replaced (for any reason he or she has to be replaced) by a person belonging to the same category and not by a person belonging to another category. For example, a nurse should not be replaced by a doctor or a theater assistant should not be replaced by a nurse and so on in the best interest of the outcome.

The best outcome in any teamwork for that matter depends upon the total involvement of each member of the team. Apart from that mutual understanding, mutual confidence and mutual trust contribute very much for that.

Unskilled Personnel Working Inside the Operating Room

Apart from the surgical team (Skilled members) there are some more people who render their services inside the operating room. Though they are not skilled persons, their services are essential, without which the routine work cannot be carried out in the operating room. At all times these people must be made to realize how important their work is for the ultimate benefit of the patient. They must also be appreciated for their good work and treated with dignity and due respect.

At least there are three categories. They are:

Stretcher Bearer

At least two persons must be posted for one operating room depending upon the number of operating tables and the time taken for finishing the operation based on type of surgery. It is essential that they must be physically fit to do this type of job.

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General Worker

At least one person must be available. They are meant for doing petty jobs and assisting others in manual works such as shifting the patients, washing the instruments, etc. Physical fitness is essential for them also as they have to do make shift duties.

Sanitary Worker

Ideally two persons must be posted for one operating room. Their job is to clear the soiled linen from the operating room as soon the surgery is over. After each surgery, they have to clean the surface of the operating table with clean cloths soaked in a disinfectant solution, and wipe it dry and then to clean the floor in the same way.

After this the nursing assistant will cover the operating table with a clean sterile cloth and keep it ready for the next operation.

However, these three categories of personnel can have their work exchanged in case of necessity. It is essential to ensure the following basic aspect with regard to the posting of these people.

They must be taught the basic discipline of the theater work and the steps needed for maintaining the asepsis.

They must have the willingness to work in the operating room environment.

They must be posted regularly for quite a good length of time so that they will get acclimatized to the routine of the operating room schedule. This helps to improve their work efficiency.

A small set up in Indian Scenario

Most of the time, the theater personnel may be working in a smaller setup with the basic minimum facilities. In such situations, an elaborate staff pattern cannot be expected. Lot of adjustments among the team members may be required. The minimum staff requirement for safe and efficient functioning will be:

Nurse

- She is either a qualified or a trained nurse with adequate experience in the operating theater work and the principles of theater asepsis
- She will be incharge of the operation theater and coordinates the entire work.

Nursing Assistant

- He/she will be assisting the nurse-in-charge to run the operation theater
- He/she must have basic knowledge of theater asepsis.

Anesthesia Technician

- He will be incharge of the anesthetic machine and accessories and maintains them.
- He will keep things ready well before starting the operation and assist the anesthesiologist and stay by his side to assist although the work
- In smaller setups like this, usually the anesthesiologist will be a visiting consultant

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- Every individual anesthesiologist will have his own pattern of working. So also, the assistance required for each anesthetist may vary
- The anesthesia technician may have to know the individual anesthetist's pattern of work and their requirement for managing anesthesia
- He will set things ready accordingly
- He will assist the in-charge nurse in the overall management of the operation theater.

Stretcher Bearer

- He is a physically fit person who can do the shifting and transferring of the patient
- He may be a general worker doing all assistance in the operation theater work.

Sanitary Worker

- He will be doing the washing and cleaning of the operation theater after every day's work is completed
- After completion of each surgery, he will collect the soiled linen and send for washing
- He will clean the operation table, wipe it with a cloth soaked in germicide or antiseptic
- Afterwards he cleans the floor and wipes the floor with germicide or anti-infective solution.

The above mentioned five categories of personnel are essential for effective functioning without compromising the safety of the patient. In such settings, *excellent cooperation, coordination, tolerance, mutual understanding* and *involvement* among the team members is possible.

In fact, in many of such small setups, good amount of major surgical works are going on well.

Coordinator of the Team

For the safe sailing of a ship, there is a need for a captain to guide its course and all activities in it. Similarly, for any team (surgical team) there is a need for a captain or a coordinator. Now that, the surgical team comprises of members, each one meant for carrying out very definite and distinct responsibilities, there is a definite need for a coordinator whose job is to organize and streamline the daily work without any flaw and misunderstanding among team-mates. The basic aim of any team is to win the game.

Here the aim of the team is to do the proposed surgery in the best possible way without compromising the safety, to reach the best outcome that is success. So here, every member is as important as the other. Each has to contribute his part in the best way thereby contributing for the successful outcome. There the matter ends happily. *No one should feel superior or inferior as far as his or her job is concerned in the team.*

Generally, the anesthesiologist coordinates the work in the operating theater. As he is available in the operating suite almost every day, he has ample time to

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spend for coordinating the work. For this reason, it is universally accepted as a norm that the anesthesiologist takes over the big responsibility of managing the theater activities, which is really a tough job. Usually surgeon could not do the job of this coordination work, as he has other jobs to look after such as outpatient clinic, review clinic, postoperative rounds on different days in a week and can not be available in the operation theater.

On certain occasions, a senior experienced *Theater Nurse* or Head Nurse may be taking up this responsibility.

Responsibilities of the Coordinator

The first concern is about the number of patients in the operation list. It is imperative that a patient posted for surgery must be operated as per schedule. *Postponing a planned surgery for want of time or anything else is a social crime and injustice towards that individual. It must be avoided at any cost.* It causes not only the psychological stress imposed on the patient and his dear ones, but also may impose unnecessary financial burden on them.

A planned surgery could be justifiably postponed only when there is genuine reason concerning the safety of the patient such as a severe respiratory infection with pyrexia. Thus, he would have acquired during his stay in the hospital and manifests only on the previous day that was missed.

It is always essential that the surgeon consults the anesthesiologist before posting the number of patients in the list as to how many surgeries could be performed. This is necessary because there may be shortage of availability of personnel of different categories such as anesthesiologists, nurses, theater technicians, and other paramedical staff on a particular day. The shortage of personnel may seriously restrict the number of surgeries that could be done on that day. If this aspect is discussed on the day before operation, the number of surgeries as well as the type of surgeries could be adjusted accordingly without causing inconvenience to any one concerned.

In certain operating rooms, there may be provision for simultaneously taking up only two patients under general anesthesia. If a list containing all patients to be done under general anesthesia (GA) is posted, it will only seriously affect the completion of the list successfully in time. It may result in postponing surgeries inevitably. That may be because of want of adequate number of anesthetic machines or adequate number of anesthesiologists to manage the patients.

If the coordinator looks into these aspects carefully and decides the planning, it will go a long way in the smooth running of the operation theater.

Wherever possible the temptation of the surgeons to operate with inadequate assistance must be curtailed. For example, operating without the help of a trained nurse and taking the help of any other paramedical assistant in that place should be discouraged.

Planning the Operation List

As the day starts, as soon as he comes the anesthesiologist must look at the list of operation and try to plan the order in which the patients may be taken up for surgery.

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This is done with the view of operating all the patients in the list giving justified priorities and finishing the operating list in time with the available resources without compromising safety. This has to be done carefully taking the following factors into consideration:

- The number of operating tables available
- The number of surgeons available
- The number of assistant surgeons available to assist them
- The number of trained nurses to assist the surgeons
- The number of anesthesiologists; Here more than the number, their ability to manage the cases must be considered.
- The number of anesthetic technicians available to efficiently assist the anesthesiologists
- The number of anesthetic machines available; and so on.

These factors play very important role in managing the list efficiently and finishing it in time. Proper planning involves deciding and fixing the order in which the patients are taken up, the number of patients to be taken up in the first round and among those how many under general anesthesia and those under regional technique, etc.

Secondly decision on *the major surgery to be taken up first in the list* has to be made. This is made after considering the type of procedure, the anticipated duration, the degree of blood loss expected, the degree of intense care needed for the patient based on his general condition and the expertise required for anesthetizing that particular patient.

With the proper understanding of the real situation and good mutual understanding and the willingness to do more service to the needy, the planning of the operating list is never a difficulty.

Planning the Team for Different Procedures

Allocation of team for different procedures means a lot in the overall performance of the team as well as the outcome of surgery.

For example, a major intricate surgery requiring great skill and experience of the surgeon necessarily requires an experienced anesthesiologist and senior well- trained nurse to assist. The anesthesiologist cannot have any command on the choice of the surgeon and his assistant. But he may explain the high risk in view of the patient's poor general condition and the difficulties involved in anesthetizing the particular patient with the request to them to do the procedure with the best assistance available and in the shortest time possible. In general, there are no difficulties encountered in this aspect. But it is utmost important that one must be extremely careful to see that in the process of making this request, no one is made to feel that his efficiency or skill is judged inferior and gets hurt. Similarly the nurse-incharge may be requested to assist that surgery or to allocate the more experienced and skillful nurse for that case. This is a very difficult job and requires very high degree of tact and communication skills. An anesthesiologist, in the course of experience has to develop this, sometimes guided by his elders in the profession.

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Planning the Postoperative Care

Another important aspect is to decide where the particular patient is transferred for the purpose of postoperative care. Based on different criteria used for judging this and also by using his own experience and judgement, the anesthesiologist may decide whether the patient has to be transferred to recovery room, postoperative ward or first to the recovery room an then to an intensive therapy unit, etc. This is always decided considering the safety only and not anything else.

Maintenance of Theater Asepsis

Though there are clear and well prescribed norms accepted universally for this purpose, every theater complex must have their set protocol for maintaining the asepsis in theater atmosphere for that institution, based on the availability of infrastructure and personnel.

If aseptic environment is not strictly maintained in the operating suite including the recovery area, any work in the operating room becomes less meaningful and likely to be dangerous. All the routine related to the sterilization of equipments as well as the theater atmosphere is strictly followed. The dressing code meant for theater personnel must be followed very strictly irrespective of the cadre in order to maintain asepsis. The rules should never be relaxed for any one for that matter. Many times this enforcement may cause unpleasantness among the personnel particularly when a senior member knowingly or unknowingly violates the aseptic precautions and that fact is pointed out to him. It needs quite a bit of good tactics to point out that to him. A statement like this may make things smoother. *"Sir, it looks as if you have forgotten to wear the mask in your hurry. Shall I bring one for you?"* If a senior person has come into the theater without changing to theater robes, one may politely ask, *"We are sorry that we have not kept theater robes for you in the changing room sir, may I bring one now for you to change?"*

Points for Theater Asepsis

Points

- Theater must always be air conditioned
- Ideally, the air entering must pass through bacterial filter (HEPA Filter)
- This may require a little higher capacity of air conditioning machine to maintain adequate flow of air
- It is better to have a minimum of 7 air changes in an hour to keep the bacterial load in the operating room atmosphere at an acceptable low level by the possible contamination from the personnel working inside the theater
- The ambient temperature must be maintained between 20 to 25° C
- Daily cleaning of the theater after the day's work and leaving the atmosphere exposed to a standard sterilizing device such as ultraviolet light
- Daily carbolising the theater
- No one is permitted to enter the theater without changing to the prescribed clean (sterile) theater robes and wearing cap and mask.
- *One of the most unclean parts of our body is the oral cavity with wide variety of bacterial contamination* and while talking micro droplets of oral secretions

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loaded with bacteria will be thrown into the atmosphere contaminating the atmosphere. To prevent this and to reduce this contamination, *a well fitting mask must be used covering both mouth and nose.* Unnecessary conversations must be avoided to reduce droplet spread from the mouth.

- Similarly, hair of scalp is one part of the body that cannot be cleaned easily and completely. There are two reasons for that. One is, the hair is always kept exposed and the creams and the oil in the hair attract dust. The second and the most important reason is that hair attracts more dust mainly because of the accumulated static electric charges and is constantly gets contaminated. For this reason if a hair falls on the operating field, the chances of severe infection is very high. So to reduce these chances of infection the hair must be kept well covered by a cloth cap that allows adequate ventilation to the scalp.
- Frequent and unnecessary movements of personnel in and out of theater must be avoided.

Further Reading

1. Bunker JP. The anaesthesiologist and the Surgeon Partners in the operating room, Little. Brown Co, 1972.
2. Eckenhoff JE. Anaesthesia from Colonial times. Philadelphia, JB Lippincott Co, 1966. Greene NM: Anaesthesiology and the University. Philadelphia, JB Lippincott Co, 1975.
3. Lidwell OM. Bacterial considerations in the Design and Utilization of Operating Theaters. Edited by IDA Johnson and AR Hunter. London: Edward Arnold, 1984.
4. Medical Defence Union, Medical Protection Society, Medical and Defence Union of Scotland., National Association of Theater Nurses and Royal College of Nursing of the United Kingdom. Theater Safeguards, MDU, MPS, MDU of S, NATN, RCN, 1986.
5. Meffen K. The good and the bad. Nursing Mirror. NYAN Supplement, 1980.
6. Nagai I, Kadota M, Tackchi M, Kumomoto R, Nakano S, Jitsukawa S. Studies on the bacterial permeability of non-woven fabrics and cotton fabrics. Journal of Hospital Infections, 1986;7:261-8.
7. National Association of Theater Nurses Guideline to the total patient care and safe practice in the operating theaters, NATN, Harrogate, 1983.
8. Nimmo WS. British J Anaesthesia, 1990;64:7.
9. Reybrouck G. Hand washing and hand disinfection: a review article. Journal of Hospital Infection, 1986;8:5-23.
10. Robert D Dripps, Leroy D Vandam: Introduction to Anesthesia. Philadelphia, Saunders Company, 1978;1:1-8.
11. Vandam LD. Early american anesthetists: The origin of professionalism in anesthesia. Anaesthesiology, 1963;38:264.
12. Vincent R. Br J Anesthesia, 1997;79:188.
13. Whyte W, Bailey PV. Reduction in microbial dispersion by clothing. Journal of Parenteral Science and Technology, 1984;39:1.

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