

A Guide to Operating Room Technique *

by

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The prevention of cross infection in the operating room is one of vital importance. Surgery is one step in the total process of restoring health to the patient and constitutes the first step in rehabilitation.

Aseptic technique is the method by which contamination with bac-

teria is prevented. Strict aseptic technique is needed at *all* times in an operating room. Freshly cut living tissue can become infected easily. It is therefore essential for all members of the operating team to know the common sources of bacteria in an operating room and the means by which they reach the sterile field to contaminate it. They must also know how to prevent contamination of a sterile field. The principles of sterile technique conscientiously carried out yield the best results and constitute a chain of protective measures for the patient. Even mild infections delay recovery and are costly to the patient in time lost and money spent. A mild infection is potentially a severe one and antibiotics have not supplanted sterile technique.

* Paper presented at an immediate post-surgical prosthetic course, sponsored by the I.A.P.O.C. in co-operation with the New York University Post Graduate Medical School, Prosthetic-Orthotic Department on January 30, 1969, St. Michael's Hospital in Toronto.

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Sources of Contamination

The sources of contamination are:

1. The patient
2. The members of the operating team
3. All articles used in the wound and on the sterile setup
4. Dust in the air
5. Other personnel and visitors in the operating room

If the principles of sterile technique are understood, the application of it becomes obvious.

Contamination by the Patient

In the operating room we prepare the patient's skin at the operative site and surrounding area. This is known in hospitals as "the prep". The purpose is to render the operative site as free as possible from bacteria so the incision can be made through it with a minimum of danger of infection from this source.

Several solutions are used for this purpose: *Bridine*, *Phisohex*, *Zephiran Chloride*, *Cetavlon*, etc. according to the orders of the surgeon.

At the end of the "prep", the patient is covered with sterile linen—these are called "the drapes"—leaving only a minimum area of skin exposed at the site of operation. The purpose of drapes is to create and maintain an adequate sterile field during the procedure.

Contamination by Members of the Operating Team

First, we must consider attire worn by the members of the team.

A cap must cover the hair completely. It prevents contamination of the sterile field by hair. Shoes should be clean and shoe covers must be worn over shoes that are not used exclusively in the operating suite. The operating suite is composed of operating rooms and doctors' lounges, so shoes worn out of this area must be covered by overshoes before entering an operating room. The same applies to the scrub suit—it must only be worn in the operating room—if worn out of the operating suite it must be changed before re-entering the operating room. A mask is put on by all personnel prior to entry into the room. It must cover both nose and mouth and fit snugly so that air is filtered through it and does not escape around the sides.

The operating team perform a surgical scrub. This is the removal of visiting "flora" and inhibits growth of resident bacteria which we all have on our hands and arms, by mechanical washing and chemical disinfection.

The solutions most commonly used are:

Bridine which is a microbicidal cleanser with the active ingredient Povidone-iodine, 7.5%.

Phisohex which contains 3% hexachlorophine, the optimum amount of this powerful, long-lasting antiseptic agent removes visiting bacteria or flora and inhibits growth of host bacteria.

Surgical soap which has proven to be very hard on the skin.

There are two accepted methods of timing the scrub. One method is by counting the number of strokes to hands and arms.

With Phisohex it is:

	Strokes to	
	Skin	Nails
Routinely (twice daily or more often)	9	15
Once daily	15	25
Infrequently	30	50

The second method is by timing by the clock. With Bridine, 10 minutes for the initial scrub and 4 minutes in between cases. With Phisohex, 6 to 8 minutes initial scrub and two minutes between cases.

On leaving the scrub sinks, the hands must be kept above waist level and away from the scrub suit. The towel is picked up taking care not to drop any water onto the sterile gown. Keeping the towel away from the scrub suit, the hands and arms are dried using alternate corners of the towel, starting with the hands and finishing at the elbow.

To put on the gown one should step far enough away from any non-sterile areas to avoid accidental contamination. The gown is unfolded, taking care that the hands do not touch the outside of the gown and the arms inserted. The circulating nurse will tie the gown.

Immediately after gowning, the gloves are put on. At St. Michael's Hospital we prefer to use the closed gown technique when the tips of the fingers do not protrude beyond the edge of the cuff of the gown. (This method was demonstrated to prosthetists on the course and they all found it very easy to do).

Once gowned and gloved, personnel are considered "sterile". Gowns are considered sterile only from waist to shoulder level in front and the sleeves. It is important that sterile persons keep their hands in sight at or above waist level. Hands are kept away from the face and arms are never folded as there is apt to be perspiration in the axillary region. Sterile persons must not touch their mask—if it requires adjustment, it must be done by the circulating nurse. When stating the size of stump sock required, you may point to it but you must not touch the package itself. Avoid leaning over non-sterile areas and stay within the sterile area and near the sterile tables if waiting to apply the post-operative pylon. Do not wander into another operating room to see what is happening there.

The circulating nurse carries out the same care in reverse. She avoids touching sterile areas, makes sure she does not stretch over a sterile field and faces the sterile setup when passing to prevent the danger of brushing against it and so contaminating the setup.

Contamination from Articles in the Wound and on the Sterile Setup

To avoid this contamination, all articles used in an operation have been previously sterilized. Sterilization may be accomplished by means of heat, chemical disinfection, or gas sterilization.

Heat—Heat destroys bacteria

by coagulating the protein in the cell. This process is hastened by the addition of moisture which also causes the destruction of the bacteria at a lower temperature.

Chemical disinfection—There are numerous solutions used for chemical disinfection: Wescodyne, Zephiran, etc., and the instruments are soaked in it for the prescribed length of time to ensure sterility. With Wescodyne the soaking time is 20 minutes. Chemical sterilization of instruments is the least effective method.

Gas sterilization—The gas used for sterilization at St. Michael's Hospital is ethylene oxide. The supplies for our prosthetists are sterilized by this method. We sterilize the stump socks, AK and BK pads, and orthoflex.

In this process, air is withdrawn from the sterilizers; then gas under pressure enters. It is a 16-hour cycle with 12 high-vacuum exhausts. Heat is applied at 160°F to hasten the sterilizing action.

The disadvantage in this method is the 72-hour aeration period necessary to allow dissipation of residual gas after the final admittance of air at the end of the cycle which only partly creates the load.

Contamination by Dust in the Air

Air conditioning units may be a source of bacteria which comes through filters into the operating room. There must be proper filters and these must be changed

frequently. Air pressure in operating rooms is greater than outside, so air is forced out of the rooms.

The other source of dust is from linen, so linen should be handled carefully to avoid sending dust into the air.

Contamination by Other Personnel and Visitors in the Operating Room

All visitors and ancillary staff such as X-Ray technicians or photographers must be properly attired before entry into the room. Visitors are restricted in this area.

At St. Michael's Hospital we set up a tray of sterile equipment for the prosthetists before the case commences. A mayo stand is covered by a sterile mayo cover. On it is placed a sterile tray and large basin in which to soak the orthoflex. We add a pair of straight scissors and a scalpel handle with a No. 22 blade. Routine supplies of lamb's wool—AK or BK pad according to the case—and 2 orthoflex bandages are placed beside the basin and one drape. The set is then covered with another drape.

At the end of surgery, soiled drapes are removed and after scrubbing, gowning and gloving by the closed glove technique, the prosthetists take the sterile drawsheets off the tray and drape the table again. They state the size of stump sock required and this is supplied. Sterile distilled water is poured into the bowl.

The adhesive spray is applied by the circulating nurse. Aseptic technique is maintained until the orthoflex has been applied bearing in mind the difficulties with a short AK stump.

Once the orthoflex has been applied the hardware is then

brought into the room and the pylon completed.

It is hoped that the recommendations that have been outlined in this paper will help you in acquiring aseptic technique and reduce the danger of cross infection.

REFERENCES

Berry & Kohn: *Introduction to Operating Room Techniques, 3rd Edition* (The

Blakiston Division, McGraw-Hill Book Company, 1966)