

# Chapter 3

## Aseptic Practices for Control of Infection: Personnel

### Precautions taken by the operation theatre staff

Aseptic measures are to be followed by the operation theatre personnel also. Personnel include the surgeons, patients and the nurses assisting and the people who are observing. Skin and hair are potential source of infection. The hand scrubbing, gowning and gloving practices should be practised to supplement the maintenance of sterile atmosphere of operation theatre.

The surgeon or any personnel entering the OT has to remove their footwear and wear slippers meant for the OT. They then change into OT dress consisting of a shirt and pair of trousers. The shirt should be tucked in completely in the waistband of the trouser.

Cap: A sterile cap is then worn in a fashion so as to cover all the hair. It can be of linen or disposable one, but of appropriate size.

Mask: A sterile mask is worn to cover the nose and mouth completely. The person should avoid talking once masked.

### Hand washing:

Hand washing is one of the most effective methods of prevention of spread of infections. A liquid soap or an antiseptic should be used to cleanse the hands.

### Conditions where hand washing is mandatory:

1. Prior to any clinical procedure
2. Before and after dressing of a wound. This is followed even if gloves have been used.
3. Before and after handling of any patient and also between procedures on the same patient.
4. After handling of any contaminated articles such as urinals, bed pans etc.
5. Any situation where the hands look or even feel dirty. After personal use of toilet. Before and after consumption of meals.
6. Before entering and leaving any clinical area.

### Hand scrubbing

Effective scrubbing is mandatory to protect the patient and the medical team from infection before and after performing surgery. The purpose of the surgical hand scrub is to reduce resident and transient skin flora (bacteria) to a minimum. Because these bacteria are firmly attached to the skin, they are difficult to remove. However, their growth is inhibited by the antiseptic action of the

scrub detergent used. Transient bacteria are usually acquired by direct contact and are loosely attached to the skin. The bacteria are easily removed by the friction created by the scrubbing procedure. Proper hand scrubbing and the wearing of sterile gloves and a sterile gown provide the patient with the best possible barrier against pathogenic bacteria in the environment and against bacteria from the surgical team. It is followed prior to any surgical intervention.

### **Step 1: (1 minute)**

- Prior to hand washing, all the jewellery on the hand and wrist watches should be removed. The nails should be short and should not be painted.
- The hands must be first washed with tap water and liquid soap. The tap should be turned on using the elbow or an unsterile person should do it. The tap should preferably, be an elbow operated one or should have a foot peddle. Liquid soap is preferred over bar soap as the latter is a potential source for harbouring micro organisms. Lather is worked up to 3 cm above the elbow for about one minute. The soap is then rinsed off. The flow of water should always be from fingertips to the elbow.

### **Step 2: (2 minutes)**

- The next step is scrubbing of the hand with a hand scrub like povidone iodine or chlorhexidine. Scrub each hand with the other. Scrub in a circular motion all surfaces to approximately 2 inches above the elbow. A special attention should be paid to web spaces, nails and sub ungal area. A sterile brush can be used to scrub the hands, starting from nails to forearm. Care should be taken to see that the hand is not scrubbed vigorously. It should not be used over the hands once used over wrists and forearms. The used brush should be dropped on the ledge. A nail brush is used, if available.
- Hands are rinsed thoroughly under running filtered water after scrubbing. If filtered water is not available, boiled and cooled water can be used. In such a case, the nurse pours water from a jug. The direction of water flow must be from fingertips to elbow. The hands are held up and elbows below.

### **Step 3: (2 minutes)**

- Scrubbing with chlorhexidine or povidone iodine is repeated again.

A minimum of five minutes of scrubbing is considered the shortest acceptable duration for hand washing prior to surgery. In the wards it can vary from 2 to 5 minutes. A 30 second scrub is recommended in between patients. If the contamination chances are high, a 60 second scrub is recommended.

After rinsing, the hands should be kept away from the body, with hands above and elbow below away from the torso. The tap should be closed with the elbow or a nurse turns it off.

The hands should be dried with a sterile towel. Begin with the hand, wrists and then forearms. The same section of the towel should not be reused. If required, a second towel can be used.

*To and fro movement of the fore arm while rinsing should be avoided as this would lead to the clean area coming in contact with dirty water.  
Splashing of water is to be avoided to prevent contamination of clothes and surroundings.*

## **Gowning**

Having completed the hand scrub, the personnel backs his/her way into the theatre or a unsterile person opens the door for you to enter. The operation theatre personnel must be aware of the precise folding and packing of sterile gowns. The gowns are always folded inside out. This is done to avoid contamination. The hands should not come in contact with the outside of the gown. This is because hands can never be completely sterilized.

### **Procedure**

The gown is picked up in such a manner that hands touch only the inside surface of the gown at the neck and shoulder seams. The gown should be allowed to unfold downward in front of the scrubbed person.

Locate the arm holes. Both the hands are placed in the sleeve. The hands are to be held out and slightly up as the arms are slipped into the sleeves.

A circulatory nurse slides her hands under the gown at the shoulder level and pulls it up. Holding the tips of the ties, secures the gown.

It is important to remember that the scrubbed person leans forward so that the ties are away from the gown. This avoids contamination of the gown.

## **Gloving**

Only sterile gloves are used in the operation theatre. They are packed in individual covers. There are two techniques of gloving- open method and closed method.

### **Open method**

A scrubbed nurse holds the glove open. The hand of the scrubbed person is pushed through the sleeve and the person touches only the inside of the glove.

The scrubbed person touches only the cuff of the glove with the ungloved hand and pulls it over. Only the inside of the glove is touched. Care should be taken not to touch the inside of the glove with the gloved hands.

### **Closed method**

The hands are covered by the cuffs of the gown. The gloves are handled only through the gown. This reduces the chances of contamination. The hand is uncovered once it is gloved.

Once gloved, the person should be careful not to touch anything non-sterile.

## Change of gloves

It is preferable to change the gloves after every surgery. In case it is not possible to do so, the gloves can be changed every 5 cases for an intraocular surgery. This is possible if the surgeon and the scrub nurse do not touch that part of the instrument which comes in contact with the patient's eye. In between surgeries chlorhexidine is used to disinfect hands.

### Change of glove is a must in the following conditions:

- Gloves have to be changed for extra ocular surgery as lot of bleeding is present.
- When performing on an infected case the gloves have to be disposed off immediately. If necessary, double gloves can be worn.
- If the personnel happen to touch any unsterile object, change of gloves is recommended.

## Disposal of OT attire after surgical procedure

A circulatory nurse unties the gown and pulls it down from the shoulder.

The gown is put in a bin with inside folded out.

The hands are first washed and the gloves are then removed holding the cuff and disposed off in a bin meant for it.

The OT dress, mask and cap are removed in the changing room and disposed off in a bin meant for them.

The linen disposed is then collected at the end of the day and washed thoroughly and left for drying or dryer used. The linen can be manually cleaned or in a washing machine. Care should be taken in choosing an area which is dust free when drying. Once dry, it is folded and packed in a bin for autoclaving. The dress and gown should be periodically checked for tears and stains.

The linen should be completely dry before packing it in the bin for autoclaving. If linen or the OT dress is found moist after autoclaving, they should not be considered sterile.

### Points to remember

- *The area below waist level of a person is unsterile.*
- *Anything, other than the items required for scrub that are touched during the 5 minute scrub time, the entire procedure is to be repeated.*

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## **Patient Preparation**

Asepsis does not stop with the care taken by the doctors and paramedics. It is also necessary to include the patients. The patient is the most susceptible of all to infections. And for an ophthalmic surgery the complications may translate to blindness. Many a times, post operative complications are due to the flora present on the patients' skin. Proper cleaning of the site to be operated upon would prevent them.

### **Patient attire and Cleaning of the area of the eye to be operated**

Prior to entering the OT, the patient is asked to wash the face thoroughly, especially around the eyelashes, with water and soap. This should be done under the guidance of a paramedic, if required. Inside the OT complex the patient is taken to the pre op room and asked to change into OT dress. Ideally, the patient should be asked to wear sterile theatre clothing. If it is not available, the patient can be asked to wear clean clothes at the time of surgery. Shoe covers and caps are given to the patients to be worn.

All the records are cross checked and the eye to be operated upon is indicated with a band on the wrist or on the case paper.

The area around the eye is then painted with povidone iodine (10%). The strokes should be from the medial canthus to the lateral canthus of the eye. Following anaesthesia, povidone iodine (0.5%) eye drops are instilled in the conjunctival sac.

Povidone iodine asepsis is the most important prophylactic measure to be followed to bring down the number of organisms present in the eyelids and conjunctiva. The bottle containing povidone iodine should be tightly capped. Fresh solution is to be prepared daily. The shelf life is about one month.

The patient is now ready to be taken inside the operation room.