

Course: Operating Room (OR) Protocol

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Author(s)

Kevin Arnold, RN, BSN is a clinical specialist in the vascular access industry specializing in educational programs, policy development, and CLASBI management & prevention. He has also has working experience in Education, Telemetry, Stroke Care, Wound Care, Intermediate Care, Emergency Department, and Home Health.

Disclosures

none

Audience

Health Care Workers

Accreditation

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Course Objectives

After reading this comprehensive course the reader will be able to:

- understand the definition of operating room and or-protocol
- be familiar with the structure of a surgical team
- list three areas of operating room
- be familiar with proper attire in operating room
- understand the hazards and various modes of transmission of infections
- understand the various principles of aseptic technique
- demonstrate proper hand washing technique
- list various OR protocols
- understand the comparative division of duties in operating room

Operating Room (OR)

The operating room or operating theater is a room specifically used by surgical and anesthesia team to carry out surgeries. Operating room must not be used for other purposes. Every operating room must have following characteristics:

- Proper lightening
- Good ventilation
- Proper equipment for procedures
- Equipment to monitor patients as needed for the procedure
- Drugs and other consumables required for routine and emergency use [1, 2].

OR Protocols

Operating room protocol is a collection of principles that must be followed by the staff present in the operating room to ensure safety of the patient and the staff. The new residents, medical students and nurses must understand these principles before entering the operating room. Various important components of operating room protocol include followings:

- To understand the basic concept of aseptic technique
- To know how to apply the concept of aseptic technique in operating room
- Demonstrate surgical scrub, gowning, and gloving
- Identify various hazards in the surgical setting
- Identify the role of the scrub person, circulating nurse, and medical student
- Discuss ways the untrained medical personnel can participate in the care of the patient and thereby become an active, useful member of the surgical team [1].

Components of surgical services team

The surgical services team consists of following components:

- **Sterile team:** it includes:
 - Surgeon
 - First assistant (RN or PA)
 - Surgical technologist (scrub)

- **Unsterile team:** it includes:
 - Anesthesia: MD/CRNA/PA
 - Circulator
 - Environmental Services
 - Sterile Processing [1, 3].

Three areas of operating room

For staff and visitors the operating room is classified into 3 areas [1, 2]:

- Unrestricted
- Semi-restricted
- Restricted

Unrestricted area-This area has following characteristics:

- Here the traffic is not limited.
- Street clothes are allowed in this area.
- This area is separated by doors from the main hospital corridor.
- This area allows access for communication with department and hospital personnel.
- The examples of this area include:
 - Operating room supervisor's office.
 - Locker rooms.
 - Surgical scheduling office.

Semi-restricted area- This area has following characteristics:

- Traffic is not allowed to everyone. You must wear scrub attire and caps to enter in this area.
- This area includes the support areas of the surgical suite.
- Examples of this area include:
 - Clean cores and sub-sterile rooms as designated by the facility
 - Corridors outside the operating room
 - Storage areas for clean and sterile supplies

Restricted area- this area has following characteristics:

- You have to wear scrub attire, caps and masks in this area.
- Areas where unwrapped sterile supplies are provided to carry out procedures are carried out are included in this section.
- Examples of this area include:
 - Procedure room
 - Operating room
 - Scrub area
 - Clean cores and sub-sterile rooms as designated by the facility

Proper clothing (attire) for the operating room

It includes:

- Operating room scrubs (shirt and pants)
- Cover jacket
- Comfortable shoes and shoe covers
- Eye protection
- Hair covers
- Personnel protective equipment [1]

Hazards in operating room

These are:

Chemical hazards- these include:

- Anesthetic gases are dangerous and these can escape into air from machine or patient.
- Formaldehyde which is used as antiseptic agent in operating room can cause skin irritation and rash.
- Bone cement (methyl methacrylate) - it causes no problem for non-pregnant adults.
- If you are pregnant, you must leave the room prior to the start of the mixing of the bone cement. You have to inform the clinician or the charge nurse before leaving. These fumes are dangerous and contain carbon monoxide, hydrogen and methane.

Biological hazards- these include:

- Radiation exposure
- Cuts and needle sticks
- Infectious wastes
- The patient's blood or body fluid splash
- Infection from the patient
- Surgical smoke [4]

Transmission of infection

Three factors are required for transmission of an infection. These include:

- I. An infectious agent
- II. Route of transmission of infectious agent
- III. A susceptible host

Various routes of transmission of an infectious agent

These include:

1-Direct transmission- it includes:

Direct contact- Infection may be transmitted by direct contact from skin to skin, mucosa to mucosa or mucosa to skin of the same or another person. Examples of direct contact are:

- Touching, kissing
- Sexual intercourse
- Continued closed contact

Examples of diseases transmitted by this route include:

- Sexually transmitted disease
- AIDS
- Leprosy
- Skin and eye infections

Droplet infection- this is direct projection of a spray of droplets of saliva and nasopharyngeal secretions during coughing, sneezing, speaking and spitting, and talking into surrounding environment.

Examples of diseases transmitted by this route include:

- Respiratory tract infections
- Eruptive fevers
- Common cold
- Diphtheria
- Whooping cough and tuberculosis

Contact with soil- following diseases can be transmitted by contact with soil:

- Tetanus
- Hook worm disease
- Mycosis

Inoculation into skin and mucosa- examples include:

- Rabies
- Hepatitis

Transplacental transmission- TORCH infections can be transmitted via this route from mother to baby.

2-Indirect transmission- it includes:

Vehicle-Borne- it implies transmission of an infectious agent through the agency of matter, food, ice, blood, serum, plasma or other biological products. Diseases transmitted via this route include:

- By food and water e.g. acute diarrheas, typhoid fever, cholera, polio, hepatitis A and food poisoning
- By blood e.g. Hepatitis B , malaria, syphilis and chaga's disease

Vector –Borne-a vector is defined as an arthropod or any living carrier that transports an infectious agent to susceptible host e.g.

- Malaria is transported by anopheles mosquito
- Plague is transported by rat

Others modes of indirect transmission include:

- Air- Borne
- Fomite –Borne
- Unclean hands and fingers [6, 7]

Control of Transmission of Infection in Operating Room and Principles of Aseptic Technique

- **Uses of aseptic technique**- remember the following concepts about aseptic technique and its uses:
- **Hand washing** is the **best way to control** the transmission of infection. Follow the following principles while hand washing in operating room:
 - *When you are going to scrub:*
 - You should remove all jewellery and trim the nails
 - Make use of soap, a brush (on the nails and finger tips) and running water to ensure the cleanliness around and underneath the nails
 - Always scrub your hands and arms up to the elbows
 - After scrubbing, hold up your arms to allow water to drip off your elbows and turn off the tap with your elbow.
 - *After scrubbing your hands:*
 - Dry your hands and forearms with a sterile towel while keeping in mind that the towel does not become contaminated.
 - Lift your hands and forearms away from your body and higher than your elbows until you keep on a sterile gown and sterile gloves.
 - *Always wash your hands after removing your gloves* [8]
- Use of Personal Protective Equipments:
 - Gloves
 - Gowns

- Masks
 - Hair covers
 - Eye protection
- Asepsis means absence of disease-causing microorganisms. Aseptic (sterile) technique is a procedure used to prevent contamination from infectious agents, and it is used to maintain a sterile environment in the operating room.
 - A sterile field is referred to the areas that surround and include the surgical room in which aseptic technique must be maintained. The sterile area in the operating room includes:
 - OR bed with sterile drapes
 - Surgical team
 - Back table
 - Mayo stand
 - Draped radiological equipment
 - Remember that sterile barriers are contaminated after penetration. The edges of a sterile package or container are considered contaminated after opening. In the operating room sterile persons can touch only sterile items, and non-sterile persons can touch only non-sterile items.
 - Always maintain the sterility and integrity of the sterile field, while moving around it by following these rules:
 - You must stay 3 feet from the sterile field
 - You should not walk between two sterile areas
 - As an un-scrubbed person, you should face the sterile field when passing by it
 - In the OR, you should work as a team to achieve the most positive outcome for the patient.
 - Remember that all of us are accountable for our actions while in the operating room.
 - Try to wear only necessary jewelry.
 - Do not wear much make-up.
 - Do not wear perfume or cologne.
 - Try to avoid chewing gum.

- Always wear name badge. [1, 6, 7]

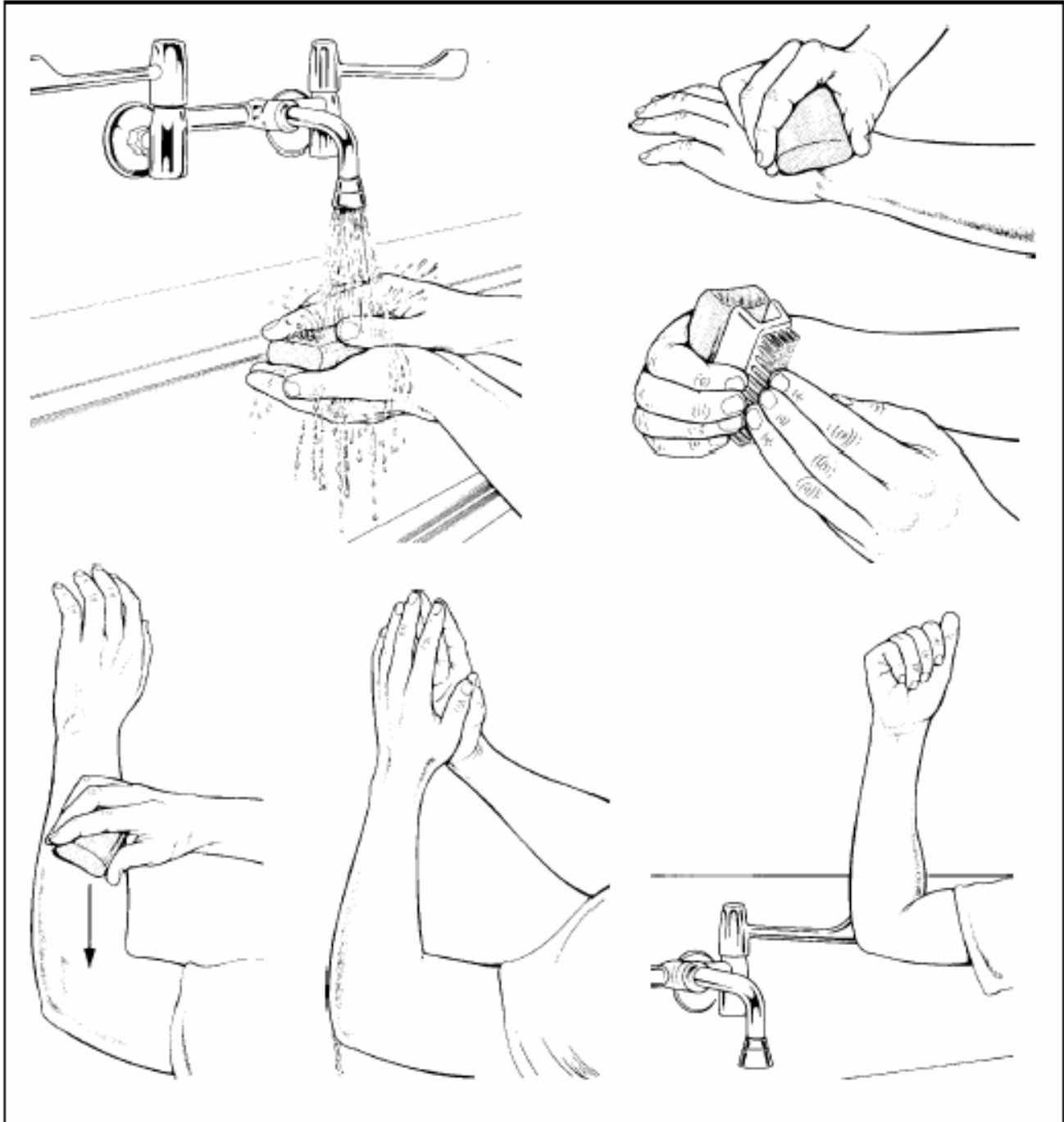


Figure 2.4

Figure 1: Hand washing and scrubbing (Source" WHO)

Summary of OR-Protocol

Remember following pearls of OR-protocol:

Lockers

- Lockers are available for your use. Use your own lockers while you're working in operating room and bring your own lock.

Dressing

- All the people who enter the semi-restricted and restricted areas of the operating room must follow the OR protocol like wearing the hospital laundered surgical clothing that are made for use only within the surgical areas.
- Always cover the all possible head and facial hair (including sideburns and neckline) when in the surgical suite.
- All staff/people entering an operating room must wear a mask.
- All jewellery should be confined or removed. Watches and plain wedding bands area allowed.
- Do not wear nail polish and artificial nails.
- Use the protective barriers (gloves, masks, protective eyewear, and face shields), provided by the hospital.
- Special shoes are recommended and dedicated to the operating room.

Hand washing

- Surgical hand scrub- a five minute anatomical timed scrub will be used for all surgical hand scrubs. Follow the hand washing technique described above.

Gloving Procedure

- You must avoid contact of sterile gloves with your ungloved hands during closed-glove procedure.
- For open-glove method, you can touch only the cuff of the glove with ungloved hand, and then only glove to glove for other hand.
- If you suspect contamination during either procedure, both gown and gloves must be discarded and new gown and gloves must be taken on.
- When procedure is finished, the gloves are removed after the gown is removed inside out, using glove-to-glove, then skin-to-skin technique.

Points to Remember about Aseptic Technique

- The patient is the center of the sterile field.
- Use the sterile items within the sterile field.
- Sterile persons are gowned and gloved.
- Consider that the tables are sterile only at table level.
- Sterile persons touch only sterile items or areas; unsterile persons touch only unsterile items or areas.
- Unsterile persons avoid reaching over sterile field; sterile persons avoid leaning over unsterile area.
- Edges of anything that encloses sterile contents in operation room are considered unsterile.
- Create sterile field as close as possible to time of use.
- Always keep an eye on the sterile areas in view continuously.
- Sterile persons must keep well within sterile area.
- Unsterile persons must keep away from sterile areas.
- Remember that destruction of integrity of microbial barriers results in contamination. Microorganisms must be kept to irreducible minimum [1,2].

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