STERILE STORAGE

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Clean/Sterile Storage

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OBJECTIVES

Following training, employees will be able to:

1. Explain the importance of sterile storage.
2. List the means by which sterility is maintained in SPD.
3. Discuss the environmental conditions necessary in SPD.
4. Define people flow and air flow.
5. Explain the proper way to handle and deliver medical supplies.
6. Discuss the two types of storage systems available and their benefits/drawbacks.
7. Define "FIFO" and the importance of stock rotation.

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CLEAN/STERILE STORAGE

1. Medical supplies and patient care equipment must be available at a moments notice to enable a hospital to provide quality care to its veterans. This necessity requires that an area be designated as a "sterile storage" area, where sterile supplies and instrument sets can be made available while protecting them from accidental contamination. In many VA hospitals there is no distinction made between sterile and nonsterile storage areas; all medical supplies are stored under the same conditions. This arrangement makes it easier to locate all like items in the same area while ensuring all patient care supplies are equally protected from contamination.

2. **IMPORTANCE OF STERILE STORAGE**

As already mentioned, one of SPD's tasks is to lower, even eliminate, the amount of microorganisms that may come into contact with a patient through the use of a variety

Technician in Sterile Storage Area

of medical supplies. The task is an important one. Each day SPD receives many instruments contaminated with blood and tissue from the Operating Room and other areas of the hospital. Supplies are received that have been in warehouses, trucks, and planes, and have been handled by many people before arriving at the hospital. Each of these items must be handled correctly in order to ensure sterility is maintained once it is achieved. The sterile storage area of SPD is designed with environmental and procedural controls which aid in the efforts to maintain the sterility of all products. In addition, the setup of the sterile storage area should assist in locating supplies quickly. When patient care items are needed right away, precious time should not be wasted searching up and down aisles for the correct product.

3. **MAINTENANCE OF STERILITY**

a. Once items have been sterilized and received in the distribution area of SPD, it is essential that each SPD technician to do everything possible to protect and preserve the sterility of those items. Certain restrictive techniques have been established to help ensure that both sterile and nonsterile supplies are kept under the best possible storage conditions for the safety and protection of both patients and employees.

b. The use of tobacco products, applying cosmetics, eating, drinking, or storing food items (including beverages) will not be permitted in SPD. Such items can spoil and draw flies or vermin, leading to the contamination of medical supplies.

c. Portable fans will not be used in any area of SPD. The wind produced by the air may force microorganisms into the sterile packs through the minute holes and folds in the packaging material. Portable fans may also interrupt the proper air flow in SPD, forcing "dirty" air into a "clean" room.

d. Specific attire to be worn by distribution personnel includes the regular SPD uniform consisting of white pants and a blue smock. Head and beard covers must be worn in the case cart storage area of the clean/sterile storage. Only medical center issued clothing is authorized to be worn in this area. The purpose of this is to protect the supplies by preventing the transmission of bacteria from outside clothing to the products. If it is necessary for personnel to enter the sterile storage area wearing other clothing, they must don a cover gown or jacket. They must also wear a head covering if they enter the case cart area.

4. **ENVIRONMENTAL CONTROL**

a. Certain environmental conditions must be maintained in SPD to assist in the attainment and maintenance of sterility. These include temperature settings, humidity, air exchanges, and cleanliness. In addition, ensuring proper people flow, air flow, and work flow will help to prevent harmful microorganisms from ever entering the clean/sterile areas of SPD.

b. **Temperature** - The room temperature in all SPD areas is to be kept between 65 degrees and 72 degrees Fahrenheit.

Humidity - Humidity levels are to stay between 35 and 75 percent.

Air Exchanges - 10 air exchanges per hour are required.

c. **Cleanliness** - A regular schedule is set up with the Environmental Management Service for cleaning SPD. This is to include wet mopping or vacuuming all floors daily, using separate cleaning equipment for the decontamination area, and cleaning the walls in the preparation and decontamination areas monthly. SPD personnel are responsible for cleaning all work surfaces and sinks daily using an approved disinfectant, and other areas, such as storage shelves, breakout rooms (clean receiving), ward closets, and equipment storage areas on a regularly scheduled basis.

d. Specific attire to be worn by distribution personnel includes the regular SPD uniform consisting of white pants and a blue smock. Head and beard covers must be worn in the case cart storage area of the clean/sterile storage. Only medical center-issued clothing is authorized to be worn in this area. The purpose of this is to protect the supplies by preventing the transmission of bacteria from outside clothing to the products. If it is necessary for personnel to enter the clean/sterile storage area wearing other clothing, they must don a cover gown or jacket provided by SPD. They must also wear a head covering if they enter the case cart area.

e. The SPD area must be kept free of insects, rodents, and other vermin. Any sign of infestation should be reported immediately to the Chief, SPD, for investigation. A routine schedule for spraying SPD for pest control should be developed with Environmental Management Service.

f. **People Flow.** Traffic in SPD should be restricted only to authorized personnel. Only those having official business in SPD should be allowed access, and these persons should be accompanied by an appropriate SPD supervisor or designee. This is necessary to minimize the amount of microorganisms entering SPD on people and their clothing. Traffic patterns are designed to always move people from clean areas to dirty. No one should move from dirty to clean areas without following prescribed aseptic techniques.

g. **Air Flow.** Air flow is carefully controlled in SPD to minimize the movement of microorganisms from dirty areas to clean. This is controlled by creating a positive air flow in the clean areas of SPD. Positive air flow means that a greater amount of air is forced into a room than is exhausted. This forces the air to seek other routes of escape, i.e., through doors, service windows, and other cracks and crevices. Positive pressure makes it difficult for airborne particles to enter that space. The dirty areas of SPD are maintained under negative pressure. Negative pressure occurs when more air is exhausted from the room than is supplied, thus creating air flow into the dirty areas

through doors and minimizing the escape of airborne microorganisms. The positive flow in the clean areas of SPD is exhausted through the dirty areas to the outside or a filtered recirculating system.

h. **Work Flow.** Work flow refers to the order in which medical/surgical items are received into SPD, processed, and dispensed for patient use. Work flow in SPD should always move from dirty to clean. Soiled instruments and patient care equipment are received in the decontamination area. After being processed, they move to the preparation area for inspecting, packaging, and sterilizing, as necessary. They are then transferred to the sterile storage area and maintained until issued. Purchased medical supplies are received into SPD in a breakout area where they are removed from their outer shipping containers before being stored in the sterile area. Sterile supplies should never enter or be stored in the decontamination area; contaminated items should never enter SPD through the clean areas. Separation of clean and dirty must always be maintained.

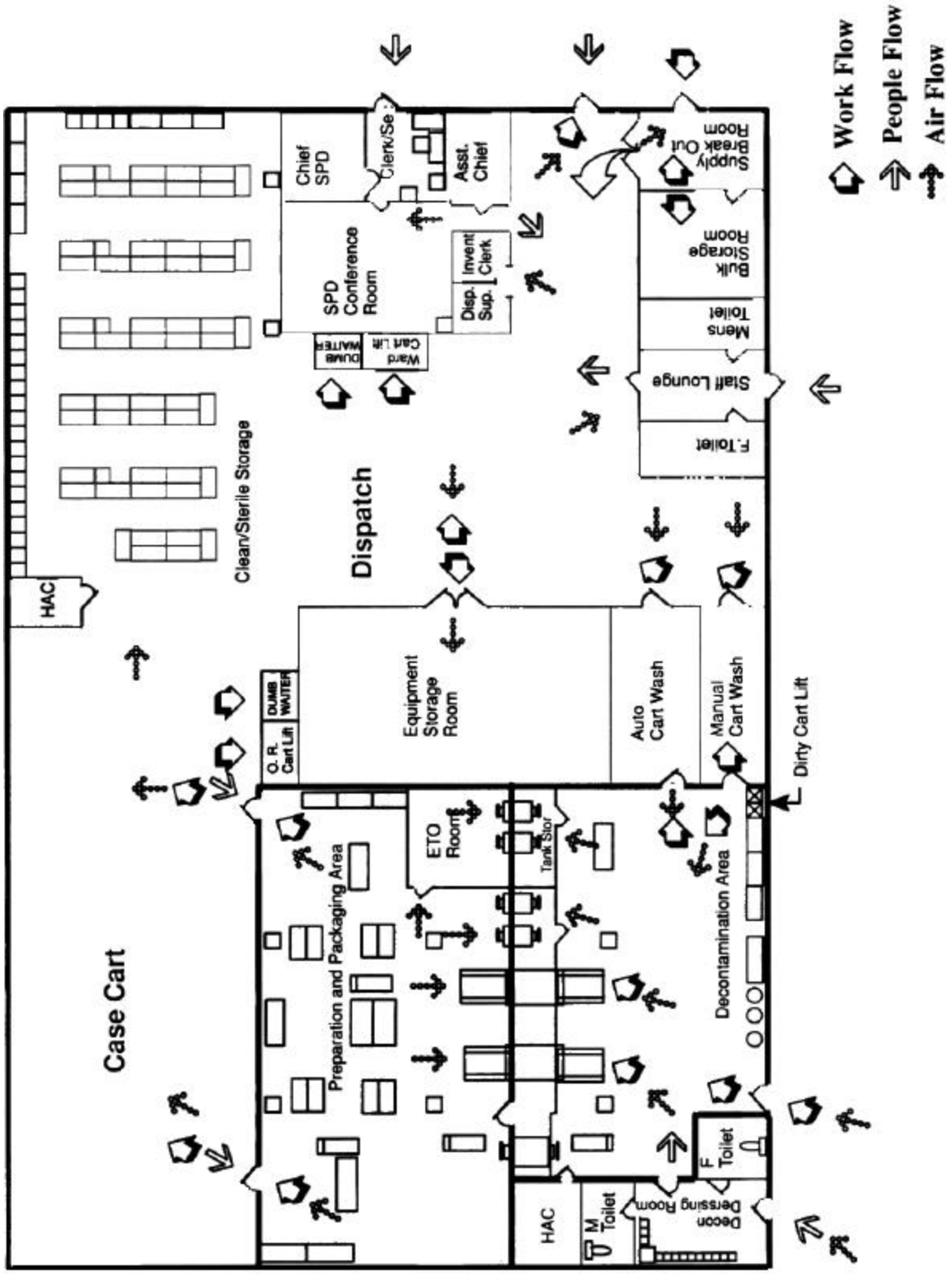
5. PRODUCT HANDLING

a. Environmental controls in SPD are not the only factors involved in ensuring that a quality product, either sterile or nonsterile, is provided to our customers. Also important is how that product is handled and stored.

b. As supplies are received in the breakout area of SPD, shipping containers are examined to ensure no damage has occurred during transport from the manufacturer. If boxes have been damaged, the contents should be examined for damage or contamination. Any questionable condition should be brought to the attention of the SPD Chief. Damaged products can often be returned to the manufacturer and replaced with acceptable ones.

c. Before any item is moved into the sterile storage area of SPD, it must be removed from its outer shipping container or corrugated box. These containers have been exposed to dusty, dirty conditions and may act as microbial harbors for a variety of organisms. Shipping containers and corrugated boxes should never be utilized as dispenser bins or storage containers. Ideally, SPD personnel should wear a cover gown over their uniform while breaking out items from their shipping containers. Care should be taken not to wear the dirty cover gown back into the sterile storage area.

d. All sterile supplies should be handled with extreme care to preserve package integrity and prevent contamination. Staples, paper clips, tape, or rubber bands must never be used in conjunction with the storage or delivery of supplies, whether sterile or nonsterile, as they may promote contamination. When carrying sterile items, they must never be compressed, such as placing them under the arm. This, too, compromises the integrity of the sterile package and promotes contamination of the contents. When delivering items, aseptic techniques should be followed. Items should not be carried


Work Flow
People Flow
Air Flow
Supply Break Out Room
Bulk Storage Room
Mens Toilet
Staff Lounge
F. Toilet
Chief SPD
Clerk/Se
Asst. Chief
SPD Conference Room
Invent Clerk
Disp. Sup.
Ward Cart Lift
DUMB WAITER
Clean/Sterile Storage
Dispatch
HAC
O. R. Cart Lift
DUMB WAITER
Equipment Storage Room
Auto Cart Wash
Manual Cart Wash
Dirty Cart Lift
Case Cart
Preparation and Packaging Area
ETO Room
Tank Stor
Decontamination Area
F Toilet
Decon Dressing Room
M Toilet
HAC

WORK FLOW

under the chin, in the teeth, etc.. Smaller amounts of items should be delivered in a bag, larger items should be delivered in/on carts.

6. **STORAGE SYSTEM**

a. There are basically two types of storage systems in use, open and closed shelving. Each offers certain benefits and drawbacks. Open shelving usually consists of wire shelves with movable dividers used to separate products. This type of shelving is the most common type of storage unit and offers the most efficient use of space. Open shelving also makes locating supplies easier when taking inventory or issuing products. When open shelving is used, care must be taken to adhere to prescribed clearances from walls, floors, and ceilings (including fixtures). A distance of 2 inches should be maintained between sterile supplies and outer walls due to possible condensation; approximately 18 inches between supplies and ceilings and ceiling fixtures, such as lights and sprinkler heads, to prevent interference with light and sprinkler operation; and all supplies should be at least 8 inches off the floor to prevent

Wire Shelving Unit

contamination from wet mopping. It is also advisable to have a solid bottom shelf on open shelving units to prevent dust, dirt, and water from being conveyed onto supplies located on the bottom shelf.

b. Closed shelving usually consists of metal cabinets, with standard type doors, or portable lockers, such as exchange carts with roll-type doors. Some say these systems offer added package protection because the supplies are not exposed to the

Closed Shelving and C-Locker

air on a continuous basis. However, there are some drawbacks to be considered. Many of these systems reduce the actual amount of storage space due to the size of each unit and the frame requirements. Care must also be taken in maintaining a neat, orderly arrangement of stock in these units; supplies can often be caught in the closing drawers and doors, resulting in damaged, unsterile products. Opening of the doors should also be done slowly to minimize the air movement into the shelving unit. A quick rush of air could force airborne microorganisms into the packaging (the "bellows" effect). Closed shelves and drawers often trap dust particles from the air and packages. Both types of shelving should be wiped down and cleaned with a hospital approved disinfectant on a regularly scheduled basis.

7. **REPLENISHMENT OF SPD STOCK (INVENTORY REPLENISHMENT)**

a. Periodically, inventories are taken of medical supplies in SPD. Both posted stock, those items stocked in the warehouse, and unposted stock, open marked procurements, are visually located to identify what needs to be ordered. With the advent of the General Inventory Package (GIP), it is possible to have the computer take over this function. With inventory levels entered into the computer and constantly updated with daily issue totals, regular orders for medical supplies can be autogenerated when supply levels in SPD reach the reorder point. Of course, this feature necessitates accuracy in counting the supplies issued every day.

b. When supplies are stocked in sterile storage, the practice of stock rotation is adhered to. The acronym "FIFO" or "First In, First Out" is employed. This means that the old supplies are issued before the new ones. On the shelf, supplies are pulled from the right and front first, and new supplies are stocked beginning on the left and back.

c. Each week, and prior to being issued, all sterile medical supplies should be checked for outdates. Outdated supplies are those whose expiration date has been passed. These items are no longer considered safe for use. Outdated sterile supplies should either be discarded or returned to SPD for reprocessing, if they are reusable. Stock rotation is important in reducing the number of outdated supplies and the costs associated with discarding and reprocessing medical supplies.

STERILE STORAGE TERMS

Air Flow
FIFO
GIP
Package Integrity
People Flow
Traffic Flow
Work Flow

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QUESTIONS

1. Why is it necessary for SPD to have a sterile storage area?

    a. So nonsterile supplies can be received in a timely manner.
    b. So sterile supplies can be received in a timely manner.
    c. Because Pharmacy won't store the items.
    d. To protect the supplies from contamination and damage until needed.

2. Which of the following items are not prohibited in the sterile storage area of SPD?

    a. chewing tobacco and cigarettes
    b. carbonated beverages and bottled water
    c. delivery carts and patient care equipment
    d. lipstick
    e. candy bars

3. Why are portable fans prohibited in SPD?

4. What is the proper attire for SPD personnel working in distribution?

5. What personal protective equipment is required in sterile storage?

6. What range of temperatures is required in SPD

7. What humidity level must be maintained in SPD?

8. How many air exchanges are require for sterile processing and storage?

9. SPD personnel are responsible for cleaning:

    a. the bathrooms, countertops, and ventilation ducts.
    b. all work surfaces and sinks daily
    c. nothing; Environmental cleans everything.
    d. the refrigerator and microwave when they have unidentifiable growths in them.

10. "People flow" refers to:

11. Traffic in SPD should always move:

12. Air flow in SPD should always move:

13. Work flow should always move:

15. Outer shipping containers and corrugated boxes should:

a. be checked for damage and contamination when received in SPD.
b. never enter the sterile storage area of SPD.
c. never be used as dispenser bins or storage containers.
d. all the above.

16. The following should never be used in the storing or delivering of supplies:

a. staples, paper clips, pins, rubber bands, or tape (other than sterilization tape).

17. Open shelving:

a. is the most common type of storage system.
b. offers the most efficient use of space.
c. makes locating supplies easier to do.
d. all the above.