

Module E

## PRINCIPLES AND PRACTICES OF ASEPSIS

Statewide Program for Infection Control and Epidemiology (SPICE)  
UNC School of Medicine

---

---

---

---

---

---

---

---

### OBJECTIVES

- Describe the principles and practice of asepsis
- Understand the role of hand hygiene in asepsis
- Understand the role of the environment in disease transmission

---

---

---

---

---

---

---

---

### DEFINING ASEPSIS

|            | Medical Asepsis   | Surgical Asepsis   |
|------------|---|--|
| Definition | Clean Technique   | Sterile Technique  |
| Emphasis   | Freedom from most pathogenic organisms                                  | Freedom from all pathogenic organisms  |
| Purpose    | Reduce transmission of pathogenic organisms from one patient-to-another | Prevent introduction of any organism into an open wound or sterile body cavity |

*(Free from disease producing microorganisms)*

---

---

---

---

---

---

---

---

### MEDICAL ASEPSIS

Medical asepsis, also known as “clean technique” is aimed at controlling the number of microorganisms and is used for all clinical patient care activities.

Necessary components of medical asepsis include:

- Knowing what is dirty versus clean versus sterile
- How to keep the first three conditions separate
- How to remedy contamination immediately



---

---

---

---

---

---

---

---

### PRINCIPALS OF MEDICAL ASEPSIS



---

---

---

---

---

---

---

---

### SURGICAL ASEPSIS



---

---

---

---

---

---

---

---

### SURGICAL ASEPSIS

Surgical asepsis, also known as “sterile technique” is aimed at removing all microorganisms and is used for all surgical/sterile procedures.

Necessary components of surgical asepsis include:

- Knowing what is and what is not sterile
- How to keep the first two conditions separate
- How to remedy contamination immediately



---

---

---

---

---

---

---

---

### PRINCIPLES OF SURGICAL ASEPSIS



- The patient should not be the source of contamination
- Healthcare personnel should not be the source of contamination
- Recognize potential environmental contamination
  - Keep door closed
  - Keep traffic to a minimum
- Separate clean and dirty activities (avoid cleaning/dusting)



---

---

---

---

---

---

---

---

### KNOWLEDGE CHECK

Which of the following is True?

1. Surgical asepsis should be used for all patient care activities
2. ✓ “Clean technique” is used for any healthcare related activity
3. Clean and dirty equipment can be stored together as long as they are not touching
4. The goal for medical asepsis is freedom from all pathogenic organisms



---

---

---

---

---

---

---

---

## ROLE OF HAND HYGIENE



---

---

---

---

---

---

---

---

## WHAT IS HAND HYGIENE?

- Handwashing with soap and water
- Antiseptic handwash
- Alcohol-based hand rub
- Surgical antisepsis



---

---

---

---

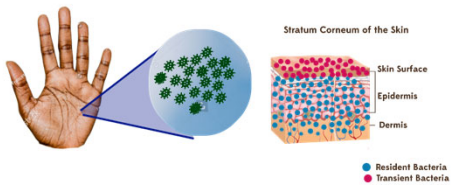
---

---

---

---

## THE ROLE OF HAND HYGIENE



---

---

---

---

---

---

---

---

### THE ROLE OF HAND HYGIENE

**5 ELEMENTS OF TRANSMISSION**

- 1 Present on the skin or near by objects
- 2 Transferred to health care workers hands
- 3 Survive for several minutes
- 4 Hand hygiene omitted or inadequate
- 5 Direct contact with patients or equipment

SPICE

---

---

---

---

---

---

---

---

### THE ROLE OF HAND HYGIENE

**34 STUDIES: 1981-2000**

- Mean baseline rates: 5%-81%
- Overall average: **< 40% Compliance**

SPICE

---

---

---

---

---

---

---

---

### REASONS FOR NONCOMPLIANCE

- Inaccessible hand hygiene supplies
- Skin irritation
- Too busy
- Glove use
- Didn't think about it
- Lacked knowledge

SPICE

---

---

---

---

---


---

---

---

### POTENTIAL ADVANTAGES ALCOHOL-BASED HANDRUBS

- Requires less time than hand washing
- Acts quickly to kill microorganisms on hands
- More effective than hand washing with soap and water
- More accessible than sinks
- Less irritating to skin than soap and water and can even improve condition of skin




---

---

---

---

---




---

---

---

### WHEN TO PERFORM HAND HYGIENE

|  |   |
|--|---|
| 1. Before touching a patient           | Before and after touching the patient   |
| 2. Before clean / aseptic procedure    | Before donning sterile gloves for central venous catheter insertion; also for insertion of other invasive devices that do not require a surgical procedure using sterile gloves<br>If moving from a contaminated body site to another body site during care of the same patient |
| 3. After body fluid exposure risk      | After contact with body fluids or excretions, mucous membranes, non-intact skin or wound dressing<br>If moving from a contaminated body site to another body site during care of the same patient<br>After removing gloves  |
| 4. After touching a patient            | Before and after touching the patient<br>After removing gloves  |
| 5. After touching patient surroundings | After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient<br>After removing gloves   |


---

---

---

---



---


---

---

---

*Video Clip: To start video click on image*




---

---

---

---

---

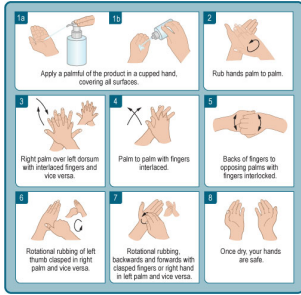
---

---

---

### HOW TO HAND RUB

- The use of an alcohol based hand rub is preferential to hand washing when hands are not visible soiled:




---

---

---

---

---

---

---

---

---

---

Video Clip: To start video click on image




---

---

---

---

---

---

---

---

---

---

### HOW TO HAND WASH

- Hand washing with soap and water should be used when hands are visible soiled or contaminated with blood and/or body fluids and after providing care for patients with diarrhea:




---

---

---

---

---

---

---


---

---

---

**HAND HYGIENE PROGRAM**  
*ADDITIONAL ELEMENTS*  
 CDC GUIDELINE FOR HAND HYGIENE IN HEALTHCARE SETTING

- Involve staff in evaluation and selection of hand hygiene products
- Provide employees with hand lotions/creams compatible with soap and/or ABHRs
- Do not wear artificial nails when providing direct clinical care
- Provide hand hygiene education to staff
- Monitor staff adherence to recommended HH practices




---

---

---

---

---

---

---

---

**SUMMARY OF HAND HYGIENE**


Hand hygiene must be performed exactly where **you** are delivering healthcare to patients (at the point-of-care).

During healthcare delivery, there are 5 moments (indications) when it is essential that **you** perform hand hygiene.

To clean your hands, **you** should prefer **hand rubbing** with an alcohol-based formulation, if available. Why? Because it makes hand hygiene possible right at the point-of-care, it is faster, more effective, and better tolerated.

**You** should wash your hands with soap and water when visibly soiled.

**You** must perform hand hygiene using the appropriate technique and time duration.




---

---

---

---

---

---


---

---


**KNOWLEDGE CHECK**

---


True or False:  
 Hand washing with soap and water is always the preferred method of hand hygiene



True



False




---

---

---

---

---

---

---



---



### ROLE OF THE ENVIRONMENT

Spaulding Classification of Surfaces:

1. **Critical** – Objects which enter normally sterile tissue or the vascular system and require sterilization
2. **Semi-Critical** – Objects that contact mucous membranes or non-intact skin and require high-level disinfection
3. **Non-Critical** – Objects that contact intact skin but not mucous membranes, and require low or intermediate-level disinfection


---

---

---

---


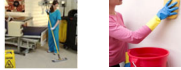
---


---

---

---

### ROLE OF THE ENVIRONMENT

|  |  |
|--|--|
| <p style="text-align: center;"><b>Clinical</b></p>  <ul style="list-style-type: none"> <li>• High potential for direct contamination</li> <li>• Spray or splatter</li> <li>• Frequent contact with healthcare personnel's hands</li> </ul> | <p style="text-align: center;"><b>Housekeeping</b></p>  <ul style="list-style-type: none"> <li>• No direct contact with patients or devices</li> <li>• Little risk of transmitting infections</li> </ul> |
|--|--|




---

---

---

---

---


---



---

---

### ROLE OF THE ENVIRONMENT

**SELECT, MIX, AND USE DISINFECTANTS CORRECTLY**

- Right product
- Right preparation and dilution
- Right application method
- Right contact time 
- Wear appropriate PPE  
(gloves, gown, mask, eye protection)


---

---

---

---

---

---

---

---

### SUPPLY AND EQUIPMENT MANAGEMENT

- Sterile/clean equipment and supplies should be carried in nursing bag/plastic container
- Perform hand hygiene
- Carry only supplies needed
- Be careful not to reach into bag with contaminated gloves



---

---

---

---

---

---

---

---

### HOME CARE (NURSING) BAGS

- Non-critical item
- Do not place on floor or other contaminated surface
- Place on visibly clean, dry surface
- If home infested place on doorknob or leave in car
- If contaminated with blood/body fluids, decontaminate with EPA-registered disinfectant



---

---

---

---

---

---

---

---

### HOME CARE (NURSING) BAGS CONT'D

- Unused supplies may be saved and used for another patient UNLESS:
  - Item removed from the bag and patient on contact precautions
  - Item was visible soiled
  - Item was opened or the integrity of the package compromised
  - Manufacturer's expiration date has been exceeded



---

---

---

---

---

---

---

---

### HOME CARE PERSONAL VEHICLE



- Separation of clean and dirty in vehicle
- Patient care and personal items stored separately
- Clean supplies should be stored in a clean area of the car, not on floor
- Store contaminated items and equipment needing cleaning in trunk (i.e., sharps containers)
- Store in a manner to avoid spilling




---

---

---

---

---

---

---

---




---

---

---

---

---

---

---

---

### ASEPSIS IN PROCEDURES

#### • Wound Care:

- Use clean technique
  - Sterile if MD ordered or fresh surgical wound
- Clean gloves to remove "old" dressing\*
- Remove gloves, perform hand hygiene\*
- Don new clean gloves
- Use only sterile irrigation solutions
- Soiled dressing should be contained in plastic bag and discarded in patient's trash



*\*Alternatively "No-touch" technique can be used*




---

---

---

---

---

---

---

---

## INTRAVASCULAR CATHETER-RELATED INFECTION

**Summary of Recommendations**

| Rank        | Description  |
|-------------|--|
| Category IA | Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies |
| Category IB | Strongly recommended for implementation and  |

**On this Page**

1. Education, training and staffing
2. Selection of catheters and sites
3. Hand hygiene and aseptic technique
4. Maximal sterile barrier precautions
5. Skin preparation

---

---

---

---

---

---

---

---

---

---

---

---

## PHLEBOTOMY

- All venous access done using safety-engineered device(s)
- Aseptic technique must be followed
- No recapping of needles
- Dispose of needles immediately in sharps container at point of use

---

---

---

---

---

---

---

---

---

---

---

---

## TRANSPORT BLOOD/BLOOD PRODUCTS

| Product                    | Temperature   |
|----------------------------|---|
| • Blood and pack red cells | • 1-10° C   |
| • Platelets                | • 1-10° C (if stored cold), or 20-24° C (at room temperature) |
| • Liquid Plasma            | • 1-10° C   |

*Temperature must be monitored using temperature sensitive tags or thermometers; Protect against direct exposure to ice packs or coolants*

---

---

---

---

---

---

---

---

---


---

---

---

### SPECIMEN COLLECTION AND TRANSPORT

- Specimens should not be hand carried to employee’s vehicle
- Place in a plastic zip lock lab specimen bag with a biohazard label
- Place in a secondary specimen bag for transportation (*rigid container preferred*)
- Secondary bag may be transported in the clean section of vehicle




---

---

---

---

---

---

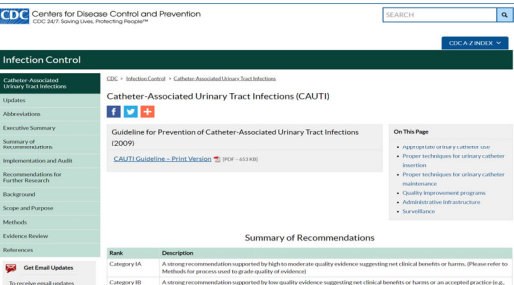
---

---

---

---

### CATHETER-ASSOCIATED URINARY TRACT INFECTIONS



The screenshot shows the CDC website page for Catheter-Associated Urinary Tract Infections (CAUTI). The main heading is "Guideline for Prevention of Catheter-Associated Urinary Tract Infections (2009)". It includes a table of recommendations with columns for Rank and Description. The table lists Category IA (strong recommendation supported by high to moderate quality evidence) and Category IB (strong recommendation supported by low quality evidence).

---

---

---

---

---

---

---

---

---

---

### INTERMITTENT URINARY CATHETERS

- Clean technique for patients doing self I/O catheterization
- Reusable catheter by a single patient
  - Wash in soap and water
  - Boil for 15 minutes OR
  - Microwave high for 15 minutes
  - Thoroughly drain catheter, allow to cool
  - Store in clean, closable container or new plastic bag

---

---

---

---

---

---

---



---

---

---

### MAINTENANCE OF LEG BAGS

- Follow manufacturer’s instructions if available
- One method:
  - Empty bag and rinse with tap water
  - Clean with soapy water and rinse
  - Instill either 1:3 white vinegar solution **OR** bleach solution > 1 tsp beach to 1 pint water
  - Soak 30 minutes in solution
  - Empty bag, rinse and air dry by hanging
  - Perform hand hygiene and use appropriate PPE


---

---

---

---

---


---

---


---

### TRACHEOSTOMY CARE

| Clean Technique  | Sterile technique  |
|--|--|
| <ul style="list-style-type: none"> <li>• In most situations</li> <li>• Change suction catheters at least daily;</li> <li>• flush with saline after each use</li> </ul> | <ul style="list-style-type: none"> <li>• Tracheostomy less than one month old</li> <li>• Physician orders</li> <li>• Use new sterile suction catheter each time</li> </ul> |



- Suction canisters used for only 1 patient, emptied daily and washed with soap and water
- Suction tubing rinsed with tap water after each use
- Tubing disinfected weekly with a 1:10 bleach/water solution or a 1:3 vinegar solution




---

---

---

---

---


---

---

---

### ENTERAL FEEDING

- Feeding bag and tubing should be rinsed after each feeding
- Tap water may be used
- Do not top off an existing bag of formula with new formula
- During feeding, check bag and tubing for foreign matter, mold and leakage




---

---

---

---

---

---

---

---

### CLEANING EQUIPMENT AND SUPPLIES

- Use clean technique to handle formula, equipment and supplies
- Equipment used for formula preparation should be cleaned using:
  - Dishwasher OR
  - Hot, soapy water
- Bags and tubing should not be used for more than 24 hour
- After 24 hours:
  - Discard tubing OR
  - Clean with soap and water, rinse, dry and air dry



---

---

---

---

---

---

---

---

### KNOWLEDGE CHECK

True or False:

Enteral feeding bags can be refilled as long as they are half empty



---

---

---

---

---

---

---

---

### KNOWLEDGE CHECK

True or False:

Asepsis includes all the following:

1. Hand Hygiene
2. Separation of clean and dirty supplies
3. Clean technique
4. Surgical technique



---

---

---

---

---

---

---

---

QUESTIONS?



---

---

---

---

---

---

---

---