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Patient Safety and Infection Prevention

Nursing Foundation

Medical asepsis, surgical asepsis, hand hygiene, standard precautions, transmission-based precautions, personal protective equipment, biomedical waste management and prevention of healthcare-associated infections.

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09. PATIENT SAFETY AND INFECTION PREVENTION

1. Patient Safety

Patient safety refers to reducing preventable harm associated with healthcare.

Common Patient Safety Risks

- Medication errors.
- Falls.
- Healthcare-associated infections.
- Pressure injuries.
- Incorrect patient identification.
- Communication errors.
- Equipment-related injuries.

2. Infection

Infection occurs when microorganisms invade the body and multiply, potentially causing tissue damage or disease.

3. Chain of Infection

1. Infectious agent.
2. Reservoir.
3. Portal of exit.
4. Mode of transmission.
5. Portal of entry.
6. Susceptible host.

Breaking any link can reduce infection transmission.

4. Types of Asepsis

Medical asepsis	Surgical asepsis
Clean technique	Sterile technique

Reduces microorganisms and their spread	Maintains a field or articles free of viable microorganisms
Routine hygiene and selected patient care	Invasive procedures requiring sterility

5. Important Terminology

- Cleaning: Physical removal of dirt and organic material.
- Disinfection: Elimination of many pathogenic microorganisms from inanimate objects.
- Sterilization: Elimination of all viable microorganisms, including bacterial spores.
- Antisepsis: Use of appropriate antimicrobial agents on living tissue.

6. Hand Hygiene

The WHO Five Moments for Hand Hygiene are:

1. Before touching a patient.
2. Before a clean or aseptic procedure.
3. After body-fluid exposure risk.
4. After touching a patient.
5. After touching patient surroundings.

Duration

- Alcohol-based hand rub: Approximately 20-30 seconds.
- Soap and water: Approximately 40-60 seconds using the healthcare handwashing technique.

Use soap and water when hands are visibly soiled and in other situations specified by infection-control protocols.

Gloves do not replace hand hygiene.

7. Standard Precautions

Apply to every patient, regardless of known infection status.

- Hand hygiene.
- Risk-based PPE use.
- Respiratory hygiene.
- Safe injection practices.
- Sharps safety.
- Environmental cleaning.
- Safe handling of linen and waste.
- Appropriate equipment reprocessing.

8. Transmission-Based Precautions

Precaution	Examples	Measures

Contact	Some diarrhoeal infections and resistant organisms	Gloves, gown and dedicated equipment as indicated
Droplet	Influenza, pertussis	Medical mask and appropriate placement
Airborne	Pulmonary tuberculosis, measles	Fit-tested respirator and appropriate airborne isolation

Additional precautions depend on the infectious agent and institutional policy.

9. Personal Protective Equipment (PPE)

- Gloves.
- Gown or apron.
- Medical mask.
- Respirator.
- Goggles.
- Face shield.

Common Donning Sequence

Hand hygiene -> Gown -> Mask or respirator -> Eye protection -> Gloves.

Remove contaminated PPE safely according to the applicable protocol and perform hand hygiene.

10. Biomedical Waste Management in India

Colour	Waste examples
Yellow	Anatomical waste, blood-soiled dressings, selected expired medicines
Red	Contaminated recyclable plastics, such as tubing, gloves and needle-free syringes
White translucent	Contaminated metal sharps, including needles and scalpels
Blue	Contaminated glassware and metallic body implants

Segregate waste at the point of generation using authorized containers and applicable rules.

11. Healthcare-Associated Infections (HAIs)

Infections associated with receiving healthcare.

Examples:

- Catheter-associated urinary tract infection (CAUTI).
- Surgical site infection (SSI).
- Central line-associated bloodstream infection (CLABSI).
- Ventilator-associated pneumonia (VAP).

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Prevention

- Hand hygiene.
- Appropriate aseptic technique.
- Device insertion only when indicated.
- Daily review of invasive device necessity.
- Environmental cleaning.
- Safe medication administration.
- Appropriate antimicrobial use.
- Infection surveillance.

12. Needle-Stick Injury Management

1. Wash the affected skin with soap and water.
2. Flush exposed mucous membranes with water.
3. Report the exposure immediately.
4. Obtain urgent occupational health assessment.
5. Follow exposure testing and post-exposure prophylaxis protocols.

Do not squeeze the wound aggressively or apply corrosive chemicals.

Important Examination Questions

1. Explain the chain of infection.
2. Differentiate medical and surgical asepsis.
3. Describe the Five Moments for Hand Hygiene.
4. Explain standard and transmission-based precautions.
5. Describe biomedical waste segregation.
6. Explain prevention of healthcare-associated infections.

Conclusion

Infection prevention and patient safety require consistent application of standard precautions, hand hygiene, aseptic practices, appropriate waste management and safe clinical care.

Quick Revision

- The chain of infection comprises agent, reservoir, portal of exit, transmission, portal of entry and susceptible host.

- Medical asepsis reduces microorganisms; surgical asepsis maintains sterility.

- Cleaning removes dirt, disinfection eliminates many pathogens and sterilization eliminates all viable microorganisms including spores.

- WHO hand-hygiene moments include before patient contact or aseptic procedures and after exposure risk,

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patient contact or surroundings.

- Standard precautions apply to all patients; additional contact, droplet or airborne precautions depend on the agent.

- Gloves do not replace hand hygiene; report occupational exposures immediately for urgent assessment.

Practice questions

Choose one best answer. The answer key and explanations follow the questions.

1. Which process eliminates all viable microorganisms, including bacterial spores?

A. Cleaning
B. Antisepsis
C. Disinfection
D. Sterilization

2. To whom do standard precautions apply?

A. Only patients with confirmed infection
B. Every patient
C. Only patients in isolation
D. Only patients receiving invasive procedures

3. Which transmission-based precaution is listed for pulmonary tuberculosis?

A. Contact
B. Droplet
C. Airborne
D. Protective isolation only

4. After adjusting a bedside table without touching the patient, a nurse is about to leave the patient zone. What hand-hygiene indication applies?

A. Only before eating
B. Hand hygiene is unnecessary without direct patient contact
C. After touching patient surroundings
D. Only after visible blood exposure

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Answer key and explanations

1. D - Sterilization

Sterilization includes destruction of bacterial spores.

2. B - Every patient

Standard precautions apply regardless of known infection status.

3. C - Airborne

Pulmonary tuberculosis requires airborne precautions.

4. C - After touching patient surroundings

Patient surroundings can carry microorganisms. The fifth WHO moment covers hand hygiene after touching the patient environment.

Reference: https://www.who.int/publications/m/item/five-moments-for-hand-hygiene

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