

CIC Study Group

Week 9



HAI Prevention Program

Agenda

Review

- Chapter 27 Hand Hygiene
- Chapter 28 Standard Precautions
- Chapter 29 Isolation Precautions
- Chapter 30 Aseptic Technique

Chapter 27

Hand Hygiene

Key Terms

Alcohol-based hand rub: A solution that contains 60-95% isopropyl alcohol and is designed to be applied to hands to reduce the number of viable microorganisms.

Antimicrobial soap: A soap that contains an antiseptic agent.

Antiseptic agents: Antimicrobial substances that are applied to the skin to reduce the number of microbial flora. Examples include alcohols, chlorhexidine, hexachlorophene, iodine, and quaternary ammonium compounds.

Antiseptic hand rub: Applying an antiseptic hand rub product to all surfaces of the hands to reduce the number of microorganisms present without rinsing with water.

Antiseptic handwash: Washing hands with water and soap containing an antiseptic agent.

Hand antisepsis: Either antiseptic handwash or antiseptic hand rub.

Hand hygiene: A general term that applies to handwashing, antiseptic hand rub, or surgical hand antisepsis.

Handwashing: Washing hands with plain soap and water.

Plain soap: Non-antimicrobial soap.

Surgical hand antisepsis: An antiseptic handwash or antiseptic hand rub performed preoperatively by surgical personnel to eliminate transient hand flora and reduce resident hand flora.

Visibly soiled hands: Hands that show visible dirt or that are visibly contaminated with proteinaceous material, blood, or other body fluids.

Background

Hand hygiene has been accepted as the single most important measure to prevent transmission of infection.

- ❖ **Alcohol-based hand sanitizers do not kill bacterial spores.**
- ❖ **Soap and water shows limited efficacy against *Clostridioides difficile*.**
 - ❖ Use of gloves for care of all patients known or suspected to harbor spore-forming organisms is crucial, followed by handwashing, if possible, or by hand hygiene with alcohol if sinks are not easily accessible.
- ❖ **Alcohol-based hand sanitizers have limited efficacy against norovirus.**
 - ❖ During Norovirus outbreak situations, handwashing with soap and water is preferred.



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Recommendations and Reports

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Guideline for Hand Hygiene in Health-Care Settings

**Recommendations of the Healthcare Infection Control Practices
Advisory Committee and the HICPAC/SHEA/APIC/IDSA
Hand Hygiene Task Force**

Recommendations from the *Guideline for Hand Hygiene in Health-Care Settings*

Indications for handwashing and hand antisepsis

- ❖ When hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, wash hands with either a nonantimicrobial soap and water or an antimicrobial soap and water.
- ❖ If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations. Alternatively, wash hands with an antimicrobial soap and water in all clinical situations.
- ❖ Decontaminate hands before having direct contact with patients.
- ❖ Decontaminate hands before donning sterile gloves when inserting a central intravascular catheter.

★ *Decontaminate hands.* To Reduce bacterial counts on hands by performing antiseptic hand rub or antiseptic handwash.

Recommendations from the *Guideline for Hand Hygiene in Health-Care Settings*

Indications for handwashing and hand antisepsis

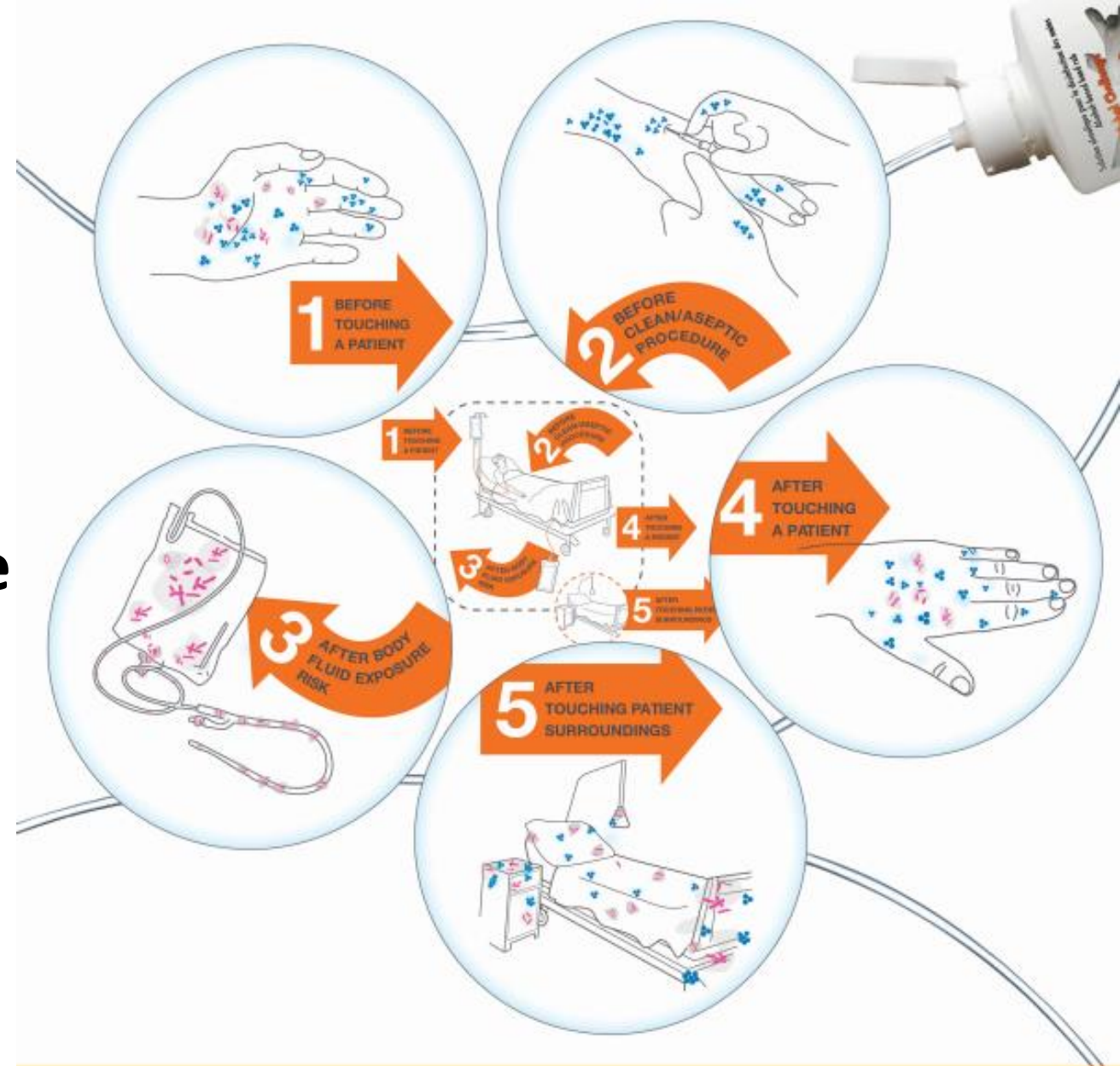
- ❖ Decontaminate hands before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure.
- ❖ Decontaminate hands after contact with a patient's intact skin.
- ❖ Decontaminate hands after contact with body fluids or excretions, mucous membranes, nonintact skin, and wound dressings if hands are not visibly soiled.
- ❖ Decontaminate hands if moving from a contaminated-body site to a clean-body site during patient care.

Recommendations from the *Guideline for Hand Hygiene in Health-Care Settings*

Indications for handwashing and hand antisepsis

- ❖ Decontaminate hands after removing gloves.
- ❖ Before eating and after using a restroom, wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water.
- ❖ Wash hands with non-antimicrobial soap and water or with antimicrobial soap and water if exposure to *Bacillus anthracis* or *Clostridioides difficile* is suspected or proven. Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient.

The 5 Moments for Hand Hygiene



Recommendations from the *Guideline for Hand Hygiene in Health-Care Settings*

Hand Hygiene Technique

- ❖ When decontaminating hands with an alcohol-based hand rub, apply product to the palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Follow the manufacturer's recommendations regarding the volume of product to use.
- ❖ When washing hands with soap and water, wet hands first with water, apply an amount of product recommended by the manufacturer to the hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use a towel to turn off the faucet. Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis.

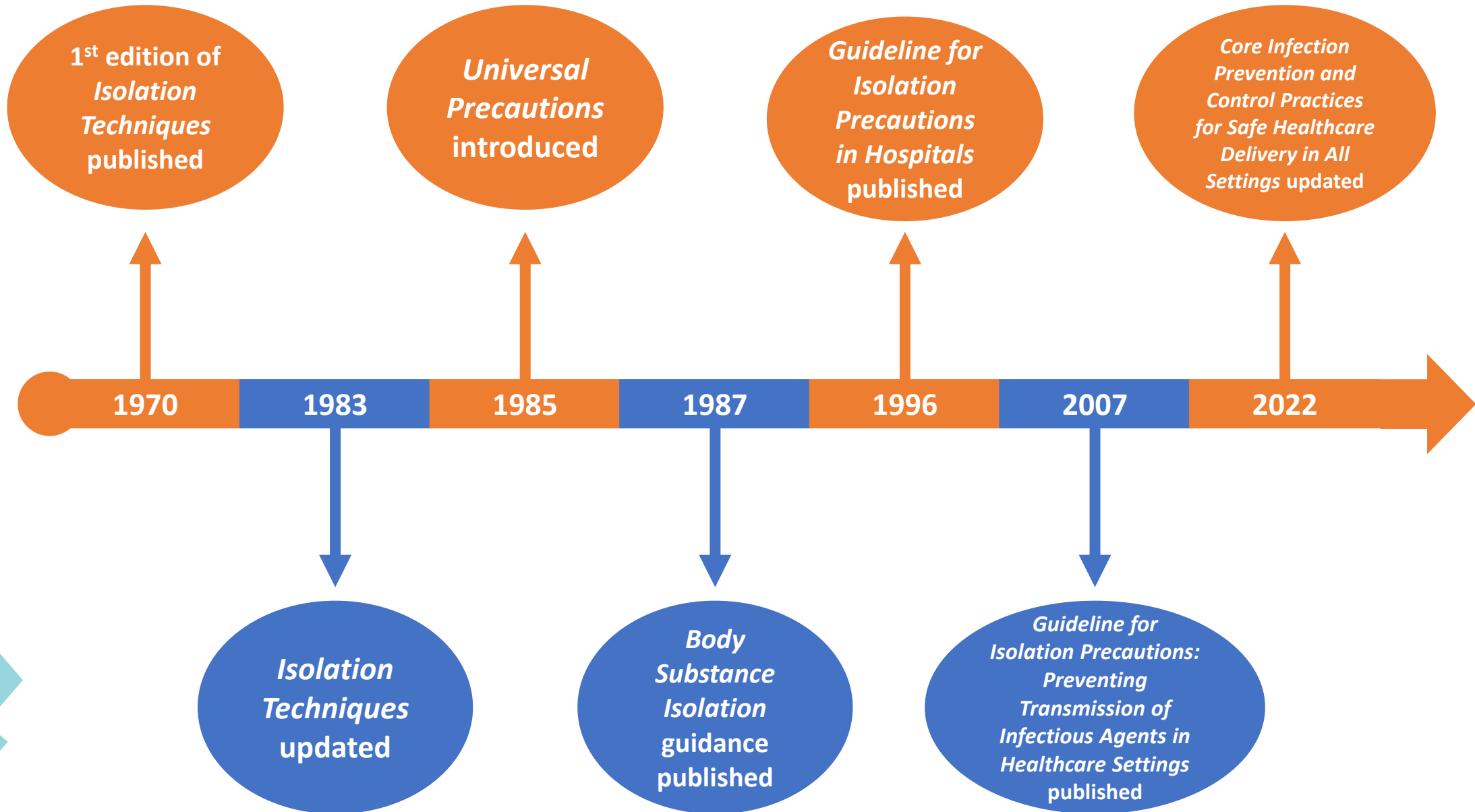
Supplemental Videos: Hand Hygiene Demonstration

- ❖ WHO: How to handrub? With alcohol-based formulation
- ❖ WHO: How to handwash? With soap and water

Chapter 28

Standard Precautions

History of Standard Precautions



Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings – Recommendations of the Healthcare Infection Control Practices Advisory Committee



Preface

The Healthcare Infection Control Practices Advisory Committee (HICPAC) is a federal advisory committee chartered in 1991 to provide advice and guidance to the Centers for Disease Control and Prevention (CDC) and the Secretary of the Department of Health and Human Services (HHS) regarding the practice of infection control and strategies for surveillance, prevention, and control of healthcare-associated infections, antimicrobial resistance and related events in United States healthcare settings. CDC has been developing recommendations for healthcare infection control to prevent infections in patients and healthcare personnel since the 1970's. These recommendations continue to evolve over time as evidence bases are built and serve as a foundation for healthcare safety across settings, a basis for quality improvement efforts, and part of the process that identifies important research gaps.

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

Standard Precautions

❖ Use Standard Precautions to care for all patients in all settings.

Standard Precautions include:

- a. Hand hygiene
- b. Environmental cleaning and disinfection
- c. Injection and medication safety
- d. Risk assessment with use of appropriate personal protective equipment based on activities being performed
- e. Minimizing Potential Exposures (e.g. respiratory hygiene and cough etiquette)
- f. Reprocessing of reusable medical equipment between each patient or when soiled

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

A. Hand Hygiene

- ❖ Require healthcare personnel to perform hand hygiene in accordance with Centers for Disease Control and Prevention (CDC) recommendations.
- ❖ Use an alcohol-based hand rub or wash with soap and water for the following clinical indications:
 - a. Immediately before touching a patient
 - b. Before performing an aseptic task (e.g., placing an indwelling device) or handling invasive medical devices
 - c. Before moving from work on a soiled body site to a clean body site on the same patient
 - d. After touching a patient or the patient's immediate environment
 - e. After contact with blood, body fluids or contaminated surfaces
 - f. Immediately after glove removal
- ❖ Ensure that healthcare personnel perform hand hygiene with soap and water when hands are visibly soiled.
- ❖ Ensure that supplies necessary for adherence to hand hygiene are readily accessible in all areas where patient care is being delivered.

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

B. Environmental Cleaning and Disinfection

- ❖ Require routine and targeted cleaning of environmental surfaces as indicated by the level of patient contact and degree of soiling.
 - a. Clean and disinfect surfaces in close proximity to the patient and frequently touched surfaces in the patient care environment on a more frequent schedule compared to other surfaces.
 - b. Promptly clean and decontaminate spills of blood or other potentially infectious materials.
- ❖ Select EPA-registered disinfectants that have microbiocidal activity against the pathogens most likely to contaminate the patient-care environment.
- ❖ Follow manufacturers' instructions for proper use of cleaning and disinfecting products (e.g., dilution, contact time, material compatibility, storage, shelf-life, safe use and disposal).

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

C. Injection and Medication Safety

- ❖ Prepare medications in a designated clean medication preparation area that is separated from potential sources of contamination, including sinks or other water sources.
- ❖ Use aseptic technique when preparing and administering medications
- ❖ Disinfect the access diaphragms of medication vials before inserting a device into the vial
- ❖ Use needles and syringes for one patient only (this includes manufactured prefilled syringes and cartridge devices such as insulin pens).
- ❖ Enter medication containers with a new needle and a new syringe, even when obtaining additional doses for the same patient.
- ❖ Ensure single-dose or single-use vials, ampules, and bags or bottles of parenteral solution are used for one patient only.
- ❖ Use fluid infusion or administration sets (e.g., intravenous tubing) for one patient only.
- ❖ Dedicate multidose vials to a single patient whenever possible. If multidose vials are used for more than one patient, restrict the medication vials to a centralized medication area and do not bring them into the immediate patient treatment area (e.g., operating room, patient room/cubicle).
- ❖ Wear a facemask when placing a catheter or injecting material into the epidural or subdural space (e.g., during myelogram, epidural or spinal anesthesia).

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

D. Risk Assessment with Appropriate Use of Personal Protective Equipment

- ❖ Ensure proper selection and use of personal protective equipment (PPE) based on the nature of the patient interaction and potential for exposure to blood, body fluids and/or infectious material:
 - a. Wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, non-intact skin, potentially contaminated skin or contaminated equipment could occur.
 - b. Wear a gown that is appropriate to the task to protect skin and prevent soiling of clothing during procedures and activities that could cause contact with blood, body fluids, secretions, or excretions.
 - c. Use protective eyewear and a mask, or a face shield, to protect the mucous membranes of the eyes, nose and mouth during procedures and activities that could generate splashes or sprays of blood, body fluids, secretions and excretions. Select masks, goggles, face shields, and combinations of each according to the need anticipated by the task performed.
 - d. Remove and discard PPE, other than respirators, upon completing a task before leaving the patient's room or care area. If a respirator is used, it should be removed and discarded (or reprocessed if reusable) after leaving the patient room or care area and closing the door.
 - e. Do not use the same gown or pair of gloves for care of more than one patient. Remove and discard disposable gloves upon completion of a task or when soiled during the process of care.
 - f. Do not wash gloves for the purpose of reuse.
- ❖ Ensure that healthcare personnel have immediate access to and are trained and able to select, put on, remove, and dispose of PPE in a manner that protects themselves, the patient, and others

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

E. Minimizing Potential Exposures

- ❖ Develop and implement systems for early detection and management (e.g., use of appropriate infection control measures, including isolation precautions, PPE) of potentially infectious persons at initial points of patient encounter in outpatient settings (e.g., triage areas, emergency departments, outpatient clinics, physician offices) and at the time of admission to hospitals and long-term care facilities (LTCF).
- ❖ Use respiratory hygiene and cough etiquette to reduce the transmission of respiratory infections within the facility.
- ❖ Prompt patients and visitors with symptoms of respiratory infection to contain their respiratory secretions and perform hand hygiene after contact with respiratory secretions by providing tissues, masks, hand hygiene supplies and instructional signage or handouts at points of entry and throughout the facility
- ❖ When space permits, separate patients with respiratory symptoms from others as soon as possible (e.g., during triage or upon entry into the facility).

Recommendations from the *Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings*

F. Reprocessing of Reusable Medical Equipment

- ❖ Clean and reprocess (disinfect or sterilize) reusable medical equipment (e.g., blood glucose meters and other point-of-care devices, blood pressure cuffs, oximeter probes, surgical instruments, endoscopes) prior to use on another patient or when soiled.
 - a. Consult and adhere to manufacturers' instructions for reprocessing.
- ❖ Maintain separation between clean and soiled equipment to prevent cross contamination.

Chapter 29

Isolation Precautions (Transmission-based Precautions)

Contact Precautions

Contact Precautions are used for diseases transmitted by contact with the patient or the patient's environment. Examples of organisms include: VRE, MRSA, C. difficile, C. auris.

- ❖ **Personal protective equipment (PPE):** Wear a gown and gloves on room entry. Change the gown and gloves between patients even if both patients share a room and/or one or both are on Contact Precautions. Always use hand hygiene between glove changes.
- ❖ **Patient placement:** A single room is preferred; however, patients with the same disease or organism may share a room. In cases where there is a shortage of patient rooms, prioritize patient cohorts by conditions that may foster transmission (i.e., uncontained drainage, stool incontinence), giving them priority for single patient room placement.
- ❖ **Patient transport:** Limit patient transport outside the room to medically necessary purposes. Inform the receiving department of the Transmission-based Precaution status of the patient. Cover or contain potentially infectious body fluids before transport. The transporter should discard contaminated PPE before transport. Don clean PPE to handle the patient at the destination.
- ❖ **Environmental measures:** Clean daily with a focus on high touch areas, patient bathrooms, and areas close to the patient. Environmental service workers should don gown and gloves before room entry to clean and disinfect the patient's room. For patients with organisms that are resistant to traditional cleaning methods (e.g., C. difficile, C. auris, Norovirus), bleach may be used as an adjunct to cleaning or as a final wipe down of the frequently touched surfaces.

Droplet Precautions

Droplet Precautions prevent transmission of diseases caused by large respiratory droplets that are generated by coughing, sneezing, or talking. Examples of diseases include Influenza, Pertussis, Meningitis caused by *Neisseria meningitidis*.

- ❖ **Personal protective equipment (PPE):** Wear a surgical mask on room entry. Handle items contaminated with respiratory secretions (e.g., tissues, handkerchiefs) with gloves. Change gloves between patients and perform hand hygiene.
- ❖ **Patient placement:** Facilities should support the empiric use of Droplet Precautions that utilize clinical respiratory syndromes to facilitate timely isolation. Single rooms are preferred; however, patients with the same disease may share a room. Priority should be given to patients with excessive sputum production when single-patient rooms are in short supply. Patients must be spatially separated by at least 6 feet. Draw privacy curtains between patients. Avoid placing immunocompromised patients with patients who are on Droplet Precautions especially if those patients may have adverse outcomes from infection.
- ❖ **Patient transport:** Limit patient transport outside the room to medically necessary purposes. If the patient must leave the room, instruct the patient to wear a surgical mask and follow respiratory hygiene and cough etiquette. Once the patient is masked, the patient transporter does not need to wear a surgical mask. Notify the receiving department of the isolation precautions status.
- ❖ **Environmental measures:** Daily cleaning with hospital-approved disinfectant of high-touch and horizontal surfaces. Environmental services personnel should don a surgical mask before room entry.

Airborne Precautions

Airborne Precautions are used to prevent transmission of infectious organisms that remain suspended in the air and travel great distances due to their small size. Examples of diseases include Measles, Varicella, Pulmonary Tuberculosis, Avian Influenza, and severe acute respiratory syndrome (SARS)-associated coronavirus.

- ❖ **Personal protective equipment (PPE):** Wear a fit-tested National Institute for Occupational Safety and Health (NIOSH)-approved N95 or higher-level respirator for respiratory protection when the patient has suspected or confirmed airborne illness or when undergoing procedures where infectious secretions have potential to be aerosolized.
- ❖ **Patient placement:** Place patients in an airborne infection isolation room (AIIR) with negative air pressure relative to the corridor. There should be at least 6 to 12 air exchanges per hour, and air should be directly exhausted to the outside. Monitor the air pressure daily with visual indicators (e.g., smoke tubes, flutter strips) and electronic methods (e.g., maintenance air exchange reports) when possible. Keep the door closed.
- ❖ **Patient transport:** Limit transport of patients to essential medical purposes. If transport out of airborne infection isolation is necessary, place a surgical mask on the patient and instruct him/her to observe respiratory hygiene and cough etiquette. Do not place an N95 mask on the patient, as this may further hinder their ability to breathe given their compromised respiratory status. Cover exposed skin lesions with clean bandages and/or clean linens. Transport personnel do not need to wear respiratory protection during transport if the patient is masked and all skin lesions are covered.
- ❖ **Environmental measures:** Routine cleaning of high touch surfaces is standard. Environmental services personnel should wear an N95 respirator on room entry. After the patient has left the examination room or the patient room, the room should remain unoccupied for enough time to allow for complete air exchange to occur.

Chapter 30

Aseptic Technique

Key Terms

Asepsis: the process for keeping away disease-producing microorganisms. Implemented to protect the patient by minimizing contamination to reduce the risk for infection.

Medical asepsis (clean technique): refers to practice interventions that reduce the numbers of microorganisms to prevent and reduce transmission risk from one person (or place) to another.

Aseptic Technique vs. Clean Technique

Aseptic Technique involves using barriers such as:

- ❖ Sterile gloves
- ❖ Sterile gowns
- ❖ Surgical masks
- ❖ Sterile drapes

Aseptic Technique should always be performed when placing invasive devices.

Other components of **aseptic technique** include:

- ❖ Appropriate PPE attire
- ❖ Hand hygiene
- ❖ Skin antisepsis
- ❖ Appropriate use of sterile devices/supplies/equipment
- ❖ Environmental cleaning and disinfection

Clean technique refers to medical aseptic practices that use clean and disinfected or **sterile** equipment and supplies to reduce the numbers of microorganisms and minimize the risk of transmission from personnel or the environment to the patient.

Application of **clean technique** includes the following situations:

- ❖ Wound care
- ❖ Placement of intravascular devices such as peripheral venous catheters
- ❖ Respiratory suctioning

*The use of nonsterile vs. sterile gloves for routine changing of surgical site dressings, tracheostomy care, and maintenance of intravascular lines remains an unresolved issue.

Procedure/ Intervention	Hand Hygiene Indicated	Type of Personal Protective Equipment to Be Used*	Supplies Indicated	Instrumentation	✕ Close Table
Wound cleaning	Yes	Clean exam gloves and personal protective equipment as appropriate	Normal saline or prepared sterile wound cleanser. Sterile supplies such as 4 × 4 or cotton applicators	Irrigation performed with sterile device while maintaining clean technique	
Routine dressing changes without debridement	Yes	Clean exam gloves and personal protective equipment as appropriate	Sterile supplies using clean technique	Sterile supplies using clean technique	
Dressing change with mechanical, chemical, or enzymatic debridement	Yes	Clean exam gloves and personal protective equipment as appropriate	Sterile supplies using clean technique	Sterile supplies using clean technique	
Dressing change with sharp, conservative bedside debridement	Yes	Sterile gloves and personal protective equipment as appropriate	Sterile supplies and sterile technique due to the potential for entering new, unaffected tissues	Sterile supplies and sterile technique	
Central line dressing change	Yes	Sterile gloves for removing old dressing and new sterile gloves for dressing change procedure	Sterile dressing change kit and sterile technique; surgeon mask should be worn	Sterile supplies and sterile technique	
Tracheal suctioning where the tracheal suction catheter is not within a closed sheath	Yes	Sterile gloves, use of personal protective equipment, including face shield or mask when suctioning	Sterile suction catheter	Sterile supplies using clean technique	
Tracheostomy care or suctioning with a suction catheter within a closed sheath	Yes	Clean exam gloves and use of personal protective equipment, including face shield or mask	Sterile supplies using clean technique	Sterile supplies using clean technique	

* The CDC and American College of Surgeons have recommended that sterile technique be used for dressing changes performed during the first 24 hours after surgery.^{5,11} The use of sterile gloves should always be considered as a method for preventing the transfer of organisms to the wound site. An individual practice of the provider may include a double-gloving technique that involves removal of the gloves after the debridement before completion of dressing change.

Concept Check

Patients with mycoplasma pneumonia should be cared for using which type of precautions?

1. Standard Precautions
2. Airborne Precautions
3. Droplet Precautions
4. Contact Precautions

A. 1,2

B. 3,4

C. 1,3

D. 1,4

Concept Check

An outbreak of Hepatitis C has occurred in the endoscopy department. Single-dose vials of medication are used in the department and observation of practices shows that the rubber stopper of each vial is wiped with alcohol before access. Medication is drawn up with a needle and syringe set and then administered to the patient. If an added dose is needed, the needle is replaced on the syringe and more medication is drawn up from the vial. If medication remains in the vial, it is stored at the recommended temperature to use on another patient. Healthcare personnel in the clinic had a 40% overall compliance with recommended hand hygiene practices.

Which practice is the most likely cause of the outbreak?

- ☒ A. Use of a single-dose medication vial for more than one patient
- ☐ B. Poor hand hygiene practices
- ☐ C. Contamination of medication through the rubber stopper
- ☐ D. Inadequate cleaning and disinfection of endoscopes

Concept Check

All the following would be considered prevention strategies to reduce the transmission of infections in a healthcare setting except?

- A. Implementing an influenza vaccine program for employees
- B. Educating staff member in PPE usage
- C. Instituting use of bleach for cleaning C. difficile patient rooms
- ☒ D. Decolonization of MRSA-positive patients prior to surgery

Week 10 Assignments

Action Items

Assigned chapter readings:

- Chapter 63: Ophthalmology Services
- Chapter 67: Respiratory Care Services
- Chapter 68: Surgical Services
- Chapter 62: Long Term Care