

Infection Control 2009

**Satellite and Live Webcast
Wednesday, January 21, 2009
11:00 a.m.- 12:30 p.m. (Central Time)**

Produced by the Alabama Department of Public Health
Video Communications and Distance Learning Division

Faculty

**Sharon Thompson BSN, RN
Infection Control Officer
Alabama Department of Public Health**

Objectives

- Define *Clostridium difficile*.
- Discuss the scope of the problem.
- Discuss the treatment options for *Clostridium difficile*.
- Discuss the four major isolation techniques and how to implement them.
- Review basic techniques of Personal Protective Equipment (PPE).

Clostridium Difficile

- Spore-forming, gram positive anaerobic bacillus
- Produces 2 exotoxins
 - A
 - B
- Causes 15 to 25% of all antibiotic-associated diarrhea

Clostridium Difficile

- Causes:
 - Pseudomembranous colitis
 - Toxic megacolon
 - Sepsis
 - Rarely death

C. Difficile

- Symptoms:
 - Watery diarrhea
 - Fever
 - Loss of appetite
 - Nausea
 - Abdominal pain and tenderness

C. Difficile

- **Causes:**
 - Antibiotic exposure
 - Gastrointestinal surgery or manipulation
 - Long length of stay in healthcare setting
 - Serious underlying illness
 - Immunocompromising conditions
 - Advanced age

C. Difficile

- **Diagnosed by:**
 - Stool culture
 - Antigen detection
 - Toxin testing
 - Enzyme immunoassay for both toxin A and B
 - Tissue culture cytotoxicity assay

C. Difficile

- **How transmitted:**
 - Shed in feces of colonized or infected patient
 - Patient may contaminate items in room (via unwashed hands)
 - When the organism is threatened by improper cleaning will form a spore
 - Spores can survive on surfaces for many months

C. Difficile

- **Transmission:**
 - Improperly washed hands of healthcare workers
 - Alcohol does not kill this organism, so hands must be washed with soap and water
 - Improper cleaning of shared patient care items
 - Ineffective cleaning of patient care environment

C. Difficile

- **Treatment:**
 - 23% resolves spontaneously within 2 to 3 days of discontinuing antibiotics
 - 10 day course of either:
 - Metronidazole (Flagyl)
 - Vancomycin

C. Difficile

- **Prevention:**
 - Contact isolation
 - Hand hygiene
 - Patient and family education
 - Environmental cleaning
 - Antimicrobial stewardship

Contact Precautions

- Use for patients with known or suspected infections or evidence of syndromes that represent an increased risk for contact transmission, including colonization or infection with MDROs
 - Vancomycin-Resistant Enterococcus (VRE)
 - Methicillin-Resistant Staphylococcus Aureus (MRSA)

Contact Precautions

- Use for patients with known or suspected infections or evidence of syndromes that represent an increased risk for contact transmission, including colonization or infection with MDROs
 - Clostridium difficile, Respiratory Syncytial Virus

Contact Precautions

- Patient Placement
 - In acute care settings place patients in single patient room
 - Alternatives when single-patient rooms are in short supply
 - Prioritize patients with conditions that may facilitate transmission

Contact Precautions

- Patient Placement
 - Cohort patients in the same room who are infected or colonized with the same pathogen
 - Ensure patients are >3 feet from each other
 - Change protective attire and perform hand hygiene between patients

Contact Precautions

- In long term settings decision made on a case-by-case basis balancing infection risks to other patients in the room and the potential adverse psychosocial impact on the patient
- In ambulatory setting place patients in an examination room or cubicle as soon as possible

Contact Precautions

- Hand hygiene and gloves
 - Observe hand hygiene practices and wear gloves according to Standard Precautions and whenever touching the patient's intact skin or surfaces and articles in close proximity to the patient

Contact Precautions

- **Gowns**
 - Wear gowns whenever you anticipate clothing will have direct contact with patient or potentially contaminated environmental services

Droplet Precautions

- Use for patients known or suspected to be infected with microorganisms transmitted by respiratory droplets (large-particle droplets [>5 microns in size] that can be generated by the patient during coughing, sneezing, talking, or the performance of cough-inducing procedures)

Droplet Precautions

- In acute care settings place patient in single patient room if possible
- In residential care settings, decisions made on a case-by-case basis
- Ambulatory settings place patient in examination room or cubicle as soon as possible

Droplet Precautions

- Wear surgical mask for close patient contact (within 3 feet)
- For patients with suspected SARS or Avian flu wear both eye protection and respiratory protection (NIOSH-approved N95 or higher)
- Limit transport of patient but if necessary the patient wears a surgical mask

Airborne Infection Isolation (All) Precautions

- Use for patients known or suspected to be infected with infectious agents transmitted person-to-person by the airborne route
 - Tuberculosis, measles, chickenpox, smallpox, viral hemorrhagic fevers, and SARS

Airborne Precautions

- **Patient Placement**
 - Acute care hospitals or residential settings
 - Single patient room with monitored negative air pressure
 - At least 6 (existing facility) or 12 (new construction) air exchanges per hour

Airborne Precautions

- **Patient Placement**
 - Acute care hospitals or residential settings
 - Direct exhaust of air to the outside or HEPA filters to the air-handling system serving exclusively the isolation room

Airborne Precautions (All)

- **In ambulatory settings**
 - Place surgical mask on patient immediately and maintain until the patient has been placed in an All room
 - Place patient in exam room at the farthest distance from other patient rooms

Airborne Precautions (All)

- **In ambulatory settings**
 - Once patient leaves, room should remain vacant for the appropriate time according to the number of air exchanges per hour (usually 1 hr.) to allow for full exchange of air

Airborne Precautions

- **Employees wear fit tested N95 respirator when entering the room or home of patient with:**
 - Infectious pulmonary or laryngeal tuberculosis or draining tuberculosis skin lesions
 - Smallpox, viral hemorrhagic fevers, SARS

Airborne Precautions

- **Employees wear nose/mouth protection upon entering room or home of patient with**
 - Measles, varicella, disseminated zoster

Types Of PPE Used In Healthcare Settings

- **Gloves – protect hands**
- **Gowns/aprons – protect skin and/or clothing**
- **Masks and respirators– protect mouth/nose**
 - Respirators – protect respiratory tract from airborne infectious agents

Types Of PPE Used In Healthcare Settings

- Goggles – protect eyes
- Face shields – protect face, mouth, nose, and eyes

Factors Influencing PPE Selection

- Type of exposure anticipated
 - Splash/spray versus touch
 - Category of isolation precautions
- Durability and appropriateness for the task
- Fit

Gloves

- Purpose – patient care, environmental services, other
- Glove material – vinyl, latex, nitrile, other
- Sterile or non-sterile
- One or two pair
- Single use or reusable

Do's And Don'ts Of Glove Use

- Work from “clean to dirty”
- Limit opportunities for “touch contamination” - protect yourself, others, and the environment
 - Don't touch your face or adjust PPE with contaminated gloves
 - Don't touch environmental surfaces except as necessary during patient care

Do's And Don'ts Of Glove Use

- Change gloves
 - During use if torn and when heavily soiled (even during use on the same patient)
 - After use on each patient
- Discard in appropriate receptacle
 - Never wash or reuse disposable gloves

Gowns Or Aprons

- Purpose of use
- Material
 - Natural or man-made
 - Reusable or disposable
 - Resistance to fluid penetration
- Clean or sterile

Face Protection

- **Masks** – protect nose and mouth
 - Should fully cover nose and mouth and prevent fluid penetration
- **Goggles** – protect eyes
 - Should fit snugly over and around eyes
 - Personal glasses not a substitute for goggles
 - Antifog feature improves clarity

Face Protection

- **Face shields** – protect face, nose, mouth, and eyes
 - Should cover forehead, extend below chin and wrap around side of face

Respiratory Protection

- **Purpose** – protect from inhalation of infectious aerosols (e.g., *Mycobacterium tuberculosis*)
- **PPE types for respiratory protection**
 - Particulate respirators
 - Half or full-face elastomeric respirators
 - Powered air purifying respirators (PAPR)

Key Points About PPE

- **Don** before contact with the patient, generally before entering the room
- **Use** carefully – don't spread contamination
- **Remove and discard** carefully, either at the doorway or immediately outside patient room; remove respirator outside room
- **Immediately perform hand hygiene**

Sequence* for Donning PPE

- Gown first
- Mask or respirator
- Goggles or face shield
- Gloves

*Combination of PPE will affect sequence – be practical

How To Don A Gown

- Select appropriate type and size
- Opening is in the back
- Secure at neck and waist
- If gown is too small, use two gowns
 - Gown #1 ties in front
 - Gown #2 ties in back



How To Don A Mask

- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with ties or elastic
- Adjust to fit



How To Don A Particulate Respirator

- Select a fit tested respirator
- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with elastic

How To Don A Particulate Respirator

- Adjust to fit
- Perform a fit check
 - Inhale – respirator should collapse
 - Exhale – check for leakage around face



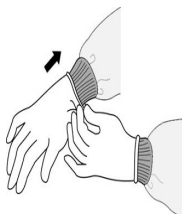
How To Don Eye And Face Protection

- Position goggles over eyes and secure to the head using the ear pieces or headband
- Position face shield over face and secure on brow with headband
- Adjust to fit comfortably



How To Don Gloves

- Don gloves last
- Select correct type and size
- Insert hands into gloves
- Extend gloves over isolation gown cuffs



How To Safely Use PPE

- Keep gloved hands away from face
- Avoid touching or adjusting other PPE
- Remove gloves if they become torn; perform hand hygiene before donning new gloves
- Limit surfaces and items touched

“Contaminated” And “Clean” Areas Of PPE

- **Contaminated – outside front**
 - Areas of PPE that have or are likely to have been in contact with body sites, materials, or environmental surfaces where the infectious organism may reside

“Contaminated” And “Clean” Areas Of PPE

- **Clean – inside, outside back, ties on head and back**
 - Areas of PPE that are not likely to have been in contact with the infectious organism

Sequence For Removing PPE

- **Gloves**
- **Face shield or goggles**
- **Gown**
- **Mask or respirator**

Where To Remove PPE

- **At doorway, before leaving patient room or in anteroom***
- **Remove respirator outside room, after door has been closed***

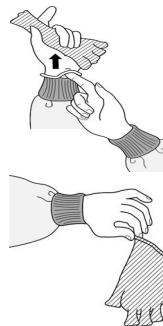
* Ensure that hand hygiene facilities are available at the point needed, e.g., sink or alcohol-based hand rub

How To Remove Gloves (1)



- **Grasp outside edge near wrist**
- **Peel away from hand, turning glove inside-out**
- **Hold in opposite gloved hand**

How To Remove Gloves (2)



- **Slide ungloved finger under the wrist of the remaining glove**
- **Peel off from inside, creating a bag for both gloves**
- **Discard**

Remove Goggles Or Face Shield



- Grasp ear or head pieces with ungloved hands
- Lift away from face
- Place in designated receptacle for reprocessing or disposal



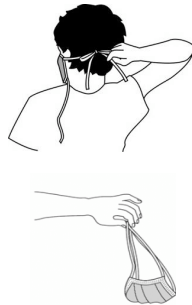
Removing Isolation Gown

- Unfasten ties
- Peel gown away from neck and shoulder
- Turn contaminated outside toward the inside
- Fold or roll into a bundle
- Discard



Removing A Mask

- Untie the bottom, then top tie
- Remove from face
- Discard



Removing A Particulate Respirator

- Lift the bottom elastic over your head first
- Then lift off the top elastic
- Discard



PPE For Standard Precautions (1)

- **Gloves** – Use when touching blood, body fluids, secretions, excretions, contaminated items; for touching mucus membranes and nonintact skin
- **Gowns** – Use during procedures and patient care activities when contact of clothing/ exposed skin with blood/body fluids, secretions, or excretions is anticipated

PPE For Standard Precautions (2)

- **Mask and goggles or a face shield** – Use during patient care activities likely to generate splashes or sprays of blood, body fluids, secretions, or excretions

PPE For Expanded Precautions

- Expanded precautions include
 - Contact precautions
 - Droplet precautions
 - Airborne infection isolation

Use Of PPE For Expanded Precautions

- Contact precautions – Gown and gloves for contact with patient or environment of care (e.g., medical equipment, environmental surfaces)
 - In some instances these are required for entering patient's environment
 - Negative pressure isolation room also required

Use Of PPE For Expanded Precautions

- Droplet precautions – Surgical masks within 3 feet of patient
- Airborne infection isolation – Particulate respirator*

*Negative pressure isolation room also required

PPE Use In Healthcare Settings: Final Thoughts

- PPEs are available to protect you from exposure to infectious agents
- Know what type of PPE is necessary for the duties you perform and use it correctly

Questions?

Contact:
sthompson@adph.state.al.us
334-206-5932