

Clostridioides difficile Infection: Preventing Transmission



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Learning Objectives

- Describe how *Clostridioides difficile* infection (CDI) transmission occurs in health care settings
- Apply basic strategies to prevent CDI transmission in health care settings



Impact on Patients and Health Care Facilities

- Illness
 - May be self-limiting to life-threatening
- Increased length of stay
- Additional costs to treat
- Financial penalty



(Image source: Antibiotic Resistance Threats in the United States, CDC, 2013; Guide to Preventing Clostridioides difficile Infections, APIC, 2013)



How Transmission Happens

- Patient skin and environment (especially bed and toilet areas) of a patient with *C. diff* become contaminated with *C. difficile*
- *C. diff* spores make pathogen removal difficult
- Bacteria and spores are passed to other patients (i.e. by healthcare personnel hands and ingested) by health care personnel hands, shared equipment and contaminated surfaces



Strategies to Prevent Transmission

- Identify CDI early
 - Clinically significant diarrhea
- Initiate Contact Precautions (i.e. private room, dedicated equipment, frequent cleaning, gloves and gown upon entry) promptly
- Promote strict glove use and hand hygiene
- Ensure appropriate cleaning and disinfection of equipment and environment

(Dubberke ER, Infect Control Hosp Epidemiol, 2014)



Contact Precautions

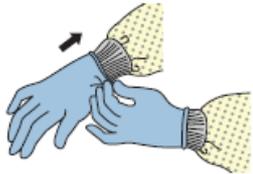
- Place patients with known or suspected CDI on Contact Precautions
- Gown and gloves, following Contact Precautions protocol
- Private room, if possible, with dedicated bathroom/commode and other equipment e.g. Blood Pressure cuff
- Maintain Contact Precautions for duration of CDI illness



(Dubberke ER, Infect Control Hosp Epidemiol, 2014)



Strict Glove Use



- Glove use is essential when caring for patients with CDI
- Gloves offer the best protection against *C. diff* transmission
- Change gloves during patient care if:
 - Gloves become contaminated during patient care
 - Moving from a “dirty” to “clean” patient care activity
 - Clean hands before reaching into a box of clean gloves
- **Remember:** it’s important to avoid contaminating the environment and yourself with soiled gloves

(Image source: Sequence for putting on PPE, CDC. Dubberke ER, Medscape, 2015; Guide to Preventing Clostridium difficile Infections, APIC, 2013)



Hand Hygiene

- Clean hands prior to entering patient environment
 - Alcohol-based hand rub (ABHR) unless hands are visibly soiled
- Clean hands immediately after glove removal
- Clean hands prior to leaving patient's environment
 - ABHR or soap and water
- **Remember:** ABHR is a preferred measure unless hands are visibly soiled

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

⌚ Duration of the entire procedure: 20-30 seconds



(Image source: *Hand Hygiene: Why, How & When?*, WHO, 2009. Dubberke ER, *Infect Control Hosp Epidemiol*, 2014)



Patient Equipment and Environment

- Single-use patient or disposable supplies are preferred
- Equipment and supplies dedicated to a patient with CDI
- For shared equipment and the environment: What's the plan for cleaning and disinfection?
 - Refer to manufacturers' instructions
 - Standard hospital disinfectant for non-outbreak situations
 - Responsibility

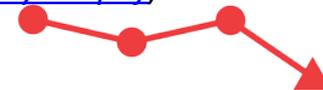


An Example of a Responsibility Framework

Item	Standard	Method	Responsible
Crash cart	When visibly soiled or dusty	Disinfectant wipe	Environmental services (EVS)
Exam lights	After use	Disinfectant wipe	Clinical Staff
Feeding pumps	Discharge	Hospital-approved disinfectant	EVS
Computer keyboard	When visibly soiled or dusty; regular intervals	Disinfectant wipe; IT-approved method	User; EVS
Glucose meter	After each use	Hospital-approved disinfectant	User
Isolettes	Between patients; weekly	Disinfectant wipe	Nursing
Vital sign machine	Between patients	Disinfectant wipe	Nurse assistant

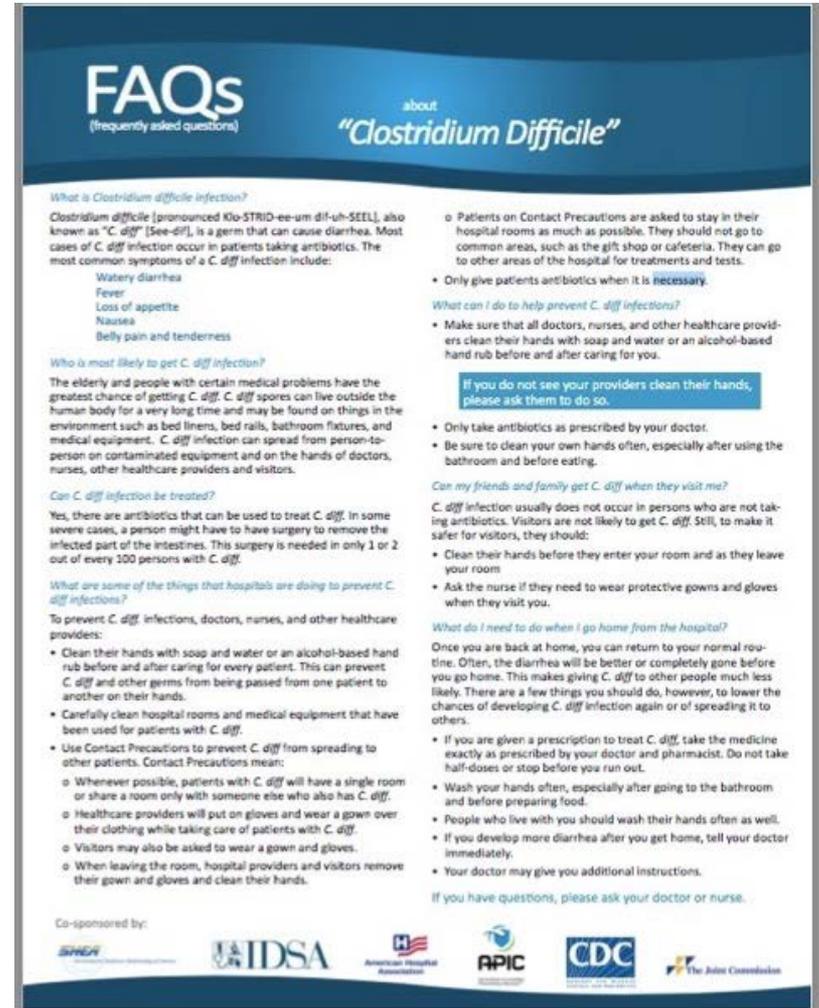
(Adapted from: Shore Health System, University of Maryland.)

http://apic.org/Resource_/TinyMceFileManager/Resources/Equipment-cleaning-policy-LD.pdf



Engaging Patients and Families

- Antimicrobial awareness
- Hand hygiene
 - “If you do not see health care providers clean their hands, please ask them to do so.”
- Visitors



FAQs
(frequently asked questions)

about
“Clostridium Difficile”

What is Clostridium difficile infection?
Clostridium difficile (pronounced Kloo-STRID-ee-um dif-uh-SEEL), also known as “C. diff” [See-diff], is a germ that can cause diarrhea. Most cases of C. diff infection occur in patients taking antibiotics. The most common symptoms of a C. diff infection include:
Watery diarrhea
Fever
Loss of appetite
Nausea
Belly pain and tenderness

Who is most likely to get C. diff infection?
The elderly and people with certain medical problems have the greatest chance of getting C. diff. C. diff spores can live outside the human body for a very long time and may be found on things in the environment such as bed linens, bed rails, bathroom fixtures, and medical equipment. C. diff infection can spread from person-to-person on contaminated equipment and on the hands of doctors, nurses, other healthcare providers and visitors.

Can C. diff infection be treated?
Yes, there are antibiotics that can be used to treat C. diff. In some severe cases, a person might have to have surgery to remove the infected part of the intestines. This surgery is needed in only 1 or 2 out of every 100 persons with C. diff.

What are some of the things that hospitals are doing to prevent C. diff infections?
To prevent C. diff. infections, doctors, nurses, and other healthcare providers:
• Clean their hands with soap and water or an alcohol-based hand rub before and after caring for every patient. This can prevent C. diff and other germs from being passed from one patient to another on their hands.
• Carefully clean hospital rooms and medical equipment that have been used for patients with C. diff.
• Use Contact Precautions to prevent C. diff from spreading to other patients. Contact Precautions mean:

- Whenever possible, patients with C. diff will have a single room or share a room only with someone else who also has C. diff.
- Healthcare providers will put on gloves and wear a gown over their clothing while taking care of patients with C. diff.
- Visitors may also be asked to wear a gown and gloves.
- When leaving the room, hospital providers and visitors remove their gown and gloves and clean their hands.

- Patients on Contact Precautions are asked to stay in their hospital rooms as much as possible. They should not go to common areas, such as the gift shop or cafeteria. They can go to other areas of the hospital for treatments and tests.

What can I do to help prevent C. diff infections?
• Only give patients antibiotics when it is **necessary**.
• Make sure that all doctors, nurses, and other healthcare providers clean their hands with soap and water or an alcohol-based hand rub before and after caring for you.
If you do not see your providers clean their hands, please ask them to do so.
• Only take antibiotics as prescribed by your doctor.
• Be sure to clean your own hands often, especially after using the bathroom and before eating.

Can my friends and family get C. diff when they visit me?
C. diff infection usually does not occur in persons who are not taking antibiotics. Visitors are not likely to get C. diff. Still, to make it safer for visitors, they should:
• Clean their hands before they enter your room and as they leave your room
• Ask the nurse if they need to wear protective gowns and gloves when they visit you.

What do I need to do when I go home from the hospital?
Once you are back at home, you can return to your normal routine. Often, the diarrhea will be better or completely gone before you go home. This makes giving C. diff to other people much less likely. There are a few things you should do, however, to lower the chances of developing C. diff infection again or of spreading it to others.
• If you are given a prescription to treat C. diff, take the medicine exactly as prescribed by your doctor and pharmacist. Do not take half-doses or stop before you run out.
• Wash your hands often, especially after going to the bathroom and before preparing food.
• People who live with you should wash their hands often as well.
• If you develop more diarrhea after you get home, tell your doctor immediately.
• Your doctor may give you additional instructions.

If you have questions, please ask your doctor or nurse.

Co-sponsored by:
NIH/NIAID, IDSA, American Hospital Association, APIC, CDC, The Joint Commission

(CDC, 2015. https://www.cdc.gov/HAI/pdfs/cdiff/Cdiff_tagged.pdf)



Patient Scenario

- Previously healthy 75-year-old woman named Mrs. Wilkins suffered a hip fracture
- Post-operatively, she developed a catheter-associated urinary tract infection and was placed on ciprofloxacin
- On day five, she was transferred from the orthopedics unit to inpatient rehab
- She began having severe surgical site pain along with watery diarrhea
- She was diagnosed with CDI and transferred to a surgical ward for suspected post-op infection
- A need for Contact Isolation was not conveyed to the receiving unit

Disclaimer: All case studies are hypothetical and not based on any actual patient information. Any similarity between a case study and actual patient experience is purely coincidental.



Barriers and Strategies: Communication

- **Barrier:** Communication issues among staff
 - When patient is transferred between nursing units
 - When transferred to lower or higher level of care
 - When patient leaves the unit
 - Leaves for therapy, radiological exams, etc.
 - When patient moves among disciplines
 - Surgery and rehabilitation services
- **Strategy:** Clear patient hand-off communication
 - “Ticket to Ride” or other visual alert
 - Build alerts into the electronic medical record



Barriers and Strategies: Cleaning and Disinfecting

- **Barrier:** Improper room and equipment cleaning and disinfection
- **Strategy:** Standardize and clearly define cleaning and disinfection procedures
 - Who is responsible for what?
 - Educate those responsible
 - Use checklists

3 EAST ALL		SCOPE OF SERVICE			MIN	
BREAK	CLOCK IN:	Clock in & report to coordinator	break		15	
A 9:45a B 10:00a	GET:	Phone:6663;Recap Sheet;Keys	lunch		30	
LUNCH	LOGIN:	Section: # Zone: 31	Huddle		15	
A 12:30P B 1:00P	SET UP	CART # 5 In EVS 3150	SETUP		10	
#	RM #	DAILY	ROOM NAME	D/C	ISOL	
1	Charge Nur.	A	GET REPORT			1
2	HALLS	A	POLICE 3 EAST HALLS			3
3	LOBBY	A	PUBLIC SIDE ELEVATOR LOBBY			5
4	LOBBY	A	PUBLIC SIDE ELEVATOR FRONT			3
5	3167 F	A	NURSES STATION FRONT			10.6
6	3147	A	Clean Supply FRONT			3
7	3145	A	TEAM BATHROOM BY 3101			5
8	3101	A	Patient Room & Bath			10.6
9	3102	A	Patient Room & Bath			10.6
10	3103	A	Patient Room & Bath			10.6
11	3104	A	Patient Room & Bath			10.6
12	3105	A	Patient Room & Bath			10.6
13	3106	A	Patient Room & Bath			10.6
14	3107	A	Patient Room & Bath			10.6
15	3108	A	Patient Room & Bath			10.6
16	3109	A	Patient Room & Bath			10.6
17	3110	A	Patient Room & Bath			10.6
18	3111	A	Patient Room & Bath			10.6
19	3112	A	Patient Room & Bath			10.6
20	3113	A	Patient Room & Bath			10.6
21	3114	A	Patient Room & Bath			10.6
22	3115	A	Patient Room & Bath			10.6
23	3116	A	Patient Room & Bath			10.6
24	3117	A	Patient Room & Bath			10.6
25	3118	A	Patient Room & Bath			10.6
26	3119	A	Patient Room & Bath			10.6
27	3120	A	Patient Room & Bath			10.6
28	3167 B	B	NURSES STATION BACK			10.6
29	3166 A	B	Office BACK			3
30	3166 B	B	Office BACK			3
31	3164 F	B	Clean Supply BACK			3

(Guide to Preventing Clostridium difficile Infections, APIC, 2013)



Barriers and Strategies: Contact Precaution Compliance

- **Barrier:** Poor compliance with Contact Isolation

- **Strategy:** Multidisciplinary approach
 - Champions from multiple disciplines
 - Enlist frontline staff to better understand barriers
 - Use audits and feedback



Key Messages

- CDI can be passed by the hands of health care personnel, by shared patient equipment and by contaminated surfaces
- Strict glove use, Contact Isolation with disposable and/or dedicated patient equipment and attention to environmental cleaning will prevent transmission
- Barriers are common; consider strategies to work together to reduce patient risk



References

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Speaker Notes



Speaker Notes: Slide 1

Welcome to the third module on *Clostridioides difficile* infection, or CDI. This module will discuss preventing transmission of the disease within health care settings.



Speaker Notes: Slide 2

This module was developed by nation infection prevention experts devoted to improving patient safety and infection prevention efforts.



Speaker Notes: Slide 3

Module 1, The Overview of CDI, discussed how antimicrobial stewardship is key to decrease risk of CDI if transmission occurs. Module 2 took a deep dive into appropriate prescribing and testing. This module will focus on decreasing the risk of transmission.

After completing this module, you will be able to describe how *C. diff* transmission occurs in health care settings and then apply basic strategies to prevent *C. diff* transmission. In addition, we will outline common barriers and offer strategies to effectively overcome these barriers.



Speaker Notes: Slide 4

Keeping our patients safe by preventing CDI is necessary when providing care in the hospital or in other health care settings. As you know, CDI can be serious and life-threatening. Patients at the greatest risk are those being treated with antibiotics and those who are hospitalized. CDI-associated costs and increased length of stay tie into the impact CDI has on patients and health care facilities. The cost to treat one CDI is estimated to be \$35,000. Additionally, health care facilities may incur financial penalties if they have a high incidence of healthcare-acquired CDI.



Speaker Notes: Slide 5

Transmission of *C. diff* is similar to other pathogens spread by contact; the patient and patient's environment become contaminated and can spread to other patients. The presence of spores makes removal of *C. diff* even more difficult, although not impossible. *C. diff* can be passed on to other patients by health care personnel's hands, shared equipment or any other contaminated surfaces within the environment. Additionally, transfers of care and insufficient communication can increase the risk of *C. diff* transmission as Contact Precautions may not be promptly instituted.



Speaker Notes: Slide 6

There are several key strategies to prevent the transmission of *C. diff* in health care settings.

The first is to promptly identify patients that are at risk for having CDI. As we discussed in Module 2, these would be patients with clinically significant diarrhea without another recognized cause. Early identification will lead to earlier treatment and reduce the chance for transmission. More details on testing can be found in Module 2, CDI Antibiotic and Testing Stewardship.



Speaker Notes: Slide 6 Continued

Second is to place patients on Contact Precautions as soon as CDI is suspected. This should include consistent and correct glove use during patient care and contact with the patient's environment. Consistent glove use has been shown to reduce transmission of *C. diff*. Similarly, good hand hygiene is crucial. For more strategies on promoting effective hand hygiene at your facility, review the Foundational Infection Prevention Strategies course on Hand Hygiene. Good hand hygiene is essential for providing safe and quality care to all patients.

Lastly, proper equipment and environmental cleaning and disinfection will help to reduce the likelihood of *C. diff* transmission through shared equipment and high-touch surfaces.



Speaker Notes: Slide 7

As mentioned in the Personal Protective Equipment, or PPE, modules, Standard Precautions are used for all patients, regardless of diagnosis. If a patient has diagnosed or suspected CDI, it's essential that they are placed on Contact Precautions right away. Patients that just begin to exhibit symptoms before treatment have already begun to shed *C. diff* spores.

Appropriate signage at the point of entry, along with the needed PPE supplies, are key to ensuring proper Contact Precautions are followed. Signs at the door or door flags are common methods to clearly indicate patients are on Contact Precautions.



Speaker Notes: Slide 7 Continued

Are the health care personnel at your facility properly following your policy for patients on Contact Precautions? Competency-based trainings to health care personnel on proper PPE use and routine audits of adherence to Contact Precautions will help identify gaps. Consider sharing audit outcomes with facility leadership to identify opportunities for improvement to further reduce CDI rates.



Speaker Notes: Slide 7 Continued

In addition, a private room with its own dedicated bathroom is preferred. Depending on your facility, this may present a challenge. Cohorting of patients may be done with the understanding that gown and gloves must be changed between patients along with hand hygiene.

Remember, Contact Precautions should be maintained during the duration of CDI illness.



Speaker Notes: Slide 8

Glove use is essential when caring for patients with CDI or working in their environment. Gloves, when used correctly, offer the best protection against *C. diff* transmission. It's important to remember the basics of glove use and Standard Precautions—if gloves become contaminated, especially with feces in the case of CDI patients, they must be changed. If moving from a dirty to a clean patient care activity, gloves must also be changed. Remember that health care personnel must avoid contaminating the environment with soiled gloves. Additionally, caution must be taken when removing gloves after patient care. Detailed information on doffing PPE, including gloves, can be found in Foundational Elements of PPE.



Speaker Notes: Slide 9

The Hand Hygiene modules provide detailed information of this essential component of safe patient care. Hand hygiene must be done prior to entering the patient's environment, after glove removal, and before leaving the patient's environment. Care should be taken to avoid contaminating hands during PPE removal prior to leaving a patient's room. It's important to remember that neither alcohol-based hand rub (ABHR) nor soap and water are completely effective in removing *C. diff* spores. For that reason, proper glove use is especially important.



Speaker Notes: Slide 9 Continued

Hand hygiene should be done per your facility's policy. ABHR is a preferred measure in normal circumstances, but soap and water is a preferred measure when there are high endemic CDI rates or a CDI outbreak. This is discussed in further detail in the Tier 2 CDI enhanced prevention measures module.



Speaker Notes: Slide 10

Since patient equipment comes into contact with the patient and their environment, it may become contaminated with *C. diff*. To prevent transmission, it's preferred to utilize single-use or disposable supplies whenever possible. Examples of commonly used equipment for which single-use patient supplies may be substituted are stethoscopes and blood pressure cuffs. Those come into contact with the patient, but may remain in the patient's room until no longer needed. As rectal thermometers have been linked to CDI outbreaks, their use should be avoided.



Speaker Notes: Slide 10 Continued

For shared patient equipment and the environment, there must be a plan for cleaning and disinfection. Routine competency-based training should be included to maintain assurances that this is being done appropriately. This is further discussed in the CDI Module, Monitoring Compliance and Improvement. Are surfaces being cleaned and disinfected as they should be with standard hospital disinfectants?

If CDI rates are high, Society for Healthcare Epidemiology of America (SHEA) and Infectious Diseases Society of America (IDSA) guidelines recommend assessing adherence to protocols for basic cleaning and disinfection before deciding to change



Speaker Notes: Slide 10 Continued

products—including a sporicidal or bleach product (see EPA list K: <https://www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-Clostridioides>).

Lastly, it must be clearly stated who is responsible for the cleaning and disinfection of equipment. Environmental cleaning is often the responsibility of environmental services, but what about the equipment only used by nursing? A responsibility framework can provide clear details on who is responsible for what, by what means and how often.



Speaker Notes: Slide 11

This is an example of what a responsibility framework might look like. The list of noncritical items for any health care facility will be more comprehensive and the method for cleaning and disinfection may differ from what's shown here. When developing a framework, all stakeholders must be represented. If your facility doesn't have a similar framework, this may be an opportunity to collaborate and streamline processes.



Speaker Notes: Slide 12

Patients and families are encouraged to become partners in their health care experiences and can help prevent CDI transmission. For *C. diff*, being aware of the risks related to antibiotic use should be included when communicating with patients and families. This FAQ sheet was developed and endorsed by several organizations and provides information that can be distributed to patients and families. It can be accessed on the CDC website.



Speaker Notes: Slide 12 Continued

This FAQ sheet also addresses the importance of hand hygiene and encourages patients and families to speak up if they do not see their health care provider clean their hands. Information for visitors is also included. While it's unlikely that visitors will contract CDI, they should also practice good hand hygiene and staff should ensure that visitors adhere to facility-specific guidelines for additional recommendations on PPE. This FAQ sheet also provides guidance on what patients should do after they are discharged from the hospital or health care facility.



Speaker Notes: Slide 13

Let's discuss a patient care scenario that might happen in your facility and some common barriers along with strategies. A previously healthy 75-year-old woman named Mrs. Wilkins suffered a hip fracture and post-operatively developed a catheter-associated urinary tract infection (CAUTI), she is placed on ciprofloxacin. On day five, she was transferred from the orthopedics unit to inpatient rehab and the following day, she began having severe surgical site pain along with watery diarrhea. She was diagnosed with CDI and transferred to a surgical ward for suspected post-op infection. Unfortunately, the need for Contact Precautions was not conveyed to the receiving unit.



Speaker Notes: Slide 13 Continued

Although the patient was initially placed on Contact Isolation, the reason for transfer was related to her surgical site. There was a gap when conveying the need for Contact Precautions. This lapse in communication placed the other patients at risk, since the patient was not isolated upon arrival.



Speaker Notes: Slide 14

In the scenario, the barrier to following CDI transmission prevention was lack of proper Contact Isolation due to impaired hand-off communication. When patients move about the health care facility or between facilities, there is a risk that information could be incorrectly transmitted or missed completely. Strategies to overcome incomplete patient handoffs include clear verbal communication; a paper notice accompanying the patient or other type of visual alert to indicate that Contact Precautions are in effect. An alert in the electronic medical record could specify the need for Contact Isolation as well.



Speaker Notes: Slide 15

Another barrier is improper cleaning and disinfection procedures. It's critical to delineate and define who is responsible for cleaning which items. Checklists are useful to ensure all items are included in the cleaning and disinfection process.



Speaker Notes: Slide 16

A final issue that can hinder CDI prevention is the common issue of poor compliance with Contact Isolation. If a lapse is observed, it's important to be able to address that person in a non-confrontational way. What's the reason behind not following Contact Isolation? Are supplies not available? Is the sign not visible? Is staff unclear on what type of PPE is needed for Contact Precautions?



Speaker Notes: Slide 16 Continued

These issues are much easier to remedy if health care personnel do not see the risk associated with CDI transmission. It's for that reason that a multidisciplinary approach will be most effective. Recruit champions to address their peer group of nurses, physicians, patient care assistants, physical therapists and others. Get an idea of what barriers exist specific to each discipline and unit—and what can be done to improve compliance and change the local culture. Use audits and feedback to track and share improvements and goals.



Speaker Notes: Slide 17

As we wrap up this module, I would like to leave you with a few key take-home messages. First, CDI can be passed from one patient to another by the hands of health care personnel, by shared patient equipment or by contaminated surfaces. Second, it is important to promote strict glove use, implement Contact Isolation promptly with disposable and/or dedicated patient equipment and attention to environmental cleaning to prevent transmission of *C. diff*. Finally, barriers are common when implementing new efforts, so consider strategies to work together to reduce the risk of CDI transmission to patients.



Speaker Notes: Slide 18

No notes.

