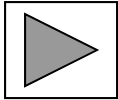
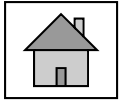


Clostridium *difficile* Infection

Sharp Health Care

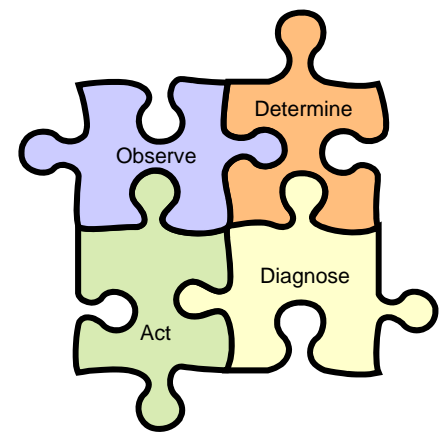


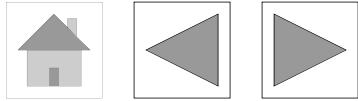


Nursing management of the hospitalized patient at risk for *Clostridium difficile* infection:

Reducing hospital transmission of infection using a nurse driven screening/testing protocol

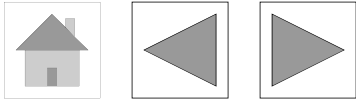
This module has 59 slides





Menu

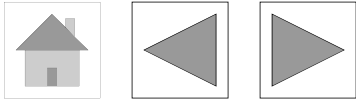
Targeted Learners
Purpose of Education
Objectives
Scope of Practice
The Scientist Role
The Leader Role
The Practitioner Role
Transfer of Knowledge
Key Scientific Points
References



Targeted Learners

This self-learning module (SLM) is designed to provide education for nurses who are direct care providers of hospitalized patients regarding *Clostridium difficile* infection.

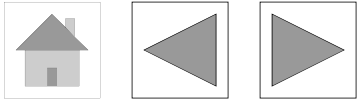




Purpose of this Education

To provide nurses with the following knowledge in order to establish a standardized nursing practice for managing hospitalized patients at risk for *Clostridium difficile* infection (CDI) including the:

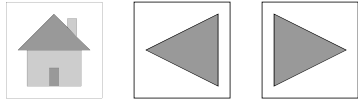
- Pathogenesis of CDI
- Identification and assessment of patients at risk for CDI
- Taxonomy of stool using a stool classification chart to assist in assessing patient symptoms
- Infection prevention practices for patients suspected or positive for CDI



Objectives

After completing this SLM, the nurse will with 100% accuracy be able to:

- List five patient risk factors for CDI
- Assess the patient for risk factors and symptoms of CDI
- Identify stool character using a stool chart and document stool pattern
- Demonstrate infection prevention practices specific to CDI during care of a CDI patient



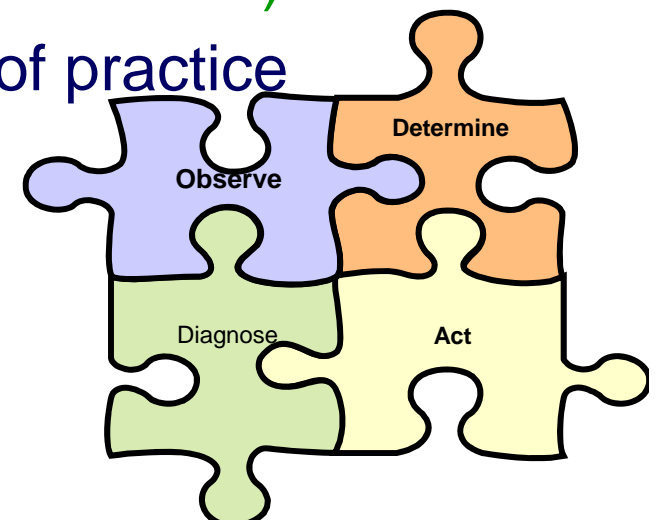
Scope of Practice

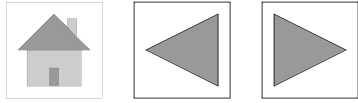
The assessment and testing process for patients at risk for CDI is an interdependent scope of practice function under California BRN Scope of Practice Act 2725

It is within a nurse's scope of practice to:

- **Observe** (for signs/symptoms of illness),
- **Determine** (if these signs/symptoms are abnormal) and
- **Act** (implement appropriate reporting or referral)

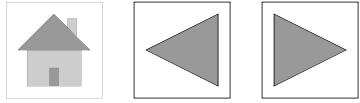
Diagnosis is within the physician scope of practice





Scope of Practice – Interdependent Nursing Functions

- Occurs when nurses undertake activities which may overlap the practice of medicine
- Nurses can implement standardized procedures when he or she determines via observation and assessment that abnormal characteristics exist
- A standardized procedure allows implementation or treatment changes based on these abnormal characteristics
- The final diagnostic piece remains within the medical scope

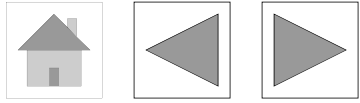


Scope of Practice – Roles of the Nurse

Nursing practice encompasses four sub roles:

- Scientist
- Leader
- Practitioner
- Knowledge Transfer

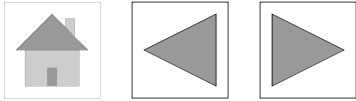
This module guides the nurse in each of the roles and explains how to manage the hospitalized patient with CDI risk factors.



The Scientist Role

Nurses need to have the scientific, evidence-based knowledge in microbiology, disease pathogenesis, patient risk factors and how the infections are transmitted to be able to prevent further infections with *Clostridium difficile*.

The Scientist role incorporates assessment, data collection, and knowledge of scientific basics.



What is *Clostridium difficile*?

Clostridium difficile is an anaerobic, gram-positive, spore-forming bacillus found in the stool

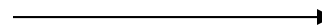
Toxin-producing strains of *C. difficile* can cause infection and illness including:

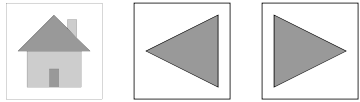
- Mild - Moderate diarrhea
- Pseudomembranous colitis



The *C. difficile* Spore

Pseudomembranous
colon on autopsy

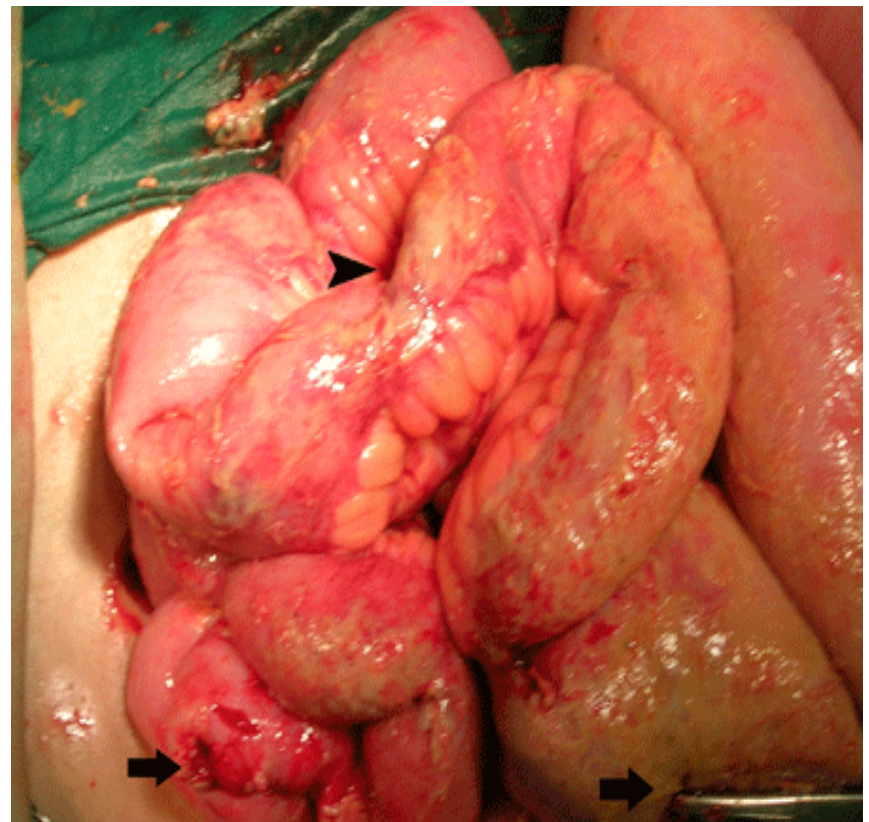
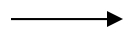


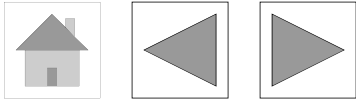


Or...more severe outcomes, such as:

- Sepsis
- Toxic dilatation of the colon (megacolon)
- Death

Megacolon
on autopsy





Pathogenesis of CDI

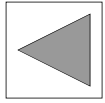
Remember: C. difficile is a fecal organism and CDI is spread via the fecal-oral route

Patients ingest the bacteria into their stomachs

It is not normally found in intestines



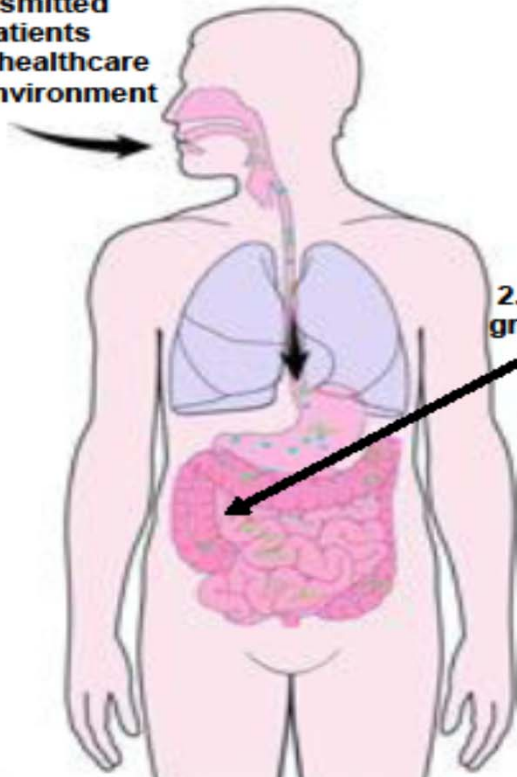
Clostridium Difficile Infection



Background: Pathogenesis of CDI



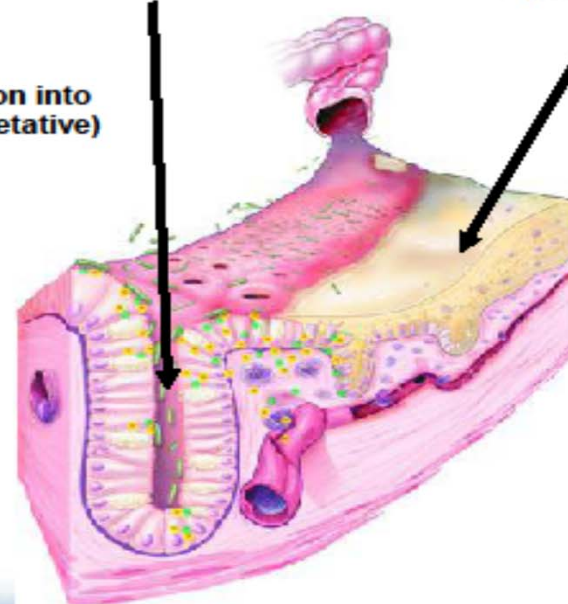
1. Ingestion of spores transmitted from other patients via the hands of healthcare personnel and environment



2. Germination into growing (vegetative) form

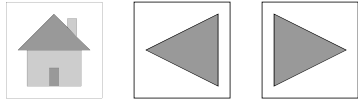
3. Altered lower intestine flora (due to antimicrobial use) allows proliferation of *C. difficile* in colon

4. Toxin A & B Production leads to colon damage +/- pseudomembrane



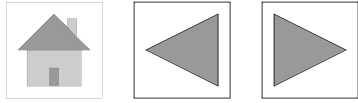
Sunenshine et al. Cleve Clin J Med. 2006;73:187-97.

SAFER • HEALTHIER • PEOPLE™



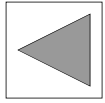
Patient Risk Factors for *C. difficile* infection

- Exposure to antibiotics or antineoplastics in the previous 60 days
- Advanced age (>65 years)
- Previous hospitalization within the previous 60 days
- Resident of a skilled nursing facility (SNF)
- History of previous *C. difficile* infection



Major Reservoirs of *C. difficile* in the Hospital

- The environment (*inanimate objects in patient surroundings*)
- Infected humans (*symptomatic and asymptomatic*)



Environmental Transmission

C. *difficile* can survive for a long time on surfaces:

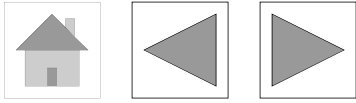
The bacteria assumes a spore form that is a protective mechanism making it impenetrable by many disinfectants

Contaminated hands of healthcare workers:

Unwashed hands pick up the spore and spread it from surface to surface

Patients touch contaminated surfaces then touch their mouth

OR...

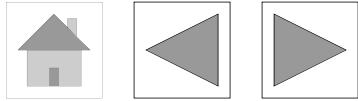


...the healthcare worker can acquire or transmit *C. difficile* from contact with contaminated surfaces

Contaminated hands can transmit the bacteria to the patient's mouth during patient care activities such as:

- *suctioning*
- *oral care*
- *emergency intubation*
- *feeding*





The Role of the Patient in Transmission

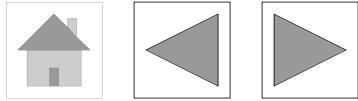
Symptomatic patients (those with diarrhea) shed *C. difficile* easily into the environment

– especially when incontinent

Asymptomatic carriers (those without diarrhea) can still shed *C. difficile* into the environment

– especially when incontinent

Always perform hand hygiene before and after contact with the patient because you never know...



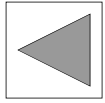
Contaminated Hospital Rooms

Rooms without recent *C. diff* patients: **2.6% to 8% of surfaces**

Rooms of previous patients with asymptomatic *C. diff* colonization: **7% to 29% of surfaces**

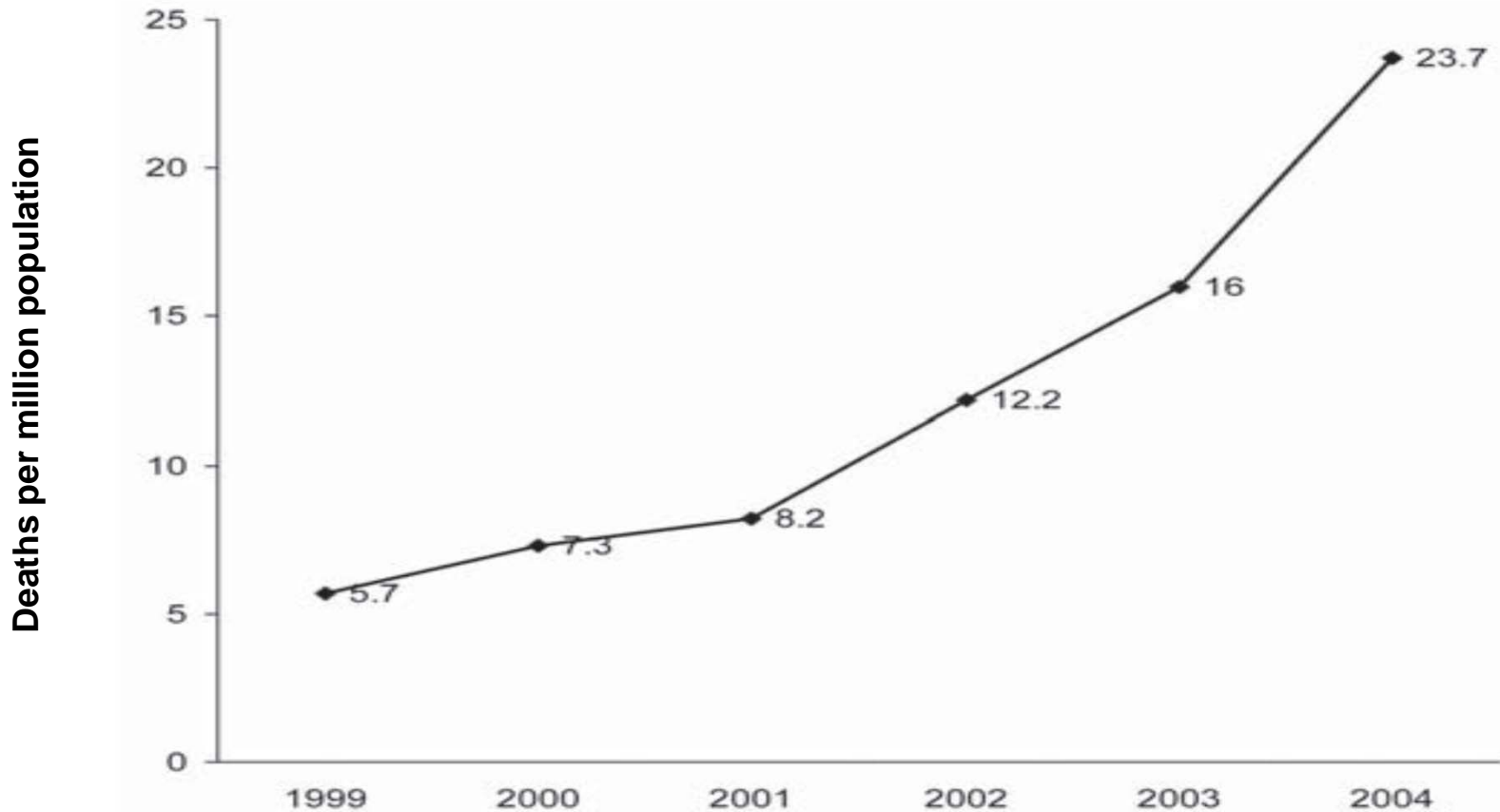
Rooms where the *C. diff* patient has active diarrhea: **20% to almost 50% of surfaces**

Infectious Disease News; Posted May 1, 2006; **C. difficile epidemiology changing, cases and virulence increase**; Presented at: 2006 International Conference on Emerging Infectious Diseases; March 19-22, 2006; Atlanta. <http://www.infectiousdiseaseneews.com/article/33502.aspx>

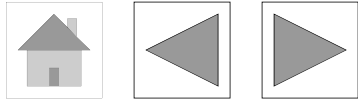


Mortality

Yearly *Clostridium difficile*-related Mortality by Listing on Death Certificates, United States, 1999–2004.



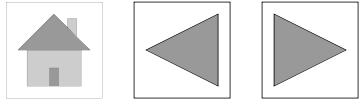
From Redelings MD, et al. *Emerg Infect Dis.* 2007;13:1417-1419.



The Leader Role

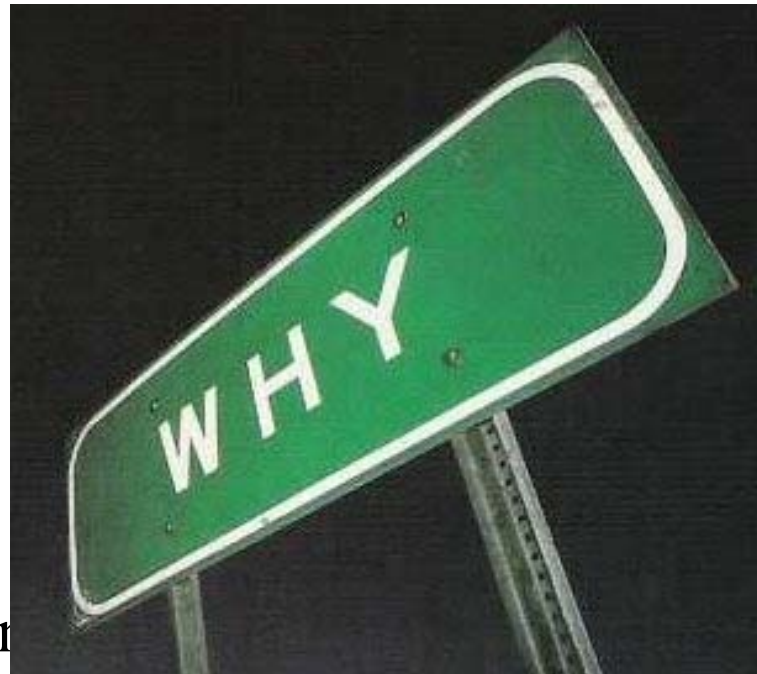
The nurse leader role requires the nurse to incorporate self-direction and decision making authority into his or her practice.

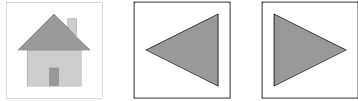
When evaluating data for *Clostridium difficile* infection, the nurse must be able to initiate assessments, data collection and tests.



Initiating Assessment

Every hospitalized patient should be assessed by the nurse for risk factors for *C. difficile* infection during the initial and ongoing physical assessment...





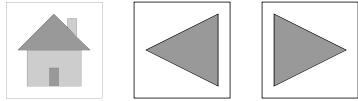
Early Detection

This results in:

- Prompt patient treatment for infection, resulting in better outcomes
- Prompt placement of patients into precautions who are at risk and symptomatic for CDI

Which leads to:

- Reduced transmission of infection to others
- Reduced contamination of the environment



Evidence-based Risk Factors

The nurse leader role entails investigating:

CDI risk factors

Patient and/or Family

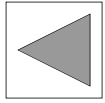
ROMACC

Electronic Medical Record

Microbiology History

Face Sheet

History & Physical



Evidence-based Data Collection

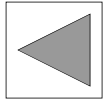
Patient stool pattern information sources:

H&P

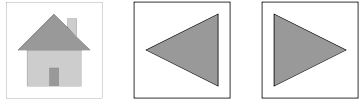
Patient and/or Family

I&O sheet for frequency and character of stool

Think CDI if the patient has risk factors and has 3 or more soft, loose or watery stools in a 24 hour period (symptom)



Clostridium Difficile Infection



The Practitioner Role

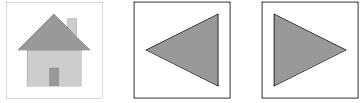
The Practitioner Role in nursing requires role-based provision of care.

Using the Scientist and Leader Role, the nurse is able to coordinate evidence-based quality of care for the patient.

Appropriate Assessment for Testing

The RN assesses the appropriateness for testing for *C. difficile* and recognizes the following situations when testing is not advised:

- Negative *C. difficile* stool test within the previous 7 days
- Diarrhea in the setting of a laxative or bowel stimulant in the previous 48 hours
- Test of cure within the previous 7 days



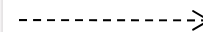
Assessment and Patient Involvement

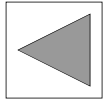
Documentation accuracy includes:

- Frequency
- Color
- Character

Involve a patient with bathroom privileges in his/her care: *Instruct patient not to flush their stool sample and to notify the nurse*

Clostridium Difficile Infection



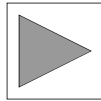
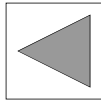


Bristol Stool Chart

The Bristol Stool Chart helps the nurse to classify the character of a stool sample

3 or more soft, loose or watery stools should raise suspicion for CDI in a patient with risk factors

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. Entirely Liquid



RGTEST , CERNER

Age: 20 years Sex: Female Loc: MC2B; I9; 6 Allergies: Latex, Perfume
 DOB: 1/15/1990 EMR: 01-63-71-86 Fin#: 42192614 Inpatient [12/28/2010 12:40 - 12/28/2010 12:40]

Interactive View / I&O Print 3 minutes ago

		30 December 2010 6:00 PST - 01 January 2011 5:59 PST															
Today's Intake: Output: Balance:		Yesterday's Intake: Output: Balance:															
		12/31/2010							12/31/2010								
		19:00 PST	16:00 PST	15:00 PST	14:00 PST	Day Shift ...	13:00 PST	12:00 PST	11:00 PST	10:00 PST	9:00 PST	8:00 PST	7:00 PST	6:00 PST	24 Hour T...	Night Shift...	5:00 PST
- Stool Output		<input type="checkbox"/> Small <input type="checkbox"/> Medium <input type="checkbox"/> Large <input type="checkbox"/> Copious <input type="checkbox"/> Explosive															
Stool Count																	
Stool Volume	mL																
Stool Description																	
Stool Color																	
- Emesis Output		<input type="checkbox"/> Liquid <input type="checkbox"/> Loose															
Emesis	mL																
Emesis Count																	
Balance		<input type="checkbox"/> Soft <input type="checkbox"/> Watery															

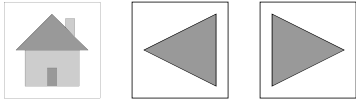
These stool descriptors are consistent with types 5-7 on the Bristol Stool Chart



CDI Stool Sample Testing

Make sure the sample is:

- Type 5-7 on Bristol Stool Chart
- Not contaminated with urine (interferes with test)
- Stool with blood or contrast is okay (does not interfere with test)
- One specimen is adequate for various tests (i.e. *C. diff*; O&P; Occult Blood; Culture)
- Sent to lab immediately after collection

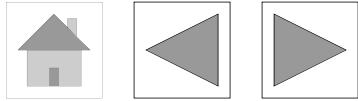


Case Study

An 82 y.o. male is admitted from a nursing home for altered level of consciousness and is diagnosed with a cerebrovascular accident. A chest xray demonstrates possible community acquired vs aspiration pneumonia and the patient is started on clindamycin and levofloxacin. The patient is incontinent of urine and stool. He passes a swallow study and is started on pureed foods with which nursing must assist.

Stop and Reflect:

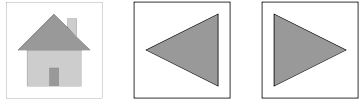
What are some considerations that the nurse should include in the care of this patient?



Considerations

- Age: The patient is >65 years old
- Antibiotics: Disrupts colonic mucosa
- Incontinence: Increased risk of environmental contamination
- Feeding Assistance: Increases risk of fecal-oral transmission
- Nursing home resident

Considering these risk factors, the nurse should assess the patient each shift for symptoms of CDI



Entity Specific Nursing Actions

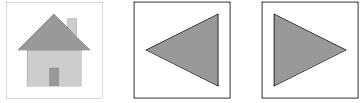
At Sharp Coronado, Grossmont and Memorial Hospitals, nurses will send a suspected *C difficile* stool specimen for testing and implement Contact Precautions.

At Sharp Chula Vista Medical Center, Sharp Mesa Vista and Sharp Mary Birch Hospital for Women and Newborns, nurses will contact the physician for orders to collect a stool specimen and wait until the results are available before initiating Contact Precautions.



Next Steps for the Role Based Nurse

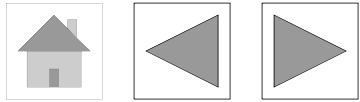
Once determination of risk factors for CDI has been made and the patient is found to be symptomatic, send a stool specimen for CDI testing and....



Patient Management

While waiting for test results:

- Initiate Contact Precautions when stool is sent for testing
- Add “Contact Precautions (*C. difficile*)” in Cerner to appear on Patient Care Summary
- Order Isolation Precautions in Cerner and click on reference text link to print out patient education
- Provide patient education to explain patient management, including Contact Precautions and CDI testing
- Follow test results



Infection Prevention for CDI Patients

Suspected or confirmed CDI patients require:

Implement Contact Precautions

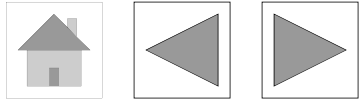
- Gowns & gloves upon entry AND Wash hands with soap and water only
- Green “Contact Precautions” sign AND Yellow “Hand Wash with Soap and Water Only” sign

Dedicated equipment (i.e. stethoscopes; thermometers; bp cuffs)

Environmental cleaning

- Use a bleach wipe product for all patient equipment and patient room surfaces

At Sharp Coronado, Grossmont and Memorial Hospitals, nurses initiate Contact Precautions without a physician order as a standardized procedure. Other facilities utilize Guidelines of Care.

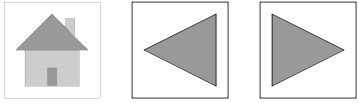


Infection Prevention for CDI Patients

The nurse will:

Educate the family and visitors to wash hands with soap and water. Hand gel can be used upon ENTRY into the room, but soap and water must be done upon EXIT.

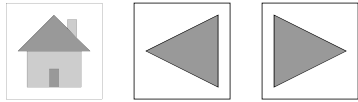
Offer family and visitors that provide patient care (i.e. bathing, toileting) gown and gloves when they perform these activities to reduce clothing contamination



Hand Hygiene: Gown and Gloves

- Nurses should perform hand hygiene upon removal of gown and gloves, and exiting the patient's room
- Remove the gloves prior to removing gown.

These are the recommendations of Association for Professionals in Infection Control and Epidemiology (APIC).



Scientist, Leader, Practitioner Nurse

Interpreting the various test results for CDI

Positive Results

C *DIFFICILE* ANTIGEN AND TOXIN
FINAL REPORT --16DEC10

Positive for Clostridium *difficile* toxin.

C *DIFFICILE* ANTIGEN AND TOXIN
FINAL REPORT --03NOV10

POSITIVE for Clostridium *difficile* antigen and toxin.

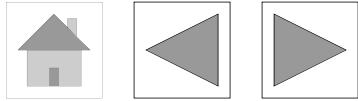
Negative Results

C *DIFFICILE* ANTIGEN AND TOXIN
FINAL REPORT-- 12DEC10

C. *difficile* toxin: NOT DETECTED

C *DIFFICILE* ANTIGEN AND TOXIN
FINAL REPORT --03NOV10

NEGATIVE for Clostridium *difficile* antigen and toxin.



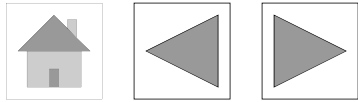
Next Steps Depend Upon Test Results

(-) Results

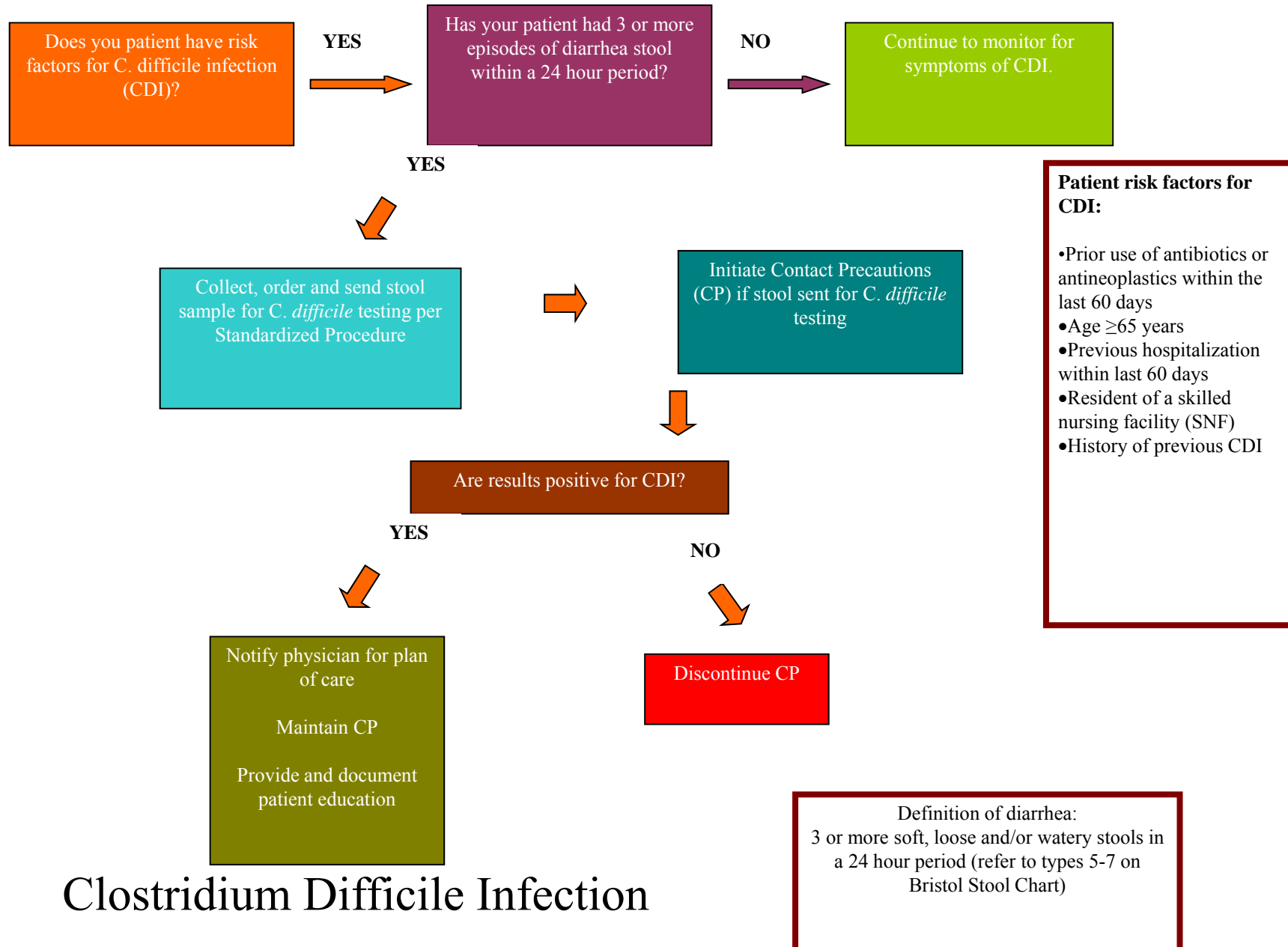
1. Discontinue Contact Precautions and D/C isolation order
2. Change “Contact Precautions” to “Infection Screening Completed per Policy” in Cerner

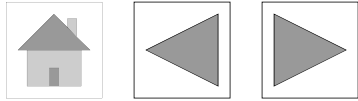
(+) Results

1. Notify physician for plan of care
2. Maintain Contact Precautions
3. Verify Patient Education Received and Documented



Putting It All Together

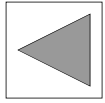




Transfer of Knowledge

The role based nurse is constantly transferring knowledge to colleagues, physicians, patients, and families.

This involves education about the condition and resolution suggestions.



Communicating the Plan to the Healthcare Team



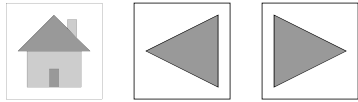
Nurse to Nurse



Nurse to Physician Assistant



Nurse to Other Providers



Nurse-to-Nurse

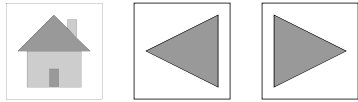


Patient Assessment...

- **Risk factors?** (*i.e. SNF resident; antibiotic exposure; age*)
- **Symptoms?** (*i.e. frequency; character; quantity*)
- **Specimen sent?**

No? *Continue to monitor for symptoms*

Yes? *Results of Test: (negative; positive; pending)*



Nurse-to-Physician



My patient has risk factors for CDI and she is symptomatic...I sent a stool for testing and results are positive...

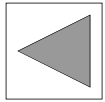
Discuss at bedside...

- Risk factors (*i.e. SNF resident; antibiotic exposure; age*)
- Symptoms (*i.e. frequency; character; quantity*)
- Specimen sent...

“Results are pending and patient is in Contact Precautions while we wait”

Discuss by phone or at bedside if test is positive...

*“Results are positive...what is the plan of care?”
(anticipate antibiotic therapy to treat infection)*



Knowledge Transfer in Documentation

TEST, CERNERB - 01-75-55-07 Opened by Newman, Gina in PowerChart

Task Edit View Patient Chart Links Help

Patient List Tear Off Attach Charges Exit Calculator AdHoc PM Conversation Depart Patient Education Use this Application/Chart Data Cerner Video Tutorials FirstNet Explorer Menu

TEST, CERNE... x

TEST, CERNERB Age: 64 years Sex: Female Loc: MC2B; I16; 1 Allergies: No Known Allergies
DOB: 10/10/1946 EMR: 01-75-55-07 Fin#: 41992893 Inpatient [6/2/2010 13:27 - 6/2/2010 13:27]

Anticipated Discharge Date --
Reason for Visit --
COUGHT - 06/02/10 13:29
Advance Directive --
None: Info provided - 06/02/10 15:54
Code Status --
Allergies --
NKA (Active) - 06/02/10 13:39
Diet Orders --
Patient Activity --

IDX Disease Alert --
Isolation Precautions -- Contact precautions (C.Difficile) -
01/02/11 17:49
Fall Risk Score --
Skin Integrity Risk Score --
Primary Pain Location --
Intensity (0-10 Scale) --
Acceptable Intensity --
Pain Score --
Lab Pregnancy Status --

Intervention Orders

Orderable	Status	Ord
-----------	--------	-----

Problems/Diagnoses

Description	Status/Type
-------------	-------------

Critical Labs (1 Day)

Lab	Result	Date/Time
-----	--------	-----------

02 June 2010 13:27 PDT - 02 Janu

Navigator

- Immunology
- Performing Location

Quick View 6/15/201 0 11:41 PDT

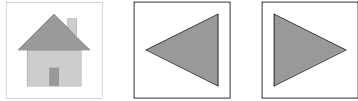
Immunology	
RPR	REACTIVE
RPR Titer	1:2 +*
TP-MHA	2
Performing Location	
Perform at	Perform at

02 January 2011 17:50 PST

http://rsanfuse.shar... Citrix XenApp - App... KINGSTON (G:) Microsoft PowerPoi... 5:50 PM

Nurse to Other Providers
“Patient is in Contact Precautions while we test for *C. difficile* infection”
OR
“Patient is in Contact Precautions because he/she is positive for *C. difficile* infection”

Clostridium Difficile Infection



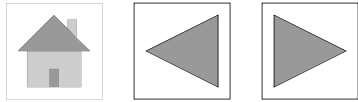
Case Study: Not so obvious

A 47 y.o. female without significant medical history is admitted for an appendectomy on October 25. During her stay she receives the antibiotic piperacillin/tazobactam. The patient is discharged to home 5 days after admission.

17 days later, the patient presents to the emergency department (ED) complaining of 3 days of unrelenting diarrhea, fatigue, dehydration and abdominal pain. A test for *Clostridium difficile* infection (CDI) is performed and the test is positive. The patient is rehydrated in the ED and is discharged home on oral metronidazole.

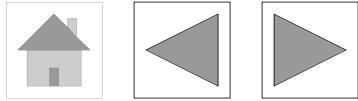
What factors put this patient at risk for acquiring CDI?

- a) Advanced age
- b) Recent hospital stay
- c) Antibiotic exposure
- d) Invasive procedure



What factors put this patient at risk?

- a) Advanced age – **Incorrect!** This patient was not >65 years of age
- b) Recent hospital stay – **Correct!** A recent exposure to the hospital within 60 days places this patient at risk
- c) Antibiotic exposure – **Correct!** Exposure to antibiotics, even a short duration, can disrupt the gut flora and put the patient at risk for CDI
- d) Invasive procedure – **Incorrect!** There are no data to support that an invasive procedure alone puts a patient at risk for CDI, although a hospital stay associated with the procedure does put the patient in a risk category

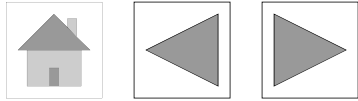


Key Scientific Points

Clostridium *difficile* is a spore-forming bacteria *found in the stool*

Toxin-producing strains of *C. difficile* can cause infection/illness including:

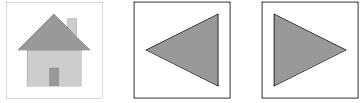
- Mild to moderate diarrhea
- Pseudomembranous colitis
- Sepsis
- Toxic megacolon
- Death



Key Assessment Points

Early recognition of a patient with risk factors for CDI and, *especially those with symptoms*, result in:

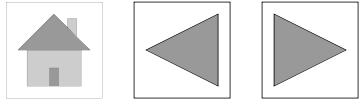
- Better patient outcomes
- Reduced transmission of infection to other patients
- Reduced contamination of environment



Key Risk Factor Points

Patient risk factors for CDI include:

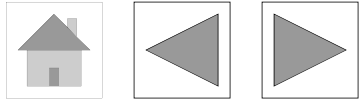
- Resident of SNF
- Advanced age
- Antibiotic/antineoplastic exposure
- Previous history of CDI
- Hospitalization within the last 60 days



Coordination of CDI Patient Care

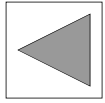
Patient management includes:

- Recognizing risk factors
- Reviewing stool patterns
- Assessing for infection symptoms
- Deciding to send stool for *C. difficile* testing
- Implementing Contact Precautions while waiting for results



Coordination of Care and Knowledge Transfer

- Communicating to patient, family, nurses, physicians and other providers
- Following test results until completion
- Acting on test results



Clostridium *difficile* Infection

CDI is a debilitating, painful infection that can cause **your patient** to have severe colon disease

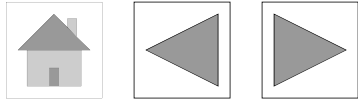
Early detection, timely testing, infection prevention practices and prompt treatment can reduce transmission of disease and **improve patient outcomes**

Healthcare workers are also at risk for CDI

Contact your hospital Infection Prevention department for more information

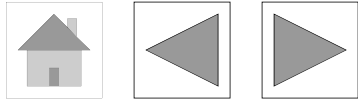


Clostridium Difficile Infection



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Acknowledgements

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