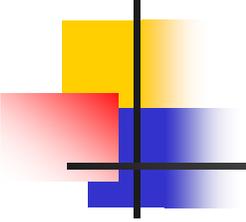


Clostridium difficile
Infection
(CDI)

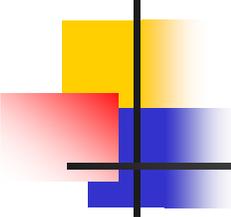
Gail Bennett, RN, MSN, CIC



Clostridium difficile

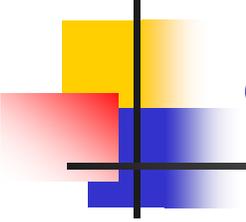
(C. difficile)

- Antibiotic induced diarrhea
- Can cause pseudomembranous colitis
- Most common cause of acute infectious diarrhea in nursing homes
- Disease may be a nuisance or cause life threatening colitis
- Increasing numbers of cases
 - Cases have tripled in US hospitals from 2000 until 2005
- Increasing disease severity and mortality



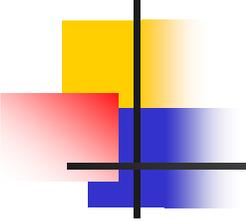
Clostridium difficile

- May cause approximately 30% of cases of healthcare associated diarrhea
- Colonization rate of *C. difficile*
 - About 10-25% of hospitalized patients
 - Long term care residents 4-20%
- Antibiotic therapy may disrupt normal colonic flora in colonized patients and *C. difficile* proliferates, producing toxins and symptomatic disease



Risk Factors for *Clostridium difficile* infection

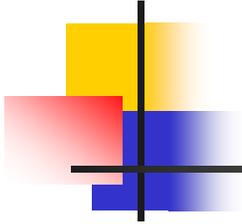
- Antimicrobial exposure
- Length of stay in a healthcare facility
- Advancing age
- Serious underlying illness
- History of non-surgical GI procedures
- Presence of a nasogastric tube
- Suppressed immune system



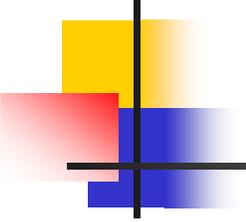
Antibiotics most often
associated with
Clostridium difficile

- Clindamycin
- Ampicillin
- Amoxicillin
- Cephalosporins
- Fluoroquinolones

Toxic Strain



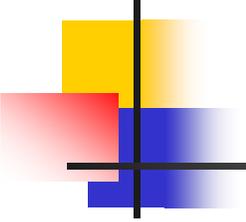
- A new strain is circulating in the U.S. , Europe, and Canada that is more toxic
- Produces large quantities of Toxins A and B
- More severe disease, higher mortality



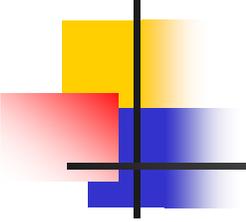
Testing for *Clostridium difficile*

- Toxin testing
 - Quick – same day
- Stool culture
 - Takes 48-96 hours
- Testing for *C. difficile* should be done on unformed (liquid) stool only unless ileus is suspected

Non-specific Treatments

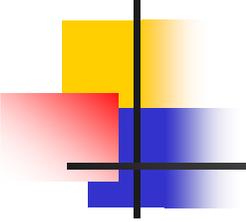


- Discontinue antibiotics if possible
- Fluid and electrolyte replacement
- Do not use antimotility agents (e.g. opiates)



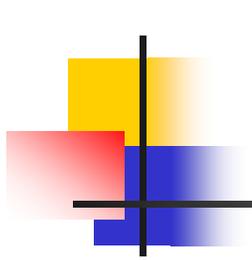
Specific Treatment for *Clostridium difficile*

- Metronidazole (Flagyl) 250 mg QID or 500 mg TID
- Vancomycin 125 mg QID - used if resident does not respond to or cannot take Flagyl; may be used first if severe disease
- Experimental fecal transplant (enemas)



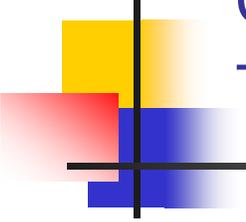
Recurrent *Clostridium difficile* infection

- Rates of recurrence
 - 20% after 1st episode
 - 45% after 1st recurrence
 - 65% after two or more recurrences
- No reports of Metronidazole or Vancomycin resistance following treatment



Institute for Healthcare Improvement (IHI) Definition of Bundles

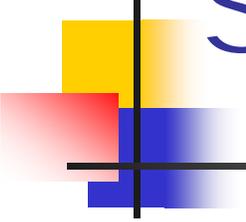
- A **bundle** is a collection of processes needed to effectively and safely care for patients undergoing particular treatments with inherent risks
- Bundles are small and straightforward
- Ideally, bundles include a set of 3-5 evidence-based interventions
- When combined, these interventions significantly improve clinical outcomes
- All of the interventions are necessary for providing the best care (“All or nothing”)



Tiered Approach to Clostridium difficile Infection (CDI) Transmission Prevention

- *C. difficile* transmission prevention activities during routine infection prevention and control responses (basic)
- *C. difficile* transmission prevention activities during heightened infection prevention and control responses (enhanced)
 - Evidence of ongoing transmission of *C. difficile*, an increase in CDI rates, and/or evidence of change in the pathogenesis of CDI (increased morbidity/mortality among CDI patients) despite routine preventive measures

Infection Control Strategies



- Hand hygiene
- Contact precautions
- Identification of cases
- Environmental disinfection
- Appropriate use of antibiotics

Hand Hygiene for *Clostridium difficile*

- For basic measures, may use alcohol handrubs with *C. difficile* – OR use soap and water
- Perform hand hygiene
 - before contact with the patient
 - after removing gloves
 - after contact with the environment

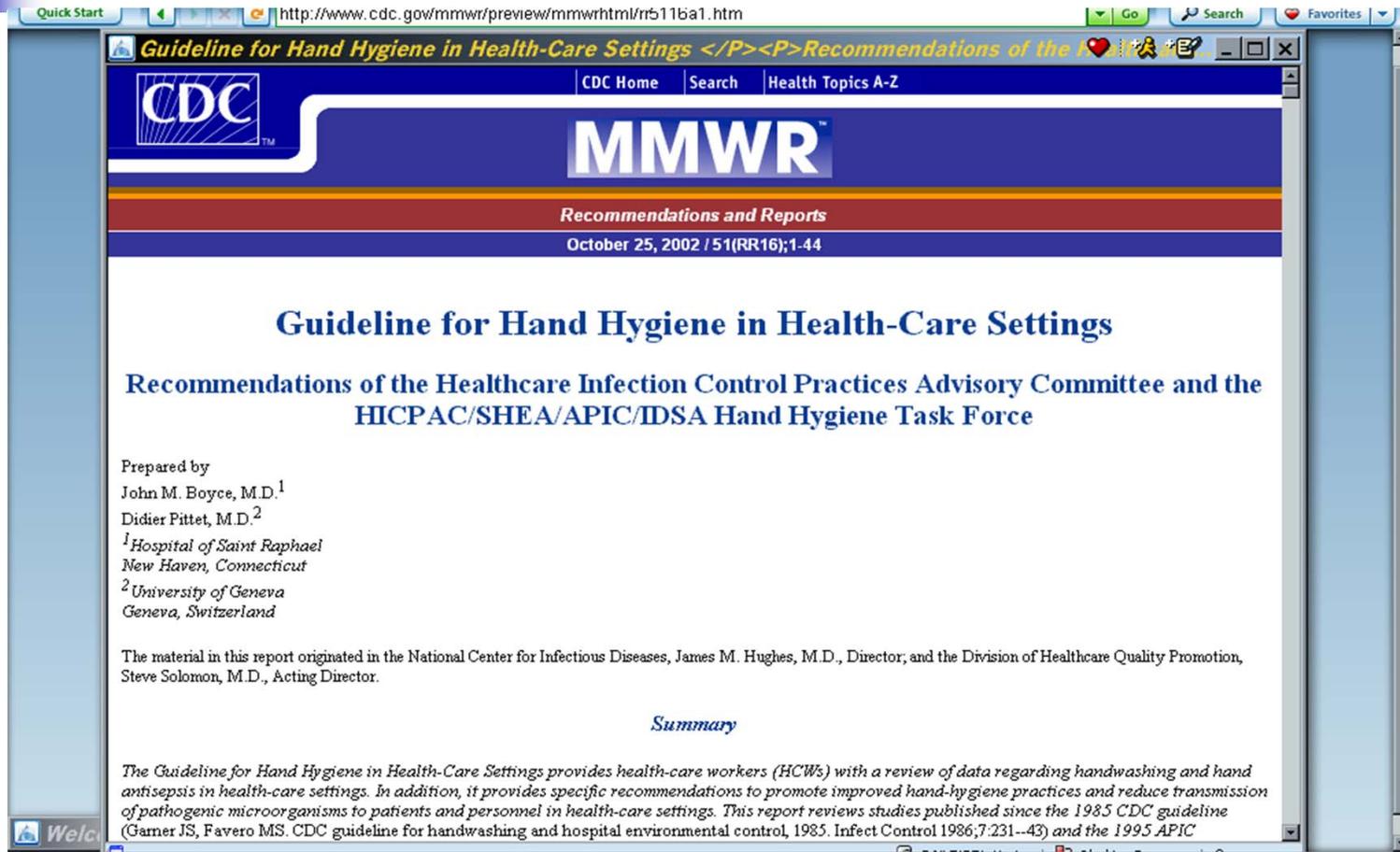


Hand Hygiene for *Clostridium difficile* (continued)

- For enhanced measures, do not use alcohol handrubs with the CDI patient – use soap and water
- Washing away the spores may be the optimal way to perform hand hygiene when transmission of *C. difficile* is occurring



CDC Guideline for Hand Hygiene in Healthcare Settings (MMWR 2002, vol.51, no. RR16)



Quick Start <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm> Go Search Favorites

CDC CDC Home Search Health Topics A-Z

MMWR

Recommendations and Reports
October 25, 2002 / 51(RR16);1-44

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

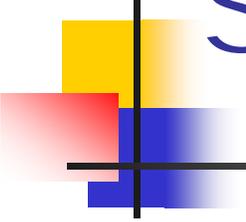
Prepared by
John M. Boyce, M.D.¹
Didier Pittet, M.D.²
¹*Hospital of Saint Raphael
New Haven, Connecticut*
²*University of Geneva
Geneva, Switzerland*

The material in this report originated in the National Center for Infectious Diseases, James M. Hughes, M.D., Director, and the Division of Healthcare Quality Promotion, Steve Solomon, M.D., Acting Director.

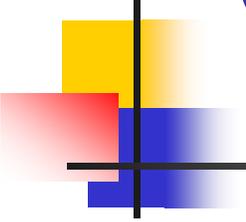
Summary

The Guideline for Hand Hygiene in Health-Care Settings provides health-care workers (HCWs) with a review of data regarding handwashing and hand antisepsis in health-care settings. In addition, it provides specific recommendations to promote improved hand-hygiene practices and reduce transmission of pathogenic microorganisms to patients and personnel in health-care settings. This report reviews studies published since the 1985 CDC guideline (Garner JS, Favero MS. CDC guideline for handwashing and hospital environmental control, 1985. Infect Control 1986;7:231-43) and the 1995 APIC

Infection Control Strategies

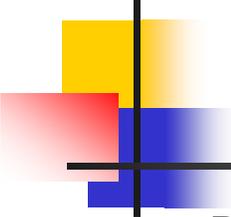


- Hand hygiene
- Contact precautions
- Identification of cases
- Environmental disinfection
- Appropriate use of antibiotics



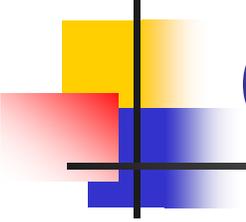
Contact Precautions

- Designed to reduce the risk of transmission of microorganisms by direct or indirect contact
- Direct contact
 - skin-to-skin contact
 - physical transfer (turning patients, bathing patients, other patient care activities)
- Indirect contact
 - Contaminated objects



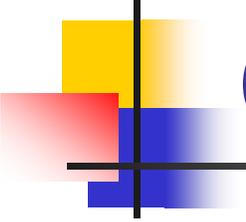
Contact Precautions

- Resident placement
 - Private room preferred
 - 2nd option: Cohorting with other resident with *C. difficile*
 - 3rd option: In LTCFs, consider infectiousness and resident-specific risk factors to determine rooming with a low risk roommate and socializing outside the room
 - Consider:
 - Clean
 - Contained
 - Cooperative
 - Cognitive
 - Patient care equipment (dedicated to single resident if possible) if not, disinfect equipment prior to leaving the room



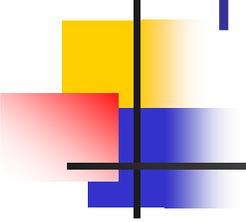
Contact Precautions (Continued)

- Contact Precautions - gloves and gowns to enter room or cubicle
- Do not re-use gowns
- Supplies outside the room
- Keep cubicle curtain drawn to limit movement between cubicles and as a reminder of precautions



Contact Precautions (Continued)

- May discontinue precautions when diarrhea ceases (may consider 48 hours without loose stool)
- Do not do a toxin “for cure” once diarrhea has stopped
- Lab should not accept stool for toxin if the stool is formed

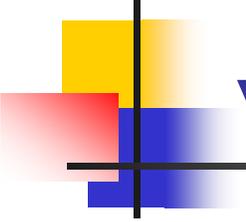


From the Horse's Mouth: CDC's Web Site

- **How is *C. difficile*-associated disease usually treated?**

After treatment, repeat *C. difficile* testing is not recommended if the patient's symptoms have resolved, as patients may remain colonized.

http://www.cdc.gov/ncidod/dhqp/id_CdiffFAQ_HCP.html



Why contact precautions for VRE and *C. Difficile*??

- Environmental contamination

The Inanimate Environment Can Facilitate Transmission

X represents VRE culture positive sites



~ Contaminated surfaces increase cross-transmission ~

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.

DONNING PPE

Type of PPE used will vary based on the level of precautions required, e.g., Standard and Contact, Droplet or Airborne Isolation Precautions

GOWN

- Fully cover torso from neck to knees, arms to end of wrist, and wrap around the back
- Fasten in back at neck and waist



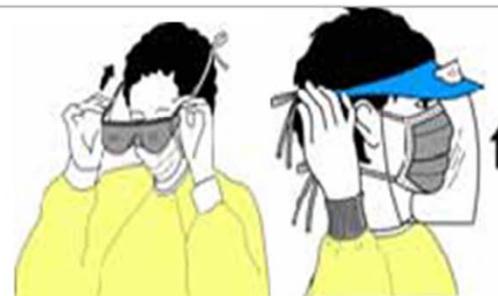
MASK OR RESPIRATOR

- Secure ties or elastic band at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



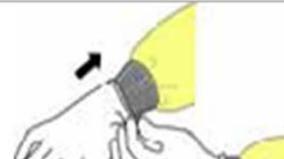
GOGGLES/FACE SHIELD

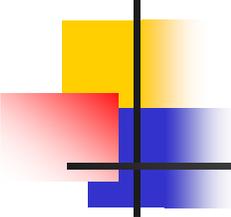
- Put over face and eyes and adjust to fit



GLOVES

- Extend to cover wrist of isolation gown





Environmental Cleaning

- Consider increasing frequency for C. difficile and VRE
- For C. difficile, may use a hypochlorite based germicidal agent
 - Less labor intensive to use an EPA registered, hospital grade pre-mixed hypochlorite product rather than trying to mix a bleach solution daily
 - Consider cleaning those rooms at the end of the cleaning shift or change water and mop heads after each C. difficile room.
- Several disinfectants now have EPA registration against C diff spores

STOP

Contact Precautions



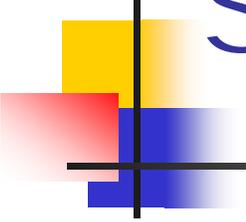
Gown & Gloves Required
For All Persons Entering Room

No Shared Equipment
(If not possible, disinfect before use on another patient)

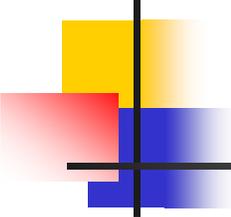
Limit Traffic To Essential Staff

Please See Nurse Before Entering
Por favor habla con una enfermera antes de entrar

Infection Control Strategies



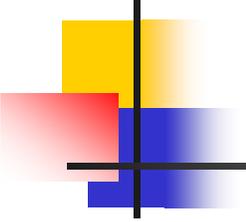
- Hand hygiene
- Contact precautions
- Identification of cases
- Environmental disinfection
- Appropriate use of antibiotics



Identification of Cases

Colonization or asymptomatic fecal carriage of *C. difficile*

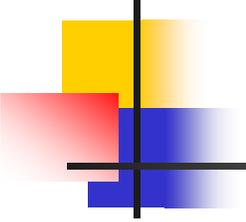
- May be common in healthcare facilities
- Studies have demonstrated colonization in LTCF residents in the absence of an outbreak has ranged from 4% to 20%
- *C. difficile* associated disease
 - Acute diarrhea



Identification of Cases

Basic Strategy:

- With cases of diarrhea, consider *C. difficile*
 - Take a detailed history for risk factors
- Norovirus, dietary changes, medications, and other things may also be causes of diarrhea
- Notify physician
- Watch for dehydration

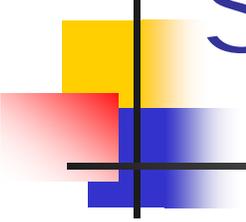


Identification of Cases

Enhanced Strategy:

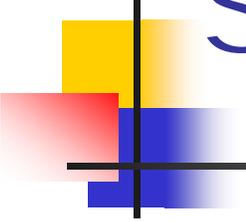
- Automatic contact precautions for all patients with orders for *C. difficile* labs
- Allow nurses to initiate the lab order and contact precautions

Infection Control Strategies



- Contact precautions
- Hand hygiene
- Identification of cases
- Environmental disinfection
- Appropriate use of antibiotics

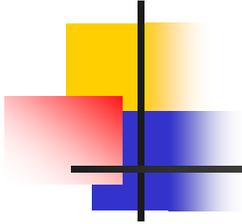
Infection Control Strategies



- Contact precautions
- Hand hygiene
- Identification of cases
- Environmental disinfection
- **Appropriate use of antibiotics**

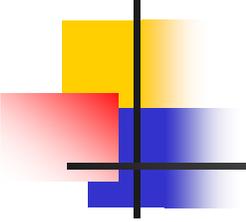
Appropriate Use of Antibiotics





- Hospitals generally have good antimicrobial stewardship programs – less often found in non-acute care

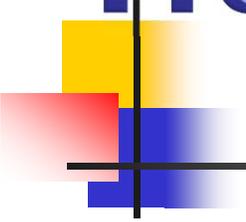
Antibiotic Review



F441: Because of increases in MDROs, review of the use of antibiotics is a vital aspect of the infection prevention and control program.

An area of increased surveyor focus- **an area where you need to assess if you are meeting the surveyor guidance**

From surveyor guidance



- 42 CFR §483.25(I), F329, Unnecessary Drugs
- Determine if the facility has reviewed with the prescriber the rationale for placing the resident on an antibiotic to which the organism seems to be resistant or when the resident remains on antibiotic therapy without adequate monitoring or appropriate indications, or for an excessive duration

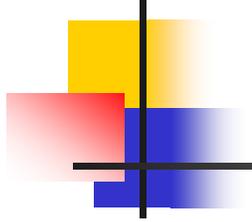
Antibiotic Monitoring and Review



- What most likely exists currently in your program:
 - Comparison of prescribed antibiotics with available susceptibility reports (charge nurse and infection preventionist)
 - Review of antibiotics prescribed to specific residents during regular medication review by consulting pharmacist
- **What may be needed:**
 - Antibiotic stewardship program in the facility (CDC recommendation – 2006 MDRO guideline)
 - Broader overview of antibiotic use in your facility with reporting to quality assurance/infection control committee

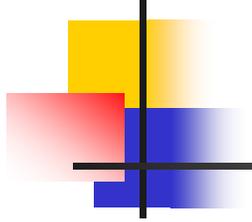
*Right drug - Right dosage - Right monitoring -
Feedback of data to MDs*

Methods to Improve Antimicrobial Use



- Prescriber education
- Standardized antimicrobial order forms
- Formulary restrictions
- Prior approval to start/continue

Methods to Improve Antimicrobial Use



- Pharmacy substitution or switch
- Multidisciplinary drug utilization evaluation (DUE)
- Provider/unit performance feedback
- Computerized decision support/on-line ordering

Antimicrobial stewardship

ent Stent Stewardship? - Get Smart for Healthcare

CDC Home
Centers for Disease Control and Prevention
Your Online Source for Credible Health Information

A-Z Index [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) <#>

Get Smart for Healthcare

Get Smart for Healthcare

- Why Inpatient Stewardship?
- Improving Stewardship Efforts
- Evidence to Support Stewardship
- Get Smart Week 2010
- Resource Library

[Get Smart for Healthcare](#)

Why Inpatient Stewardship?

Overview

The Centers for Disease Control and Prevention has launched *Get Smart for Healthcare*, a new campaign focused on improving antimicrobial use in inpatient healthcare settings such as acute-care facilities, and long-term care through the implementation of antimicrobial (or antibiotic) stewardship programs. These antimicrobial (or antibiotic) stewardship programs are interventions designed to ensure that hospitalized patients receive the right antibiotic, at the right dose, at the right time, and for the right duration.

Antimicrobial stewardship interventions have been proven to improve individual patient outcomes, reduce the overall burden of antibiotic resistance, and save healthcare dollars. Implementation of an antimicrobial stewardship program in a healthcare facility – regardless of inpatient setting – will help ensure that hospitalized patients receive the right antibiotic, at the right dose, at the right time, and for the right duration. As a result, there is reduced mortality, reduced risks of *Clostridium difficile*-associated diarrhea, shorter hospital stays, reduced overall antimicrobial resistance within the facility, and cost savings. Despite all of these benefits, antimicrobial stewardship programs and interventions are far from the norm in U.S. hospitals today.

If everyone — healthcare providers, hospital administrators, policy makers, and patients — works together to employ effective prevention strategies and invest in antimicrobial stewardship programs, we can more effectively combat antibiotic resistance and ultimately save lives.

On this Page

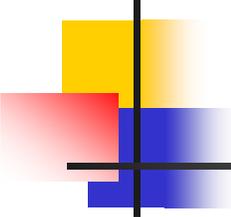
- Overview
- Fast Facts

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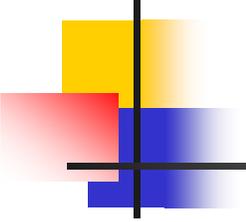
Contact Us:

- Centers for Disease Control and Prevention
1600 Clifton Rd
Atlanta, GA
30333
- 800-CDC-INFO
(800-232-4636)
TTY: (888) 232-6348
24 Hours/Every Day
- cdcinfo@cdc.gov



CDC Fast Facts

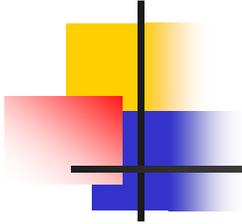
- Antibiotic overuse contributes to the growing problems of *Clostridium difficile* infection and antibiotic resistance in healthcare facilities.
- Improving antibiotic use through stewardship interventions and programs improves patient outcomes, reduces antimicrobial resistance, and saves money.
- Interventions to improve antibiotic use can be implemented in any healthcare setting—from the smallest to the largest.
- Improving antibiotic use is a medication-safety and patient-safety issue.
- <http://www.cdc.gov/getsmart/healthcare/inpatient-stewardship.html>



Monitoring of practices is crucial!

- We must observe to see that our policies and recommended processes are being done and done correctly
- Educate staff when you see non-compliance
- Enforce that all staff must follow the rules for contact precautions and hand hygiene

Additional Practice Issues



- Should not use rectal thermometers in your building
 - Associated with transmission of enteric pathogens

Summary of Prevention Measures from the CDC Toolkit

Core Measures

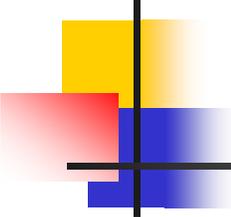
High levels of scientific evidence

- Contact Precautions for the duration of illness
- Hand hygiene in compliance with CDC/WHO
- Cleaning and disinfection of equipment and environment
- Laboratory-based alert system
- CDI surveillance
- Education

Supplemental Measures

Some scientific evidence

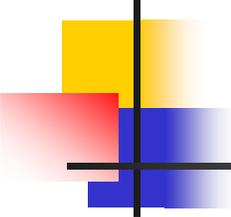
- Prolonged duration of Contact Precautions
- Presumptive isolation
- Evaluate and optimize testing
- Soap and water for hand hygiene upon exiting the CDI room
- Universal glove use on units with high CDI rates
- Bleach for environmental disinfection
- Antimicrobial stewardship program



References

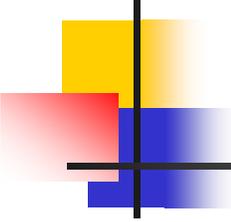
- Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults: 2010 Update by the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA)

<http://azdhs.gov/phs/oids/epi/disease/cdif/documents/Clinical%20Practice%20Guidelines%20for%20C%20Diff%20Infection%20%202010%20update%20by%20SHEA-IDSA.pdf>



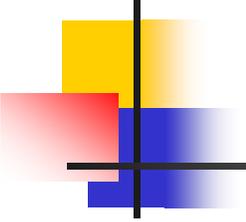
References

- APIC Guide to the Elimination of *Clostridium difficile* Infections in Healthcare Settings.
http://www.apic.org/Content/NavigationMenu/PracticeGuidance/APICEliminationGuides/Cdiff_Elimination_guide_logo.pdf
- SHEA: *Clostridium difficile* in Long Term Care Facilities for the Elderly
http://www.shea-online.org/Assets/files/position_papers/SHEA_Cdiff.pdf



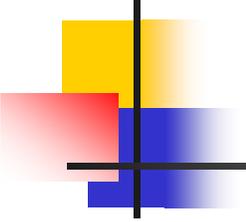
References (continued)

- Spotlight on *Clostridium difficile* Infection: An Educational Resource for Pharmacists
- David P. Nicolau , PharmD, FCCP, FIDSA
<https://secure.pharmacytimes.com/lessons/200902-02.asp>



CDI Toolkit – CDC

- *Clostridium difficile* (CDI) Infections Toolkit (pdf)
- CDI Toolkit
 - available in PowerPoint format
- *Clostridium Difficile* Infection (CDI) Baseline Prevention Practices Assessment Tool For States Establishing HAI Prevention Collaboratives Using ARRA Funds Using Recovery Act Funds
- <http://www.cdc.gov/HAI/recoveryact/stateResources/toolkits.html>



Prevention IS PRIMARY!

*Protect patients...protect healthcare personnel...
promote quality healthcare!*

Thank you!

gailbennett@icpassociates.com

www.icpassociates.com