

Understanding and Preventing *Clostridium difficile*



Minnesota Department of Health
Infectious Disease Epidemiology,
Prevention, and Control Division
PO Box 64975
Saint Paul, MN 55164-0975
651-201-5414 or 1-877-676-5414
www.health.state.mn.us



What is *Clostridium difficile*?

- Anaerobic gram-positive, spore-forming rod bacterium
- A major cause of antibiotic-associated diarrhea
- Causes a range of symptoms, from asymptomatic colonization to life-threatening disease
- The elderly are at highest risk for morbidity and mortality from *C. difficile* infection
- Key prevention measures: hand hygiene and appropriate antibiotic use



Important Risk Factors

- Antibiotic exposure is the major risk factor
 - > 90% of health-care associated *C. difficile* infection occurs during or after recent antibiotic therapy
 - All antibiotics increase the risk of *C. difficile* infection
 - Clindamycin, cephalosporins, penicillins, and fluoroquinolones are most-often associated with *C. difficile* infection
- Age > 65 years
- Nasogastric or gastostomy feeding tubes
- Anti-ulcer medications such as proton-pump inhibitors



Development of Infection

- Usually a sequence of events cause *C. difficile* infection (the order is important)
 1. Systemic antibiotics disrupt normal bowel flora
 2. Exposure to *C. difficile* spores
 3. Presence of host susceptibility factors
- Up to 20% of patients with *C. difficile* infection suffer a recurrence



Transmission

- Spread through the fecal-oral route
- Environmental transmission is common
 - Contaminated hands of healthcare workers
 - Contaminated objects (commodes, telephones, thermometers)
- Environmental decontamination can be difficult since *C. difficile* produces spores, which are difficult to kill
 - Spores can survive for months on environmental surfaces because they are resistant to many commonly used disinfectants



Clinical Symptoms

- Watery diarrhea is the most common clinical symptom
 - Grossly bloody stools are uncommon
- Other symptoms: fever, lower abdominal pain, nausea, and anorexia
- WBC (>20,000), high fever, elevated creatinine, profuse diarrhea and abdominal pain may be signs of progressive or severe disease (e.g., sepsis, dehydration, peritonitis, paralytic ileus, toxic megacolon)



Colonization

- Colonization is more common than symptomatic infection
 - Most people who have *C. difficile* in their stool do not develop any symptoms
- Colonization should not be treated with antibiotics
 - Unnecessary antibiotic use can lead to antibiotic resistance, toxicity, and adverse drug reactions
- People without clinical symptoms should not be tested
 - Only loose or watery stools should be tested unless ileus is suspected

Treatment



- **Stop the antibiotic if possible!**
 - No other treatment may be needed in mild cases
- Metronidazole is recommended as first-line therapy for most cases of mild-to-moderate disease
- Provide fluid and electrolyte repletion as needed
- Do not give anti-peristaltics or opiates
- Monitor clinical status closely



Infection Prevention

- Use antibiotics only when clinically indicated
- Perform hand hygiene: healthcare worker's hands are a major *C. difficile* transmission route
 - Use soap and water instead of alcohol-based hand rubs when caring for persons with *C. difficile* infection; *C. difficile* spores are not killed by alcohol
- Wear gloves or gown according to infection control policies
- Clean / disinfect the environment:
 - Use 1:10 bleach solution or EPA-registered cleaner/disinfectant
 - Do not share patient care items (e.g., rectal thermometers)

Conclusions



- *C. difficile* is a major cause of antibiotic-associated diarrhea.
- The elderly are at highest risk for morbidity and mortality from *C. difficile* infection.
- Key prevention measures include hand hygiene and judicious antibiotic use.