Clostridium Difficile

Epidemiology

**Source:** Soil, environment
++CDAD patients ± Colonized pts

**Transmission**
++ Direct contact -hands
+Indirect contact +fomites,
+environmental surfaces

**Incubation 7d**
Difficult to determine because of carriers

**Diffic infection or Diffic Associated Disease (CDAD)**
Diarrhea, nausea, vomiting, lower abdominal pain and tenderness, fever, anorexia, malaise. Stools are watery, voluminous, lacking gross blood or mucus.

**Communicability:** Mostly CDAD, lesser from colonization

**Environment major source of infection:**
Survive on hands of personnel (by transient carriage), Survive for months on fomites, or contaminated environment:
Activities that carry an increased risk of transmission are:
Oral care, oral suctioning, Feeding (enteral tube ), Nasogastric tube insertion, Oral medication, antacid tx Intubation, Rectal thermometers, Commodes, enemas Gastrointestinal tract surgery.

**Fusidic acid orally 500mg 3 times a day for 10 days**
**Teicoplanin orally 100-400mg twice a day for 10 days**
**Bacitracin 25,000 units four times daily for 7-10 days**
**Nitazoxanide, an anti-protozoal used against cryptosporidium and giardia, at a dosage of 500 mg 2 times per day for 7 days, or at a dosage of 500 mg 2 times per day for 10 days**
**Fusidic acid orally 500mg 3 times a day for 10 days**

**Recurrences are found in 10% to 20% of cases.**
Early recurrences within 30 days are usually due to the same strains. Later recurrences within 30 days are usually due to new strains.

Diagnosis

**Most diagnostic tests detect the toxin:**
Enzyme immuno-assay for toxin: Enzyme immunoassay (EIA) or cell cytotoxicity assay
Sensitive, cheap and easy to perform.
EIA for toxins A and B, or EIA for toxin A & toxin B cell culture cytotoxicity assay
Latex agglutination tests should not be used.
Cell cytotoxicity assay: Stool extract added to tissue cell culture with/without neutralizing antibo.
Toxin present if cytotoxic effect in cultures not neutralized and no specific (positive with other bacteria).
Negative test useful to rule out CDAD.
Positive test is often a false positive test and should be confirmed.
Sigmoidoscopy or colonoscopy visualization of pseudo-membranes = pseudomembranous colitis (PMC) is caused by Cdiff in 90% of cases.

**NDC:** 5055-0410-05

**Testing of asymptomatic patients not indicated for identification of carriers since treatment of carriers is futile.**
**Specificity & sensitivity of the tests designed for CDAD.**
**Testing asymptomatic persons results in poor positive predictive value. Most positive test results = false positives.**
**False positive test in asymptomatic patient additional antibiotic tx increase risk developing CDAD.**
**Testing is not indicated for a test of cure (toxin may persist in the stools even after a successful treatment).**
**Persistently positive test results at the end of treatment are not predictive of CDAD relapse.**

Treatment

**Simple measures** sufficient for 20% of patients, particularly mild disease
1-All CDAD patients need fluid and electrolyte replacement,
2-Avoid anti-peristaltic agents and opiates
3-Discontinue antimicrobial therapy ASAP in patients in whom clinically significant diarrhea or colitis develops.

**Asymptomatic persistence of Cdiff and its toxins in stools following treatment is common. DO NOT repeat stool testing or re-treatment.**

http://www.infectiousdisease.dhh.louisiana.gov (800)256-2748
A case of community associated CDAD weeks after discharge with onset of symptoms more than 48 hours after admission or less than 4 weeks after discharge.

A case of healthcare facility associated CDAD:
- Pseudomembranous colitis at histological examination
- Pseudomembranous colitis found in endoscopy or surgery or a toxin-producing Cdiff or which

A case of CDAD weeks after the last specimen tested positive is a new case of CDAD with symptoms.

A symptomatic patient with an additional positive test more than 8 weeks after the last specimen tested positive is a recurrence of CDAD.

A symptomatic patient with an additional positive toxin assay within 2 to 8 weeks after the last specimen tested positive is a new case of CDAD.

Proper handling of contaminated waste (including diapers) and fomites inadvertent sharing of items between patients.

Gowning whenever getting in the room.

Hand-washing is preferred as alcohol-based hand sanitizers less effective against the spore forming Cdiff.

Contact precautions including Gowning whenever touching:
- patient
- surfaces contaminated including areas in contact with the patient
- high touch surfaces as bedrails, light switches, faucets

Patient placement:
- Private room with a bathroom solely used by the patient
- If private room not available, cohorting with another CDAD.
- If sharing room, at least a 3 foot separation between beds to avoid inadvertent sharing of items between patients.
- Curtain or a red tape on the floor identifying areas of restricted access.

Proper handling of contaminated waste (including diapers) and fomites

Patient transport:
- Transportation or movement outside the room should be limited.
- Patient needs to be taught proper hand hygiene prior to getting out of their room.
- Contact precautions status need to be communicated to all HCP that come in contact with the patient.

3-Education of healthcare providers, patient and visitors

HCP need to understand: the difference between CDAD and Cdiff colonization; the great propensity of Cdiff to contaminate and persist in the environment as spores; the effective methods for environmental disinfection; the importance of handwashing; the proper implementation of contact precautions; the prudent use of antibiotics.

Participation of patients and visitors is crucial to minimize the contamination of the environment.

4-Prevent onset of CDAD

Limit the use of antimicrobial agents: Restrict the use of clindamycin and of broad-spectrum antibiotics (particularly cephalosporins);

Encourage the proper use of antibiotics.

Carriers of the organism appear to be resistant to acquisition of outbreak-associated strains. Individuals with asymptomatic colonization are no more likely to develop CDiff diarrhea than are those with negative stool cultures.

Metronidazole not effective in eradicating asymptomatic carriage with CDiff, and treatment with oral vancomycin results in only transient elimination of fecal carriage of the organism.

Antibiotic treatment of asymptomatic patients excreting CDiff is not recommended.

Disinfectants

Cdiff spores are fairly resistant to quaternary ammoniums, alcohol and phenolic compounds which are not sporicidal.

Only chlorine based (bleach) or vaporized hydrogen peroxide disinfectants are active on spores.

A 10% solution of sodium hypochlorite (household bleach has about 6% ClONa) is adequate. It must be made fresh daily (one part bleach and 9 parts tap water). The addition of 1 part vinegar (5% acetic acid) may improve the germicidal action.

Cleaning

Thorough cleaning is necessary to maximize the disinfectant action of the germicide.

Use a commercially available solution which contains a detergent or use a detergent for thorough cleaning before applying the bleach solution.

Contact time of 1 minute should be sufficient. Wetting the surface with the bleach solution and allowing it to dry should provide sufficient contact time.