Pediatric C. difficile Infection Diagnosis Pathway

Evidence Based Outcome Center

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EXCLUSION CRITERIA

- C. difficile test performed in the last 7 days
- Positive C. difficile test in the past 30 days
- No Risk Factors for C. difficile infection are present
- Laxative use in the last 48 hours
- New or changed tube feeds in the last 24-48 hours
- Other infectious cause for diarrhea found or suspected
- Less than 12 months of age (consult ID)

DO NOT RETEST WITHIN 7 DAYS (Order will be auto cancelled)

GUIDELINE INCLUSION CRITERIA

Patient ≤ 1 year of age with persistent diarrhea despite supportive care

OR

Diarrhea with concerning abdominal findings and the following:

GUIDELINE INCLUSION CRITERIA

Patient > 1 year of age with persistent diarrhea despite supportive care.

The following may or may not be present:

- Antibiotic Exposure
- Other etiology ruled out

Antibiotic Exposure
&
Other etiologies ruled out

NO

YES

Consider other etiologies.

Asymptomatic carriage is reported to be 30% – 70% in healthy infants as they are thought to have immature or diminished receptors sites for toxins.

Collect Stool Specimen for testing

Initiate contact precautions: 1

- Wash hands with soap and water
- Use bleach disinfectant wipes

Specimen Collection Criteria:

- Stool takes the shape of the container
- Only use formed stool if there is suspicion of ileus

Exceptions to the criteria require discussion of rationale with the laboratory and strongly consider ID consult.

2 Step Algorithm

Step 1 Test:
Glutamate Dehydrogenase (GDH)
AND
Toxin A/B

Step 1 Evaluation

Negative → Manage OFF-PATHWAY

Equivical

Step 2 Test:
PCR **OR** NAAT
(Reflex)

Step 2 Evaluation

Negative → Manage OFF-PATHWAY

Positive

Positive → C. difficile Infection Treatment Pathway

Test only patient with risk factors for Cdifficile infection.

Risk Factors include:

- Currently on antibiotics
- Antibiotics in the last 2 months
- Recent cancer chemotherapy
- GI Surgery
- Presence of NJ, G, or J tube
- Underlying bowel disease
- Hirschsprung disease

Families of patients with *C. difficile* infection should wash hands with soap and water after contact with the patient or surfaces which may have become soiled with stool.
Alcohol hand sanitizer may not be effective against *C. difficile* organisms.
A 10% bleach solution should be used to clean and disinfect diaper changing tables and bathroom surfaces.

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dell children's Ascension

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Pediatric C. difficile Infection Management Pathway

Evidence Based Outcome Center

DO NOT RETEST FOR 'CURE'
(Order will be auto cancelled)

GUIDELINE INCLUSION CRITERIA

C. difficile infection diagnosed by GDH, Toxin A/B EIA, or PCR/NAAT

Determine Disease Severity:
C. difficile Disease Classification

Discontinue or shorten antibiotic course for non-C. difficile antibiotics if possible.

Special concern:
Clindamycin
Cephalosporins
Flouroquinolone

Stop or change PPI/acid-suppressants

Antiperistaltic medications should be avoided

Recurrent C. difficile Infection?

YES → Consider Infectious Disease and Gastrointestinal Consult

Patients with more than 2 – 3 recurrences may be candidates for ALTERNATIVE THERAPIES
(ID Consult strongly recommended)

NO

Initiate Antibiotic Treatment
Based on disease severity

Severe OR Severe and complicated:
Consider Infectious Disease and Gastrointestinal Consult

Improvement in 72 hours?

NO → Manage OFF-PATHWAY

YES

C. difficile infection antimicrobial therapy complete
AND
Asymptomatic

NO → Manage OFF-PATHWAY

YES

End Contact Precautions [1]

Manage Patient's Underlying Condition

Families of patients with *C. difficile* infection should wash hands with soap and water after contact with the patient or surfaces which may have become soiled with stool.
Alcohol hand sanitizer may not be effective against *C. difficile* organisms.
A 10% bleach solution should be used to clean and disinfect diaper changing tables and bathroom surfaces.

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Laboratory Diagnostic Tools Comparison			
Assay	**Target**	**Advantages**	**Disadvantages**
Toxin A/B	Toxins A and B	Specific (75% - 100%)	Least sensitive technique (63% - 94%)
GDH	Organism	Sensitive (> 94%)	Least specific technique (58% - 68%) Does not identify toxin production
PCR or NAAT	Gene for toxin A or B	Sensitive (>85% - 95%) Specific (89% - 99%)	Detects genetic material only Does not detect toxins

Sensitivities and specificities from Cohen, S. et al. Infect Control Hosp Epidemiol 2010;31:431

Evaluation of C. difficile Diagnostic Tests				
Step 1	**Action**	**GDH**	**TOXIN**	**PCR**
	Treat	+	+	
	No Treatment	-	-	
Step 2	**Action**	**GDH**	**TOXIN**	**PCR**
	Treat	+	-	+
	No Treatment (Carriage)	+	-	-
		-	+	-
	Indeterminate: Infectious Disease Consult	-	+	+

The 2 step testing algorithm includes a sensitive assay for glutamate dehydrogenase (GDH), produced by all C. difficile organisms, but not specific to A and B toxin-producing strains that cause C. difficile Infection (CDI).
The enzyme immunoassay (EIA) is specific for the A and B toxin-producing strains.
The polymerase chain reaction (PCR) or transcription-mediated amplication (TMA) detects genetic material from the A and B toxin-producing strains.

Disease Classification	
Classification	**Criteria**
Mild or moderate	≥ 3 loose stools in 24 hours **AND** Feeding well
Severe	≥ 3 loose stools in 24 hours **AND** Two or more the following: • Not feeding well • Febrile • Abdominal pain/tenderness • Blood in stool • Dehydration and/or electrolyte disturbances • Elevated white blood cell count (> 15,000 cells/microL) • Elevated age-adjusted serum creatinine level • Serum albumin level < 2.5 g/dL • Pseudomembranous colitis
Severe and complicated	Severe criteria met **AND** One or more of the following: • Hypotension/shock • Complete Ileus • Megacolon • Ileitis, pancolitis, clinical or radiographic evidence of bowel perforation • Critical care admit for CDI

Pediatric C. difficile Infection
Initial Episode Antibiotic Treatment
Evidence Based Outcome Center

Treatment for initial episode of C. difficile Infection				
Classification	**Antibiotic**	**Dose**	**Max dose**	**Duration**
Mild or moderate	Metronidazole PO	7.5 mg/kg every 6 hours	500 mg Q6 hours	10-14 days
Severe	Metronidazole PO	7.5 mg/kg every 6 hours	500 mg Q6 hours	10-14 days
	OR			
	Vancomycin PO	10 mg/kg every 6 hours	125 mg Q6 hours	10-14 days
Severe & Complicated	Metronidazole IV	7.5 mg/kg every 6 hours	500 mg Q6 hours	10-14 days
	AND			
	Vancomycin PO	10 mg/kg every 6 hours	500 mg Q6 hours	10-14 days
Severe & Complicated **WITH** complete ileus	Metronidazole IV	7.5 mg/kg every 6 hours	500 mg Q6 hours	10-14 days
	AND			
	Rectal vancomycin retention enema Optimal dose and volume for rectal vancomycin have not been established, but some experts recommend 50 mL for ages 1–3 years, 75 mL for ages 4–9 years, and 100 mL for ages 10 years.	500 mg in 100 ml NS 4 times/day		10-14 days

Pediatric C. difficile Infection
Alternative Antibiotic Treatment
Evidence Based Outcome Center

Treatment for recurrent C. difficile Infection			
Vancomycin PO pulsed-tapered regimen	**Dose**	**Max dose**	**Duration**
Step 1	10 mg/kg four times daily	125 mg/dose	10-14 days
Step 2	10 mg/kg twice daily	125 mg/dose	7 days
Step 3	10 mg/kg once daily	125 mg/dose	7 days
Step 4	10 mg/kg every other day	125 mg/dose	7 days
Step 5	10 mg/kg every three days	125 mg/dose	14 days
Alternative antimicrobial therapies			
Fidaxomicin	16 mg/kg twice daily		
Nitazoxanide 1-3 years	100 mg twice daily		
4-11 years	200 mg twice daily		
≥ 12 years	500 mg twice daily		
Rifaximin	400 mg three times daily		
Subsequent Reccurences: Consider fecal transplant			

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