CDI Management in Post-Acute Care: Part 2

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Speaker Disclosures

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The opinions presented herein are my own and do not represent those of the Veterans Affairs system or the federal government.
Outline

...some people poop more than others...

- Pathophysiology
- Risk Factors
- Diagnosis & Treatment
- Infection Control & Prevention
Diagnosis & Treatment
# Diagnostic Criteria

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| Non-Severe                | • ≥ 3 liquid stools/day  
• Positive test for *C. difficle.*  
• Consider managing outside of hospital |
| Severe                    | • WBC ≥ 15K  
• Creatinine ≥ 1.5 x normal (AKI)  
• Initial management better in acute care |
| Severe, complicated       | • Clinically unstable  
• Ileus  
• Toxic megacolon  
• Possible ICU transfer  
• Consult Surgeon & Infectious Disease  
• Monitor serum lactate, WBC |

Cohen *et al.* Infec Control Hosp Epi 2010; 31:431-55
## Treatment of Non-Severe \textit{C. difficile} Infections

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop the inciting antibiotics</td>
<td>A-II</td>
</tr>
<tr>
<td>Oral metronidazole</td>
<td>A-I</td>
</tr>
<tr>
<td>If on warfarin, oral vancomycin</td>
<td>A-I</td>
</tr>
</tbody>
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Cohen \textit{et al.}. \textit{Infec Control Hosp Epi} 2010; 31:431-55
Treatment, Recurrent Disease

No tests of cure!

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Treatment, Recurrent Disease

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<table>
<thead>
<tr>
<th>Recurrence</th>
<th>Treatment</th>
</tr>
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<tbody>
<tr>
<td>Any</td>
<td>Stop the inciting antibiotics</td>
</tr>
<tr>
<td>First</td>
<td>Repeat metronidazole</td>
</tr>
<tr>
<td>Second</td>
<td>Oral vancomycin</td>
</tr>
<tr>
<td>&gt;2nd</td>
<td>.....oral vanco......or......</td>
</tr>
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Cohen et al. Infec Control Hosp Epi 2010; 31:431-55;
Fidaxomicin

- Active against *C. difficile* but spares other members of gut microbiome
- Treatment outcomes = vancomycin
- Reduces the risk of recurrent disease

Cost Comparison

Fidaxomicin (10 days) $ 3300
Vancomycin (capsules; 14 days) $ 2000
Vancomycin (compounded) $ 40
Metronidazole $ 30

Cruz; Pharmacy & Therapeutics, 2012 37(5):278-81
Fecal Microbiota Transplant (FMT)

- Administration of feces from a healthy donor
- Symptom resolution in 1-2 days
- 15/16 (93%) patients cured with 1-2 treatments
- In small series of 10 adults >80 years, 8 of 10 had symptom resolution

Fresh or Frozen?

- Randomized non-inferiority study
- 232 adults (~73 years) with refractory CDI
- Frozen → thawed FMT works as well as fresh FMT
- FMT is a cost-effective, well-tolerated strategy

Lee et al. JAMA 2016;315(2):142-149
Drekonja et al. VA ESP Project #09-009;2014
Poop Pills

- Oral, capsulized, frozen fecal microbiota transplantation
- Capsules stored at -80°C. Each treatment made from a single donor
- Trial on 20 patients, ages 7 – 90 with refractory/ recurrent CDI
- 15 capsules a day for 2 days
- 14 responded to first treatment; 4 to second treatment for 90% cure rate

Hecker et al. OFID 2016; 3(2): ofwo91
Youngster et al JAMA 2014; 312(17):1772-78
Poop Pills

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Youngster et al JAMA 2014; 312(17):1772-78
Freeze-Dried Poop Pills

Case Report:
46 year old woman with Crohn’s disease who developed refractory C. difficile infection

What can brown do for you?
Infection Control & Prevention
Nursing-Home Onset

Guerrero et al. Infec Control Hosp Epi 2011; 32:513-15
Hunter et al. Open Forum Infecti Di 2016 3(1); PMID 26798767
Kim et al Infect Control Hosp Epi 2011; 32:656-60
Nursing-Home Onset

Exposure to *C. difficile* spores

Guerrero *et al.* Infec Control Hosp Epi 2011; 32:513-15
Hunter *et al.* Open Forum Infecti Di 2016 3(1); PMID 26798767
Kim *et al* Infect Control Hosp Epi 2011; 32:656-60
C. difficile Spores

- May be recovered months after left on a surface
- Difficult to kill using routine cleaning agents
- Spores are shed onto residents’ skin and into their environment

Kim et al. Jnl Hosp Infection 1981; 143(1) 43-50
Consider Extending Isolation

Time until negative results for *C. difficile* cultures from residents’ abdomen or chest

Asymptomatic Carriers

Riggs et al. Clinical Infec Dis 2007; 45:99208
There’s no place like home…
There’s no place like home…

…but how do we clean it?

Slide Courtesy of Curtis Donskey
Sitzlar et al Infect Control Hosp Epi 2012; 33:534-36
## Steps You Can Take: Infection Control

<table>
<thead>
<tr>
<th>Minimize Transmission by Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private rooms if know or suspect <em>C. difficile</em> infection</td>
</tr>
<tr>
<td>Encourage hand hygiene</td>
</tr>
<tr>
<td>Extend isolation</td>
</tr>
<tr>
<td>Have them use common equipment at the end of the day</td>
</tr>
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Cohen *et al.* Infec Control Hosp Epi 2010; 31:431-55
http://www.cdc.gov/HAI/prevent/prevention_tools.html#ltc
Steps You Can Take: Infection Control

<table>
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<th>Minimize Transmission by Staff</th>
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<tr>
<td>Hand hygiene with soap &amp; water</td>
</tr>
<tr>
<td>Single use/disposable equipment</td>
</tr>
<tr>
<td>Dedicated equipment (<em>e.g.</em>, slings)</td>
</tr>
<tr>
<td>Mandatory education annually; more often for high-turnover staff</td>
</tr>
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Cohen *et al.* Infec Control Hosp Epi 2010; 31:431-55
http://www.cdc.gov/HAI/prevent/prevention_tools.html#ltc
Steps You Can Take: Infection Control

Minimize Transmission by Staff

| Contact precautions (gown, glove) |
| Make equipment available at the door |
| Designate someone on every shift to replenish supplies |
| Supply disinfectant wipes with bleach |

Cohen et al. Infec Control Hosp Epi 2010; 31:431-55
http://www.cdc.gov/HAI/prevent/prevention_tools.html#ltc
## Steps You Can Take: Infection Control

### Minimize Environmental Reservoirs

<table>
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<th>Action</th>
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<tr>
<td>Involve &amp; educate housekeeping staff</td>
</tr>
<tr>
<td>Daily disinfection of high-touch surfaces</td>
</tr>
<tr>
<td>Assess adequacy of cleaning before changing to a new product</td>
</tr>
<tr>
<td>Cleaning &amp; disinfection with sporicidal agent (i.e. bleach)</td>
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http://www.cdc.gov/HAI/prevent/prevention_tools.html#ltc
Probiotics for Primary Prevention?

• Metanalysis slightly favors probiotics
  • *Lactobacillus casei*, *L. acidophilus* and *L. rhamnosus* in varying combinations
  • *Sacromyces boulardii*
• Above given as part of clinical trials
• FDA-approved probiotics?

Evans & Johnson, Clin Infec Dis 2015:60 (s2)S122-8
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- FDA-approved probiotics?
  
  - Yogurt
  
  - Kefir

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Evans & Johnson, Clin Infec Dis 2015:60 (s2)S122-8

### Steps You Can Take: Infection Prevention

#### Facility-wide Measures

<table>
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<tbody>
<tr>
<td>Antimicrobial Stewardship Program</td>
</tr>
<tr>
<td>Surveillance for C. difficile infection</td>
</tr>
<tr>
<td>Avoid tests of cure</td>
</tr>
<tr>
<td>Laboratory-based alert system</td>
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http://www.cdc.gov/HAI/prevent/prevention_tools.html#ltc
## Steps You Can Take: Infection Prevention

### Early response to potential CDI

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<th>Define criteria to suspect CDI</th>
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<tr>
<td>Preemptive contact isolation</td>
</tr>
<tr>
<td>Standing orders to test for <em>C. difficile</em> (when criteria met)</td>
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http://www.cdc.gov/HAI/prevent/prevention_tools.html#ltc
Take Home Messages

• Metronidazole and oral vancomycin are the mainstays of treatment.

• Fecal microbiota transplant is safe and effective.

• Infection control is especially challenging in post-acute and long-term care.
Together, we can wipe out *C. diff*

Let’s doo it!

Thank you!

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