

## Clostridium difficile Infection (CDI)

**BOTTOM LINE: Guideline concordant therapy for CDI improves patient outcomes, including recurrences and mortality.<sup>1</sup>**

### Impact of CDI in Alberta Health Services (AHS)

- 1098 cases of hospital-acquired CDI in AHS in 2014, or 3.3 cases per 10,000 patient days<sup>2</sup>

#### Adverse Outcomes:

- ICU admission
- Prolonged hospital stay
- Colectomy
- Increased hospital costs
- Death - 60 preventable deaths in 2014 = attributable mortality rate of 3.4%<sup>2</sup>

### Prevention of CDI

- Immediate contact precautions for known or suspected cases (see <http://www.albertahealthservices.ca/ipc/hi-ipc-resource-manual-main-document.pdf> (page 54))
- Hand hygiene with soap & water is preferred to alcohol hand rub; the friction and running water remove *C. difficile* spores
- Adequate environmental cleaning strategies
- Judicious use of antimicrobials & acid suppressive therapy:
  - Only use antibiotics when necessary.
  - Reassess empiric antibiotics at 48-72 hours and narrow the spectrum based on microbiology & clinical status.
  - Discontinue antibiotics & acid suppressive medications if possible.

### Guideline Concordant CDI Therapy<sup>1</sup>

Patients whose prescribers followed CDI guidelines experienced fewer complications (17.2% vs. 56.3%, P<0.0001):

- ↓ mortality (5.4% vs. 21.8%, P = 0.0012)
- ↓ CDI recurrence (14% vs. 35.6%, P = 0.0007)<sup>1</sup>

### CDI Order Sets in AHS/Covenant Health

Order Set Name or Number	AHS Zone/ Location
C.Difficile (Clostridium Difficile Management) order set in SCM	Calgary Zone
Red Deer - #19867	Central Zone
Central Zone - #19868	
Adult – Form #19718	Edmonton Zone
Pediatric – Form #19719	North Zone
Form CV-0318	Covenant Health

### CDI Risk Factors

- Hospitalization
- Severe illness
- Advanced age (> 65 years old)
- Antibiotic therapy:
  - Inpatients on antibiotics are 60% more likely to develop CDI.<sup>3</sup>
  - a 10% increase in ward antibiotic exposure leads to a 1.34-fold increase in CDI incidence in patients **with and without** direct recent antibiotic exposure.<sup>3</sup>
- Acid suppressive therapy (PPIs and H2 blockers)

### Antimicrobial Treatment of CDI<sup>4</sup>

Mild to Moderate Infection	
First or second episode	Metronidazole 500mg PO/NG TID for 10 days <b>Failure to respond in 3-5 days, change to:</b> Vancomycin 125mg PO/NG QID for 10 days
Third or greater episode	Vancomycin 125mg PO/NG QID for 10 days then 125mg BID for 7 days, then 125mg daily for 7 days, then 125mg q2days for 7 days, then 125mg q3days for 7 days
Severe Infection*	
Vancomycin 125mg PO/NG QID for 10 days <b>If ileus/NPO:</b> Vancomycin 500mg PR***† QID for 10 days PLUS Metronidazole 500mg IV q8h† for 10 days	

\*\* Vancomycin 500mg in 100mL NS via colonic tube clamped x 3h.  
† Switch to PO/NG as soon as possible; see doses under 1<sup>st</sup> or 2<sup>nd</sup> episode.

### Therapeutic Interchanges in CDI

Original Order	Interchange
Vancomycin PO at any dose if patient does not meet criteria for severe CDI* or for oral vancomycin (see next page)	Metronidazole 500mg PO TID
Vancomycin oral doses > 125mg PO QID	Vancomycin 125mg PO QID***
Vancomycin oral doses (capsules)	Vancomycin IV solution given PO at same dose

\* Severe CDI: WBC>15 x 10<sup>3</sup>/L, creatinine ≥ 1.5x baseline, hypotension, shock, megacolon

\*\*\* Higher doses of oral/NG vancomycin are not needed as:

- faecal levels achieved with 125mg PO QID (using IV formulation) are 500-1000x higher than the MIC<sub>90</sub> of vancomycin against *C. difficile*<sup>5</sup>
- a recent study in patients with severe CDI showed no difference in cure rates or other outcomes with doses higher than 125mg PO QID<sup>6</sup>

### Oral Vancomycin GUIDELINES

Oral vancomycin is used solely for the treatment of *C. difficile* infection and only if there is:

- a) documented failure or clinical deterioration on metronidazole therapy
- b) clinical relapse of *C. difficile* infection with symptoms after 2 courses of metronidazole therapy
- c) severe *C. difficile* infection (defined as WBC > 15x10<sup>9</sup>/L, serum creatinine ≥ 1.5 times baseline, hypotension, or shock) or documented or impending toxic megacolon
- d) intolerance or adverse effects of metronidazole therapy

#### References

1. Brown AT, Seifert CF. Effect of treatment variation on outcomes in patients with *Clostridium difficile*. *Am J Med* 2014;127:865-70.
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3. Brown K, Valenta K, Fisman D, et al. Hospital ward antibiotic prescribing and the risks of *Clostridium difficile* infection. *JAMA Intern Med* 2015;175(4):626-33.
4. Blondel-Hill E, Fryters S, eds. *Bugs & Drugs 2012*. 2012 edition. Edmonton, AB: Alberta Health Services; 2012. p. 307-9. Alberta Health Services. *Bugs & Drugs* (March 5, 2015; 2.0.1) [mobile application software]. [Internet]. Available from: <https://itunes.apple.com/ca/app/bugs-drugs/id609765024?mt=8>
5. Gonzales M, Pepin J, Frost EH, et al. Faecal pharmacokinetics of orally administered vancomycin in patients with suspected *Clostridium difficile* infection. *BMC Infect Dis* 2010;10:363-9.
6. Lam SW, Bass SN, Neuner EA, et al. Effect of vancomycin dose on treatment outcomes in severe *Clostridium difficile* infection. *Int J Antimicrob Agents* 2013;42(6):553-8.
7. Hoang H, Zurek K, Remtulla S. Covenant Health Antimicrobial Stewardship E-Newsletter, April 16, 2014, Issue 2. Available at [http://www.compassionnet.ca/PatientResident/CHASE\\_Newsletter\\_Issue\\_2.pdf](http://www.compassionnet.ca/PatientResident/CHASE_Newsletter_Issue_2.pdf)