

Central Zone C. difficile Infection Toolkit Evaluation Plan – Summary Report

February 2016 – December 2017

Contents

Executive Summary.....	1
Central Zone CDI Cases and Toolkit Evaluation	2
Introduction	2
Descriptive Statistics	4
Facility Summaries	4
Zone Collated Summaries	5
Red Deer Regional Hospital CDI Case Summaries	7

Executive Summary

There were 62 CDI cases reported from July – December 2017. Utilization of the CDI PPCO remains a challenge at particular patient care areas, with overall use in 48% of cases (previous six month period was 44%). Concordance to empiric therapy guidelines in this time period was 81% (previous six month period was 70%).

New Canadian *Clostridium difficile* infection identification and treatment guidelines will be published imminently. These will affect the criteria and empiric treatment for CDI cases.

Central Zone CDI Cases and Toolkit Evaluation

Introduction

February 2016 – December 2017

The Central Zone *Clostridium difficile* Infection (CDI) Toolkit was launched zone wide in 2015. The Toolkit consists of pre-printed care orders (PPCO) to assist prescribers in identifying and treating CDI according to clinical guidelines, as well as patient care flow maps, a checklist for nursing staff and signs to post at the entry to patient rooms. The contents of the Toolkit were based on the Infectious Disease Society of America (IDSA) Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults 2010. These guidelines are expected to be updated for 2018.

Cases meeting CDI surveillance criteria (adult, inpatient acute care, 3 or more type 6/7 stools in 24 hours or 6 or more type 6/7 stools in 36 hours, positive *C. difficile* toxin) are monitored by site Infection Control Professionals (ICP) and clinical pharmacists. Case specific summaries are provided to the attending physician and unit manager at the conclusion of each case.

This report summarizes uptake of the Central Zone CDI Toolkit components, concordance to CDI guidelines and provides descriptive statistics about the nature of CDI cases to the ASWG, Central Zone Infection Prevention Committee and Provincial Antimicrobial Stewardship Committee. Healthcare and community acquired cases are not differentiated in this report. Starting July 1, 2017 CDI cases in AHS continuing care facilities have been added to the summary.

From February 2016 to December 2017, 180 CDI cases have been identified. The majority of cases (75) were reported at Red Deer Regional Hospital, followed by Wetaskiwin Hospital and Care Centre (20) and Stettler Hospital and Care Centre (10).

For the July – December 2017 reporting period there were 62 CDI cases reported, continuing the upwards trend in the overall number of CDI cases. Red Deer and Wetaskiwin continued to have the lowest PPCO utilization rates of sites with more than two cases reported in each evaluation period. Stettler achieved 100% PPCO use in this reporting period, compared to 40% in the previous reporting period.

- 77% of cases are classified as mild/moderate CDI infection
- 81% are first CDI occurrences
- 73% of patients were discharged with symptom resolution
- 48% of cases are identified prior to or within the first 3 days of hospital stay
- Contact precautions are reported in place 90% of the time
- 92% of cases had exposure to antibiotics in the 60 days prior to CDI diagnosis. Ceftriaxone, ciprofloxacin and piperacillin-tazobactam are the most commonly prescribed antibiotics, with one or more agents occurring in 36% of cases. When applicable, antibiotic de-escalation were reviewed in 89% of cases
- 63% of patients were on acid reduction therapy at the time of CDI diagnosis. When applicable, acid reduction therapy was reviewed or discontinued on 78% of cases

- For the July – December 2017 period overall empiric CDI therapy concordance to guidelines was 81%. When a PPCO was in place, CDI therapy was guideline concordant 73% of the time. Non-concordance was due to a number of reasons, including:
 - Misclassification of CDI severity (mild/moderate or severe)
 - Over treatment. For example: Extended length of therapy (14 days vs. 10 days), vancomycin ordered for first occurrence of mild/moderate CDI, vancomycin taper therapy for a second occurrence
 - Under treatment. For example: metronidazole used for a 3rd or greater CDI occurrence, metronidazole used when classified as severe CDI
 - Use of non-standard doses of metronidazole or oral vancomycin

New international and Canadian CDI guidelines have been published in Q1 of 2018. This will necessitate review and alignment of Central Zone's CDI Toolkit.

Respectfully submitted,

Darren Pasay, B.Sc.Pharm.
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Descriptive Statistics

Facility Summaries

	#CDI Cases				PPCO USED				GUIDELINE CONCORDANCE (%)			
	Feb- June 2016	July- Dec 2016	Jan- June 2017	July- Dec 2017	Feb- June 2016	July- Dec 2016	Jan- June 2017	July- Dec 2017	Feb- June 2016	July- Dec 2016	Jan- June 2017	July- Dec 2017
Red Deer	12	18	18	26	42%	22%	39%	38%	58%	72%	67%	77%
CCMHBI	2	3	2		100%	66%	50%		50%	33%	100%	
Wetaskiwin	4	3	6	9	0%	33%	33%	44%	100%	66%	66%	100%
Olds	2			4	50%			75%	50%			75%
Drumheller		1		2		100%		50%		0%		50%
RMH												
DV		6	1	3		50%	100%	67%		83%	0%	100%
Ponoka		2	4	2		50%	100%	0%		0%	75%	100%
Lacombe			4	2			0%	0%			75%	100%
Stettler	1	2	5	2	100%	0%	40%	100%	100%	50%	100%	100%
Innisfail		1	1	1		100%	100%	100%		100%	100%	100%
Rimbey	1				100%				100%			
Vermilion		2	3	2		50%	0%	100%		100%	66%	50%
Three Hills				1				100%				100%
Wainwright		2				50%				100%		
Two Hills			2	2			50%	100%			50%	100%
Daysland	1				100%				0%			
Sundre		1	2	2		0%	100%	100%		0%	100%	50%
Hanna	4	3		1	0%	66%		0%	50%	66%		100%
Tofield	1		2	2	0%		100%	0%	100%		50%	0%
Viking				1				0%				100%
Provost												
Coronation			1				0%				N/A	
Hardisty												
Lamont*		1				0%				0%		

CCMHBI = Centennial Centre for Mental Health and Brain Injury; DV=Drayton Valley; RMH=Rocky Mountain House

*Non-AHS facility

Zone Collated Summaries

	Feb-June 2016	July-Dec 2016	Jan-June 2017	July-Dec 2017
TOTAL CDI CASES	29	45	54	62
Gender				
M	13 (45%)	17 (38%)	23 (43%)	23 (37%)
F	16 (55%)	28 (62%)	31 (57%)	39 (63%)
Age (years)				
0-20			1 (2%)	
21-40	5 (17%)	6 (13%)	2 (4%)	2 (3%)
41-60	8 (28%)	5 (11%)	9 (17%)	17 (27%)
61-80	5 (17%)	17 (38%)	26 (48%)	19 (31%)
81-100	10 (34%)	15 (33%)	17 (31%)	24 (39%)
>100	1 (3%)	1 (2%)		
CDI Episode #				
First	21 (72%)	38 (84%)	46 (85%)	55 (89%)
Second	4 (14%)	6 (13%)	3 (6%)	4 (6%)
Third	4 (14%)	1 (2%)	5 (9%)	3 (5%)
CDI Severity				
Mild/moderate	22 (76%)	34 (76%)	40 (74%)	50 (81%)
Severe	7 (24%)	11 (24%)	14 (26%)	8 (13%)
Admission to CDI diagnosis (days)				
Prior to admission	1 (3%)	2 (4%)	1 (2%)	3 (5%)
Day of admission to 3 days	15 (52%)	23 (51%)	28 (52%)	26 (43%)
Greater than 3 days to 7 days	4 (14%)	6 (14%)	6 (11%)	12 (20%)
Greater than 7 days to 30 days	6 (21%)	5 (11%)	12 (22%)	14 (23%)
Greater than 30 days	3 (10%)	9 (20%)	7 (13%)	3 (5%)
30 Day/Discharge Outcome				
Symptoms resolved	22 (76%)	32 (71%)	33 (61%)	44 (73%)
ICU Admission		1 (2%)	1 (2%)	
Colectomy	1 (3%)			1 (2%)
Death – not related to CDI	3 (10%)	1 (2%)	1 (2%)	4 (10%)
Death – attributed to CDI			1 (2%)	
Discharged withOUT symptom resolution		7 (16%)	15 (28%)	8 (13%)
Lost to follow up	3 (10%)	2 (4%)	2 (4%)	1 (2%)
Sporicidal Precautions Sign posted on patient room				
Yes	27 (93%)	38 (84%)	50 (93%)	56 (90%)
No	2 (7%)	4 (9%)		4 (6%)
Unknown		3 (7%)	4 (7%)	2 (3%)
CDI Case Flow Map available on patient care unit				
Yes	25 (86%)	35 (78%)	50 (93%)	62 (100%)
No	4 (14%)	10 (22%)	2 (3%)	
Unknown			2 (3%)	
Patient exposed to antibiotics in previous 60 days				
Yes	27 (93%)	36 (80%)	44 (81%)	57 (92%)
No	2 (7%)	7 (20%)	10 (19%)	5 (8%)

Antibiotic Therapy review/de-escalated				
Yes	9 (31%)	20 (44%)	21 (39%)	33 (53%)
No	5 (17%)	6 (13%)	6 (11%)	7 (11%)
Unknown	1 (3%)	3 (7%)		3 (5%)
Not applicable	14 (48%)	15 (33%)	27 (50%)	19 (31%)
Patient on acid reduction therapy at time of CDI diagnosis				
Yes	13 (45%)	30 (67%)	36 (67%)	39 (63%)
No	16 (55%)	14 (33%)	18 (33%)	23 (37%)
Acid reduction therapy reviewed/de-escalated				
Yes	11 (38%)	18 (40%)	26 (48%)	28 (45%)
No	1 (3%)	6 (13%)	7 (13%)	11 (18%)
Unknown		1 (2%)	1 (2%)	1 (2%)
Not applicable	15 (52%)	19 (42%)	20 (37%)	22 (35%)

February 2016 – December 2017			
When PPCO present (n=88)		When PPCO NOT present (n=111)	
Guideline concordant:		Guideline concordant:	
Yes	68 (77%)	Yes	75 (68%)
No	18 (20%)	No	30 (27%)
Unknown/Not applicable	2 (2%)	Unknown/Not applicable	6 (5%)

July 2017 – December 2017			
When PPCO present (n=30)		When PPCO not present (n=31)	
Guideline concordant:		Guideline concordant:	
Yes	24 (80%)	Yes	25 (81%)
No	5 (17%)	No	5 (16%)
Unknown/Not applicable	1 (3%)	Unknown/Not applicable	1 (3%)

Antibiotic Exposure in previous 60 days (count)					
ceftriaxone	56	vancomycin	18	fluconazole	2
ciprofloxacin	56	clindamycin	17	penicillin	2
piperacillin-tazobactam	30	amoxicillin-clavulanate	16	trimethoprim	2
metronidazole	25	levofloxacin	10	dapsone	1
cefazolin	24	azithromycin	7	fosfomycin	1
cefixime	23	cloxacillin	5	imipenem	1
amoxicillin	21	meropenem	4	methenamine	1
co-trimoxazole	21	moxifloxacin	3	piperacillin	1
cephalexin	20	cefuroxime	2	rifampin	1
nitrofurantoin	19	doxycycline	2	tobramycin	1

Red Deer Regional Hospital CDI Case Summaries

There were 26 CDI cases reported at RDRHC from July to December 2017.

Compliance with sporicidal precautions signage (85%) decreased from previous reporting periods. Patient Care Flow Map availability remained at 100%. Overall PPCO utilization is poor with only 10 of 26 instances using it (38% adherence). Individual units ranged from 0-100% of cases having evidence of its use. Unit 23 continued to have a high degree of compliance to PPCO use (100%). Units 24, 31, 32 and ICU did not use the PPCO, despite having more than one CDI case. Units 32P and 33 had partial use of the PPCO. Units 21 and 22 had single CDI cases, but did not use the PPCO in either circumstance.

CDI therapy concordance to guidelines ranges from 0-100%; with units 23, 24 and 31 having the lowest incidence of concordance.

Targeted intervention, including engagement of medical and nursing staff will be required to increase uptake of the CDI Toolkit components.

Unit #	#CDI Cases				PPCO USED				GUIDELINE CONCORDANCE (%)			
	Feb-June 2016	July-Dec 2016	Jan-June 2017	July-Dec 2017	Feb-June 2016	July-Dec 2016	Jan-June 2017	July-Dec 2017	Feb-June 2016	July-Dec 2016	Jan-June 2017	July-Dec 2017
21			3	1			1 (33%)	0 (0%)			3 (100%)	1 (100%)
22	2	1	1	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (50%)	1 (100%)	1 (100%)	1 (100%)
23	5	3	2	5	5 (100%)	3 (100%)	1 (50%)	5 (100%)	4 (80%)	2 (66%)	1 (50%)	3 (60%)
24		3		2		0 (0%)		0 (0%)		2 (66%)		1 (50%)
31	3	5	3	5	0 (0%)	1 (20%)	0 (0%)	0 (0%)	1 (33%)	4 (80%)	2 (66%)	3 (60%)
32	2	2	2	2	0 (0%)	0(0%)	1 (50%)	0 (0%)	1 (50%)	2 (100%)	2 (100%)	2 (100%)
33		2	2	3		0 (0%)	2 (100%)	2 (67%)		0 (0%)	1 (50%)	3 (100%)
35			1	1			1 (100%)	1 (100%)			1 (100%)	0 (0%)
32P		2	4	4		0 (0%)	1 (25%)	2 (50%)		2 (100%)	1 (25%)	4 (100%)
ICU				2				0 (0%)				2 (100%)
TOTAL	12	18	18	26	5 (42%)	4 (22%)	7 (39%)	10 (38%)	7 (58%)	13 (72%)	12 (67%)	21 (81%)