

Healthcare-associated infections surveillance report

Carbapenemase-producing organisms (CPO) update

August 2017

Highlights for Q4 2016/17 (December 1, 2016 – March 31, 2017)

- 28 new cases of CPO were identified among 25 patients in BC acute care facilities
- NDM was the most common gene identified (19/28 cases, 67.9%)
- 17 cases (60.7%) reported healthcare exposure outside Canada. No known risk factors were observed among 9 cases (32.1%)

Carbapenems are a class of antibiotics usually reserved to treat serious infections, and are often considered one of the antibiotic treatments of last resort. However, over the last decade, some bacteria have developed resistance to carbapenems by producing an enzyme (carbapenemase) that breaks down the structure of these antibiotics. These antibiotic-resistant bacteria are called carbapenemase-producing organisms (CPO). CPOs can arise through the acquisition of carbapenemase genes from other bacteria. Some common examples of these genes are the New-Delhi Metallo- β -lactamase (NDM) and *Klebsiella pneumoniae* carbapenemase (KPC).

CPOs usually spread person-to-person through contact with infected or colonized people, or via contaminated surfaces or medical equipment. Many people with CPOs have the bacteria in or on their body without causing symptoms (this is called colonization). Others may have infections in various body sites (such as bloodstream, urinary tract, surgical site, etc.), with very limited antibiotic treatment options, and consequently poor clinical outcomes. Actions that can help prevent the spread of CPOs include screening patients for CPO, good hand hygiene by both healthcare workers and patients, and thorough cleaning and disinfection of rooms and medical equipment.

Since 2010, the British Columbia Centre for Disease Control's Public Health Laboratory (BCCDC PHL), the microbiology laboratories in healthcare facilities and communities, and infection prevention and control have been working collaboratively on testing for and monitoring CPOs in the province. Following an outbreak of CPOs in a BC hospital in February 2014, a provincially mandated active surveillance program for CPO was established in BC's acute care facilities. Since July 2014, all laboratory isolates recovered from patient specimens that are suspected of harbouring a carbapenemase gene are submitted to BCCDC PHL for confirmatory testing. If an isolate from a patient in an acute care facility is identified with a carbapenemase gene for the first time or with a new carbapenemase gene, it is considered to be a new case of CPO, and is reported to the Provincial Infection Control Network of BC (PICNet).

This report summarizes the new cases of CPO identified in BC acute care facilities during fiscal quarter 4 (Q4, December 1, 2016 – March 31, 2017) of fiscal year 2016/17. Twenty-eight new cases of CPO were identified among twenty-five patients during Q4, – twenty-two patients were identified with a single carbapenemase gene and three patients with two carbapenemase genes. NDM was the predominant gene identified among the new CPO cases, accounting for 67.9% (19/28), followed by KPC (5, 17.9%), OXA-48 (3, 10.7%), and SME (1, 3.6%).

By health authority¹, eighteen new CPO cases (64.3%) were identified in Fraser Health, seven cases (25.0%) in Vancouver Coastal Health, two cases in Interior Health, and one case in Provincial Health Services Authority. No new cases were identified in Island Health and Northern Health during Q4.

New cases were investigated for risk factors that may have contributed to CPO transmission in the past twelve months, including healthcare encounters outside of Canada (e.g. overnight hospitalization, certain medical or surgical procedures), close contact with a CPO patient or the patient's environment, transfer from or stay in a care unit which was under investigation for CPO transmission. Of the twenty-eight new cases in Q4, seventeen cases (60.7%) reported healthcare exposure outside Canada, and two cases (7.1%) were associated with other risk factors. Nine cases (32.1%) had no known risk factors, meaning that the source of their CPO acquisition could not be identified.

During the period Q1–Q4 of 2016/17, a total of 84 new cases of CPO have been identified among patients in acute care facilities.

**Number of new cases of CPO identified in BC acute care facilities by carbapenemase gene
(Q4: December 1, 2016 – March 31, 2017)***

Health authority	NDM	OXA-48	KPC	VIM	SME	Total
Fraser Health	14	2	2	0	0	18
Interior Health	1	0	0	0	1	2
Island Health	0	0	0	0	0	0
Northern Health	0	0	0	0	0	0
Vancouver Coastal Health	4	1	2	0	0	7
Provincial Health Services Authority	0	0	1	0	0	1
Subtotal in Q4	19	3	5	0	1	28
Total in 2016/17	59	14	8	2	1	84

* based on the date of specimen collection from which a CPO gene was identified. The number of CPO cases includes new CPO cases identified among inpatients in acute care facilities or hemodialysis patients only. The isolates recovered from outpatients or residents in residential care facilities, or submitted by community laboratories were excluded.

For more information about CPO and the provincial surveillance program, please visit the PICNet website at <https://www.picnet.ca/surveillance/cpo>.

¹ This report did not include the CPO cases identified outside of acute care facilities. CPO became a reportable disease in BC in December 2016.