

Healthcare-associated infections surveillance report

Carbapenemase-producing organisms (CPOs) update

March 2018

Highlights for Q3 2017/18 (September 8 – November 30, 2017)

- 11 new cases of CPO were identified in 11 patients in BC acute care facilities.
- The NDM resistance gene accounted for the majority of cases (8, 72.7%).
- 4 cases (36.4%) reported healthcare encounters outside Canada.
- 4 cases (36.4%) had no risk factors identified.

What are carbapenemase-producing organisms (CPOs)?

Carbapenems are a class of antibiotics usually reserved to treat serious infections, and often considered one of the antimicrobial treatments of last resort. 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 (CPOs). The most common carbapenemase resistance genes include NDM, KPC, OXA-48, etc..

Why are CPOs considered important?

CPOs are an important emerging threat to public health. First, these organisms are often resistant to multiple classes of antimicrobials, substantially limiting treatment options. Second, infections caused by these organisms are associated with high mortality rates, up to 50% in some studies. Third, many carbapenem resistance genes can be transmitted from one species of bacteria to another, potentially facilitating widespread resistance. Fourth, since *Enterobacteriaceae* are a common cause of infections, carbapenem resistance in these organisms could have far-reaching impact. Outbreaks of CPOs are more difficult and costly to contain.

How are CPOs spread?

People can carry CPOs without causing any symptoms of illness (this is called colonization), but they still can pass the germs to other people. CPOs usually spread person-to-person through contact with infected or colonized people, or via contaminated surfaces. This can happen in both community and healthcare settings. Without proper precautions, CPOs can spread easily from person-to-person in hospitals, especially in countries where CPOs are endemic.

How can we prevent the spread of CPOs?

Good hand hygiene by both healthcare providers and patients, such as washing hands often with soap and water or using an alcohol-based hand sanitizer, is a simple and effective way to prevent the spread of CPOs. The public should avoid unnecessary exposure to health care in endemic countries. In healthcare settings, identifying CPO cases and placing colonized or infected patients on contact precautions, using medical devices and antimicrobials wisely, and carefully cleaning and disinfecting rooms as well as medical equipment can significantly reduce the risk of CPO transmission.

How can CPOs be treated?

CPO colonization does not need to be treated with antibiotics. If a CPO is causing an infection, the antibiotics that will work against it are limited, but some options are still available. In addition, some infections may be treatable with other therapies, such as draining the infection.

Tracking CPOs in BC

The first CPO case in British Columbia (BC) was identified in 2008 from a traveller returning from an endemic country where the patient had exposure to medical procedures. Since then, CPOs have been identified among patients in both community settings and healthcare settings, but remain uncommon in the majority of hospitals.

Under the revised provincial CPO surveillance protocol, endorsed by the Provincial Communicable Diseases Policy Advisory Committee, all new cases of CPO identified from BC acute care and community settings are to be reported to the Provincial Infection Control Network of BC (PICNet). This quarterly report summarizes new cases of CPO identified in BC during quarter 3 of fiscal year 2017/18 (Q3, September 8 – November 30, 2017).

There were eleven new CPO cases identified in Q3, in eleven patients – no patients were identified with more than one carbapenemase gene this quarter (each gene identified for the first time in a given patient is counted as a new case of CPO). The majority of new cases (8 cases, 72.7%) harbored NDM genes. Three cases harbored KPC genes (27.3%).

Seven cases (63.6% of all cases) were identified in Fraser Health. Vancouver Coastal Health reported three cases (27.3%), and Provincial Health Services Authority reported one case (9.1%). No new cases were identified in Interior Health, Island Health, or Northern Health in Q3.

New cases were investigated for risk factors that may have contributed to CPO acquisition in the past twelve months, including healthcare encounters outside Canada (e.g. overnight hospitalization, certain medical or surgical procedures), close contact with a known CPO patient or the patient's environment, and transfer from or stay in a care unit which was under investigation for CPO transmission. Of the eleven new cases in Q3, four cases (36.4%) reported healthcare exposure outside Canada, and three (27.3%) were associated with other risk factors¹. Four cases (36.4%) reported no known risk factors, meaning that the source of their CPO acquisition could not be identified.

**Number of new cases of CPO identified in BC acute care facilities by carbapenemase gene
(September 8 – November 30, 2017)***

Health authority	NDM	OXA-48	KPC	Total
Interior Health	0	0	0	0
Fraser Health	6	0	1	7
Vancouver Coastal Health	1	0	2	3
Island Health	0	0	0	0
Northern Health	0	0	0	0
Provincial Health Services Authority	1	0	0	1
Subtotal in Q3 2017/18	8	0	3	11
Total in 2017/18	55	14	10	79

* based on the date of specimen collection from which a CPO gene was identified.

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

¹ These risk categories are not mutually exclusive – patients reporting healthcare exposure outside Canada may also have other risk factors identified.