PICNet
PROVINCIAL INFECTION CONTROL NETWORK OF BRITISH COLUMBIA
A program of the Provincial Health Services Authority

PHSA Laboratories
Public Health Microbiology & Reference Laboratory

Healthcare-associated infections surveillance report

Carbapenemase-producing organisms (CPOs) update

January 2018

Highlights for Q2 2017/18 (June 16 – September 7, 2017)

- 28 new cases of CPO were identified in 25 patients in BC acute care facilities.
- The majority of new cases harbored the NDM resistance gene (20, 71.4%).
- 14 cases (50.0%) reported healthcare encounters outside Canada.
- 11 cases (40.7%) 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).

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 *Enterobacteriacae* 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 colonizations do 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 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.

This quarterly report summarizes new cases of CPO identified in BC acute care facilities during quarter 2 of fiscal year 2017/18 (Q2, June 16 – September 7, 2017) [1]. There were twenty-eight new CPO cases identified in Q2, occurring in twenty-five patients. This included twenty-two patients with a single CPO gene and three patients who each had two CPO genes – each gene identified for the first time in a given patient was counted as a new case of CPO. The majority of new cases (20 cases, 71.4%) harbored the NDM resistance gene. KPC and OXA-48 resistance genes were found in four cases each (14.3%).

By health authority[1], twenty-three new CPO cases (82.1%) were identified in Fraser Health, and five cases (17.9%) in Vancouver Coastal Health. No new cases were identified in Interior Health, Island Health, Northern Health, or Provincial Health Services Authority during Q2.

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 twenty-eight new cases in Q2, fourteen cases (50.0%), reported healthcare exposure outside Canada, and two cases (7.1%) were associated with other risk factors. Twelve (42.9%) 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 (Q2: June 17 – September 8, 2017)*

Health authority	NDM	OXA-48	KPC	Total
Interior Health	0	0	0	**0**
Fraser Health	17	4	2	**23**
Vancouver Coastal Health	3	0	2	**5**
Island Health	0	0	0	**0**
Northern Health	0	0	0	**0**
Provincial Health Services Authority	0	0	0	**0**
Subtotal in Q2 2017/18	**20**	**4**	**4**	**28**
Total in 2017/18	**47**	**14**	**7**	**68**

* 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 CPOs and the provincial surveillance program, please visit the PICNet website at https://www.picnet.ca/surveillance/cpo.

[1] CPO cases identified outside of acute care facilities were not included. CPO was designated as a reportable condition in BC on December 22, 2016. The BCCDC Public Health Laboratory, PICNet, and Infection Prevention and Control in the health authorities are working with the Provincial Communicable Diseases Policy Advisory Committee to include CPO cases identified in community settings in the current surveillance program.