Quarterly Update on Carbapenem-Resistant Enterobacteriaceae and Other Carbapenemase-Producing Organisms for Washington State

ISOLATES REPORTED TO THE DEPARTMENT OF HEALTH AND TESTED AT THE PUBLIC HEALTH LABORATORIES, BY DATE OF COLLECTION, JANUARY-MARCH 2017

Washington State Department of Health has performed surveillance and testing for CRE since October 2012. This update summarizes reports of carbapenem-resistant Enterobacteriaceae (CRE) isolates and other carbapenemase-producing organisms (CPO) collected from January through March, 2017. We include all CRE and CPO isolates diagnosed in-state and isolates from Washington residents diagnosed out-of-state and reported to the department. Isolates were included if they were the first unique genus/species/carbapenemase profile reported from an individual patient since surveillance began in 2012. If an isolate produced more than one carbapenemase, it was counted once for each novel carbapenemase.

The CRE case definition since May 2015, is: *E. coli, Klebsiella* spp., and *Enterobacter* spp. resistant to any carbapenem (according to Clinical Laboratory Standards Institute breakpoints: minimum inhibitory concentrations of ≥4 mcg/ml for meropenem, imipenem, and doripenem or ≥ 2 mcg/ml for ertapenem).


The Washington State Public Health Laboratories (PHL) test CRE isolates for the following carbapenemase genes:

- *Klebsiella pneumoniae* carbapenemase (KPC)
- New Delhi metallo-β-lactamase (NDM)
- Oxacillin-hydrolyzing β-lactamase-48 (OXA-48)
- Verona integron-encoded metallo-β-lactamase (VIM)
- Imipenem-hydrolyzing β-lactamase (IMP)

In addition, PHL tests other Gram-negative organisms. CR-Pseudomonas isolates are submitted by 22 sentinel laboratories in Washington. The department requests that CR-Acinetobacter are submitted by all laboratories in the state. Other CR-genera within the family Enterobacteriaceae are submitted and tested on special request.

The bar graph shows CRE and carbapenemase-producing Enterobacteriaceae isolates collected January through March 2017, compared to those submitted and tested in 2016 (Figure 1).
Quarter 1 2017

- Sixty-six CRE isolates were reported statewide in the first quarter of 2017. The contrasting color/pattern at the top of each bar represents the number of CRE isolates that were confirmed by PCR testing to carry a carbapenemase gene (Figure 1).
- Of 66 CRE isolates, 39 (59%) were Enterobacter spp., 18 (27%) E. coli, and 9 (14%) Klebsiella spp. (Figure 2).
- Of 66 CRE isolates, 6 (9%) isolates from 6 individual patients tested positive for carbapenemase: 4 KPC and 2 NDM. (Figure 2)
- Five of nine (56%) Klebsiella isolates were carbapenemase-positive, whereas 1 of 18 (6%) Enterobacter isolates, and zero E. coli isolates tested positive for carbapenemase. (Figure 2)
- The four KPC cases are likely associated with healthcare received in Washington State.
- Both NDM cases had history of international healthcare identified as the suspected source of transmission.
- Six carbapenemases were diagnosed in two Washington counties in quarter one of 2017 (Figure 4). Two cases were diagnosed outside of the patient’s county of residence. We offer this breakdown of cases by county to inform local health, facilities and providers of recent carbapenemase activity in their region. The quarter one map is shown in Figure 4 below.
- Forty-five CR-Pseudomonas and three CR-Acinetobacter isolates were submitted for carbapenemase testing in the first quarter of 2017, and none tested positive for carbapenemase production (Figure 3).
The Public Health Laboratories accepts and tests other carbapenem-resistant Gram negative organisms, such as other genera in the family Enterobacteriaceae, upon request, or if specialized screening tests (e.g., RAPIDEC® Carba-NP or Rosco Diagnostica Neo-Sensitabs) indicate suspicion for carbapenemase production.

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