

Testing and Response for Clinical Laboratory Identification of Carbapenem-Resistant *Enterobacteriaceae* (CRE)

Washington DOH surveillance case definition (as of May 1, 2015):

E. coli, *Klebsiella* spp., or *Enterobacter* spp. resistant to any carbapenem (minimum inhibitory concentrations of ≥ 4 mcg/ml for meropenem, imipenem, and doripenem or ≥ 2 mcg/ml for ertapenem)

Clinical labs: Submit to Washington State Public Health Lab (PHL) with [PHL microbiology submission form](#) and local antimicrobial susceptibility test result

Infection Control: Ensure patient is on Standard Precautions + Contact Precautions (+ additional transmission-based precautions per patient status)

PCR testing at PHL for select carbapenemase genes (KPC, NDM-1, VIM, IMP, OXA-48)

CARBAPENEMASE TESTING RESULT IS SENT TO SUBMITTER, FACILITY INFECTION CONTROL, AND LHJ, stating either “Negative for KPC, NDM-1, VIM, IMP, OXA-48” or “Positive for carbapenemase” (type specified)

RECOMMENDED ACTIONS BY PUBLIC HEALTH AND/OR FACILITY INFECTION CONTROL

For All CRE (implement when CRE identified by clinical lab)

- Flag medical records to indicate patient carries CRE.
- Educate healthcare providers and facilities caring for patient regarding infection transmission risk.
- Recommend healthcare providers use Contact Precautions for direct patient care in all healthcare settings.
- Request that facility microbiology perform retrospective and prospective surveillance for additional cases.
- Provide verbal and written educational materials to patient, and home caregivers.

For Carbapenemase-producing CRE

- In addition to recommended actions for all CRE, public health should investigate case to identify likely source and whether transmission to other patients occurred.
 - **Strongly consider surveillance cultures of epi-linked patients, or point prevalence survey on affected ward.**
 - Local Health should report case through PHIMS as a “Rare Disease of Public Health Significance” and complete and fax supplemental [DOH CRE report form](#) to DOH Communicable Disease Epidemiology at 206-418-5515.

Carbapenemases identified at Washington State Dept of Health Public Health Laboratories (PHL) include:

KPC— <i>Klebsiella pneumoniae</i> carbapenemase	VIM—Verona integron encoded metallo- β -lactamase	OXA-48—Oxacillinase-48
NDM—New Delhi metallo- β -lactamase	IMP—Imipenemase metallo- β -lactamase	

Please note, this testing may not identify all potential carbapenemases, but is likely to identify most carbapenemases found in Enterobacteriaceae in the US.

Infection Control for CRE

	Acute Care Facilities	Long Term Care Facilities
CP-CRE (PCR +) (<i>E. coli</i>, <i>Klebsiella</i> spp., or <i>Enterobacter</i> spp.) Infected or colonized	Contact precautions, private room or patient and/or staff cohorting.	<ol style="list-style-type: none"> Strongly recommend permanent contact precautions and private room or patient and/or staff cohorting. “Isolation” not necessary unless other factors such as uncontrolled drainage or behavior makes transmission likely. Use signage on the door of the resident's room; permanent dedication of ALL personal care equipment; best possible hand hygiene for both employees and resident (before leaving room); best possible sanitizing and disinfecting of resident's room and ALL care items touching the resident.
CRE (PCR -) (<i>E. coli</i>, <i>Klebsiella</i> spp., or <i>Enterobacter</i> spp.) Infected or colonized	Contact precautions, private room or patient and/or staff cohorting.	<ol style="list-style-type: none"> Time-limited contact precautions. Private room or patient and/or staff cohorting, if feasible. Follow actions in #2 above. See Oregon CRE Toolkit for guidance on discontinuation of contact precautions in Long Term Care settings, available at http://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/CRE/Documents/cre_toolkit.pdf.
Other CRE (Other than <i>E. coli</i>, <i>Klebsiella</i> spp., or <i>Enterobacter</i> spp.)	Institute routine facility infection control for organisms of this type.	ACTIVE infection with CRE or other MDRO—contact precautions as above. COLONIZED with CRE or other MDRO —standard precautions, unless uncontained drainage, incontinent, or other behavioral transmission risk.

Additional information about CRE surveillance and investigation can be found in the Washington State Department of Health [CRE Reporting and Investigation Guideline](#). Please contact Office of Communicable Disease Epidemiology at 206-418-5500 with questions about this document.