Highly Antibiotic Resistant Organisms: Reporting and Specimen Submission Requirements for Healthcare Facilities, Healthcare Providers and Laboratories in Washington State
October 23, 2012

Requested Action:

- Notify your local health jurisdiction within 24 hours of patients from whom the following multidrug resistant organisms are identified:
    - Carbapenem-resistant Enterobacteriaceae (CRE) [1]
    - Vancomycin-resistant *Staphylococcus aureus* (VRSA)
- Submit all VRSA and CRE [1] isolates to the Washington State Public Health Laboratories (PHL) for confirmation. See below for specimen submission instructions.[2]
- If infection or colonization with a multidrug-resistant organism (MDRO) (e.g., MRSA, VRE, VISA/VRSA, Extended spectrum beta-lactamases (ESBLs), CRE, resistant *Streptococcus pneumoniae*) is suspected in a patient, implement contact precautions immediately.[3]
- To determine carbapenem-nonsusceptibility, refer to new Clinical and Laboratory Standards Institute (CLSI) breakpoints for carbapenem susceptibility testing for Enterobacteriaceae (Table 1). [4]

Background

Multidrug resistant organisms (MDROs) pose a serious public health threat, especially in healthcare settings. Morbidity, mortality, costs and treatment failures are all increased for infections due to antibiotic-resistant organisms. Furthermore, some antibiotic resistance is easily transmissible between bacterial species and even genera.

Department of Health (DOH), in collaboration with local health jurisdictions in Washington, conducts mandated surveillance for antibiotic resistance under Washington Administrative Code (WAC) chapter 246-101-630. As part of this surveillance, DOH encourages healthcare providers, hospital infection preventionists, healthcare facilities, and laboratories to report and submit specimens for certain MDROs. The reasons for emphasizing reporting at this time are:

- Healthcare associated infections (HAIs) are a huge problem in the United States, causing around 1.7 million infections, 99,000 deaths, and $28-33 billion in excess healthcare costs each year.
- MDROs cause only about 16% of all HAIs each year, but require special infection control precautions and active surveillance after identification.
- Certain organisms, such as carbapenem-resistant Enterobacteriaceae (CRE), are rare in our state. Prompt recognition and preventive actions can keep them from becoming endemic.
- DOH can offer epidemiologic and laboratory assistance in HAI investigations, including consultation on infection control and providing molecular testing, if indicated.

Carbapenem-resistant Enterobacteriaceae (CRE) are endemic in several eastern states, but are rare in Washington. The family Enterobacteriaceae includes fecal organisms such as *Klebsiella, E. coli*, *Enterobacter, Morganella, Proteus* and *Serratia.* Several different mechanisms cause carbapenem resistance, but any CRE requires urgent infection control measures to prevent spread. As of October

2012, DOH is aware of only 11 CRE isolates detected in Washington, including *Klebsiella pneumoniae* with a Verona integron-encoded metallo-beta-lactamase (VIM) carbapenemase in a patient who received medical care in Greece (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5937a4.htm), several Enterobacteriaceae producing New Delhi metallo-β-lactamase (NDM-1) carbapenemase in a patient with medical care in India, and *K. pneumoniae* containing the KPC gene in a patient transferred from a California hospital. According to CDC, as of June, 2012, Washington and California are the only states in the country that have identified all three of these mechanisms of carbapemen-resistance in Enterobacteriaceae. DOH requests that healthcare providers, healthcare facilities and laboratories report CRE to local public health as a "Rare Disease of Public Health Significance" and an "emerging condition with outbreak potential. "

Only 13 cases of vancomycin-resistant *S. aureus* have been identified in the United States since 2002; none have been reported in Washington State (http://www.cdc.gov/HAI/settings/lab/vrsa_lab_search_containment.html). Due to the rarity of this organism and the ease of transferring resistance among bacterial species, Centers for Disease Control and Prevention (CDC) request that healthcare providers coordinate with public health authorities and submit surveillance isolates to CDC. VRSA is reportable by healthcare providers and healthcare facilities to local health authorities under WAC 246-101-101, and is to be reported by laboratories to DOH under WAC 246-101-201.

For questions regarding this document, please call your local health jurisdiction (http://www.doh.wa.gov/AboutUs/PublicHealthSystem/LocalHealthJurisdictions.aspx) or the DOH Office of Communicable Disease Epidemiology at 877-539-4344.

Table 1. Current Clinical and Laboratory Standards Institute Interpretive Criteria for Carbapenems and Enterobacteriaceae

Agent	Current Breakpoints (M100-S22) MIC (µg/mL)		
	Susceptible	Intermediate	Resistant
Doripenem	≤1	2	≥4
Ertapenem	≤0.5	1	≥2
Imipenem	≤1	2	≥4
Meropenem	≤1	2	≥4

(Table 1 reproduced from CDC 2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant Enterobacteriaceae [CRE] [http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html])

1. Case definition of CRE is: Intermediate or resistant to imipenem, doripenem or meropenem and resistant to all tested 3rd generation cephalosporins.

The following organisms can have intrinsic carbapenem resistance so should be reported and submitted only if intermediate or resistant to at least 2 carbapenems: *Serratia, Yersinia, Proteus, Providencia* and *Morganella.* If testing has been performed against only one carbapenem and the organism is found to be non-susceptible, please report and submit.

2. Include the correct microbiology form with all specimens submitted to PHL: http://www.doh.wa.gov/Portals/1/Documents/5230/302-013-Micro.pdf . Note that the PHL require all clinical specimens have two patient identifiers, a name and a second identifier (e.g., date of birth), on both the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source (e.g., blood, wound) and collection date.

3. For CDC guidance on control and management of highly antibiotic resistant organisms, please see:

- Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006 (http://www.cdc.gov/hicpac/mdro/mdro_toc.html)
- Investigation and Control of Vancomycin-Intermediate and -Resistant *Staphylococcus aureus* (VISA/VRSA): A guide for Health Departments and Infection Control Personnel (http://www.cdc.gov/hai/pdfs/visa_vrsa/visa_vrsa_guide.pdf)
- 2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE) (http://www.cdc.gov/hai/organisms/cre/cre-toolkit/rCREprevention.html)
- 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf)

4. Clinical and Laboratory Standards Institute (CLSI). Performance Standards for Antimicrobial Susceptibility Testing; Twenty Second Informational Supplement (January 2012). CLSI document M100-S22. Wayne, Pennsylvania, 2012.