

Antibiotic-Resistant Organism Updates

The Washington State Department of Health performs surveillance for highly antibiotic resistant organisms. Some of these isolate-types are mandated to be submitted statewide, and some are requested to be submitted by sentinel labs on a voluntary basis. This article describes updates to surveillance for antibiotic resistant organisms as of January 2020.

Since 2016, the Washington State Department of Health Public Health Laboratories (WA PHL) is the Antibiotic Resistance (AR) Laboratory for the western United States. The AR Lab Network is funded by Centers for Disease Control and Prevention (CDC) and provides increased multidrug resistant organism (MDRO) surveillance and advanced antibiotic resistance testing. Isolates submitted by clinical labs to the AR Lab Network West Regional Laboratory undergo identification, mechanism testing, and susceptibility testing.

The AR Lab performs the following antibiotic resistance testing on isolates and samples shown in Table 1 on page 3.

Surveillance Updates

In 2019, the AR Lab Network West Regional Laboratory added several new tests.

- **Real-time PCR for *Candida auris* colonization screening.**
 - o The PCR assay replaced culture-based screening, reducing turn-around time from 14 business days to two to three business days.
- **Real-time PCR for the detection of OXA-variants in *Acinetobacter baumannii*, including OXA-23-like, OXA-24/40-like, and OXA-58-like.**
 - o This test is performed on *Acinetobacter*

isolates when AST results show elevated carbapenem resistance, but a common carbapenemase is not detected (e.g. negative for IMP, KPC, NDM, OXA-48, VIM).

- **Real-time PCR for the detection of IMP-variants, including IMP-1, IMP-4, IMP-13, IMP-14, IMP-18, IMP-26, and IMP-27.**
 - o This test is performed on isolates that are mCIM positive, but a common carbapenemase is not detected (e.g. negative for IMP, KPC, NDM, OXA-48, VIM).
- **Targeted surveillance colonization screening**
 - o Targeted screening is performed on people with risks for uncommon carbapenemase colonization, such as OXA-variants and IMP-variants that the routine PCR screen does not detect, --epi-linked contacts of carbapenemase case patient and people with recent international healthcare exposures (see CDC recommendations for healthcare providers below). A culture based

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Practice Guidelines

The following practice guidelines have been developed by the Clinical Laboratory Advisory Council. They can be accessed at the [LQA website](#).

Acute Diarrhea	Lipid Screening
Anemia	PAP Smear Referral
ANA	Point-of-Care Testing
Bioterrorism Event Mgmt	PSA
Bleeding Disorders	Rash Illness
Chlamydia	Red Cell Transfusion
Diabetes	Renal Disease
Group A Strep Pharyngitis	STD
Group B Streptococcus	Thyroid
Hepatitis	Tuberculosis
HIV	Urinalysis
Infectious Diarrhea	Wellness
Intestinal Parasites	

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screening method to detect the organism is used and then reflexed to PCR for mechanism testing.

The [ARLN test menu](#) has recently been updated and should be used to access specimen collection and submission instructions and forms for all multidrug resistant organism testing (except tuberculosis).

CDC recommends that healthcare providers consider screening for

- Carbapenemase colonization in admitted patients who have been hospitalized in a foreign country within the previous six months
- *Candida auris* colonization in admitted patients who have been hospitalized in a region with sustained *Candida auris* transmission within the previous 12 months. (click [here](#) to see maps which include New York, New Jersey and Illinois)
- *Candida auris* colonization in any patient with a non-KPC carbapenemase

To efficiently detect carbapenemase producers in CRPA, CDC has updated submission requirements. Clinical laboratories should submit CRPA isolates that are:

- Resistant to at least one carbapenem (excluding er-tapenem) and non-susceptible to cefepime or ceftazidime

ELABORATIONS is a free monthly publication of the Washington State Department of Health (DOH) Public Health Laboratories (PHL) and Office of Laboratory Quality Assurance (LQA).

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CDC recommends that clinical laboratories speciate all *Candida* isolates from invasive infections, and all *Candida* isolates from patients hospitalized in a foreign country in the previous 12 months.

Several automated identification methods can misidentify *C. auris* as other rare *Candida* species. See Table 2 on page 3 for identification methods and *Candida* species that should be suspected as *C. auris* and submitted to PHL for confirmatory testing. Please identify the fungal identification method used in your lab and educate lab personnel regarding *Candida* species that should raise concern for *C. auris*.

Surveillance Reminders

All Washington labs should submit the following isolate-types to PHL:

- Carbapenem-resistant *E. coli*, *Klebsiella* species, and *Enterobacter* species
- Suspected or confirmed *Candida auris* isolates
- Carbapenem-resistant *Acinetobacter* species

In addition to submitting the isolate-types above, volunteer sentinel labs (and other interested labs) submit one or more of the following isolate-types to PHL:

- Carbapenem-resistant *Pseudomonas aeruginosa*
- Carbapenem-resistant *Citrobacter* species
- Carbapenem-resistant *Morganella*, *Proteus* and *Providencia* species (Note: These genera have intrinsic resistance to imipenem. Submit only those that are resistant to another carbapenem in addition to imipenem.)
- All *Candida* species EXCEPT *albicans*

Table 3 on page 4 summarizes species and resistance criteria for laboratories submitting isolates for MDRO surveillance.

We thank laboratories for their diligence in reporting and submitting antibiotic resistant organisms to public health. The ARLN will cover shipping costs associated with MDRO submission upon request. Please contact ARLN@doh.wa.gov if you are interested in sentinel laboratory participation or if you have any questions/concerns regarding testing or shipping. Contact Kelly Kauber at kelly.kauber@doh.wa.gov or by phone at 206-418-5500 for questions about admission- or surveillance-screening.

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Table 1 is reproduced from CDC.

Table 1. Isolates or Samples Solicited at Washington Antibiotic Resistance Lab and Testing Performed

Isolate/Sample Type	Testing Performed
Carbapenem-resistant Enterobacteriaceae (CRE)	<ul style="list-style-type: none"> Species identification (ID) Mechanism testing Antibiotic susceptibility (AST)
Carbapenem-resistant <i>Acinetobacter baumannii</i> (CRAB)	<ul style="list-style-type: none"> Species ID Mechanism testing AST
Carbapenem-resistant <i>Pseudomonas aeruginosa</i> (CRPA)	<ul style="list-style-type: none"> Species ID Mechanism testing AST
Non-albicans <i>Candida</i> species	<ul style="list-style-type: none"> Species ID Antifungal susceptibility testing (AFST)
Carbapenemase-producing organism (CPO) colonization screening sample	<ul style="list-style-type: none"> Mechanism testing Species ID (only if a carbapenemase is detected)
<i>Candida auris</i> colonization screening sample	<ul style="list-style-type: none"> <i>Candida auris</i> identification Antifungal susceptibility testing (AFST) (only if <i>Candida auris</i> is detected)
Targeted surveillance colonization screening sample	<ul style="list-style-type: none"> Species ID Mechanism testing

Table 2. When to Suspect *Candida auris*

Identification Method	Organisms <i>C. auris</i> can be misidentified as
Vitek 2YST	<ul style="list-style-type: none"> <i>Candida haemulonii</i> <i>Candida duobushaemulonii</i>
API 20C	<ul style="list-style-type: none"> <i>Rhodotorua glutinis</i> (characteristic red color not present) <i>Candida sake</i>
BD Phoenix yeast identification system	<ul style="list-style-type: none"> <i>Candida haemulonii</i> <i>Candida catenulata</i>
MicroScan	<ul style="list-style-type: none"> <i>Candida famata</i> <i>Candida guilliermondii</i> <i>Candida lusitaniae</i> <i>Candida parapsilosis</i>
RapID Yeast Plus	<ul style="list-style-type: none"> <i>Candida parapsilosis</i>

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Table 3. Species, Resistance Criteria, and Submitters for Washington State MDRO Surveillance

Family or Genus	Antibiotic Resistance Criteria	Submitters
CR-Enterobacteriaceae: <i>E. coli</i> <i>Klebsiella spp.</i> <i>Enterobacter spp.</i>	Resistant to ≥ 1 carbapenem: Minimum inhibitory concentrations (MIC) ≥ 4 mcg/ml for meropenem, imipenem, and doripenem, and ≥ 2 mcg/ml for ertapenem OR Kirby-Bauer zone of inhibition diameter (ZID) ≤ 19 mm for meropenem, imipenem, and doripenem, and ≤ 18 mm for ertapenem	All labs
CR- <i>Acinetobacter spp.</i>	Resistant to ≥ 1 carbapenem: MIC ≥ 8 μ g/mL for any carbapenem OR Kirby-Bauer (ZID) ≤ 14 mm for doripenem and meropenem, and ≤ 18 mm for imipenem	All labs
<i>Candida auris</i> (suspected or confirmed)	None	All labs
All <i>Candida spp.</i> EXCEPT <i>albicans</i> ¹	None	Sentinel labs
CR- <i>Pseudomonas</i> species ¹	Resistant to ≥ 1 carbapenem: MIC ≥ 8 μ g/mL for any carbapenem OR Kirby-Bauer (ZID) ≤ 15 mm for any carbapenem AND Non-susceptible or resistant (I or R) to ceftazidime (MIC ≥ 16 μ g/mL or Kirby Bauer ZID ≤ 17 mm) or cefepime (MIC ≥ 16 μ g/L or Kirby Bauer ZID ≤ 17 mm)	Sentinel labs ²
Carbapenem-resistant <i>Citrobacter spp.</i>	Resistant to ≥ 1 carbapenem: MIC ≥ 4 mcg/ml for meropenem, imipenem, and doripenem, and ≥ 2 mcg/ml for ertapenem OR Kirby-Bauer ZID ≤ 19 mm for meropenem, imipenem, and doripenem, and ≤ 18 mm for ertapenem	Sentinel labs ²
Carbapenem-resistant <i>Morganella</i> , <i>Proteus</i> and <i>Providencia spp.</i> ³	Resistant to 1 carbapenem in addition to imipenem: MIC ≥ 4 mcg/ml for meropenem and doripenem, and ≥ 2 mcg/ml for ertapenem OR Kirby-Bauer ZID ≤ 19 mm for meropenem and doripenem, and ≤ 18 mm for ertapenem	Sentinel labs ²

¹If the number of each isolate-type for submission is too burdensome, sentinel labs may submit only a subset.

²All labs are encouraged to submit these isolate types but are not required to do so.

³Note: These genera may have intrinsic resistance to imipenem. Only those that are resistant to a carbapenem other than imipenem should be submitted.

27th Annual Clinical Laboratory Conference

November 9, 2020

Mark Your Calendars
Now!!!!!!

Calendar of Events

Training Classes:

2020 ASCLS-WA Spring Meeting

April 23-24 Richland

2020 Northwest Medical Laboratory Symposium

October 14-17 Portland, OR

27th Annual Clinical Laboratory Conference

November 9 Tukwila

Contact information for the events listed above can be found on page 2. The Calendar of Events is a list of upcoming conferences, deadlines, and other dates of interest to the clinical laboratory community. If you have events that you would like to have included, please mail them to ELABORATIONS at the address on page 2. Information must be received at least one month before the scheduled event. The editor reserves the right to make final decisions on inclusion.



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