Washington State Department of Health
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News and Issues for Washington's Clinical Laboratories

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Updates to Multidrug-Resitant Organisms

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 voluntarily by sentinel labs. This article describes updates to surveillance for antibiotic resistant organisms, as of November 2020.

Since 2016, the Washington State Department of Health Public Health Laboratories (WA PHL) has served as the Antibiotic Resistance (AR) Laboratory for the western U.S. The AR Lab Network is funded by Centers for Disease Control and Prevention (CDC). It performs 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.
See the Table 1 on page 3 to see the antibiotic resistance tests performed on the isolates and samples by the AR

Surveillance Updates

Washington continues to identify cases of carbapenem-resistant *Pseudomonas aeruginosa* carrying Verona intergron-encoded metallo-β-lactamase (VIM) associated with weight loss surgery in Tijuana. Please report any such cases of CRPA in people with recent medical tourism to local public health and submit these isolates to PHL for carbapenemase testing.

In 2020, the AR Lab Network West Regional Laboratory expanded Antimicrobial Susceptibility Testing for Hard-to-Treat Infections (ExAST)

- At the direction of CDC, the Washington State Public Health lab is piloting a program to assist labs and clinicians to evaluate the effectiveness of new-to-market antibiotics for treating infections caused by metallo-β-lactamase (MBL)-producing Enterobacteriaceae.
- Susceptibility results are reported for ceftazidime/avibactam, aztreonam, and aztreonam/avibactam to help assess utility of combination therapy.
- Eligible isolates include Enterobacteriaceae that:
  Test non-susceptible to all beta-lactams, including either ceftazidime/avibactam or meropenem/vaborbactam (these isolates may be MBL-producing isolates with few effective treatment options). **OR**

  Possess MBL genes (NDM, VIM, or IMP) confirmed by molecular test
  Turn-around-time is three business days
  Pre-approval is required. Please contact ARLN@doh.wa.gov.

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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.

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Updates to Multidrug-Resistant Organisms

The AR Lab Network also added Real-time PCR for the detection of the big five carbapenemases (IMP, KPC, NDM, OXA-48, and VIM) in Enterobacteriaceae species, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii*

- This CDC-created assay replaced an in-house method used since 2015. This new assay improves efficiency, reduces turn-around-time, and detects additional carbapenemase variants.

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

CDC recommends that health care providers consider screening for

- Carbapenemase-producing organism colonization screening in admitted patients who have been hospitalized in a foreign country within the prior six months
- *Candida auris* colonization screening in admitted patients who have been hospitalized in a region with sustained *Candida auris* transmission within the prior 12 months. (See maps); this includes New York, New Jersey, Illinois, Orange County (California), and Los Angeles County (California).
- *Candida auris* colonization screening in any patient with a non-KPC carbapenemase
- *Candida auris*/Carbapenemase-producing organism colonization screening in patients who have had close health care contact with known cases.
- Please contact your local health jurisdiction (LHJ) to arrange colonization screening

CDC recommends that clinical laboratories speciate all *Candida* isolates from invasive infections, and all *Candida* isolates from patients hospitalized in an area with sustained *C. auris* transmission (seen No. 4 above for details) in the prior 12 months.

Several automated identification methods can misidentify *C. auris* as other rare *Candida* species. See Table 2 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*
- Please contact ARLN@doh.wa.gov if your laboratory is interesting in becoming a sentinel laboratory.

Table 3 on page 5 summarizes species and resistance criteria for laboratories submitting isolates for MDRO surveillance.

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Laboratory Quality Assurance
Public Health Laboratories

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

Isolate/Sample Type	Testing Performed
Carbapenem-resistant Enterobacteriaceae (CRE)	• Species identification (ID) • Mechanism testing • Antibiotic susceptibility testing (AST)
Carbapenem-resistant *Acinetobacter baumannii* (CRAB)	• Species ID • Mechanism testing • AST
Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)	• Species ID • Mechanism testing • AST
Non-*albicans Candida* species	• Species ID • Antifungal susceptibility testing (AFST)
Carbapenemase-producing organism (CPO) colonization screening sample	• Mechanism testing • Species ID (only if a carbapenemase is detected)
Candida auris colonization screening sample	• *Candida auris* ID • AFST, by request only
Targeted surveillance colonization screening sample	• Species ID • Mechanism testing

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Table 2. When to Suspect *Candida auris*

Identification Method	**Organisms *C. auris* can be misidentified**
Vitek 2YST*	*Candida haemulonii* *Candida duobushhaemulonii*
API 20C	*Rhodotorua glutinis (characteristic red color not present)* *Candida sake*
BD Phoenix yeast identification system	*Candida haemulonii* *Candida catenulata*
MicroScan	*Candida famata* *Candida guilliermondii*** *Candida lusitaniae*** *Candida parapsilosis***

Table 2 is reproduced from CDC.
*There have beeen reports of *C. auris* misidentified as *Candida lusitaniae* and *Candida famata* on VITEK 2. A confirmatory test, such as cornmeal agar, may be warranted for these species.
***C. guilliermondii*, *C. lusitaniae*, and *C. parapsilosis* generally make pseudohyphae on cornmeal agar. If hyphae or pseudohyphae are not present on cornmeal agar this should raise suspicion for *C. auris* as *C. auris* typically does not make hyphae or pseudohyphae. However, some *C. auris* isolates have formed hyphae or pseudohyphae. Therefore, it would be prudent to consider any *C. guilliermondii*, *C. lusitaniae*, and *C. parapsilosis* isolates identifed on MicroScan or any *C. parapsilosis* isolates identified on RapID Yeast Plus as possible *C. auris* isolates and forward them for further identification.

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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: *E. coli* *Klebsiella spp.* *Enterobacter spp.*	Resistant to ≥1 carbapenem: Minimum inhibitory concentrations (MIC) ≥4 µg/ml for meropenem, imipenem, and doripenem, and ≥ 2 µg/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-Acinetobacter spp.	Resistant to ≥1 carbapenem: MIC ≥8 µg/mL for any carbapenem **OR** Kirby-Bauer ZID ≤14 mm for doripenem and meropenem, and ≤18 mm for imipenem	All labs
Candida auris (suspected or confirmed)	None	All labs
All *Candida spp.* EXCEPT *albicans*[1]	None	Sentinel labs
CR-*Pseudomonas* species[1]	Resistant to ≥1 carbapenem, excluding ertapenem: MIC ≥8 µg/mL for any carbapenem **OR** Kirby-Bauer ZID ≤15 mm for any carbapene **AND** Non-susceptible or resistant (I or R) to ceftazidime (MIC ≥16 µg/mL or Kirby Bauer ZID ≤17 mm) or cefepime (MIC ≥16 µg/mL or Kirby Bauer ZID ≤17 mm	Sentinel labs[2]
Carbapenem-resistant Citrobacter spp.	Resistant to ≥1 carbapenem: MIC ≥4 µg/ml for meropenem, imipenem, and doripenem, and ≥ 2 µg/ml for ertapenem **OR** Kirby-Bauer ZID ≤19 mm for meropenem, imipenem, and doripenem, and ≤18 mm for ertapenem	Sentinel labs[2]
Carbapenem-resistant *Morganella*, *Proteus* and *Providencia* spp. [3]	Resistant to 1 carbapenem in addition to imipenem: MIC ≥4 µg/ml for meropenem and doripenem, and ≥ 2µg/ml for ertapenem **OR** Kirby-Bauer ZID ≤19 mm for meropenem and doripenem, and ≤18 mm for ertapenem	Sentinel labs[2]

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

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

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

Calendar of Events

Training Events:

2021 ASCLSWA Joint Spring Seminar
April 21-23 Virtual Event

2021 Northwest Medical Laboratory Symposium
October 6-9 Virtual Event

2021 Annual Clinical Laboratory Conference
November TBA Virtual Event

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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