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To: Wisconsin Local Health Departments, Tribal Health Agencies, Health Care Providers, and Infection Preventionists

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Surveillance for Carbapenemase-Producing Carbapenem-Resistant *Acinetobacter baumannii* (CP-CRAB), Carbapenemase-Producing Carbapenem-Resistant *Pseudomonas aeruginosa* (CP-CRPA), and *Candida auris*

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Summary

Antimicrobial resistance poses a threat to health care in all settings. Emerging multidrug-resistant organisms (MDROs), such as carbapenem-resistant *Acinetobacter baumannii* (CRAB), carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), and *Candida auris,* have led to health care-associated outbreaks in states across the country. Wisconsin has solicited CRAB isolates and performed colonization screenings at select facilities since 2018, and has detected 233 unique cases. Antibiotic susceptibility testing has also revealed that many of these isolates were "pan-resistant," or resistant to all common antibiotics, making infections with such organisms very difficult to treat. While voluntary submission of MDRO isolates provides important information about the presence of these organisms in the state, systematic statewide surveillance is needed to fully assess the extent to which CRAB and other MDROs are present in Wisconsin. Surveillance is necessary to determine prevalence, identify transmission, and guide control efforts to prevent these organisms from becoming endemic in health care settings.

Appendix A of Wis. Admin. Code ch. DHS 145 states "any illness caused by an agent that is foreign, exotic or unusual to Wisconsin, and that has public health implications" is a reportable condition. Therefore, I am including carbapenemase-producing carbapenem-resistant Acinetobacter baumannii (CP-CRAB), carbapenemase-producing carbapenem-resistant *Pseudomonas aeruginosa* (CP-CRPA), and *Candida auris* as communicable diseases for which general powers under Wis. Stat. ch. 252 and Wis. Admin. Code ch. 145 apply as a category II reportable disease.

Starting July 1, 2022, and until further notice, all Wisconsin acute care hospitals (including children's, orthopedic, and other specialty hospitals), critical access hospitals, long-term acute care hospitals, and skilled nursing facilities should report cases of CP-CRAB, CP-CRPA, and *Candida auris* among patients and residents to the Wisconsin Electronic Disease Surveillance System (WEDSS), or by mailing or faxing a completed Acute and Communicable Disease Case Report (F-44151) to the address on the form.

Background

Antimicrobial resistance is an increasing concern in the U.S., including antibiotic resistance among health care-associated pathogens. Some organisms are resistant to nearly all antimicrobial agents and infections with these pathogens can cause high morbidity and mortality. Surveillance for carbapenem-resistant Enterobacterales (CRE), conducted in Wisconsin since 2011, enables the Division of Public Health (DPH) to quantify, track, and respond to cases. This memo adds similarly epidemiologically important MDROs to statewide surveillance.

In November 2019, the Centers for Disease Control and Prevention (CDC) released *Antibiotic Resistance Threats in the United States, 2019*. This report provides updated national statistics on key antibiotic-resistant organisms and, as in a previous version of the report, categorizes organisms as "urgent," "serious," or "concerning" threats to public health. CRE, carbapenem-resistant *Acinetobacter*, and *Candida auris* are classified as urgent threats in the 2019 report. Multidrug-resistant *Pseudomonas aeruginosa* is classified as a serious threat to public health.

Carbapenemase-Producing Organisms

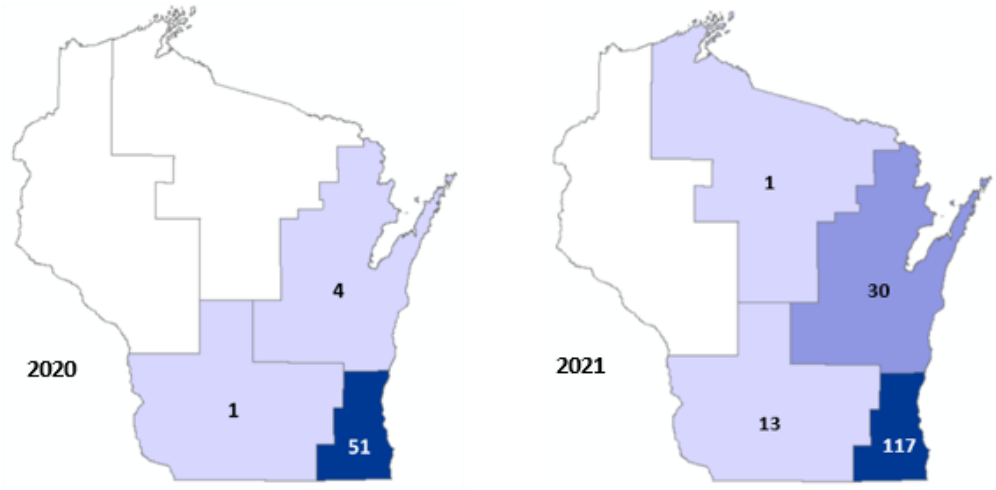
Carbapenems are critical antibiotics and carbapenem-resistant bacteria can be difficult to treat. The most concerning of the carbapenem-resistant organisms are those that are carbapenemase-producing. Carbapenemase resistance mechanisms are often located on a plasmid, a mobile genetic element that can transmit resistance between bacteria. Carbapenemase-producing carbapenem-resistant Enterobacterales (CP-CRE) have been reportable in Wisconsin since July 2018, but carbapenemases have also been documented in other bacterial orders.

Two non-Enterobacterales bacteria known to contain carbapenemases are *Pseudomonas aeruginosa* and *Acinetobacter baumannii*. Per the *Antibiotic Resistance Threats Report*, carbapenemases have only been detected in two to three percent of *P. aeruginosa* isolates in the United States, but invasive infections with *P. aeruginosa* can cause serious illness or death. CP-CRPA has been associated with travel abroad, including a 2018 outbreak among U.S. citizens who underwent surgery at a hospital in Mexico. A total of five cases of CP-CRPA were identified in Wisconsin in 2020 and 2021, most with confirmed or suspected international travel. Rapid detection of CP-CRPA is important to prevent transmission and maintain low rates of this organism in the state.

Acinetobacter baumannii is of increasing concern to CDC and recent data indicates that many resistant isolates are carbapenemase-producing. Infections with CP-CRAB tend to occur among patients with indwelling medical devices, such as tracheostomies. Because CRAB can survive on surfaces in the patient environment, it can be very difficult to contain transmission between patients, especially in long-term care facilities (LTCFs). In 2020 and 2021, 161 CP-CRAB clinical and colonization isolates were identified in Wisconsin. In 2021, among the 134 individuals for whom case history information was available, 90% (n=121) were either a current or former resident of a LTCF. As shown in Figure 1 below, even without soliciting isolates from all clinical labs, the number of reported cases of CP-CRAB increased from 2020 to 2021. Also concerning is that while cases had previously been detected primarily in the southeast region of the state, cases of CP-CRAB were detected in nearly all regions of the state in 2021. This increase in cases and the apparent geographical spread of CP-CRAB underscore the need for systematic, statewide surveillance for these organisms.

Figure 1.

Reported Carbapenemase-Producing Carbapenem-Resistant *Acinetobacter baumannii* (CP-CRAB) Cases* in Wisconsin, 2020 and 2021



Data source: Wisconsin State Laboratory of Hygiene

*Cases include both clinical and colonization screening isolates. Also, the numbers in the table and maps are not de-duplicated across years. This means that an individual with a positive specimen in both 2020 and 2021 would be included in the numbers for both years.

Candida auris

Candida auris is an emerging fungal pathogen that is often multidrug-resistant, with some strains or types resistant to all three classes of antifungals. *C. auris* can also cause outbreaks in health care facilities and persist on patients' skin and in the environment. Per CDC, invasive infections with *C. auris* appear to be associated with high mortality.

After first being found in each of its four border states, Wisconsin identified its first case of *C. auris* in January 2022. Illinois in particular has reported a large number of cases of *C. auris*, with 271 cases reported in 2021. Over the past two years, outbreaks of *C. auris* and other MDROs have been documented on COVID-19 units or with connections to practice changes or shortages associated with the pandemic that further stressed the health care delivery system.

Surveillance for these organisms is needed to better understand their prevalence in Wisconsin. A more complete picture of the prevalence and movement of these MDROs enables public and private health care partners greater opportunities to prevent and contain their spread.

Specimen Collection and Laboratory Testing

Specific details regarding the surveillance case definitions are included in the WEDSS EpiNets for each organism, which are linked below. Cases will be determined with positive laboratory criteria. **All CRAB and select CRPA isolates (as determined by Wisconsin State Laboratory of Hygiene [WSLH] guidance) identified in clinical microbiology laboratories should be sent to WSLH for**

carbapenemase resistance mechanism testing, as is the process with CP-CRE isolates. In addition to identifying the specific carbapenemase resistance mechanism for the isolate, this process also builds a repository of resistance patterns that can be used to identify clusters and epidemiologically link cases across facilities. **Clinical microbiology laboratories are currently asked to submit all non-*albicans* isolates of *Candida* to WSLH for *Candida auris* testing, which will form the basis for identifying cases.** All of these results confirmed by WSLH will also be automatically sent to WEDSS to support public health and clinical response.

Reporting

Specific details and definitions can be found in the WEDSS EpiNets for each organism:

- Communicable Disease Case Reporting and Investigation Protocol: Carbapenemase-Producing Organisms (EpiNet)
- Communicable Disease Case Reporting and Investigation Protocol: *Candida auris* (EpiNet)

Webinar

The Wisconsin Healthcare-Associated Infections (HAI) Prevention Program will hold a series of webinars over the next few months regarding the addition of CP-CRPA, CP-CRAB, and *Candida auris* to communicable diseases reporting surveillance. The webinars will describe the surveillance and response processes for different types of facilities and partners. Information on these webinars will be sent out via DHS listservs separately.

Contacts

- Wisconsin HAI Prevention Program: 608-267-7711 or DHSWIHAIPreventionProgram@wi.gov
- Wisconsin HAI Prevention Program staff contacts
- Wisconsin local and tribal health departments

References

- Communicable Disease Case Reporting and Investigation Protocol: Carbapenemase-Producing Organisms (EpiNet)
- Communicable Disease Case Reporting and Investigation Protocol: *Candida auris* (EpiNet)
- CDC *Antibiotic Resistance Threats in the United States*, 2019
- CDC Diseases and Organisms in Healthcare Settings webpage
- Wisconsin Department of Health Services, Division of Public Health, Antibiotic Resistance webpage
- Wisconsin Department of Health Services, Division of Public Health. Multidrug-Resistant Organism (MDRO) Reportables webpage