

Proposal for Conducting Statewide Surveillance for Carbapenem-resistant *Acinetobacter baumannii* (CRAB) in Minnesota under the Minnesota Communicable Disease Rule (4605.7080)

Division: Infectious Disease Epidemiology, Prevention and Control Division

Section: Healthcare-Associated Infections and Antimicrobial Resistance Section

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Under part 4605.7080 of the Communicable Disease Reporting Rule, the Commissioner may select new diseases/syndromes if certain criteria are met. Specifically, 4605.7080 says:

“Subpart 1. **Disease selection.** The commissioner shall, by public notice, require reporting of newly recognized or emerging diseases and syndromes suspected to be of infectious origin or previously controlled or eradicated infectious diseases if:

- A. the disease or syndrome can cause serious morbidity or mortality; and
- B. report of the disease or syndrome is necessary to monitor, prevent, or control the disease or syndrome to protect public health.”

“Subp. 2. **Surveillance mechanism.** The commissioner shall describe a specific, planned mechanism for surveillance of the disease or syndrome including persons and entities required to report, a time frame for reporting, and protocols for the submission of test results and clinical materials from cases and suspected cases to the Minnesota Department of Health, Public Health Laboratory.”

1. DISEASE SELECTION

The commissioner shall, by public notice, require reporting of newly recognized or emerging diseases and syndromes suspected to be of infectious origin or previously controlled or eradicated infectious diseases if:

A. The disease or syndrome causes serious morbidity or mortality.

Based on the following information, the Minnesota Department of Health (MDH) finds that carbapenem-resistant *Acinetobacter baumannii* (CRAB) causes serious morbidity or mortality.

Acinetobacter baumannii is a bacterium that can cause a wide range of infections in humans, such as wound, bloodstream, and urinary tract infections. Such infections are typically healthcare-associated infections (HAIs), which are infections that patients get while receiving treatment for medical or surgical conditions. Carbapenem-resistant *Acinetobacter baumannii* (CRAB) have emerged across the globe and have become a

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very concerning antibiotic resistance threat. Carbapenems are broad-spectrum antibiotics, often considered antibiotics of last resort for treating patients with severe or antibiotic resistant *Acinetobacter* infections. CRAB are resistant to carbapenems and most other available antibiotics, resulting in limited treatment options, poor patient outcomes (e.g., poor functional status, prolonged hospital stays, discharge to long-term care facilities), and high mortality rates.

Risk factors for CRAB infection include: recent exposure to health care, invasive medical devices (e.g., urinary catheter), and/or antimicrobial therapy. Patients with a recent history of receiving health care in countries outside the U.S. with a high prevalence of CRAB may also be at increased risk for CRAB colonization or infection. Colonization means that the organism can be found on the body but is not causing any symptoms or disease; however, colonized patients are at increased risk for infection if colonizing bacteria gain access to body sites like the bladder, lungs, or the bloodstream. CRAB-colonized or infected patients can spread the bacteria to other patients by the hands of health care workers, through contaminated medical equipment or the health care environment. Quickly identifying patients with CRAB and implementing infection control interventions are critical to controlling the spread of CRAB in health care settings.

B. Report of the disease or syndrome is necessary to monitor, prevent, or control the disease or syndrome to protect public health.

Based on the following information, MDH finds that reporting of Carbapenem-resistant *Acinetobacter baumannii* (CRAB) is necessary to monitor, prevent, and control the disease to protect the public's health.

In 2013, the Centers for Disease Control and Prevention (CDC) released its first ever report on antibiotic resistance, *Antibiotic Resistance Threats in the United States, 2013*. It identified CRAB (specifically, multidrug-resistant *Acinetobacter*) as one of 12 'serious' public health threats that could worsen and become an urgent threat without ongoing public health monitoring and prevention activities. In a newly released 2019 update to this report, CRAB was escalated to threat level 'urgent' because of the emergence of easily spread resistance and the lack of current antibiotics or antibiotics in development to treat CRAB infections¹. If action to control these infections is not taken quickly, CRAB can rapidly become an issue not only in individual health care facilities but also across an entire community of inter-connected health care settings, highlighting the important role for public health in CRAB prevention and control efforts.

Unlike other antibiotic-resistant organisms (e.g., methicillin-resistant *Staphylococcus aureus*) that represent a single species and a single resistance mechanism, CRAB are complex and resistance can be due to a variety of mechanisms. CRAB that produce an enzyme known as a carbapenemase are able to efficiently break down carbapenem antibiotics, rendering them ineffective. These CRAB are referred to as carbapenemase-

¹CDC. Antibiotic Resistance Threats in the United States, 2019 (<https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf>). Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

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producing CRAB (CP-CRAB) and include a variety of different types of carbapenemase genes. The genes that code for many of these carbapenemases are contained on genetic elements that may be transferred between bacteria, thus facilitating the spread of resistance. In 2011, MDH initiated active, laboratory- and population-based sentinel surveillance for CRAB in Hennepin and Ramsey counties. Outside of these two counties, health care facilities and clinical laboratories have been voluntarily reporting CRAB cases and sending CRAB isolates to the MDH public health laboratory (PHL) for further characterization (e.g., polymerase chain reaction [PCR] testing for carbapenemase genes²). Approximately 20% of CRAB reported to MDH are positive for carbapenemase genes. The CDC recently developed a public health strategy to contain the spread of highly antibiotic resistant organisms, such as CP-CRAB. MDH works closely with health care facilities to implement this strategy when highly antibiotic resistant organisms are identified in Minnesota patients. Statewide reporting of CRAB to MDH will enable rapid identification of CP-CRAB cases, implementation of the containment strategy to slow the spread of CRAB in Minnesota, and provide data to facilitate coordination across the spectrum of health care to protect the public's health.

Statewide surveillance for CRAB is also critical to more completely describe the epidemiology of CRAB in Minnesota, including microbiologic characteristics (e.g., resistance mechanisms), patient demographics, co-morbidities, body site(s) of infection, epidemiologic classification (healthcare- vs. community-associated), and patient outcomes. Most clinical laboratories in Minnesota do not have the resources or capacity to identify carbapenemase genes in CRAB, but the MDH-PHL performs this testing at no cost to health care facilities. Information on resistance genes is crucial to detecting outbreaks and understanding local epidemiology. MDH will use the data collected through surveillance and isolate submission to monitor CRAB trends, estimate the incidence and prevalence of CRAB statewide and by region to identify health care clusters or geographical areas of concern, describe CRAB resistance genes present in MN, and drive targeted infection prevention and control measures to protect the health of Minnesotans.

Outbreaks of CRAB reported in other states and countries have often involved multiple health care settings (e.g., hospitals, nursing homes), highlighting the importance of early detection and prompt implementation of infection prevention and control measures, as well as communication of a patient's CRAB status between facilities upon transfer. Expanding surveillance beyond the existing sentinel surveillance in Hennepin and Ramsey Counties will improve awareness of CRAB in Minnesota and drive targeted interventions and outbreak response activities, which are crucial for protecting the public's health against this serious threat.

2. SURVEILLANCE MECHANISM

²PCR is a fast technique used to reproduce (amplify) selected sections of DNA or RNA for analysis. It can identify genetic segments of viruses or bacteria.

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The commissioner shall describe a specific, planned mechanism for surveillance of the disease or syndrome including persons and entities required to report, a time frame for reporting, and protocols for the submission of test results and clinical materials from cases and suspected cases to the Minnesota Department of Health, Public Health Laboratory.

A. Disease or Syndrome

CRAB includes *Acinetobacter baumannii* and *Acinetobacter baumannii* complex isolated from any body site that is resistant to any one of the following carbapenem antibiotics, imipenem, meropenem, or doripenem, based on current Clinical and Laboratory Standards Institute Standards (M100)³ or that demonstrates production of a carbapenemase.

B. Reporting Entities

The Commissioner requires all mandated reporters to report CRAB. For a list of mandated reporters, see Minnesota Administrative Rules, Chapter 4605.7030 (<https://www.revisor.mn.gov/rules/4605.7030/>).

C. Reporting Time Frame

Providers and laboratories must report CRAB cases to MDH within one working day after the test result is finalized.

D. Protocol for Submission

a. Provider Submissions

Providers will report using a designated case report form and must be submitted either by direct electronic transmission, phone, or fax. The report must include, at a minimum, the following information:

1. Patient data – patient name, date of birth, gender, race, ethnicity (if available), telephone number, residential address, including street, city, county, state, and postal code
2. Culture data – specimen collection date, specimen source, isolate genus and species, antibiotic susceptibility report (medical record), and carbapenemase test results (if known/reported in medical record)
3. Facility data – patient medical record number, date of report, physician name, address, and telephone number, name of hospital (including date of admission/discharge) or other health care facility, and the diagnostic laboratory name

³CLSI: M100 Performance Standards for Antimicrobial Susceptibility Testing
(<http://clsi.org/standards/products/microbiology/documents/m100/>)

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b. Clinical and Laboratory Submissions

Clinical and reference laboratories must forward CRAB isolates from any body site (e.g., urine, blood, sputum, wound) along with results of antibiotic susceptibility testing performed on the isolate to the PHL. The submission must include, at a minimum, the following information:

1. MDH isolate submission form(s) with project number.
2. Results of antibiotic susceptibility testing, including automated testing instrument printouts (e.g., Vitek2, Phoenix, etc.), and/or results of other manual susceptibility testing performed (e.g., manual MicroScan, E-test, disk diffusion), including MIC value, zone size, and final interpretation result.
3. Results of additional testing performed on the specimen and/or isolate(s) for carbapenemase production (e.g., PCR, nucleic acid testing [NAAT]).

Upon request from the Commissioner, each reporting facility shall provide access to additional information from all medical, pathological, and other pertinent records related to the CRAB diagnosis, treatment, and follow-up for the purposes of surveillance and infection prevention and control per Minnesota Rules 4605.7090. Epidemiologists review select patient medical records using a standardized case report form that is used to collect basic demographic information and risk factors of epidemiologic or infection prevention concern.

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