Multidrug-resistant *Acinetobacter* (MDR-A)

rev April 2017

BASIC EPIDEMIOLOGY

Infectious Agent

Acinetobacter are strictly aerobic Gram negative coccobacilli of the Moraxellaceae family and have more than 25 species within the genus. They have an intrinsic resistance factor that enables them to hydrolyze carbapenem, causing resistance to carbapenems and penicillins. Multidrug-resistant *Acinetobacter* strains can also circumvent antibiotics by producing porins, modifying penicillin-binding proteins and producing aminoglycoside modifying enzymes, among other ways.

Transmission

Acinetobacter species are ubiquitous in nature and have been found in soil, water, animals and humans. In humans, it has been isolated from the skin, throat and rectum, and has been reported to be a colonizer of the respiratory tract in healthcare settings.

Transmission can occur via direct person-to-person contact or secondary contact with contaminated environmental surfaces, medical devices, or equipment. Additionally, the hands of healthcare workers who frequently touch these objects in patient environments often become vectors of transmission if hand hygiene compliance and/or transmission-based precautions are not adhered to.

Incubation Period

There is no set incubation period for exposure-to-illness onset.

Communicability

Acinetobacter is capable of surviving on inanimate surfaces for extended periods of time, from a few weeks to a month or more. When outbreaks occur, often due to incomplete surface cleaning of the environment and medical instrument, and *Acinetobacter* becomes endemic to a healthcare setting, implementing successful and sustainable elimination can prove to be extremely challenging.

Clinical Illness

Healthcare-associated *Acinetobacter* respiratory tract infections, including ventilator associated pneumonia, catheter related urinary tract infections, bloodstream infections, and wound infections have all been well documented in medical literature. There have also been reports of *Acinetobacter* meningitis, endocarditis, osteomyelitis, corneal perforation and infection associated with peritoneal dialysis. Symptoms associated with MDR-A infections generally vary based on the site that is infected (e.g., cough if in the lungs, urinary symptoms if in the bladder) but can also include general symptoms like fever or chills.

Severity

MDR-A patients, per one study, showed higher in-hospital mortality rates up to 26% infected patients were more likely to have both longer hospital and ICU lengths of stay than uninfected patients.

DEFINITIONS

Clinical Case Definition
When found in a clinical culture MDR-A can represent an infection or colonization. There is no set clinical case definition as MDR-A can cause many types of symptoms.

Laboratory Confirmation
Acinetobacter species from any body site/source that is laboratory confirmed.

Case Classification

- **Confirmed**:
  - *Acinetobacter* species from any body site/source that:
    test non-susceptible (i.e., intermediate or resistant) to at least one of the antibiotics listed below, in at least three of the following six antimicrobial classes.

Note: no other antibiotics can meet case definition, only the one's listed in the table below.

Beta-Lactam	Aminoglycosides	Carbapenems	Fluoroquinolones	Cephalosporins	Sulbactam
Piperacillin Piperacillin/ Tazobactam	Amikacin Gentamicin Tobramycin	Imipenem Meropenem Doripenem	Ciprofloxacin Levofloxacin	Cefepime Ceftazidime	Ampicillin/ Sulbactam

- **Probable**: there is no probable case definition

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation
Local and regional health departments will promptly address all reports of MDR-A. The jurisdiction where the healthcare facility is located conducts the investigation and ensures control measures are promptly taken. The investigation steps below describe the public health activities to be completed when a suspected or confirmed MDR-A case is reported. Investigations and control measures are required for infection or colonization with any type of MDR-A.

Case Investigation Checklist

- ☐ The jurisdiction that conducts the investigation is according to the location where the patient tested positive for MDR-A. (E.g.; patient tested positive for MDR-A, and is in hospital in jurisdiction A, but the patient resides in jurisdiction B, jurisdiction A would conduct the investigation).
- ☐ Immediately ensure contact precautions have been implemented for anyone with suspected or confirmed MDR-A.
- ☐ Confirm that the laboratory results meet the case definition.
  - If it is unclear, call a DSHS Regional HAI Epidemiologist for assistance.
- ☐ Ensure additional control measures are in place for cases and/or facilities. (see "specific control measures" section below)
- ☐ Review the medical records. If needed, speak to an Infection Preventionist (IP) at the healthcare facility to verify demographics, symptoms, and course of illness.
- ☐ If the patient has been discharged from the reporting healthcare facility and the receiving healthcare facility is known, the investigator ensures that the receiving healthcare facility is informed of the MDR-A case and ensures control measures are in place.

- Refer to the MDR-A Investigation form for additional questions to address.
  - The MDR-A Investigation Form is available on the DSHS Website: http://www.dshs.state.tx.us/idcu/investigation/
- All suspected and confirmed cases of MDR-A require the investigation form to be completed.
- A paper copy of the investigation form and laboratory report is NOT required to be sent to DSHS EAIDB unless specifically asked.
- Enter all case investigations and submit a notification in NBS within 30 days of the initial report.
  - The jurisdiction that conducted the investigation enters the case in NBS.
  - The jurisdiction is entered as the jurisdiction who conducted the investigation and not the jurisdiction of residency.
  - Once the case is reviewed and approved by DSHS central office, the central office will update the jurisdiction to the jurisdiction of residency for aggregate reporting purposes.
  - NOTE: if a case is multi-jurisdictional, it is the responsibility of the investigator to notify other jurisdictions of the case.

Prevention and Control Measures

Control measures for Cases

Ideally, the facility is performing control measures for the case and the investigator is communicating directly with the facility, most likely with the IP or the responsible representative over infection prevention. The investigator may also speak with the patient directly if applicable. The investigator ensures the below control measures are addressed but not all specific control measures might be necessary for all case investigations.

Specific Control Measures

- Facilities are responsible for ensuring that healthcare personnel are vigilant with hand hygiene practices and ensure that:
  - Hand hygiene sinks are accessible and free from clutter/supplies;
  - Alcohol-based hand sanitizers are accessible and well stocked.
- Ensure the patient is on contact precautions/ contact isolation. Contact precautions include but are not limited to:
  - Performing hand hygiene before entry into the patient room;
  - Donning (putting on) gown and gloves either before or upon immediate entry into the patient's room; (note some facilities might require more PPE)
  - Doffing (removing) gown, gloves and any other personal protective equipment (PPE) should be removed before exiting or immediately upon exiting the patient's room. Hand hygiene should be performed after removal of PPE.
  - Hand hygiene should be performed before exiting or immediately upon exiting the patient's room.
  - No recommendation currently exists for when to discontinue contact precautions. A facility should consult with an infectious disease physician, the IP, or the other provider that initiated the precautions. The facility may also call a DSHS regional HAI Epidemiologist for assistance.
- Ensure the facility is performing disinfection of reusable equipment before and after each use.
- Recommend single patient rooms if available.
  - If single rooms are not feasible, recommend cohorting like patients (ex: a patient with MDR-A and another patient with MDR-A)

- Recommend staff cohorting if possible.
- Recommend reducing the use of invasive medical devices for patients on the unit where the case was cared for, as invasive devices increase patient's risk of infection.
- Increase the frequency of cleaning of high touch areas.
- Provide education on MDR-A as needed, with specific emphasis on contact precaution and the above control measures.
    - If additional help is needed regarding providing education, contact your DSHS Regional HAI Epidemiologist. (Education could be provided to: anyone at the facility, family members, and the patient.)

Treatment
Each case will have a unique treatment option. It is recommended that the reporting facility collaborate with a clinical pharmacist, an infectious disease physician, and/or an antibiotic stewardship resource for an individualized treatment plan.

Exclusions
Students (K-12) and daycare age children with MDR-A wound infection need to be excluded from attendance until drainage from wounds or skin and soft tissue infections is contained and maintained in a clean dry bandage; restrict from situations that could result in the infected area becoming exposed, wet, soiled, or otherwise compromised. No other exclusions apply.

MANAGING SPECIAL SITUATIONS

Outbreaks
If an outbreak is suspected, immediately notify a DSHS Regional HAI Epidemiologist. The DSHS regional HAI Epidemiologist will notify central office and work with central office as needed.

Outbreak Definition
At this time there are no defined criteria for an outbreak. If your health department believes they have detected an outbreak, it is recommended to speak with the DSHS Regional HAI Epidemiologist.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School and Child-care Facilities, and General Public Reporting Requirements
Cases of Multidrug-resistant *Acinetobacter* (MDR-A) should be reported **within 1 working day** to the local or regional health department. If jurisdiction is unclear, call a DSHS Regional HAI Epidemiologist or Emerging and Acute Infectious Disease Branch (EAIDB) at 512-776-7676 for assistance.

Local and Regional Reporting and Follow-up Responsibilities
Local and regional health departments should:

- Promptly investigate all reported cases.
- Ensure control measures are in place and provide education to prevent further spread of disease (see specific control measures section located in this document).
- Enter the case into NBS when the first occurrence is reported and create the NBS notification to DSHS on all cases of MDR-A. Complete additional case information and enter the remaining information within 30 days of initial report.
    - Please refer to the NBS Data Entry Guide for specific details on how to properly complete an NBS investigation, how to data enter a laboratory report and submit a NBS notification.

When a cluster or an outbreak is investigated, local and regional health departments should:

- Report suspected outbreaks within 24 hours of identification to the Regional DSHS Regional HAI Epidemiologist
    - Fax the investigation form and all other supporting documents to the DSHS Regional HAI Epidemiologist.
- If labeling a case as part of an outbreak, the outbreak must be named in NBS. Outbreak names must be requested through the NEDSS (NBS) office. The staff can be reached by phone (512) 458-7111 ext. 7729 or email nedss@dshs.state.tx.us

DISEASE REPORTING

Purpose of Reporting and Surveillance

- To prevent transmission of infections with MDR-A in healthcare facilities and the community, by decreasing the likelihood of transmission through the investigation process.
- To improve the detection, monitoring and epidemiological characterization of MDR-A in Texas.
- To develop, implement and evaluate strategies to prevent the emergence, transmission and persistence of MDR-A.
- To conduct and support epidemiological studies to identify outbreaks and potential sources of ongoing transmission in various populations.
- To identify further trends related to continued antibiotic resistance and the development of MDROs in Texas.

Requested Reporting

- Report to your local health jurisdiction ***within 1 working day.***

Local Health Jurisdiction Investigation Responsibilities

- Local health departments may request assistance with the investigation of MDR-A by contacting both the DSHS Lead Epidemiologist and the DSHS Regional HAI Epidemiologist for the health service region (HSR). Because of the potential for transmission of MDR-A to vulnerable patients in healthcare settings, public health action is imperative in controlling further transmission by: instituting control measures, identifying and screening close contacts of cases that could transmit in healthcare settings, if indicated, and ensuring that the facility IP has been notified and that appropriate infection control measures are in place.

LABORATORY PROCEDURES

Clinical laboratories are not required to submit isolates to the DSHS Laboratory at this time. To obtain confirmatory, gene sequencing or phenotypic testing, clinical laboratories should contact a reference laboratory for those services. The reference lab will give guidance on specimen collection, submission form and shipping.

Any specimen sent to the DSHS Laboratory for possible outbreak situations or molecular testing requires prior approval from a DSHS Regional HAI epidemiologist.

UPDATES

April 2017

- Added information and clarification about jurisdiction and who should investigate cases and included information about consulting with a DSHS regional HAI Epidemiologist for more help with an investigation.
- Added more specific information about control measures and isolation.
- Clarified instructions on how to handle an outbreak.