

Carbapenem-Resistant *Acinetobacter* (CRA) Investigative Guidelines October 2025

REPORT WITHIN 1 WORKING DAY

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To prevent transmission of carbapenem-resistant *Acinetobacter* spp. (CRA) between patients, within or among healthcare facilities, or between healthcare facilities and the community.
2. To identify outbreaks and potential sources of ongoing transmission
3. To educate people about how to reduce their risk of infection
4. To better characterize the epidemiology of this infection including social, environmental, and behavioral contexts for transmission
5. To identify communities and populations at elevated risk for disease or severe illness to inform equity-centered prevention efforts

1.2 Laboratory and Clinician Reporting Requirements

Laboratories, clinicians, and other persons providing healthcare are required to report positive lab results and confirmed cases to the Local Public Health Authority (LPHA) by 5pm of the working day following identification or diagnosis. [See §3 for case definitions.](#)

Clinical and reference laboratories must forward isolates from any sterile or non-sterile site (e.g., urine, blood, sputum, endotracheal aspirate, bronchoalveolar lavage, wound) that meet the confirmed [CRA case definition](#) (see §3) along with the antimicrobial susceptibility testing (AST) system printouts (e.g., Vitek 2, Microscan) to the Oregon State Public Health Laboratory (OSPHL).

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Confirm that a case meets the case definition by reviewing the isolate susceptibility information (antibiogram), consulting with the Acute and Communicable Disease Prevention Section (ACDP) on-call epidemiologist as necessary. Minimum inhibitory concentration (MIC) values are needed to verify that a case meets the definition. [See §3 for case definitions.](#)
2. Report all confirmed cases to the Oregon Public Health Division (PHD) Acute and Communicable Disease Prevention (ACDP) Section by 5pm of the working day following initial clinician or lab report. Enter information into Orpheus as the investigation occurs.
3. Intervene to prevent the spread of the organism and take action based upon the resistance mechanism of the isolate. See §3.2 for resistance mechanism and §4.2 for case investigation details.
4. Interview all confirmed cases.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Acinetobacter species are Gram-negative bacilli commonly found in soil and water. Certain species are part of the normal bacterial flora of the skin. Most species of *Acinetobacter* do not typically cause infections. The exception is *Acinetobacter baumannii*, an opportunistic pathogen, infection by which is mostly associated with healthcare. *A. baumannii* survive for prolonged periods of time on surfaces and medical equipment. Most *Acinetobacter* infections (90–95%) are *A. baumannii*.

A. baumannii that cause clinical infections show high rates of resistance to commonly used antibiotics. Carbapenem antibiotics (e.g., doripenem, ertapenem, imipenem and meropenem), sometimes described as “antibiotics of last resort,” are used to treat healthcare-associated infections caused by multi-drug resistant *Acinetobacter* species and other Gram-negative bacilli (e.g., Enterobacterales order bacteria, *Pseudomonas aeruginosa*). Unfortunately, when carbapenem antibiotic resistance develops, few safe and effective treatment options remain, and the risk of patient morbidity and mortality increases. Carbapenem-resistant *Acinetobacter baumannii* are commonly referred to as CRAB in the scientific literature.

Non-*baumannii* *Acinetobacter* species are less likely to cause infections and less likely to display carbapenem resistance. However, when these organisms do acquire carbapenem resistance, they also represent a transmission risk and a risk to patient health. For this reason, Oregon requires reporting of all carbapenem-resistant *Acinetobacter* (CRA) species and submission of isolates to OSPHL.¹

Carbapenemase-producing CRA

Resistance to carbapenems and other antibiotics in *Acinetobacter* spp. can be caused by many cellular mechanisms including production of extended-spectrum β -lactamases (ESBLs), efflux pumps, decreased cell permeability, and production of carbapenemases.^{2,3} Carbapenemases are enzymes that degrade carbapenem antibiotics. Resistance genes that code for carbapenemases can be exchanged among different Gram-negative bacteria via genetic packets called transposons or plasmids. Carbapenemases can be found in many Gram-negative bacteria and include:

- *Klebsiella pneumoniae* carbapenemase (KPC)
- New Delhi metallo-beta-lactamase (NDM)
- Imipenem-hydrolyzing-lactamase (IMP)
- Verona integron-encoded metallo-beta-lactamase (VIM)
- Oxacillinase-48 (OXA-48)

Acinetobacter species carry other oxacillinase variants that are unique to this genus. Examples include OXA-23, OXA-24/40, OXA-58, and OXA-235.

Acinetobacter that have carbapenemase genes are sometimes referred to as carbapenemase-producing CRA (CP-CRA) or simply carbapenemase-producing organisms (CPOs). From a public health perspective, CP-CRA are the most concerning CRA because their resistance can be easily spread, and they are associated with higher morbidity and mortality. Unfortunately, most CRA are CP-CRA; CDC found that carbapenemase genes were detected in 83% of CRA isolates.

CRA has been reported in all 50 states. Once CRA become entrenched in a region or health care facility, carbapenem antibiotics may lose their effectiveness, and patients may die for lack of treatment options. If CRA become prevalent, empiric therapy will necessitate 2nd- and 3rd-line antibiotics, which may be less effective, cost more, and cause more side effects. If healthcare providers and public health officials can rapidly identify and isolate patients with CRA in Oregon, we may be able to prevent or delay their becoming endemic.

2.2 Description of Illness

CRA typically causes healthcare-associated infections, especially in intensive-care units (ICUs). Patients at highest risk of infection are those requiring prolonged or intensive care, especially patients on mechanical ventilation, with open wounds from surgery, or with indwelling medical devices such as catheters. The two most common kinds of infection caused by CRA are pneumonia and bloodstream infections. Pneumonia occurs most often in the presence of mechanical ventilation. Bloodstream infections are typically catheter-related infections or complications of respiratory tract infections. CRA

can also cause wound or surgical-site infections, urinary-tract infections (typically associated with urinary catheters), endocarditis and meningitis.^{4,5}

2.3 Reservoirs

Acinetobacter species are commonly found in the environment in soil and water. Many species, including *A. lwoffii*, *A. johnsonii*, *A. radioresistens*, *A. pittii*, and *A. junii*, can harmlessly colonize the skin of healthy individuals as part of normal human flora. The most clinically important species, *A. baumannii*, is most frequently found in patients and the hospital environment. It has been less commonly detected in various non-hospital environments including soil, water, and high-touch surfaces like tables.⁶ *A. baumannii* can survive for long periods in healthcare environments on surfaces, medical equipment, and water sources such as sinks. Patients infected or colonized with *A. baumannii* in healthcare settings can act as reservoirs, shedding bacteria into their environment. Various body sites including skin, respiratory, and gastrointestinal tracts may be colonized by CRA.^{7, 8}

2.4 Sources and Routes of Transmission

CRA are transmitted from person to person through stool or infected body secretions. Transmission often occurs via the hands of healthcare workers, contact with contaminated environmental surfaces, or shared medical equipment that has not been properly cleaned.

2.5 Risk Dynamics

Any person can be infected with CRA. However, older adults and people with certain pre-existing conditions may be at greater risk of infection.

The patients most at risk for CRA infection are those with chronic medical conditions, frequent or prolonged stays in healthcare settings, invasive medical devices (e.g., ventilators or intravenous catheters), or a history of taking antibiotics for long periods of time. These risk factors may be associated with age, disability, or medical vulnerability.

For individuals infected or colonized with CRA, effective hand hygiene mitigates the risk of transmission to others.

2.6 Incubation Period

Because CRA and other carbapenem-resistant organisms (CROs) can colonize people without causing infection, the incubation period is unknown.

2.7 Period of Communicability

Persons can transmit CRA to others if the organism is present in bodily fluids or on the body. Patients may be intermittently positive on serial surveillance cultures and colonized for long periods of time.

2.8 Treatment

Infectious disease consultation is recommended for treatment decisions. Differentiating between colonization and infection can be difficult. Treatment with antibiotics is not typically recommended for persons merely colonized. Antibiotic options may be limited and may cause adverse reactions.

3. CASE DEFINITIONS, DIAGNOSIS, AND LABORATORY SERVICES

3.1 Confirmed Case

Use the minimum inhibitory concentration (MIC) values to interpret resistance (the automated antimicrobial susceptibility testing result directly from the laboratory is preferred, see Table 1). In some cases, Kirby-Bauer disc diffusion results may be provided; see Table 2.

A confirmed case of CRA is a patient whose clinical or surveillance specimen yields an isolate of the *Acinetobacter* species that:

1. is resistant to any carbapenem (doripenem, ertapenem, imipenem, or meropenem) using current CLSI breakpoints; (See Tables 1 and 2)

OR

2. tests positive by molecular test, such as PCR or next-generation sequencing (NGS), for a carbapenemase; (e.g., KPC, NDM, OXA-48, OXA-23)

Table 1. Carbapenem MIC Breakpoints for *Acinetobacter* spp.

Carbapenems	Current MIC Breakpoints (µg/mL)*		
	MIC Interpretation ⁵		
	Susceptible	Intermediate	Resistant
Doripenem	≤2	4	≥8
Ertapenem [‡]	-	-	-
Imipenem	≤2	4	≥8
Meropenem	≤2	4	≥8

* MIC = minimum inhibitory concentration

5 CLSI. Table 2b-2. Zone Diameter and MIC Breakpoints for *Acinetobacter* spp. In: CLSI M100-ED35:2025 Performance Standards for Antimicrobial Susceptibility Testing, 35th Edition. Jan 2025. Available from: <https://em100.edaptivedocs.net/>

‡ Ertapenem has weak activity against *Acinetobacter* spp. and should not be used to determine carbapenem resistance.

Table 2. Kirby-Bauer Disc Diffusion Interpretations for *Acinetobacter*

Carbapenems	Current Disk Diffusion Zone Diameters (mm)*		
	Zone Size Interpretation ⁵		
	Susceptible	Intermediate	Resistant
Doripenem	≥18	15–17	≤14
Ertapenem [‡]	-	-	-
Imipenem	≥22	19–21	≤18
Meropenem	≥18	15–17	≤14

*mm = millimeters

5 CLSI. Table 2b-2. Zone Diameter and MIC Breakpoints for *Acinetobacter* spp. In: CLSI M100-ED35:2025 Performance Standards for Antimicrobial Susceptibility Testing, 35th Edition. Jan 2025. Available from: <https://em100.edaptivedocs.net/>

‡ Ertapenem has weak activity against *Acinetobacter* spp. and should not be used to determine carbapenem resistance.

In rare cases where susceptibility results for a single isolate are discrepant (e.g. meropenem resistant by Vitek but meropenem susceptible by Kirby Bauer), case determination should prioritize the following sources: (1)

confirmatory or reference methods used at the clinical lab (e.g. Kirby Bauer), (2) initial susceptibility tests performed at the clinical laboratory (e.g. Microscan or Vitek), (3) susceptibility testing performed at a public health laboratory.

Some labs will suppress carbapenem results on reports. If you receive a report that calls the *Acinetobacter* species isolated a CRA or CRAB but the available carbapenem results are susceptible, call the lab to ask for any suppressed carbapenem results. These results will be on the automated antimicrobial susceptibility testing report.

Note: *Acinetobacter radioresistens* isolates are excluded from this definition if they are carbapenem-susceptible and the only carbapenemase gene detected is OXA-23. This species carries a chromosomal OXA-23 gene that may not be expressed.

3.1.1 Resistance Mechanism

We are more concerned about some CRA than others, with CPOs (see Table 3) being of most concern.

Table 3. Type of CRA

Description	Organisms Included	Recommended Measures
Carbapenemase producing organism (CPO)	<i>Acinetobacter</i> positive by PCR or NGS for KPC, NDM, OXA-23, OXA-24, OXA-235, or other carbapenemase	• Most aggressive control measures • See CRO Toolkit
CRA with acquired resistance NOT due to carbapenemase production	<i>Acinetobacter</i> that meet definition but are PCR negative for carbapenemases	• Intensified control measures including contact precautions • See CRO Toolkit

3.1.2 Repeat Culture Results

Repeat positive culture results for the same carbapenem-resistant organism collected within 30 days of the initial positive collection date should be entered as a new lab in the existing Orpheus case record. After 30 days, review the susceptibility results for both labs. If the new susceptibility results look very similar to the existing case's susceptibility results, the new lab can be added to the existing case. If the susceptibility results look very different, consult with the ACDP on-call epidemiologist to determine whether a new case should be created in Orpheus.

A positive culture for a different CRA organism (different species) or different organism/carbapenemase combination (e.g., OXA-23 + *A. baumannii* vs. NDM + *A. Baumannii*) should be entered as a new incident case, regardless of the collection date.

3.2 Services Available at the Oregon State Public Health Laboratories

All CRA isolates received by OSPHL will be tested for carbapenemase production by the Carba-R PCR panel for detection of OXA-48, KPC, NDM, IMP, VIM carbapenemases. CRA will be forwarded to Washington State Public Health Lab for detection of OXA-variant carbapenemases including OXA-23, OXA-235, OXA-24/40 and OXA-58.

4. ROUTINE CASE INVESTIGATION

4.1 Confirm Case

Confirm that a case meets the case definition by reviewing the isolate's susceptibility information or consult with the ACDP on-call epidemiologist ([See §3 for case definitions](#))

4.2 Case Investigation

Routine case investigation should include the documentation of case demographic, clinical and laboratory data. Personal information should be collected based on people's self-reported identities and should include "REAL-D" and "SOGI" information.

Interview the case (or primary caregivers) and any additional persons who may be able to provide pertinent information. Use professional interpretation services rather than relying on family members or community interlocutors unless there is mutual consent between the case and the lay interpreter that they will feel more comfortable communicating without a professional intermediary.

Work with the healthcare facility or physician (if case is an outpatient) to investigate and institute control measures, as indicated in Oregon's [CRO Toolkit \(https://rebrand.ly/CRO-Toolkit\)](https://rebrand.ly/CRO-Toolkit). If multiple healthcare facilities are involved, work with all facilities to institute appropriate control measures. If a case is to be transferred to a new facility, work with the receiving facility to ensure they are prepared to implement infection control measures. If the case has a CPO, the ACDP MDRO Epidemiologists will assist the LPHA in consulting the facility or physician.

Promptly enter data into Orpheus. Be sure to obtain:

1. Demographic information including name, address, date of birth,

- REAL-D and SOGI information;
- 2. Name of organism (as “subtype” in Orpheus);
- 3. Date of initial culture collection (as “onset” in Orpheus);

“Risks” Tab in Orpheus

- 4. Any medical care outside Oregon during the last 12 months;
- 5. Any medical care outside the United States during the last 12 months;
- 6. Any travel outside Oregon during the last 12 months;

“Follow-up” Tab in Orpheus

- 7. Any healthcare transfers and confirmation of interfacility transfer notice;
- 8. If case was hospitalized or in a long-term care facility, whether they were on contact precautions or enhanced barrier precautions;
- 9. Whether patient education was provided emphasizing hand hygiene;

“MDRO” Tab in Orpheus

- 10. Patient location on 4th calendar date prior to initial culture date;
- 11. Hospitalization status at the time of culture;
- 12. Any admissions to acute or long-term care facilities in the 30 days before specimen collection through the time of investigation (365 days for CPOs). Include facility name and dates of admission and discharge.

In general, infection control measures include (See Table 4 and the [CRO Toolkit](#)):

- 1. Emphasis on hand hygiene;
- 2. Standard precautions at all times;
- 3. Transmission-based precautions (e.g., contact precautions) when contact with bodily fluids is a possibility, or there is an active infection;
 - a. Acute healthcare facilities should use contact precautions, even for colonized patients to reduce transmission among high-risk populations.
 - b. Long-term care facilities should use contact precautions for patients with CRA infections and colonized patients at higher risk of transmission (e.g., draining wounds, patients incontinent of urine or stool). See the [CRO Toolkit](#) for additional details. CDC also recommends Enhanced Barrier Precautions (EBP) for patients colonized with CRA

or other MDROs when contact precautions do not apply and for CRA-naïve patients at higher risk of acquiring CRAs (e.g., patients with indwelling medical devices or wounds). [More information about EBP](#) is available through CDC (<https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html>).

- c. CPO cases are rare, and contact precautions are always recommended.
 - d. In all settings, appropriate transmission-based precautions should be maintained for a minimum of one year for CRA cases and indefinitely for CPO cases.
4. Enhanced environmental cleaning, including high touch surfaces;
 5. Interfacility communication of patient's CRA status at transfer or time of discharge.
 - a. Interfacility transfer notification is required by [OAR 333-019-0052](#).
 - b. CPOs also require communication to the LPHA when there is a new transfer or admission of a case.

4.3 Identify Potentially Exposed Persons

Identification of contacts is generally not indicated for CRA that are not carbapenemase-producing. The risk of infection in otherwise healthy people is low. CRA testing for contacts is not recommended.

CPO cases require a containment response which is typically coordinated by ACDP MDRO Epidemiologists. During this response, CPO colonization screening of other patients in healthcare facilities visited by the index case may be recommended. ACDP MDRO Epidemiologists will identify which patients should be tested based. ACDP HAI staff will coordinate with the healthcare facility to collect and test specimens. LPHA staff may be asked to assist with screening or with outreach to people discharged from healthcare facilities.

CPO colonization screening of otherwise healthy friends, family, or healthcare worker contacts is not usually indicated. If a close contact of a person with a CPO infection has frequent or prolonged stays in healthcare settings and has medical risk factors like indwelling medical devices (e.g., ventilators or urinary catheters), consult with an ACDP MDRO Epidemiologist to determine if the person should be screened for CPO colonization.

Table 4. Summary of Infection Control Recommendations by Healthcare Setting

Response and Control Measures by Local Public Health Authorities	ACH	SNF	LTACH/vSNF	Other residential	Outpatient
Advise facility infection preventionist (IP) or staff responsible for infection prevention and control	Always				
Review and share relevant section of CRO Toolkit	CRA: p. 21-22 CPO: p. 22-24	CRA: p. 25-26 CPO: p. 26-28	CRA: p. 16-17 CPO: p. 17-18	CRA: p. 31-33 CPO: p. 33-34	CRA: p. 35-36 CPO: p. 36-37
Provide additional resources as appropriate	CRO/CPO Patient FAQ (spanish) CPO Provider FAQ CPO Wallet Card (spanish)				
Confirm key infection control measures are in place:	Always				
Appropriate transmission-based precautions	Contact precautions*	See CRO Toolkit, p. 28-30 *	Contact precautions*	Standard precautions	Standard precautions
Private room and bathroom	Yes	Yes	Yes	Yes	n/a
Chart flag in medical record and clinical team notified	Always				
Remind facility of required notification:	Always				
If patient is transferred, discharging facility must notify receiving facility in writing	Always				
If patient is re-hospitalized, dies, or is transferred the LPHA must be notified	CPO only				
Provide education to patient. Emphasize hand hygiene.	Always				
Mail CPO wallet card to case	CPO only				

* Contact precautions are recommended for a minimum of one year for non-CPO CRA cases, and indefinitely for CPO cases.

ACH - acute care hospital

SNF – skilled nursing facility

other residential – e.g. memory care, assisted living

LTACH – long-term acute care hospital

vSNF – ventilator-capable skilled nursing facility

5. CONTROLLING FURTHER SPREAD

5.1 Education

Cases and those providing medical care for cases should be educated about proper hand hygiene particularly after using the toilet, touching any areas of the body with an infection (e.g., infected wounds), or touching surfaces that may be contaminated from stool or bodily fluids (e.g., toilets, medical devices such as catheters).

These educational resources can be shared with cases and medical practitioners:

CRO/CPO for patients – Recommended for persons infected or colonized with CRA or CPO

[English](https://rebrand.ly/CROCPOInfectedColonizedFAQ) (https://rebrand.ly/CROCPOInfectedColonizedFAQ)

[Spanish](https://rebrand.ly/CPOPatientSP) (https://rebrand.ly/CPOPatientSP)

CPO wallet card – It is strongly recommended that LPHAs print and distribute these to any persons infected or colonized with CPO. These cards can be shown to healthcare professionals on admit to ensure appropriate patient care.

[English](https://rebrand.ly/CPOWalletCard) (https://rebrand.ly/CPOWalletCard)

[Spanish](https://rebrand.ly/CPOWalletSP) (https://rebrand.ly/CPOWalletSP)

CPO for providers – Recommended for professionals providing healthcare to patients with CPO

[English](http://www.rebrand.ly/CPOProviderFAQ) (http://www.rebrand.ly/CPOProviderFAQ)

CRO Toolkit (comprehensive infection control guidance for CRO and CPO) – Recommended for infection prevention and healthcare staff

[English](https://rebrand.ly/CRO-Toolkit) (https://rebrand.ly/CRO-Toolkit)

When providing health education, it is important to remember that Oregonians represent a diverse array of cultures and vary in their preferred languages, ideas about health, and health literacy. Best practices include:

- Make every effort to provide information in the case's preferred language. Provide translated health education materials and utilize professional interpreter services whenever possible.
- Consult with ACDP epidemiologists about accessing OHA Interpretation Services when preferred language materials and services are not available at the LPHA. Avoid using family members, community leaders, or "lay" interpreters. However, respect people's preference if they desire a lay interpreter instead of interpretation services.

- In all oral communication and written materials, use [plain language](#) and [equity-centered communication](#) to convey inclusive and easily understood health messages.
- Tailor communications to the specific cultures of the intended audiences, for example using locally preferred names for places, body parts etc.
- When relevant and possible, consult with relevant community leaders and organizations about how to conduct investigations in the most appropriate (culturally and scientifically) manner.

When a potential outbreak may be concentrated in a particular community, it is critical that that investigations proceed in a manner that is culturally (and scientifically) appropriate, which may require requesting guidance from relevant community leaders and organizations. The ability to conduct these investigations effectively requires that local public health authorities systematically engage cultural leaders and organizations in all of their work, prior to the need for investigating a potential outbreak.

5.2 Isolation and Work or Child Care Restrictions

Not applicable outside of healthcare settings. Appropriate transmission-based precautions should be used in healthcare settings.

5.3 Case Follow-up

Generally not indicated. If you are notified of a transfer CRO or CPO case, provide education and infection control guidance to the receiving facility. Update Orpheus if notified of the death of a person infected or colonized with CPO.

5.4 Protection of Contacts

There is no prophylaxis, restrictions, or requirements for contacts of CRA cases. The importance of good hand washing should be stressed.

Healthcare contacts may be more likely to become ill or colonized if they have certain medical risk factors (See §2.5 Risk Dynamics) or if appropriate infection control measures are not implemented in healthcare settings or poorly adhered to by healthcare workers. Ensure healthcare facilities have a plan for infection control and staff education.

5.5 Environmental Measures

In healthcare settings, environmental services staff should be notified of new cases. Frequent and thorough disinfection of patient rooms, bathrooms, and high-touch surfaces can reduce the risk of transmission through the environment. Review the [CRO Toolkit](#) for more information.

Bleach-based products can be used at home to clean toilets, bathrooms, and high-touch surfaces.

6. MANAGING SPECIAL SITUATIONS

6.1 Health Equity

OHA's strategic goal is to eliminate health inequities in Oregon by 2030. Health inequities are systematic, avoidable differences in health that are rooted in social and economic injustices, not simply differences in disease incidence, health outcomes and access to healthcare. When managing special situations, tailor interventions and communications based on individual circumstances and community history and culture, including intergenerational experiences that have contributed to inequities (e.g., displacement, economic exploitation, racial segregation). As appropriate, consult with culturally rooted organizations, such as Indigenous/tribal agencies, Oregon Health Authority Regional Health Equity Coalitions (<https://www.oregon.gov/oha/EI/Pages/RHEC.aspx>), or culturally specific service providers to develop effective plans for conducting investigations, with an eye toward building trusting relationships.

6.2 Case is Deceased

If a case is deceased, collect as much information as possible from the case's medical record. To collect information that cannot be obtained from the medical record, attempt a proxy interview of a family member, caregiver, or other person with knowledge of the case's recent medical history. When interviewing family or friends of the case, maintain a compassionate trauma-informed approach and allow them to determine the extent of their involvement.

When possible, complete a full case investigation, including the collection of REAL-D and SOGI information from a proxy. Complete case information allows us to better understand these pathogens, risk factors associated with mortality, and inequities.

In situations where a proxy interview must be limited, prioritize actionable information. This includes information about healthcare procedures, hospitalizations, or residential care in the past 30 days (12 months for CPOs).

Notify these healthcare facilities so they can monitor for additional CRA cases.

6.3 Possible Common-source Outbreak

If the number of reported cases in your county is higher than usual, note possible epidemiologic connections, especially procedures or encounters at healthcare facilities. CRA and CPO outbreaks are most commonly associated with healthcare settings.

If there are indications of a potential common-source outbreak, contact communicable disease epidemiologists at ACDP immediately at 971-673-1111

GLOSSARY

CRA – carbapenem-resistant *Acinetobacter*.

CRO – carbapenem-resistant organisms; includes CRA and other carbapenem resistant pathogens (e.g., carbapenem-resistant Enterobacterales, carbapenem-resistant *Pseudomonas aeruginosa*).

CPO – carbapenemase producing organisms; a subset of CRO that produce carbapenemase enzymes as the mechanism of carbapenem resistance.

IMP – imipenem-hydrolyzing-lactamase; a carbapenemase.

KPC – *Klebsiella pneumoniae* carbapenemase.

NDM – New Delhi metallo-beta-lactamase; a carbapenemase.

OXA-[number] – oxacillinase-[number]; a carbapenemase.

PCR – polymerase chain reaction; used to detect genes that code for carbapenemase production.

VIM – Verona integron-encoded metallo-beta-lactamase; a carbapenemase.

REFERENCES

1. CDC. Antibiotic Resistance Threats in the United States. 2019. Available from: <https://www.cdc.gov/drugresistance/Biggest-Threats.html>
2. Bonomo RA, Szabo D. Mechanisms of multidrug Resistance in *Acinetobacter* species and *Pseudomonas aeruginosa*. Clin Infect Dis. 2006; 43(Suppl 2):S49–S56. Available from: https://academic.oup.com/cid/article/43/Supplement_2/S49/332756

3. Bello-Lopez E, Rocha-Gracia RC, Castro-Jaimes S, Cevallos MA, Vargas-Cruz M, Verdugo-Yocupicio R, et. al. Antibiotic resistance mechanisms in *Acinetobacter* spp. strains isolated from patients in a paediatric hospital in Mexico. J Glob Antimicrob Resist 2020; 23:120–9. Available from: <https://www.sciencedirect.com/science/article/pii/S2213716520302204>
4. Wong D, Nielsen TB, Bonomo RA, Pantapalangkoor P, Luna B, Spellberg B. Clinical and Pathophysiological overview of *Acinetobacter* infections: a century of challenges. Clin Microbiol Rev 2016; 30(1):409–47. Available from: <https://journals.asm.org/doi/10.1128/CMR.00058-16>
5. Bartal C, Rolston KV, Neshier L. Carbapenem-resistant *Acinetobacter baumannii*: colonization, infection and current treatment options. Infect Dis Ther 2022; 11(2):683–94. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8960525/>
6. Eveillard M, Kempf M, Belmonte O, Pailhories H, Joly-Guillou ML. Reservoirs of *Acinetobacter baumannii* outside the hospital and potential involvement in emerging human community-acquired infections. Int J Infect Dis 2013; 17(10):E802–5. Available from: [https://www.ijidonline.com/article/S1201-9712\(13\)00156-2/fulltext](https://www.ijidonline.com/article/S1201-9712(13)00156-2/fulltext)
7. Atrouni AA, Joly-Guillou ML, Hamze M, Kempf M. Reservoirs of non-*baumannii* *Acinetobacter* species. Front Microbiol 2016; 7:49. Available from: <https://www.frontiersin.org/articles/10.3389/fmicb.2016.00049/full>
8. Shamsizadeh Z, Nikaeen M, Esfahani BN, Mirhoseini SH, Hatamzadeh M, Hassanzadeh A. Detection of antibiotic resistant *Acinetobacter baumannii* in various hospital environments: potential sources for transmission of *Acinetobacter* infections. Environ Health Prev Med 2017; 22:44. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5664838/>

UPDATE LOG

October 2025: Updated to match CRO Toolkit and CRE Investigative Guidelines (Heather Hertz, Evelyn Donahoe)

October 2023: Newly created guidelines in line with new reporting requirements. CRE Investigative Guidelines used as a template. (Heather Hertz, Evelyn Donahoe)