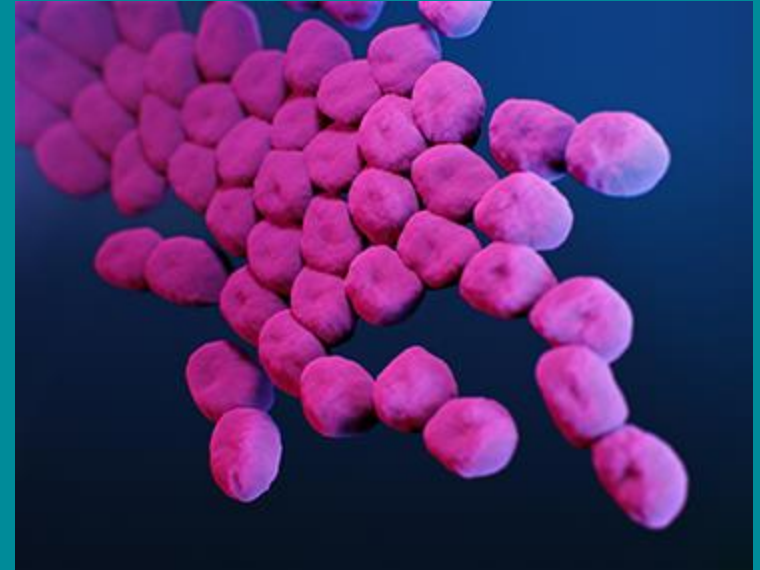


# Carbapenem-Resistant *Acinetobacter baumannii* (CRAB)



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# Disclosures

- Work funded by CDC grant
- Conflicts of interest?



# Learning Objectives

Following the presentation, participants will be able to..

- Identify what is a CRAB
- Learn the Current Epidemiology of CRAB's
- CRAB Identification and Testing
- Identify CRAB risk factors
- CRAB Transmission
- CRAB Mitigation

# What is a CRAB?

- *Acinetobacter* is a group of bacteria (germs) commonly found in the environment, like in soil and water. While there are many types, the most common cause of infections is *Acinetobacter baumannii*, which accounts for most *Acinetobacter* infections in humans
- When resistant to multiple antibiotics, they're multidrug resistant
- Carbapenem-resistant *Acinetobacter* are usually multidrug-resistant.
- *Acinetobacter baumannii* can cause infections in the blood, urinary tract, and lungs (pneumonia), or in wounds in other parts of the body. It can also “colonize” or live in a patient without causing infections or symptoms, especially in respiratory secretions (sputum) or open wounds.



# CARBAPENEM-RESISTANT **ACINETOBACTER**

THREAT LEVEL **URGENT**



**8,500**  
Estimated cases  
in hospitalized  
patients in 2017



**700**  
Estimated  
deaths in 2017



**\$281M**  
Estimated attributable  
healthcare costs in 2017

*Acinetobacter* bacteria can survive a long time on surfaces. Nearly all carbapenem-resistant *Acinetobacter* infections happen in patients who recently received care in a healthcare facility.

# Why are CRAB Considered Epidemiologically Important?

- Carbapenem-resistant *Acinetobacter* cause pneumonia and wound, bloodstream, and urinary tract infections. These infections tend to occur in patients in intensive care units.
- Carbapenem-resistant *Acinetobacter* can carry mobile genetic elements that are easily shared between bacteria. Some can make a carbapenemase enzyme, which makes carbapenem antibiotics ineffective and rapidly spreads resistance that destroys these important drugs.
- Some *Acinetobacter* are resistant to nearly all antibiotics and few new drugs are in development.

# Why are CRAB Considered Epidemiologically Important?

- Treatment options for infections caused by carbapenem-resistant *Acinetobacter baumannii* are extremely limited. There are few new drugs in development.

PERCENT OF GERMS THAT TESTED NON-SUSCEPTIBLE (NOT SENSITIVE) TO OTHER TYPES OF ANTIBIOTICS

Select Antibiotics	2013	2014	2015	2016	2017
Any fluoroquinolone	98%	93%	97%	92%	89%
Any extended-spectrum $\beta$ -lactam	80%	75%	81%	79%	75%
Ampicillin/sulbactam	62%	62%	59%	64%	61%
Trimethoprim/sulfamethoxazole	84%	74%	81%	77%	66%

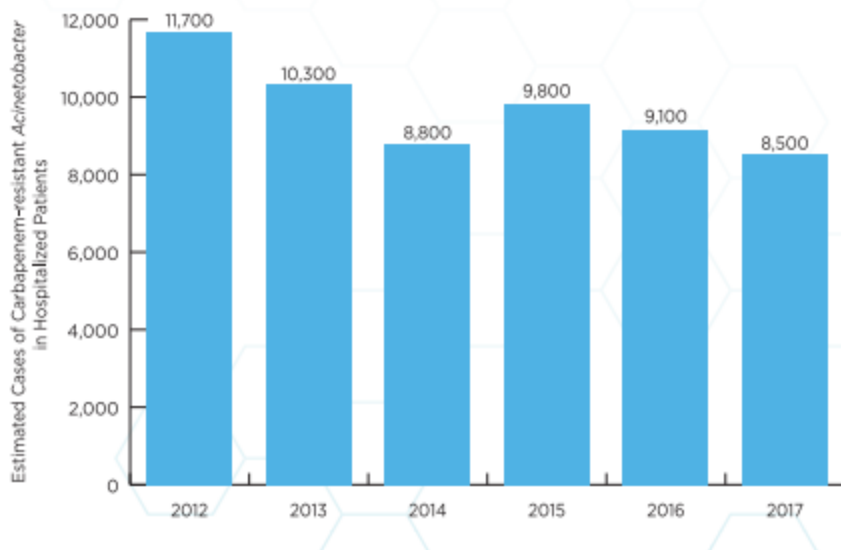
Germs refer to isolates (pure samples of germs) from eight of CDC's Emerging Infections Program sites. See Technical Appendix for antibiotic susceptibilities details.

# Current CDC CRAB Statistics

- In 2017, carbapenem-resistant *Acinetobacter* caused an estimated 8,500 infections in hospitalized patients and 700 estimated deaths in the United States.

## CASES OVER TIME

Continued infection control and appropriate antibiotic use are important to maintain decreases in carbapenem-resistant *Acinetobacter* infections.





# CRAB Identification

- Standard microbiology identification and sensitivities
- Molecular testing to look for a carbapenemase gene

# How to Test for CRAB

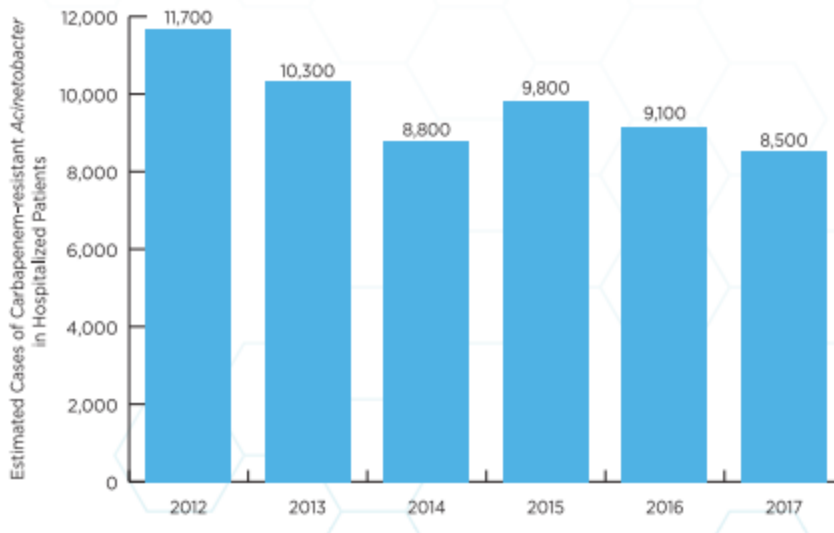
- Testing in the Antibiotic Resistance Laboratory Network (AR Lab Network) during 2019 found that carbapenemase genes were detected in 83% of CRA isolates tested. These carbapenemase gene-positive CRA (CP-CRA) are divided into two categories based on the type of gene present:
  - Most CP-CRA possess genes for carbapenemases that have been specifically identified among *Acinetobacter* species. These more common genes make OXA-23-like, OXA-24/40-like and OXA-58-like oxacillinases. Because these genes were detected frequently, they are not targeted for routine molecular testing.
  - A small proportion of CP-CRA possessed mobile genes that encode carbapenemases (KPC, IMP, NDM, VIM, OXA-48-like) found often in other gram-negative bacteria, such as Enterobacterales. These genes are amplifying the problem of resistance and are targeted for further molecular testing.

# How Common are CRAB Infections?

- Usually found in healthcare settings, or in patients who received care outside of the United States

## CASES OVER TIME

Continued infection control and appropriate antibiotic use are important to maintain decreases in carbapenem-resistant *Acinetobacter* infections.



# Who is Most Likely to get a CRAB Infection?

- *Acinetobacter* infections typically occur in people in healthcare settings. People most at risk include patients in hospitals, especially those who:
  - are on breathing machines (ventilators)
  - have devices such as catheters
  - have open wounds from surgery
  - are in intensive care units
  - have prolonged hospital stays
- In the United States, *Acinetobacter* infections rarely occur outside of healthcare settings. However, people who have weakened immune systems, chronic lung disease, or diabetes may be more susceptible.

# How are CRAB Germs Spread or Transmitted?

- *Acinetobacter* can live for long periods of time on environmental surfaces and shared equipment if they are not properly cleaned.
- The germs can spread from one person to another through contact with these contaminated surfaces or equipment or through person to person spread, often via contaminated hands

# What Can Clinicians do to Prevent CRAB Transmission?

- When available, house patients infected or colonized with CRA in single patient rooms. If the number of single patient rooms is limited, reserve these rooms for patients with highest risk for transmission (e.g., incontinence).
- Use gown and gloves (e.g., [Contact Precautions](#) in Acute Care settings and [Enhanced Barrier Precautions](#) in long-term care settings for patients/residents who are infected or colonized with CRA). Consider empiric use of these precautions for patients transferred from high-risk settings.
- Review facility infection prevention and control practices and provide staff with feedback, particularly for:
  - Hand hygiene adherence
  - Personal protective equipment donning and doffing and adherence
  - Environmental cleaning and disinfection

# Public Health Departments and CRAB

**Take Steps Now!** Public health departments should lead coordination.



- Identify the health care facilities in the area and how they are connected.
- Dedicate staff to improve connections and coordination with health care facilities in the area.
- Work with CDC to use data for action to better prevent infections and improve antibiotic use in health care settings.
- Know the antibiotic resistance threats in the area and state.

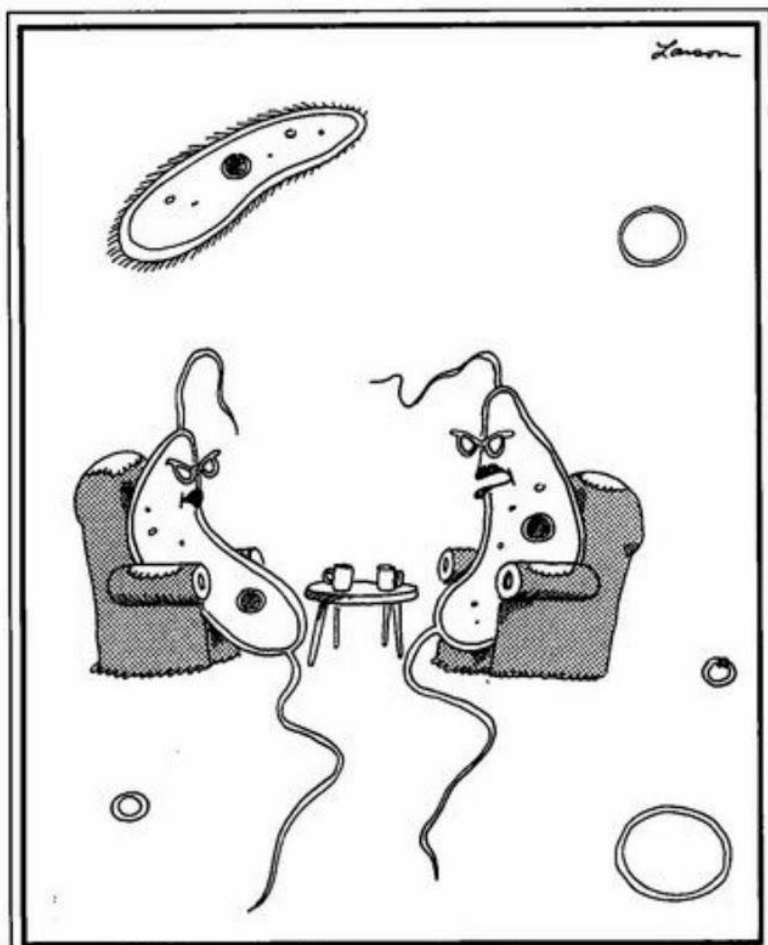
SOURCE: CDC Vital Signs, August 2015.

# Health Departments Should

- Understand the prevalence or incidence of CRAB in their jurisdiction by performing some form of regional surveillance for these organisms.
- Increase awareness among healthcare facilities of the regional prevalence of CRAB and prevention strategies and initiatives.
- Provide a standardized form for facilities to use during patient transfers, especially between hospitals and long-term care facilities.
- Consider including CRAB infections on your state's Notifiable Diseases List.
- Include a range of facility types when developing regional CRAB prevention projects.
- Be a resource for healthcare facilities on appropriate infection prevention measures and antimicrobial stewardship



# Questions?



**"He told you that? Well, he's pulling your flagellum, Nancy."**

# Resources

- <https://www.cdc.gov/hai/organisms/acinetobacter.html>
- <https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf>
- <https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf>
- CDC Homepage for AR Lab Network: <https://www.cdc.gov/drugresistance/laboratories.html>
- CDC Containment Strategy Guidelines for Multidrug-Resistant Organisms: <https://www.cdc.gov/hai/containment/guidelines.html>
- CDC Antibiotic Resistance Threats Report (2019): <https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf>