# The Battle Against Multidrug-Resistant Organisms; We are in this Together

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# Welcome to the Massachusetts MDRO Webinar Series!

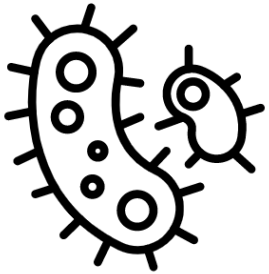
- **Massachusetts is currently seeing the emergence and rise of several multidrug-resistant organisms (MDROs)**
- **Now is the time to work together to limit them from spreading further, ultimately preventing harm to patients and residents**
- **This is the first of several webinars for healthcare facilities of all types in focused on this topic**

# Objectives of Today's Webinar

- **To not talk about COVID-19**
- **To bring together healthcare facilities of all types to learn about MDROs that are affecting the Commonwealth**
- **To lay a foundation of knowledge that will be built upon in future webinars**

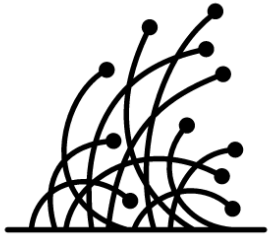

THANK
YOU

# What are Multidrug-Resistant Organisms (MDROs)?

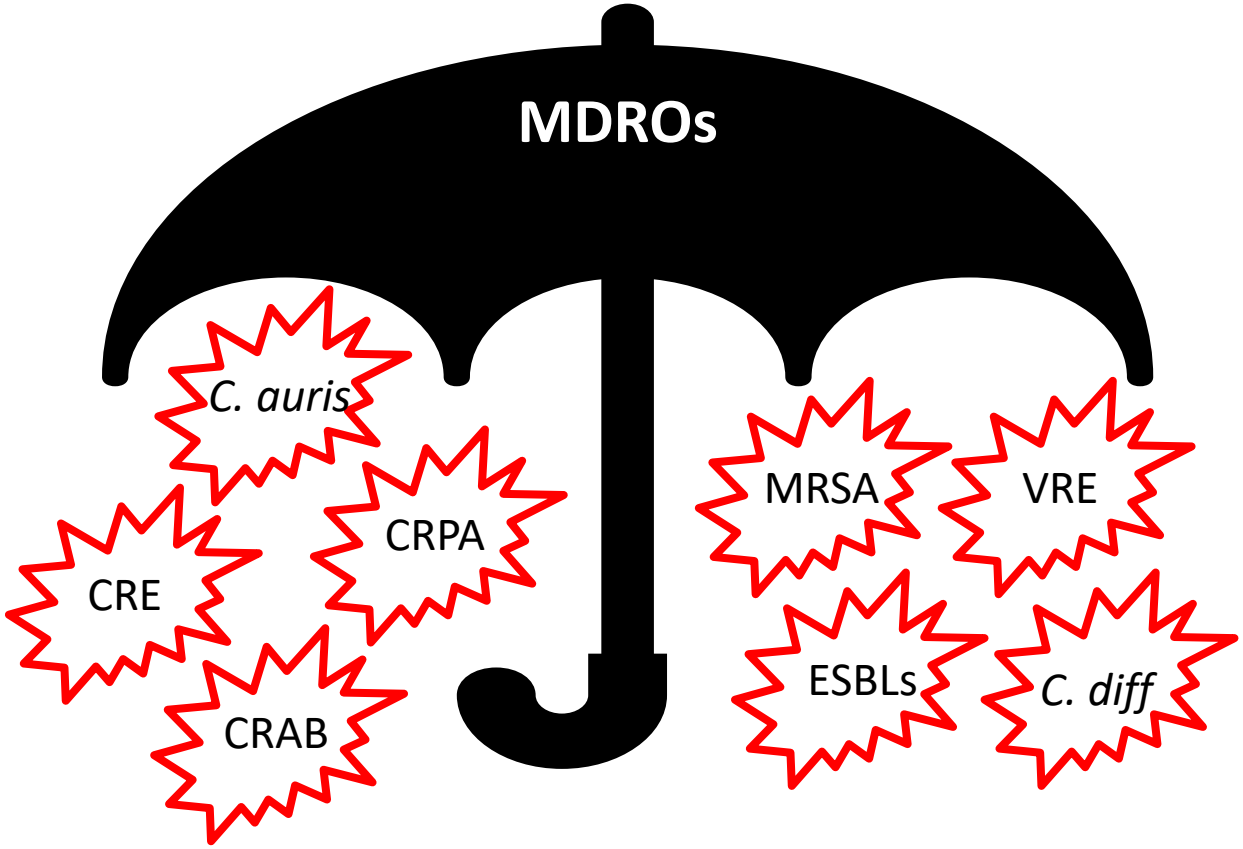


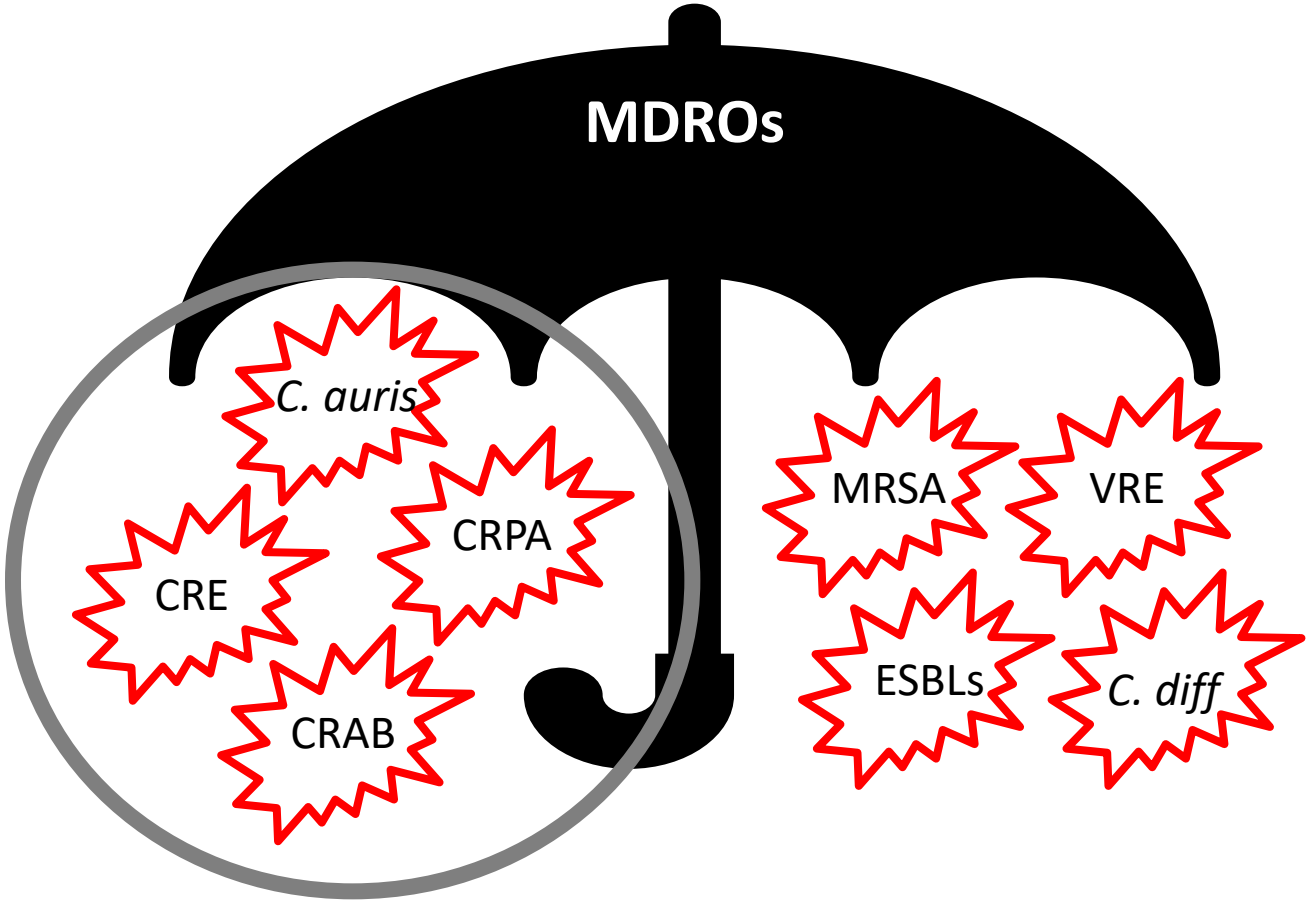
Bacteria

**Resistant to all or most antimicrobials tested**, making them hard to treat



Fungi


MDROs
C. auris
CRE
CRPA
CRAB
MRSA
VRE
ESBLs
C. diff


MDROs
C. auris
CRE
CRPA
CRAB
MRSA
VRE
ESBLs
C. diff

# Where do MDROs come from?

**Germs are exposed to antimicrobials in people, animals, and our environment**

**Germs defend themselves by developing resistance which can be passed to their progeny (family) and some kinds of resistance can be shared by jumping between germs (friends)**

**The resistant germs can move from person-to-person or from the environment to people**

# MDROs often Affect the Sickest of the Sick

- Multiple healthcare stays
- Prolonged healthcare stays
- Invasive devices (e.g., tracheostomies)
- Ventilator-dependent
- Recently received antibiotics and antifungals

# MDRO Infections

- MDROs can cause many different types of infections
  - Bloodstream
  - Urinary tract
  - Respiratory system

- Infections with MDROs are associated with worse outcomes
  - Longer hospital stays
  - Higher mortality

# MDRO Colonization

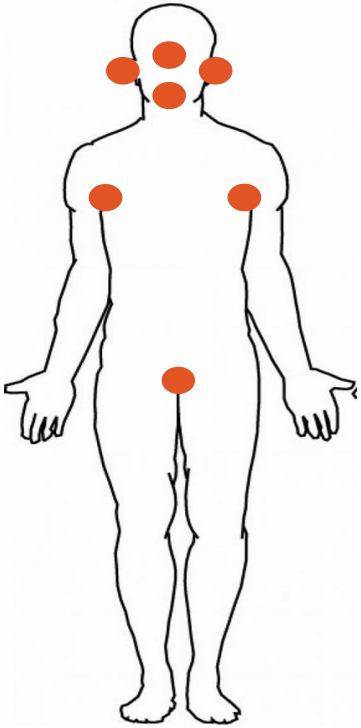
- Colonization means that a person is carrying a MDRO but does not have symptoms of an infection
- Some colonized people will develop infections
- Colonized people play a large role in the spread of MDROs to other people in healthcare settings (require infection control action)


Colonization

# Colonization Duration

- **Colonization can persist for many months**

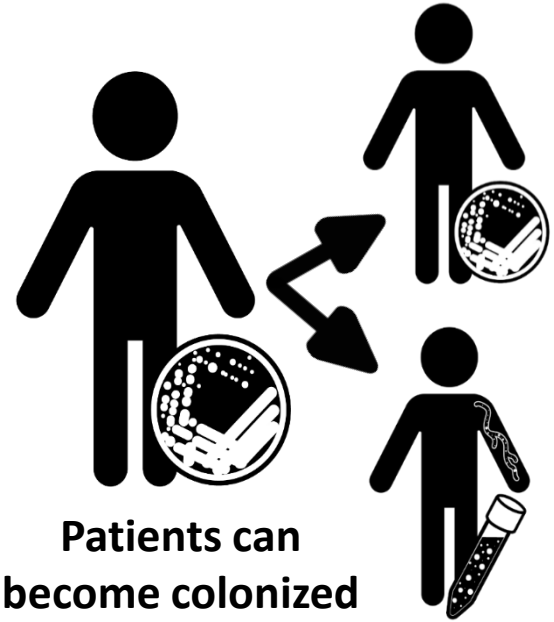
- **Currently, no well-established decolonization strategies**



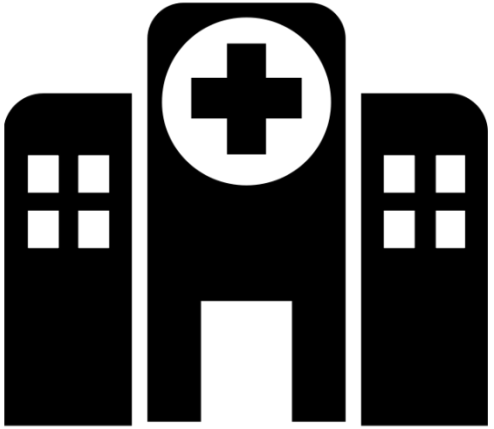
# *Candida auris (C. auris)*

# Why are we concerned about *Candida auris?*

Highly drug-resistant



Patients can become colonized and develop invasive infections



Spreads in healthcare settings

# *C. auris* Resistant Isolates in ARLN Northeast Region


**>99%**

Azoles


**53%**

Polyenes


**2%**

Echinocandins

- **55% multidrug-resistant**
- **Multiple pan-resistant cases reported in US since 2019**

*Preliminary data from AR Lab Network*

# Increase in *C. auris* Resistance

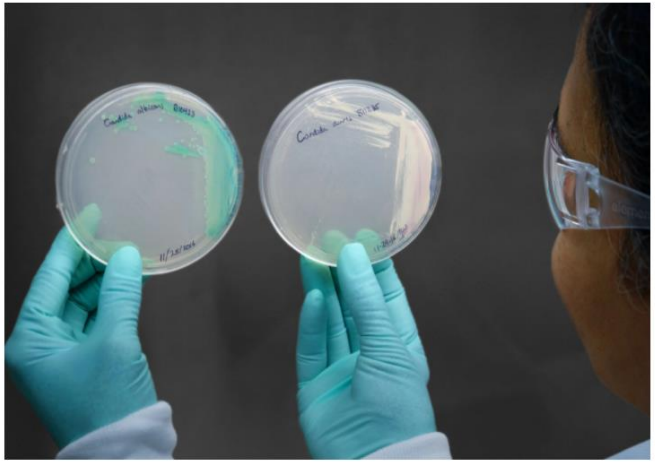
- **2 independent clusters of pan- or echinocandin-resistant cases among patients with no prior echinocandin use**

- **First evidence of spread of pan- or echinocandin-resistant strains**

The New York Times

## *Outbreaks of Untreatable, Drug-Resistant Fungus Spread in 2 Cities*

For the first time, the C.D.C. identified several cases of Candida auris that were resistant to all drugs, in two health facilities in Texas and a long-term care center in Washington, D.C.



Cultured Candida auris, right, which was first discovered in 2009. Centers for Disease Control and Prevention

## Can cause invasive infections and high mortality

5-10% of colonized patients develop bloodstream infections

Mortality of invasive infections is

**~40%** ***within the first 30 days***

Adams E, Quinn M, Tsay S, et al. Candida auris in Healthcare Facilities, New York, USA, 2013–2017. *Emerg Infect Dis*. 2018;24(10):1816-1824.

# vSNFs and LTACHs are disproportionately affected

## *C. auris* prevalence

**in vSNFs:23-71%**

**in LTACHs:23-36%**

## *C. auris* prevalence

**in SNFs: 0-2%**

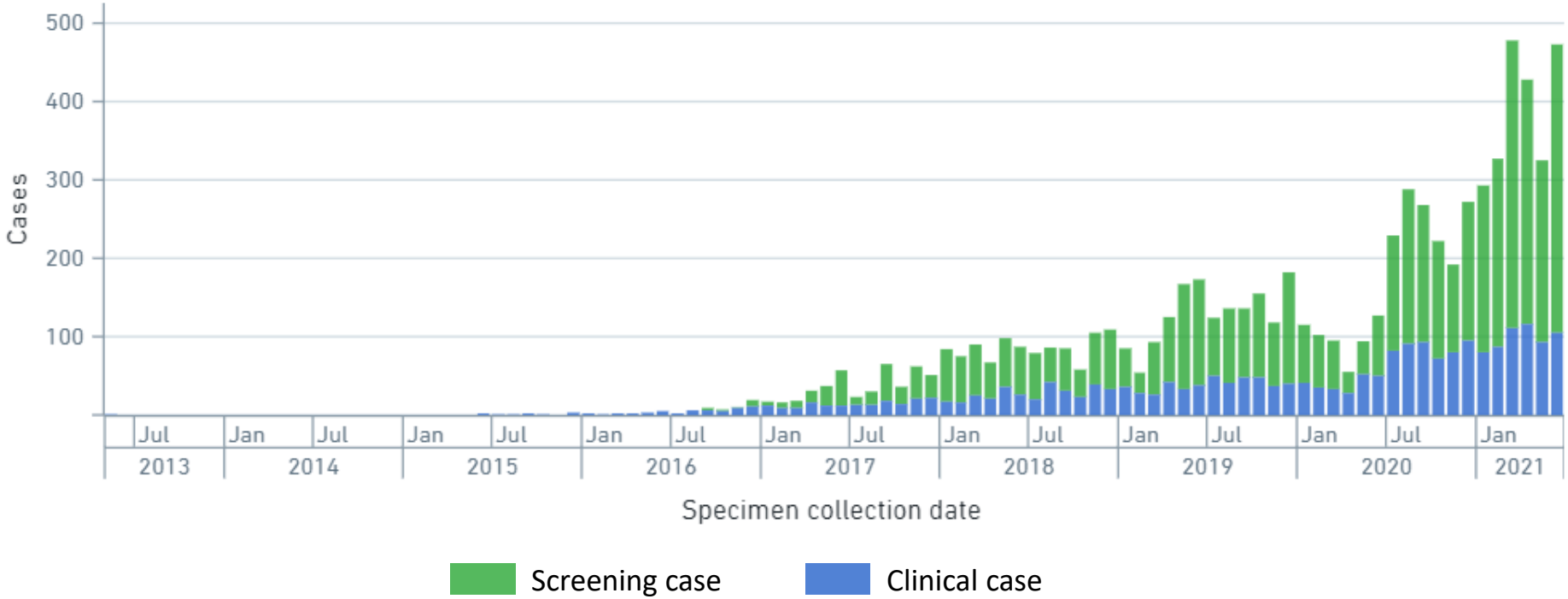
**In ACHs: 0-14%**

Pacilli, et al. Clin Infect Dis. 2020 Dec 31;71(11):e718-e725.

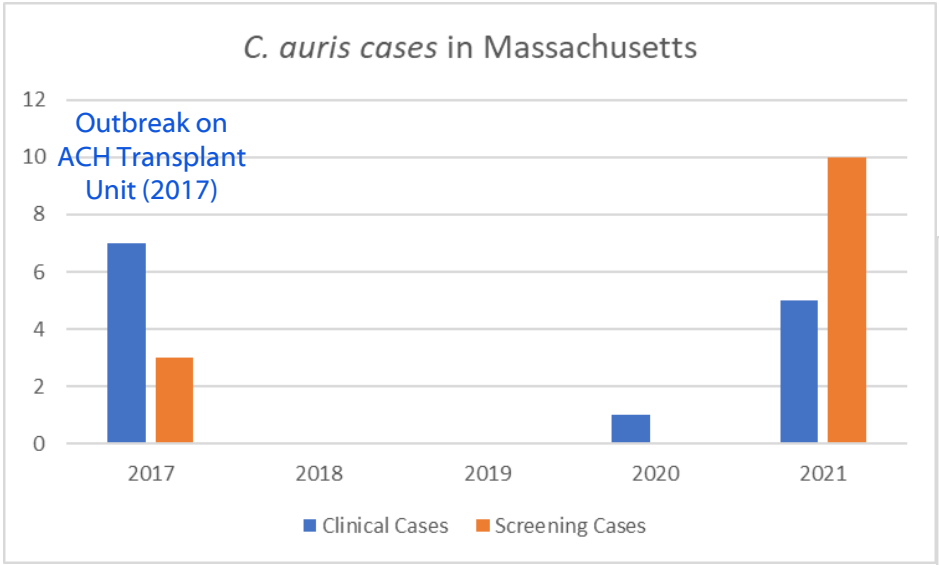
vSNF = skilled nursing facility with ventilator units;
SNF = skilled nursing facility

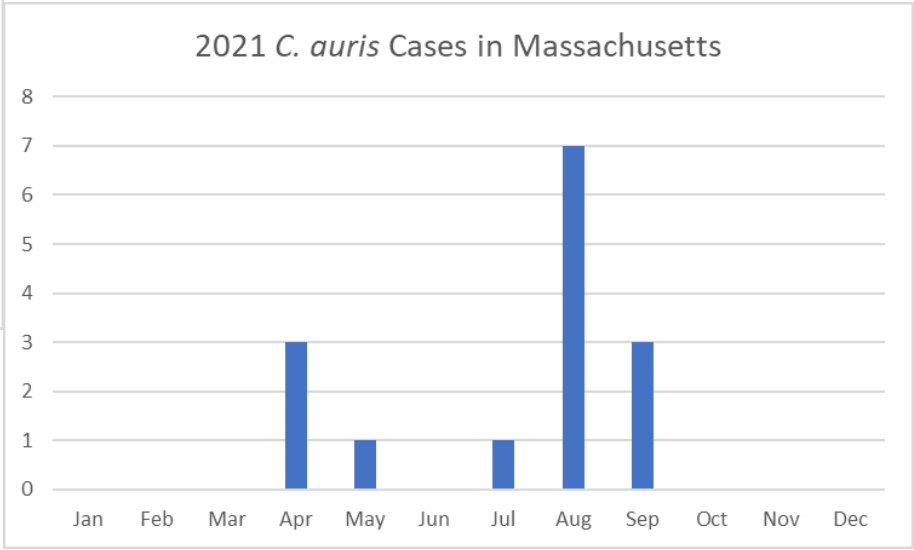
LTACH = long-term acute care hospital
ACH = short-stay acute care hospital

# Increasing transmission of *C. auris* in the United States

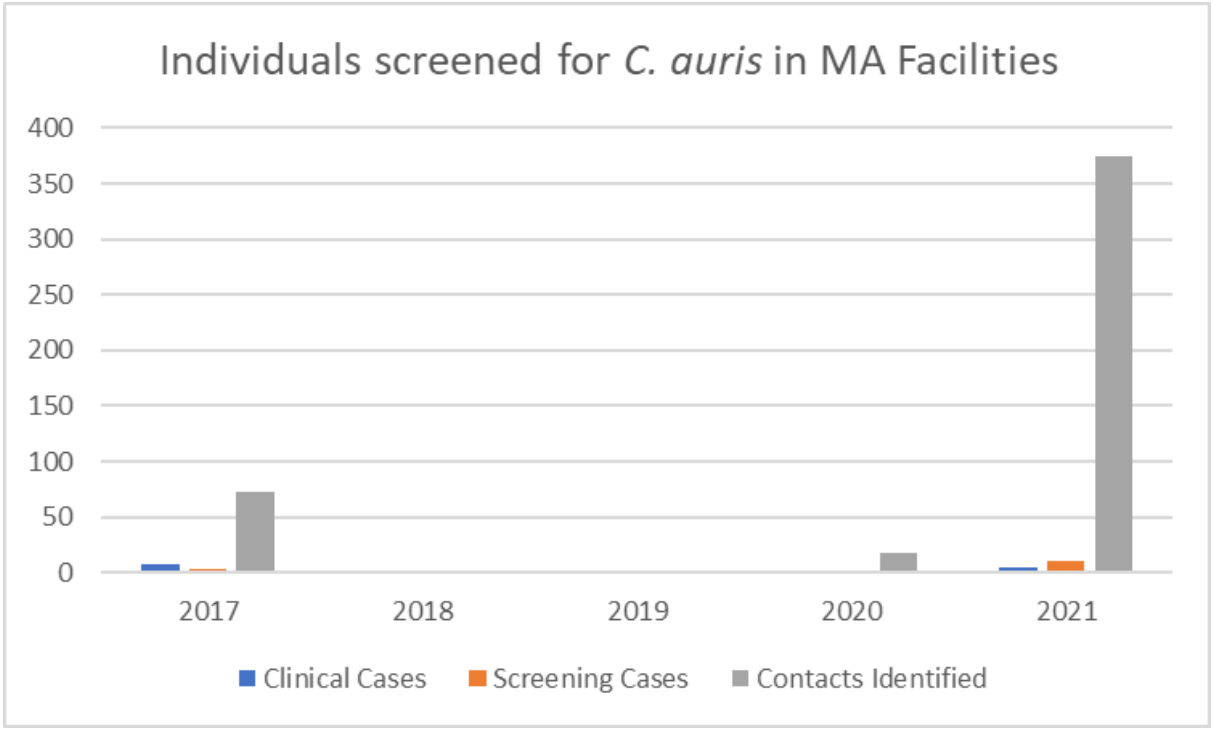


# *C. auris* in Massachusetts



# Colonization Screening for *C. auris* in MA



# Carbapenemase-Producing Organisms (CPOs)

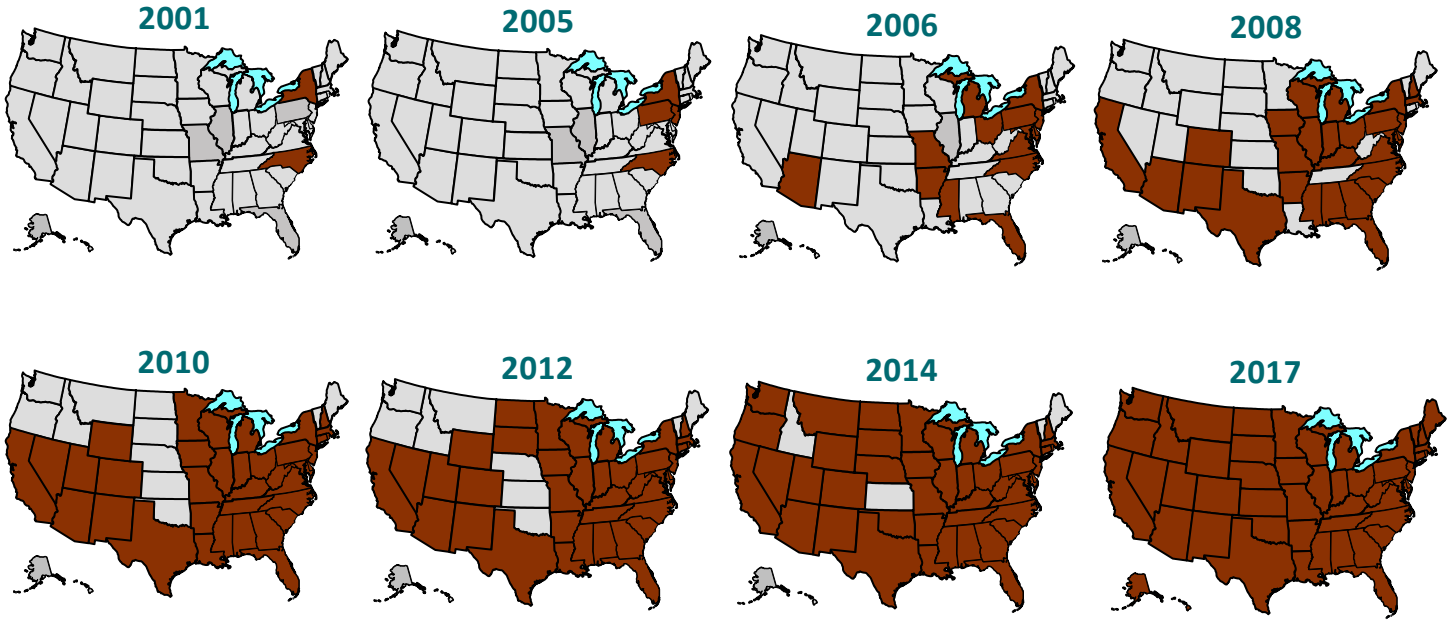
# Carbapenemase-Producing Organisms (CPOs)

- Carbapenemases are enzymes that destroy the carbapenem and other beta-lactam antibiotics
  - KPC, NDM, VIM, IMP, OXA-48

- Bacteria that can make these enzymes are CPOs
  - CP-CRE, CP-CRAB, CP-CRPA
  - Are often resistant to many other types of antibiotics
  - Can share how to make these enzymes with other bacteria

# Carbapenemases can Spread Rapidly

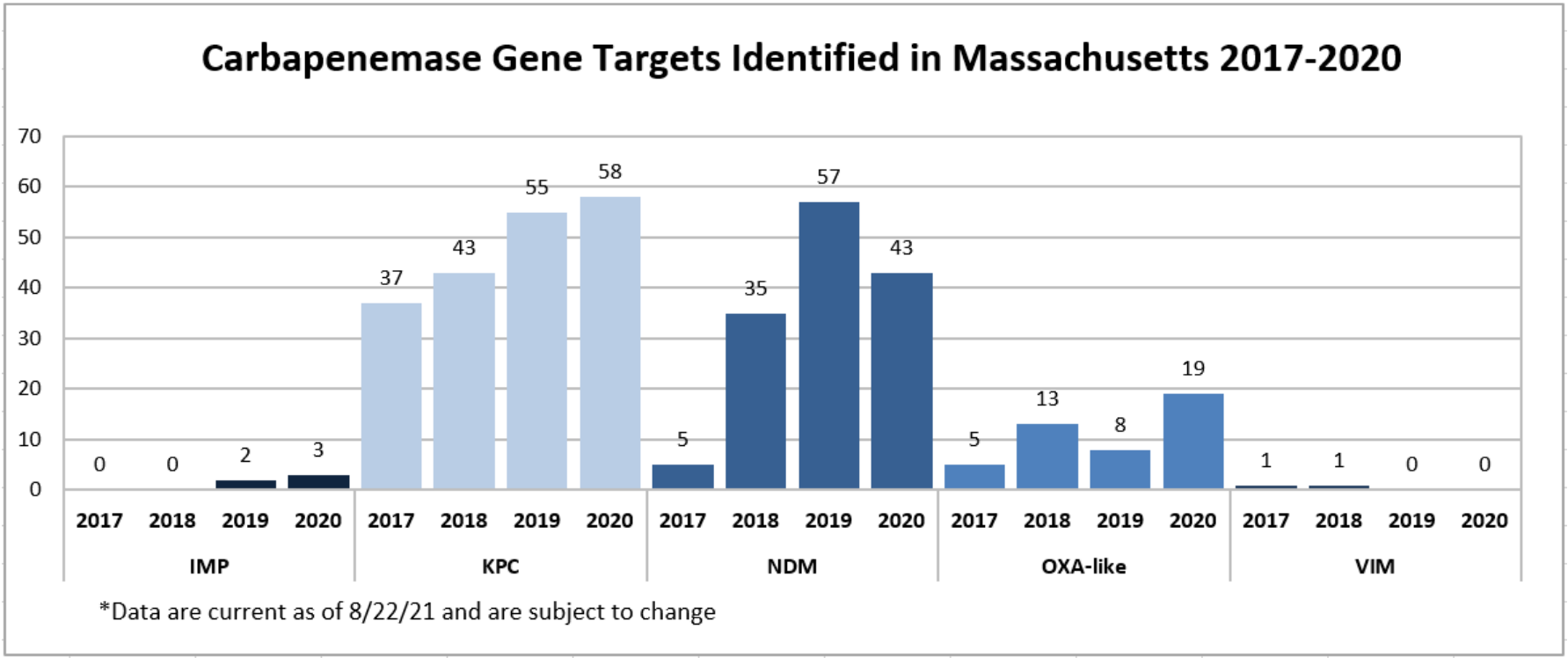
KPC-CRE found in the US spread from 2 states in 2001 to 50 states, DC, and PR by 2017



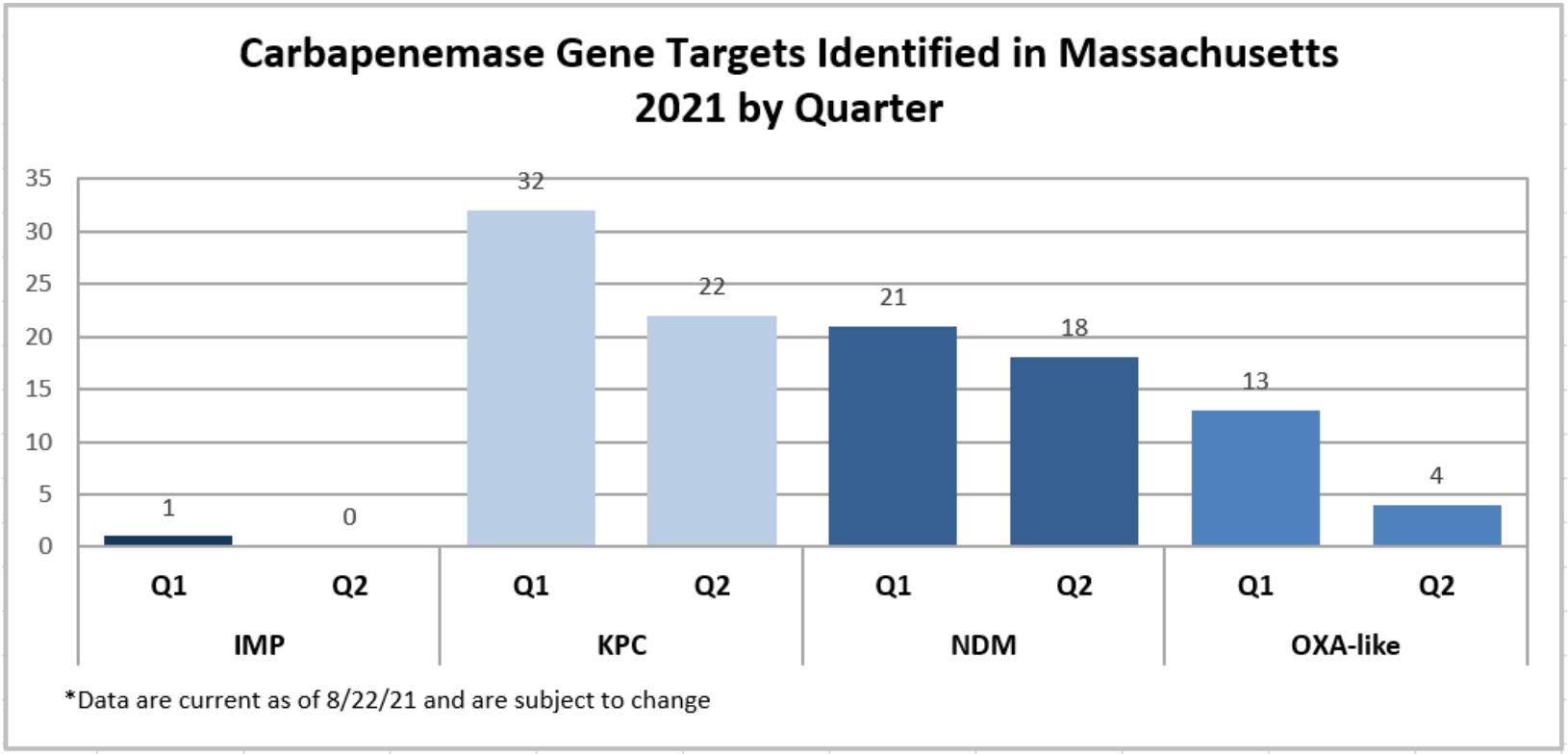

States with *Klebsiella pneumoniae* carbapenemase (KPC)-producing Carbapenem-resistant Enterobacterales (CRE) confirmed by CDC

https://www.cdc.gov/hai/organisms/cre/trackingcre.html

# CPOs in Massachusetts



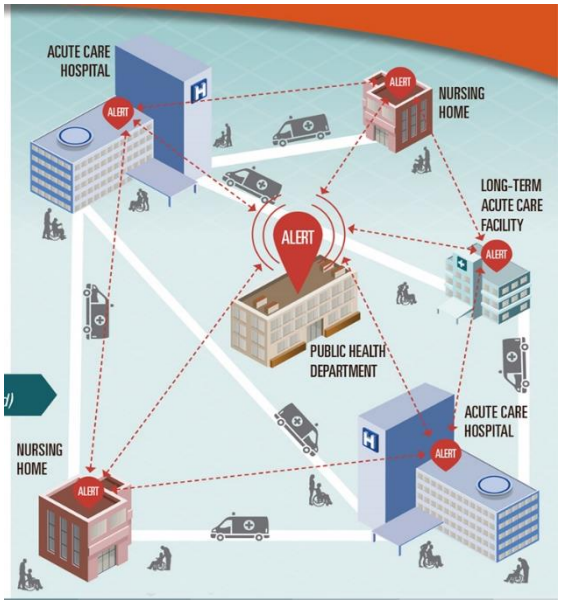
# CPOs in Massachusetts



# Healthcare Facilities and MDROs

# We are all Connected

- **Healthcare facilities exist in intricate networks of patient/resident sharing**
- **What one facility does or does not do can affect a whole region**
- **Limiting the spread of MDROs is everyone's responsibility!**



# High Acuity Post-Acute Care Facilities

- **Long-term acute care hospitals (LTACHs) and ventilator-capable skilled nursing facilities (vSNFs)**
- **Care for high acuity patients/residents for longer durations**
- **Demonstrate higher rates of MDRO transmission and outbreaks compared to other healthcare facility types**
- **Play a critical role in limiting the spread of MDROs in a region**

# Acute Care Hospitals

- **Tend to see less internal MDRO transmission but can still experience large outbreaks**
- **Play a critical role in identifying and communicating the presence of MDROs**
- **Play an important role in setting the standard of practice for infection control in a region**

# Other Healthcare Facilities and Providers

- **Lower acuity long term care facilities, outpatient clinics, home health, medical transport**

- **Less likely to experience MDRO outbreaks but are not immune to them either**

- **But can still have a negative impact on the spread of MDROs with:**
  - **Poor understanding of MDROs and how they transmit**
  - **Poor communication with other providers or their health departments**
  - **Poor infection prevention and control practices**

# The Blame Game

- **Sometimes facilities can fall into the blame game trap**

- **This can be counterproductive for:**
  - **Them**
  - **Their patients/residents, and**
  - **All other healthcare facilities in the region**

The New York Times

DEADLY GERMS, LOST CURES

# How a Chicago Woman Fell Victim to Candida Auris, a Drug-Resistant Fungus

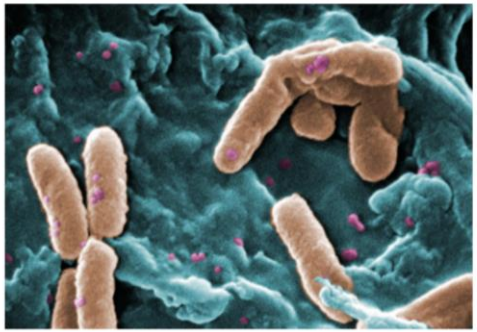
The mysterious infection has appeared at hospitals around the world, but few institutions or families have discussed their experience.



The New York Times

# Culture of Secrecy Shields Hospitals With Outbreaks of Drug-Resistant Infections

The lack of transparency puts patients at risk, some say. Institutions say disclosure could scare some people away from seeking needed medical care.



The C.D.C. made a public announcement when an antibiotic-resistant form of the rod-shaped Pseudomonas aeruginosa bacteria sickened several American travelers to Tijuana, Mexico. But it does

The New York Times

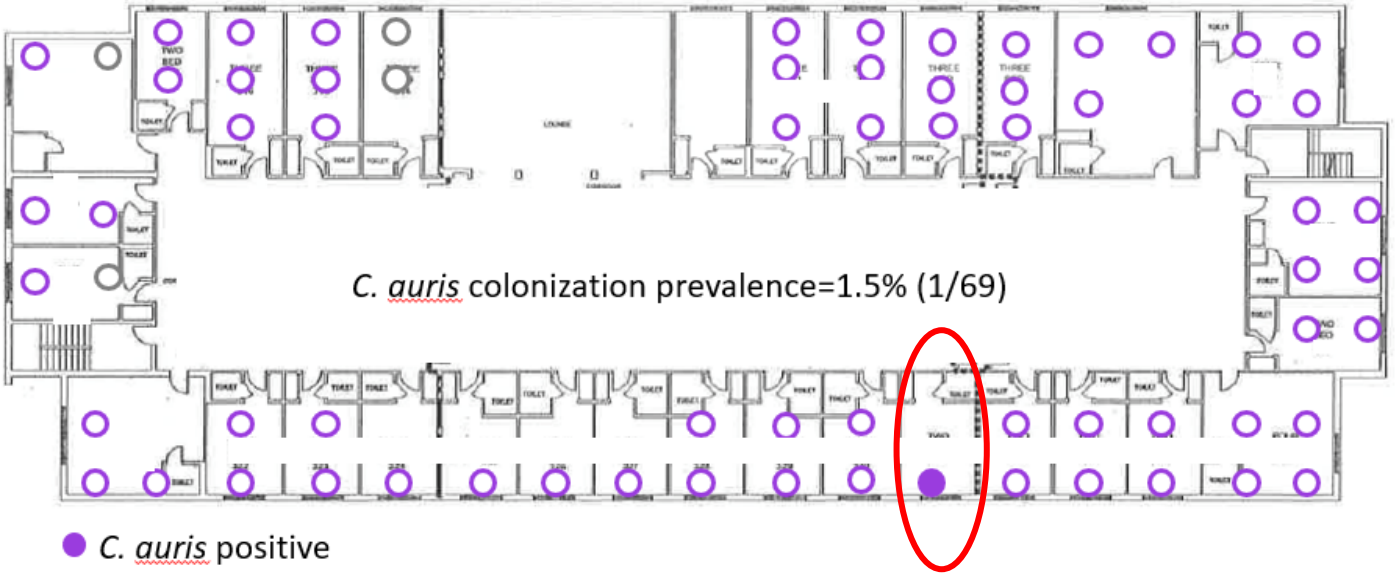
# New York Identifies Hospitals and Nursing Homes With Deadly Fungus

The policy change, for the virulent drug-resistant germ Candida auris, came as the C.D.C. reported that more people are dying of drug-resistant infections than it previously estimated.

a Davila with her husband, Anthony Hernandez, battled a C. auris infection, among other ailments,

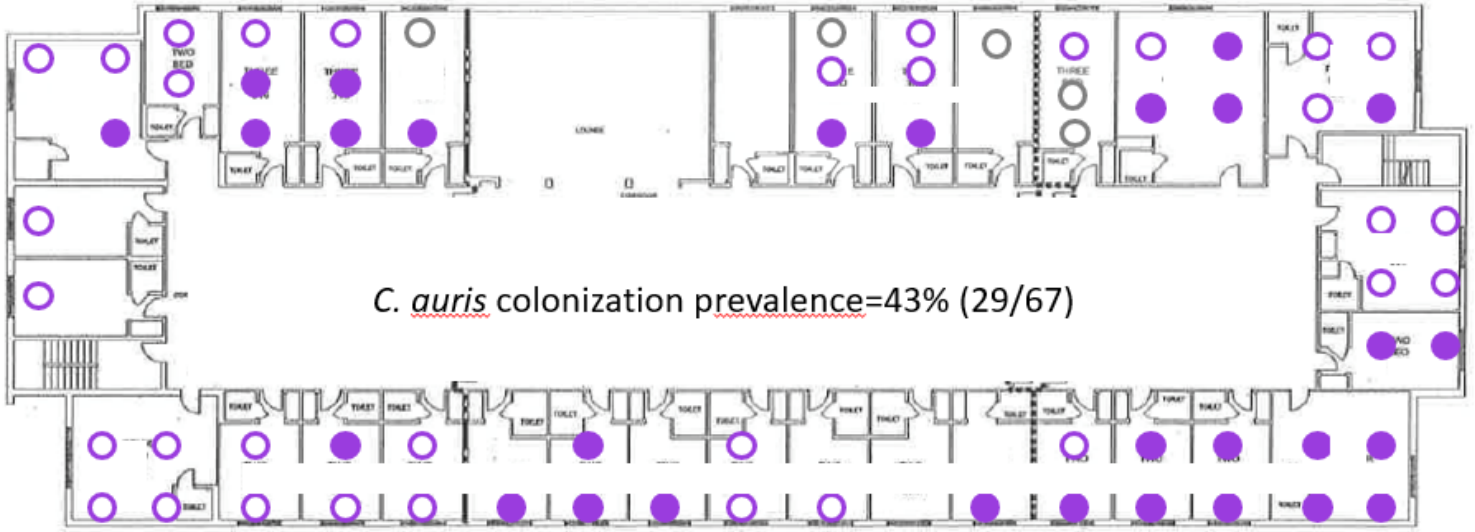
# Preventing MDRO Spread

# vSNF A Ventilator/Trach Floor
# March 2017 *C. auris* PPS Results




vSNF = skilled nursing facility with ventilator units; PPS = point-prevalence survey Slide courtesy of Chicago Department of Public Health.

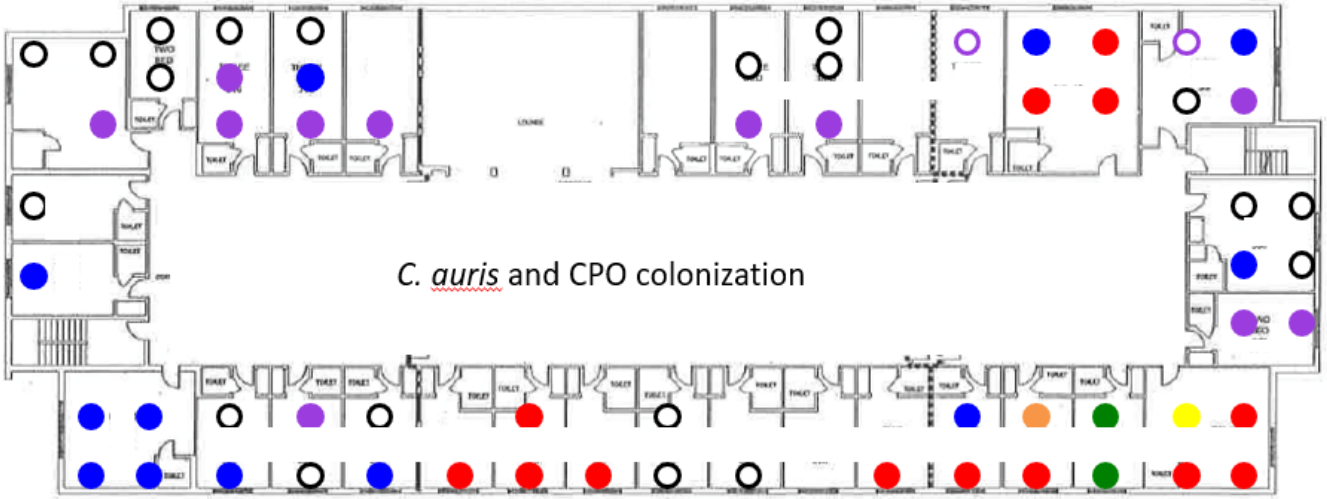
# vSNF A Ventilator/Trach Floor
# January 2018 *C. auris* PPS Results




- *C. auris* positive
- Screened negative for *C. auris*
- Not tested for C. auris (refused or not in room)

vSNF = skilled nursing facility with ventilator units; PPS = point-prevalence survey Slide courtesy of Chicago Department of Public Health.

# vSNF A Ventilator/Trach Floor
# January 2018 CPO and *C. auris* PPS Results




- *C. auris*
- *C. auris* and KPC
- KPC or CRE with unknown mechanism of resistance
- *C . auris*, KPC, and NDM
- *C. auris*, VIM-CRPA, and KPC
- *C. auris* and KPC-CRPA
- Screened negative for *C. auris*, but not tested for CRE
- Screened negative for CRE and *C. auris*

vSNF = skilled nursing facility with ventilator units
CPO = carbapenemase-producing organism; PPS = point-prevalence survey

Slide courtesy of Chicago Department of Public Health.

# But this is not just a one facility problem….


https://www.dph.illinois.gov/topics-services/diseases-and-conditions/infectious-diseases/candida-auris

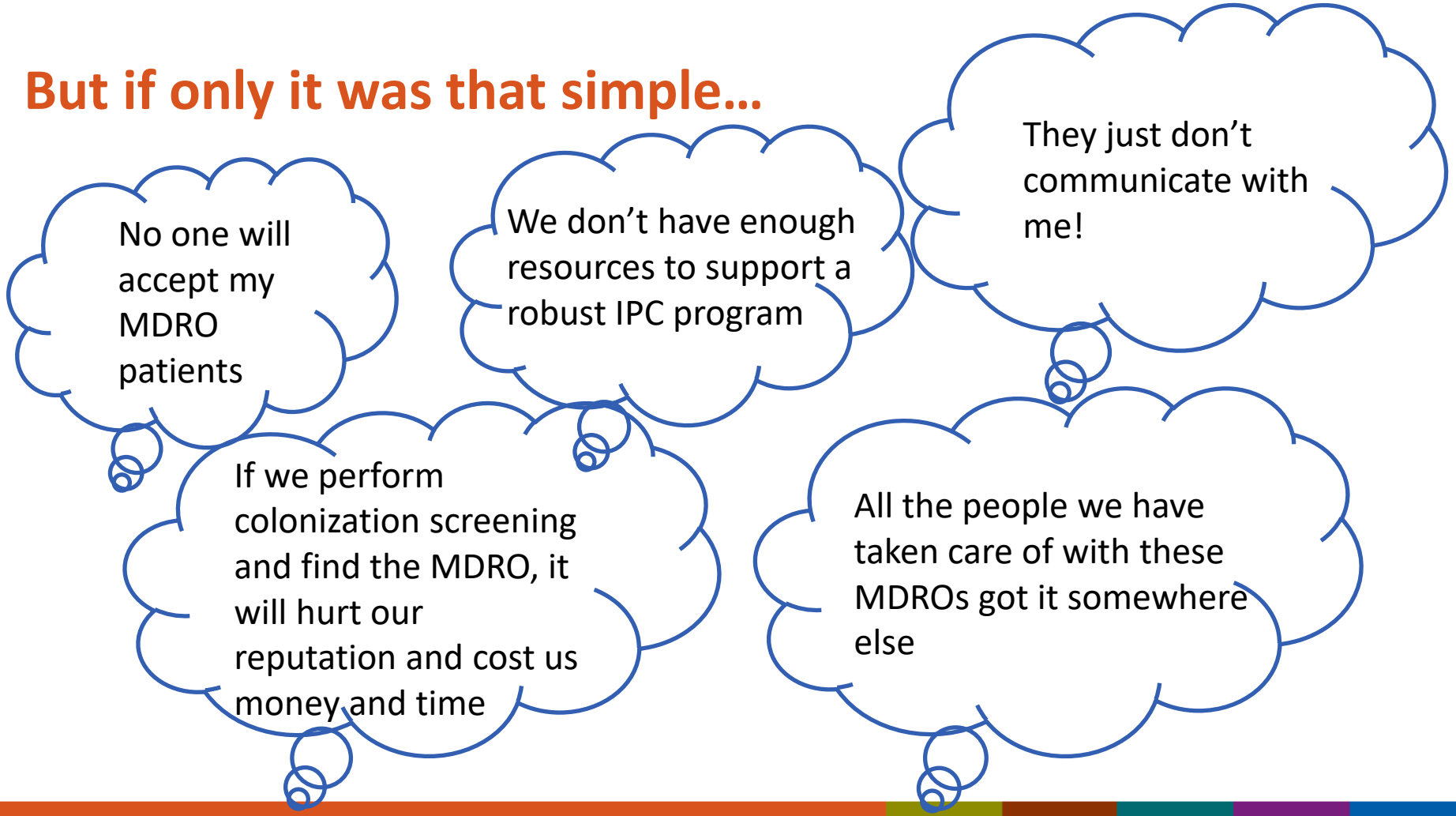
# Battling MDRO Spread in 3 Simple Steps

1. **Identify as many people as possible who are infected or colonized with MDROs in a region**

2. **Have good baseline infection control practices and use recommended infection control practices for people with MDROs in healthcare facilities**

3. **Communicate at transfer to other facilities which people have MDRO(s)**

# But if only it was that simple…



# So it can be complicated…

**But it’s easier if we all work towards a common goal of implementing the 3 steps together**

# Terminology

- **All Facilities:** Activities that apply to all facilities listening

- **Some Facilities:** Activities that will apply to only some of the facilities listening; your health departments will let you know if this type of activity may benefit you.


We will share a brief story about how other facilities have successfully implemented some of these activities

# Step 1: Identify those with MDROs

# Identify Individuals with MDROs from Clinical Cultures

## All Facilities:

- **Understand what your laboratory's ability is to detect these organisms**
  - **Future webinar topic: *C. auris* laboratory identification**
- **Know and follow reporting rules and isolate submission (even if you're using a contracted laboratory)**


## Some Facilities:

- **Consider using enhanced detection methods**
  - **Identify all *Candida* species isolated from all laboratory culture**

# Identify Colonized Individuals

- **Colonization screening: Using a swab to sample different body sites to determine if that person has the MDRO of interest (i.e., colonized but not infected) (future webinar topic)**
  - **Point prevalence survey**
  - **Admission screening**
  - **Discharge screening**

- **Point prevalence survey (PPS): When colonization screening is performed on a group of people to determine how many of them are colonized**

# Identify Colonized Individuals

## All Facilities:

- **Response PPS: A PPS conducted in response to the identification of someone with a MDRO**
  - **Detect additional individuals for whom IPC actions are required**
  - **Can suggest if transmission is occurring within a facility**

# Identify Colonized Individuals


## Some Facilities:

- **Proactive PPS: A PPS conducted at a facility regardless and even prior to the identification of someone with a MDRO**
  - **Best utilized in certain high-risk healthcare facilities**
  - **Can allow for earlier interventions to reduce the risk of more widespread transmission within and between facilities**
  - **Should look for multiple types of MDROs**

**Versus**

# Identify Colonized Individuals

## Some Facilities:

- **Admission screening: Performing colonization screening for some individuals upon admission to a facility**

- **Discharge screening: Performing colonization screening prior to someone being discharged**

# Step 2: Utilize Recommended IPC Practices

# Utilize Recommended IPC Practices

## All Facilities:

**Three core strategies to limit the spread of MDROs (future webinar)**

1. **Hand hygiene**
2. **Contact Precautions for all facilities or Enhanced Barrier Precautions in nursing homes (future webinar)**
3. **Environmental cleaning and disinfection**
   - **Sink hygiene**

# Hand Hygiene

- **Alcohol-based hand sanitizers are the preferred method of hand hygiene in most clinical situations**

- **Hand hygiene observations and feedback are essential to improving adherence**

# Contact Precautions

- **Used by ACH and LTACHs for patients with MDROs**

- **Will also apply to certain nursing homes residents**
  - ***C. difficile,* scabies, norovirus**
  - **However, Enhanced Barrier Precautions (EBP) can often apply to residents with certain MDROs**

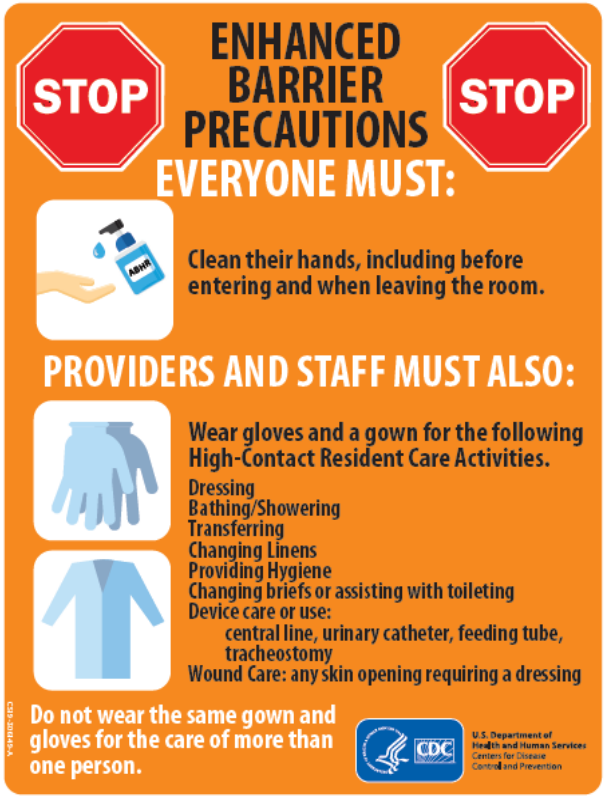

- Private rooms are preferred (<u>but not required</u>) for patients/residents requiring Contact Precautions

- If not possible,
  - Prioritize private rooms for individuals with uncontainable secretions or excretions
  - Cohort individuals with like organisms (future webinar)

- Patients should be restricted to their room except for medically necessary movement

# Enhanced Barrier Precautions (EBP) (future webinar)

- **Utilized in nursing homes only**
- Use of gown and gloves:
  - For high touch activities only
  - For residents with known MDROs (CRE, CRAB, CRPA, *C. auris*)
  - Or those who may be at increased risk (indwelling devices, wounds) if currently residing on the same unit as someone with a MDRO
- Please contact your health department before implementing for additional tips



# Standard Precautions

**Used in all settings and with all patients**

- **Gloves**
  - **Use when touching blood, body fluids, secretions, excretions, contaminated items, and touching mucous membranes and non-intact skin**
- **Gowns**
  - **Use during any procedure and patient care activity when contact anticipated with blood/body fluids, secretions, or excretions**
- **Mask, goggles, or face shield**
  - **Use during any activity likely to generate splashes or sprays with blood, body fluids, secretions, or excretions**

# Environmental Cleaning and Disinfection

- Effective cleaning and disinfection of healthcare facility surfaces and equipment is critical
- Focus on, at least, daily cleaning and disinfection of high touch surfaces
- Clean and disinfect non-disposable, non-dedicated equipment after each use:
  - Vital sign machines
  - Glucometers
  - Portable radiology equipment

# Environmental Cleaning and Disinfection

- Ensure you are using the correct cleaning/disinfection product for the correct contact time
  - Contact time: Is the amount of time a disinfectant must remain wet on a surface to be effective
  - All staff with cleaning duties should know this time for each product they use

# *C. auris* Specific Cleaning and Disinfection Products

- **First choice:**
  - **List P: Antimicrobial Products Registered with EPA for Claims Against *Candida auris***
    - https://www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris
- **Second choice:**
  - **List K: EPA's Registered Antimicrobial Products Effective Against *C. diff* Spores**
    - https://www.epa.gov/pesticide-registration/list-k-epas-registered-antimicrobial-products-effective-against-clostridium

# Strongly consider using disinfectants effective against *C. auris*

# Sink Hygiene

- **Sinks and drains in healthcare facilities can become contaminated with MDROs**

- **All facilities should limit patient and patient care equipment exposure to the splash zone of sinks and drains (3 feet on all sides)**

- **All facilities should create a water management program to limit *Legionella* and other opportunistic pathogens of premise plumbing from growing and spreading in their facilities**

- **More information: https://www.cdc.gov/hai/prevent/environment/water.html**

# Utilize Recommended IPC Practices

## All Facilities:

- Return to pre-COVID IPC practices
  - Changing gloves and gowns after each patient/resident encounter
    - Gowns and gloves should be removed prior to room exit
  - Placing environmental disinfectant wipes at points of use
  - Use disposable or dedicated patient care equipment for patients on Contact Precautions
  - Implement or return to IPC observations (auditing) and feedback
  - Staff reeducation

# Step 3: Communicate

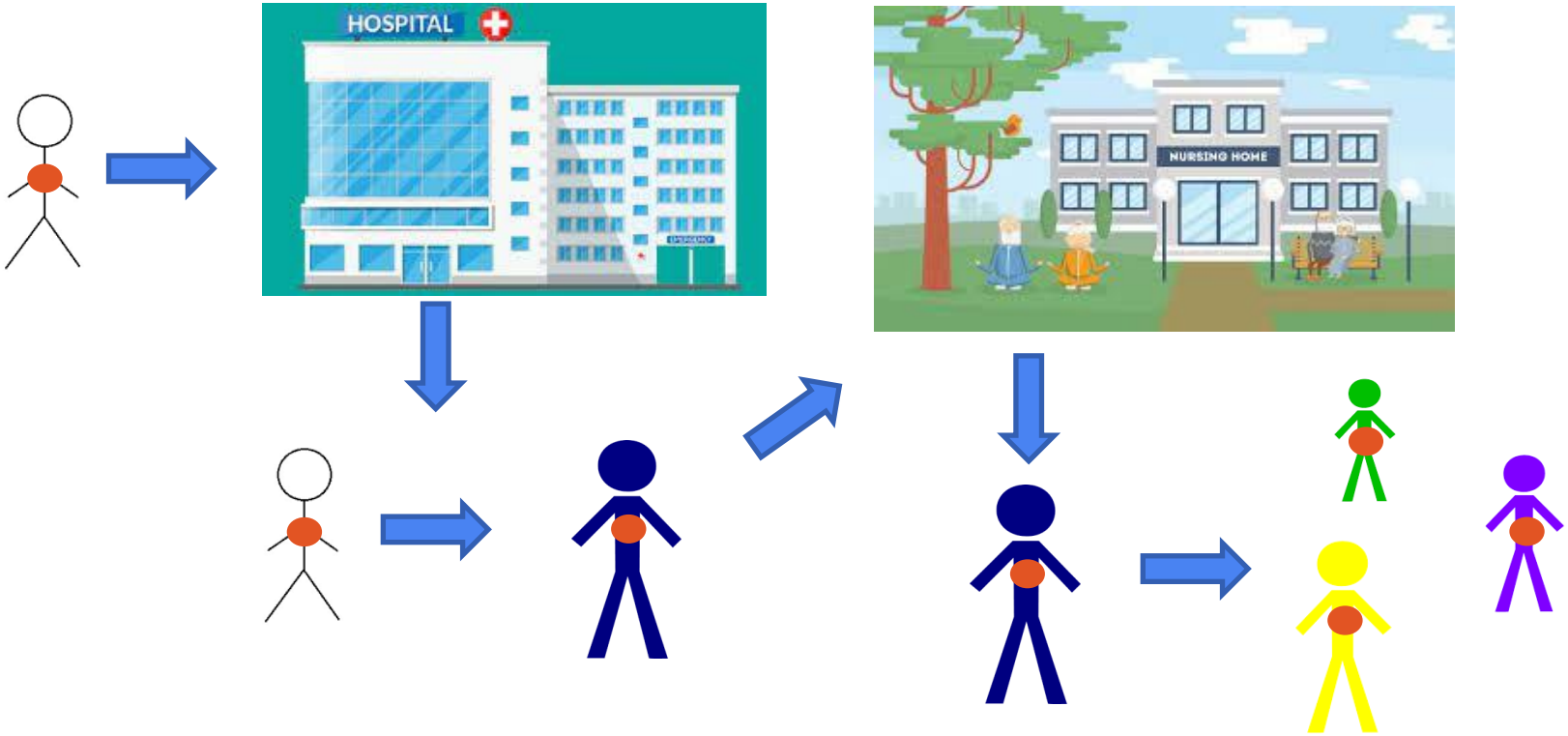
# Life is Better with Effective Communication

- **To ensure safe patient/resident care, we need effective communication at any transition**
  - **Between units**
  - **Between facilities (interfacility)**
  - **This includes someone's MDRO status pending laboratory screening tests**
- **Give what you wish to receive**

# But Communication is often a Challenge

- **Don’t know  when or what to communicate**
- **Don’t know how to best communicate**
- **Don’t know who to communicate with**
- **Don’t have time to effectively communicate**

# But by Not Effectively Communicating MDRO Status



# We Need You (All Facilities)

- **To assess how you communicate an individual's MDRO status within your facility and with other facilities/providers (future webinar)**
  - **How is this done? Verbally? On Paper?**
  - **What is communicated?**
  - **Who is responsible for the communication?**
    - **How do you ensure the receiver and communicator of the information understands?**
    - **Who do you receive and transfer to the most?**

# Next Steps for All Facilities

# Be Sure to Report MDROs to MASPHL

## MDPH CRE Reporting Requirements

Report any of the following *Enterobacteriaceae* (isolated from any source):

•With resistance to **one or more** of the following carbapenems:

•Imipenem (MIC >=4 µg/ml)

•Doripenem (MIC >=4 µg/ml)

•Meropenem (MIC >=4 µg/ml)

•Ertapenem (MIC >=2µg/ml)

•OR that demonstrate carbapenemase production (CP-CRE).

Specifically, an isolate that is either:

•Positive for carbapenemase production via phenotypic test (i.e., CarbaNP, mCIM)

OR

•Positive for a carbapenemase resistance mechanism (KPC, NDM, OXA, VIM, or IMP) via molecular test (i.e., PCR)

Ideally, reporting should be done automatically through electronic laboratory reporting to MDPH. Questions about reporting should be directed to 617-983-6801.

| |
|---|
| *Enterobacter cloacae* |
| *Escherichia coli* |
| *Klebsiella aerogenes*** |
| *Klebsiella oxytoca* |
| *Klebsiella pneumoniae* |

# Be Sure to Submit Isolates to MASPHL

- All isolates with the following profile are to be sent to the MA SPHL:
- ***Enterobacter cloacae; Escherichia coli; Klebsiella aerogenes; Klebsiella oxytoca*** *and* ***Klebsiella pneumoniae*** (isolated from any source) with resistance to **one or more** of the following carbapenems**:** imipenem; meropenem; and/or doripenem (at MIC >=4 mcg/ml). *Note: ertapenem resistance alone is not a criterion for isolate submission.*

- OR **any organism** demonstrating carbapenemase production, by phenotypic testing using the mCIM-Modified Carbapenem Inactivation Method; or Carba-NP; or by mechanism-specific testing by PCR detection of the following gene targets: KPC; NDM; OXA; VIM; and IMP.

- As of January 1, 2020, the MA SPHL also requests submission of:

- **All Carbapenem-resistant *Acinetobacter baumannii*** (CRAB) isolates

- **All Carbapenem-resistant *Pseudomonas aeruginosa*** (CRPA) isolates that are also non-susceptible to cefepime and/or ceftazidime

- For ***Candida auris*****,** contact the MDPH Division of Epidemiology at 617-683-6800 to facilitate confirmatory testing at MDPH's regional public health laboratory.

# IPC Practices

- **Identify where gaps in your IPC practices exist and work on them before you have a problem**
  - **Consider cleaning and disinfecting products with *C. auris* activity**
  - **MDPH can help with IPC practice assessments**

- **Return to pre-COVID-19 IPC practices when the situation and resources allow**

# Communication

- **Assess your current communication practices**
- **What can be done to improve them as individual facilities?**
- **What can be done to improve them as a region of facilities?**
- **Please consider attending our future webinar on this topic to provide us with your thoughts and suggestions about improving communication**

# Continue to Educate Yourself and Your Staff

- **Please pass on what you have learned to your staff, additional links at the end of this slide deck**

- **Contact your health department if you are interested in more individualized trainings**

- **Attend future webinars**

# Future Webinar Topics

- Colonization Screening 101 (next webinar topic)
- *C. auris* laboratory identification
- ABCs of MDROs (with a focus on CPOs)
- MDROs and IPC Basics
- Enhanced Barrier Precautions (nursing homes)
- Spotlight on Communication
- How do we fix our communication problems?
- ACH MDRO Challenges Feedback Sessions
- LTCFs MDRO Challenges Feedback Sessions

# Educational Links

https://www.cdc.gov/hai/organisms/cre/cre-clinicians.html

https://www.cdc.gov/hai/organisms/cre/cre-facilities.html

https://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf

https://www.cdc.gov/hai/containment/guidelines.html

https://www.cdc.gov/fungal/candida-auris/health-professionals.html

https://www.cdc.gov/fungal/candida-auris/c-auris-infection-control.html

# IPC Educational Links

https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html

https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html

https://www.cdc.gov/handhygiene/index.html

https://www.who.int/teams/integrated-health-services/infection-prevention-control/hand-hygiene/tools-and-resources

https://www.cdc.gov/infectioncontrol/projectfirstline/index.html

# Contact

- **MA 24/7 Epidemiology Line with questions: 617-983-6800**

# Thank you for attending!

# Questions?

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.