Candida auris

Candida auris epidemiology

What is *C. auris*?

- *C. auris* is an emerging and often multidrug-resistant fungus
- First discovered in 2009
- Made nationally notifiable in 2018
- Added to Texas Notifiable Conditions List in 2021

1. Candida auris (C. auris) is a type of yeast/fungus that can cause severe illness.
2. • It is often resistant to antifungal treatments.
3. • It spreads very easily in healthcare settings through direct contact.
4. • It is hardy in the environment and can survive for weeks on surfaces
5. • Patients may be colonized with C. auris and asymptomatic.

First reported in Japan and now, worldwide

Japan

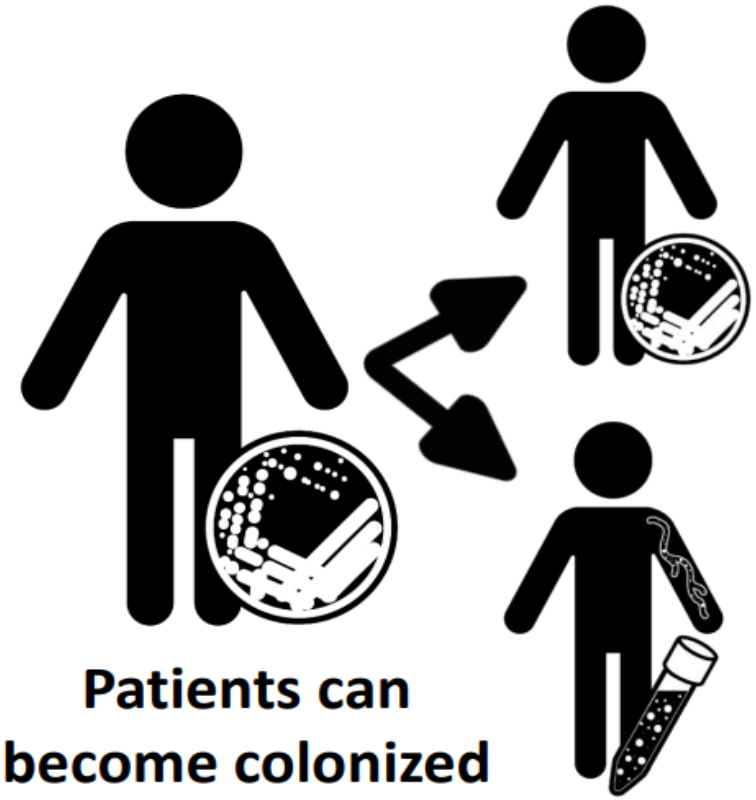
2009

United States

2016

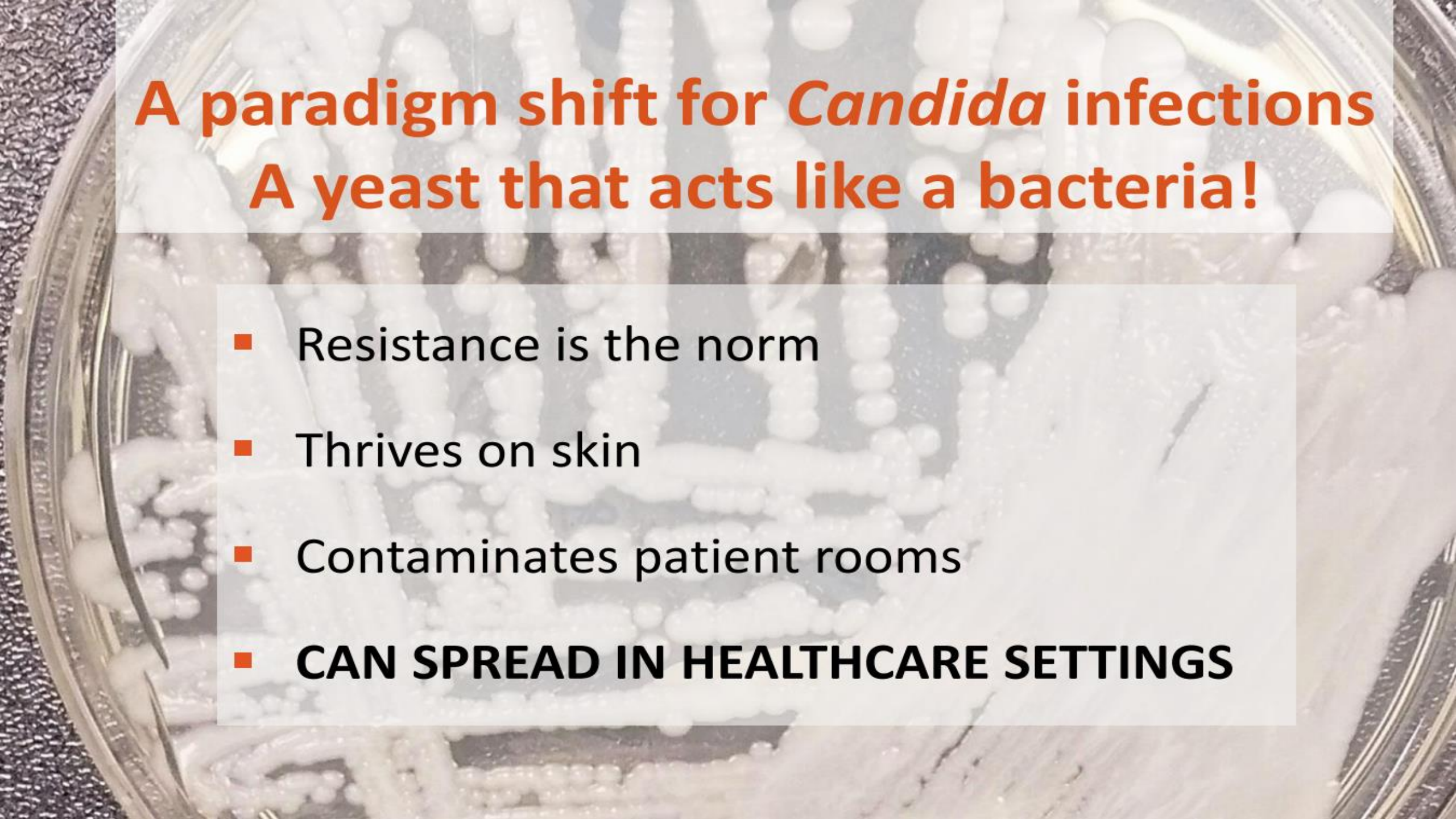
Why are we concerned about *Candida auris?*

Highly drug-resistant



Patients can become colonized and develop invasive infections

Spreads in healthcare settings



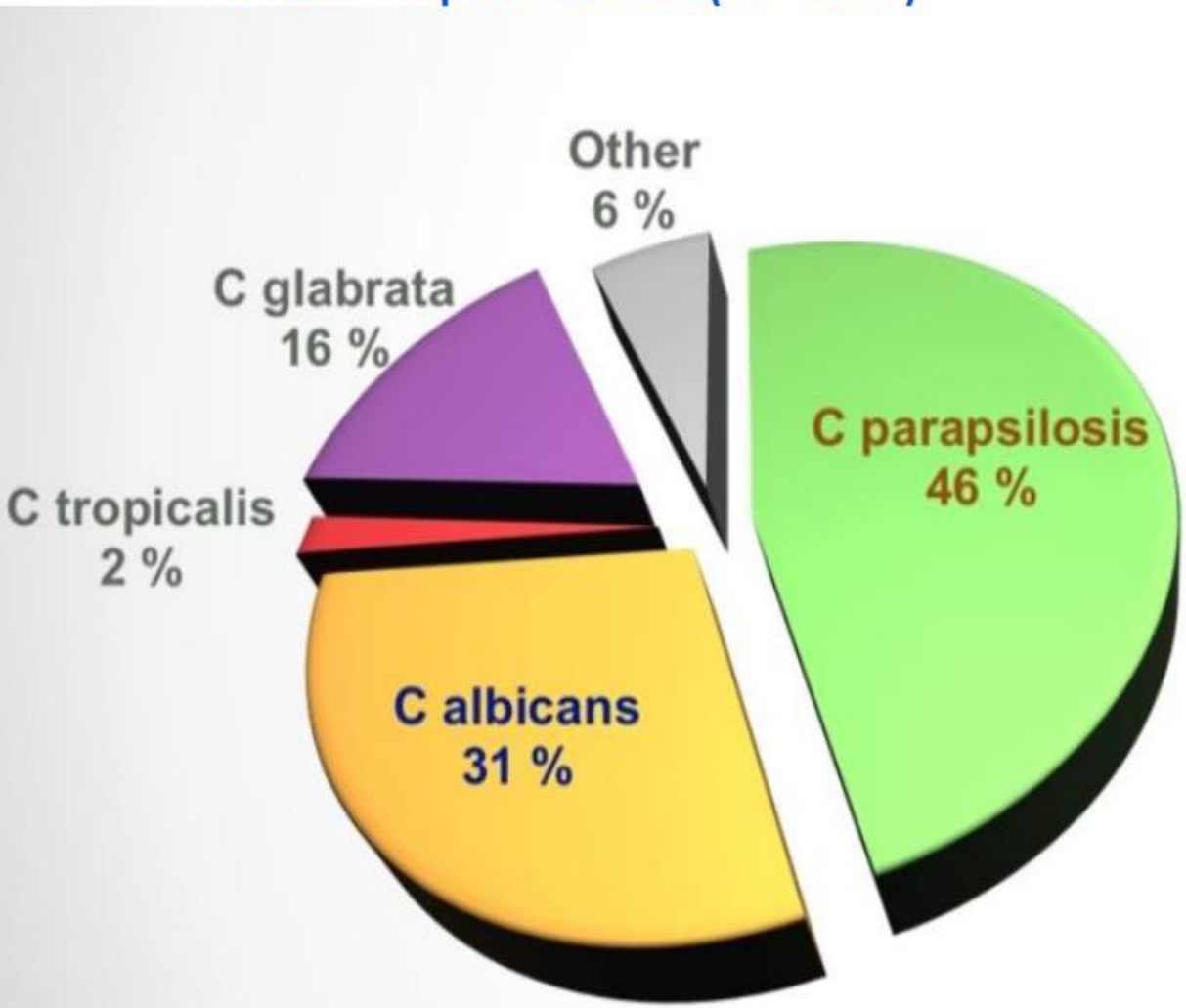
A paradigm shift for *Candida* infections
A yeast that acts like a bacteria!

- Resistance is the norm
- Thrives on skin
- Contaminates patient rooms
- **CAN SPREAD IN HEALTHCARE SETTINGS**

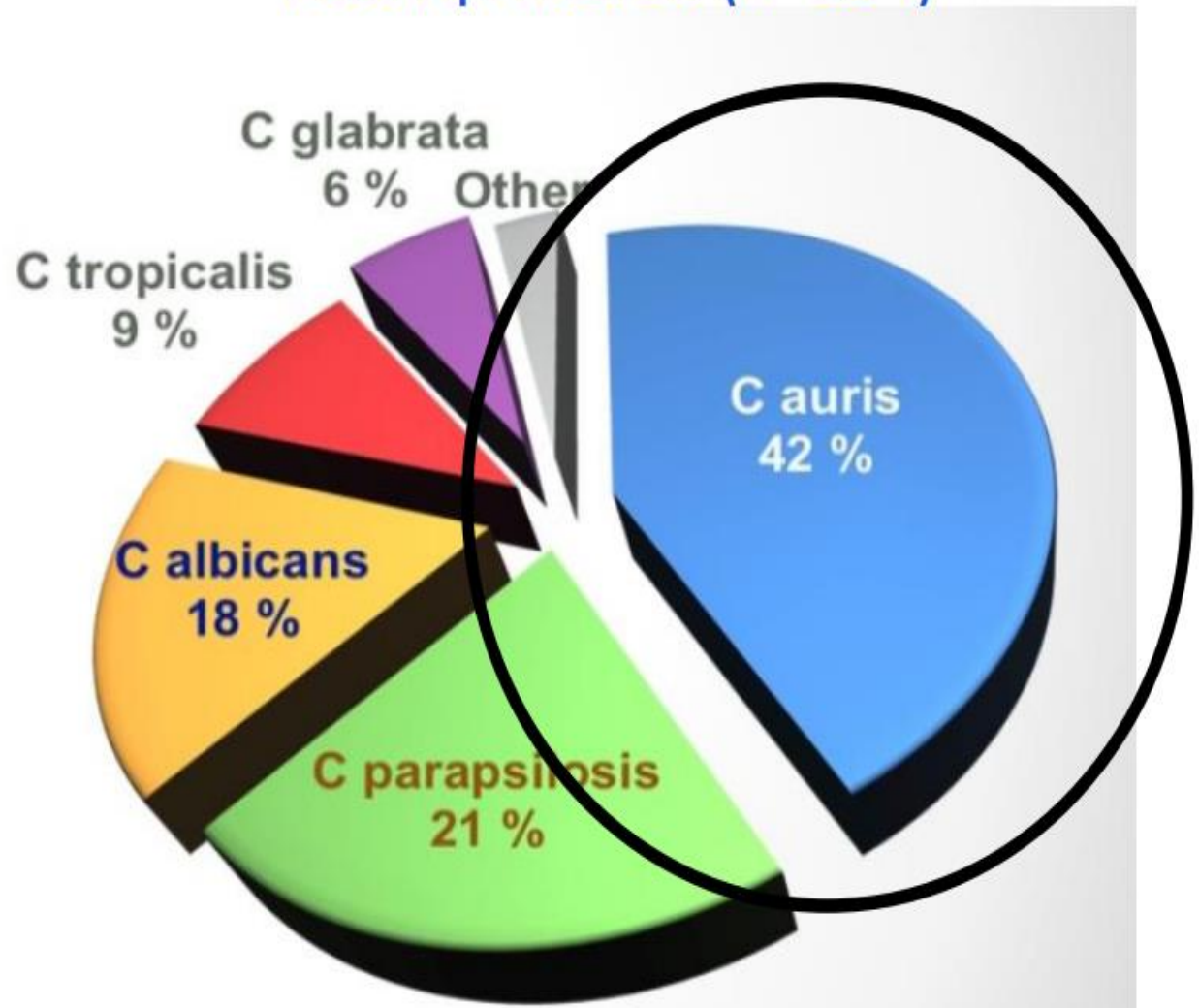
C. auris cases have been reported in >30 countries

Spain Outbreak (2016-2017)

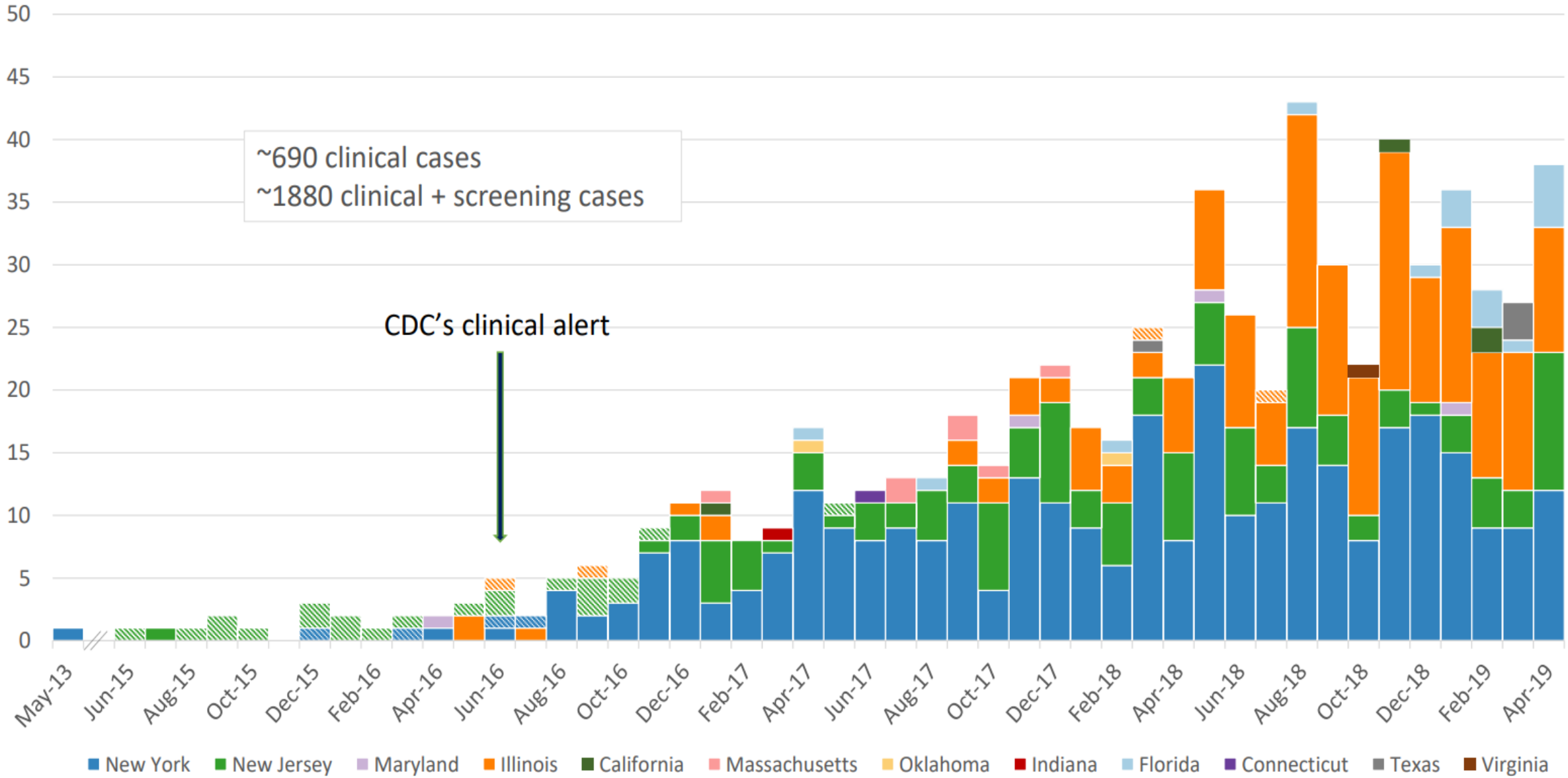
Pre – April 2016 (n=154)



Post April 2016 (n=154)



C. auris clinical cases reported by state of collection— United States, 2013–April 2019

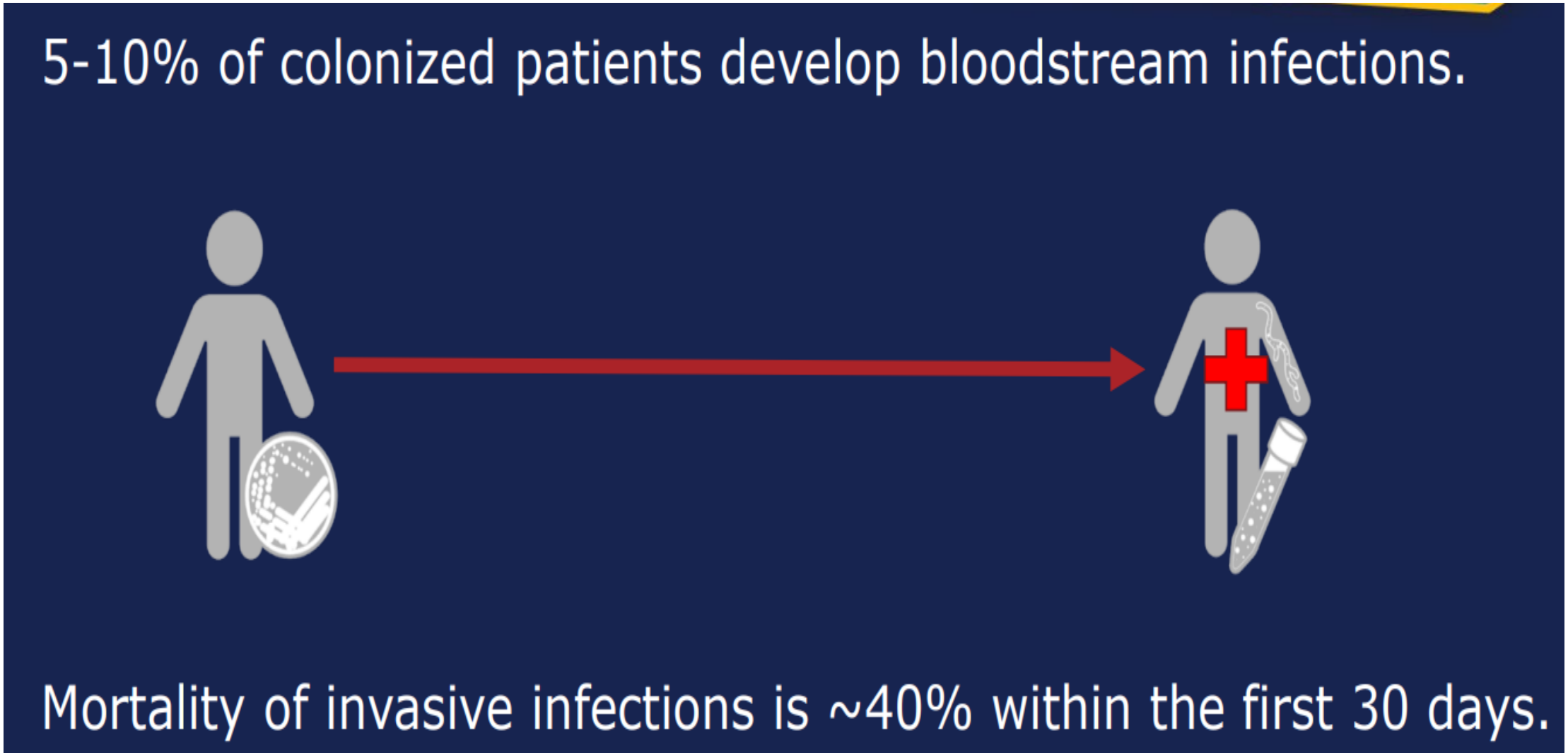


Why is C. auris a problem?

Causes dangerous infections

- Can cause bloodstream infections and death, particularly hospital and nursing home patients with serious medical problems
- Resistant to medicines
- Antifungal medicines commonly used to treat Candida infections often do not work for C. auris
- Some C. auris infections resistant to all three types of antifungal medicines
- Referred to as Multi-Drug Resistant Organisms (MDROs)

C. auris Morbidity and Mortality



Why is C. auris a problem?

1. Difficult to identify
   - Often misidentified as other types of fungi unless specialized laboratory technology used
   - Misidentification might lead to patient getting wrong treatment

2. Easily spread in hospitals and nursing homes
   - Caused outbreaks in healthcare facilities and can spread through contact with affected patients and contaminated surfaces or equipment

3. Persists on surfaces
   - Good hand hygiene and cleaning in healthcare facilities is important because C. auris can live on surfaces for several weeks

Risk factors for C. auris

1. Tracheostomies
2. Ventilator-dependent
3. Colonized with other multidrugresistant organisms
4. Recently received antibiotics and antifungals
5. Immunosuppressive conditions
6. Medical device use – Tracheostomy/Ventilator
7. Frequent or prolonged stays in healthcare facilities

Not a threat to general public or healthy individuals

Infection vs. Colonization

Infection

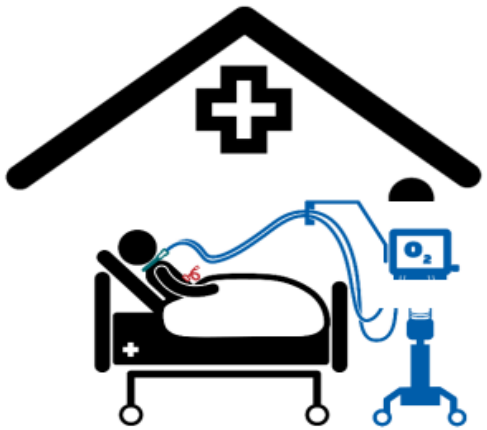
- Presence of signs and symptoms
- Bloodstream, wound, and ear infections have been documented
  - Lung and bladder infections?
- Treatment is usually necessary
- Requires use of Transmission-based Precautions

Colonization

- No signs or symptoms detected or reported
- May occur on skin, nares, oropharynx, rectum, and other body sites
- No treatment necessary
- Requires use of Transmission-based Precautions

Stays in certain types of post-acute care facilities is a major risk factor: vSNFs and LTACHs

C. auris **prevalence in nursing home units with ventilator beds**

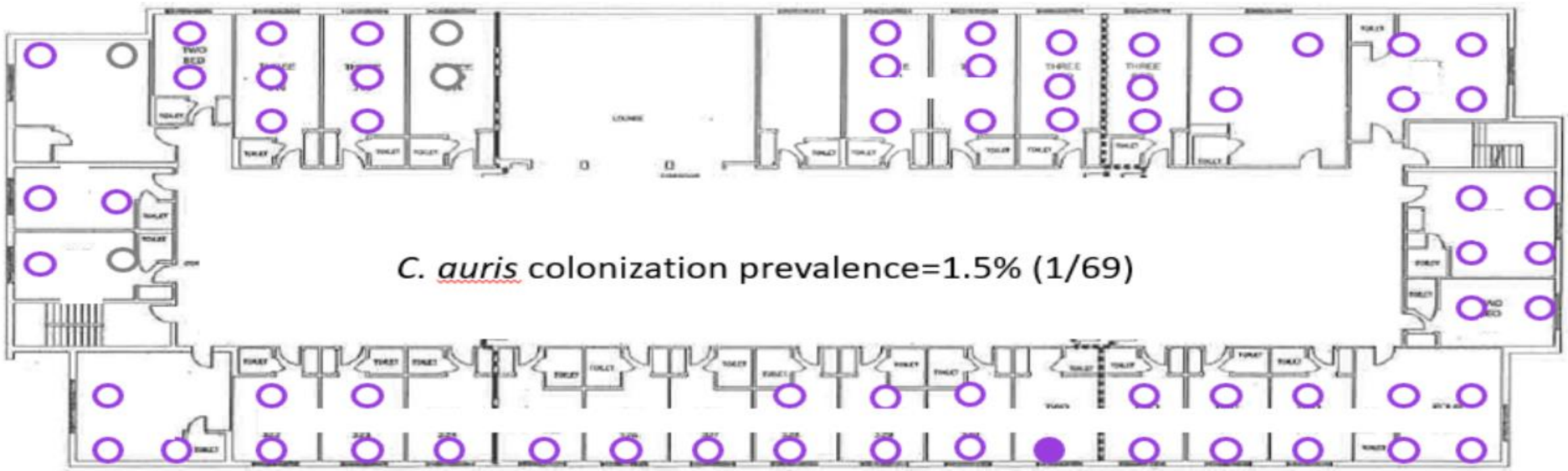


7.7%

C. auris **prevalence in regular nursing homes**

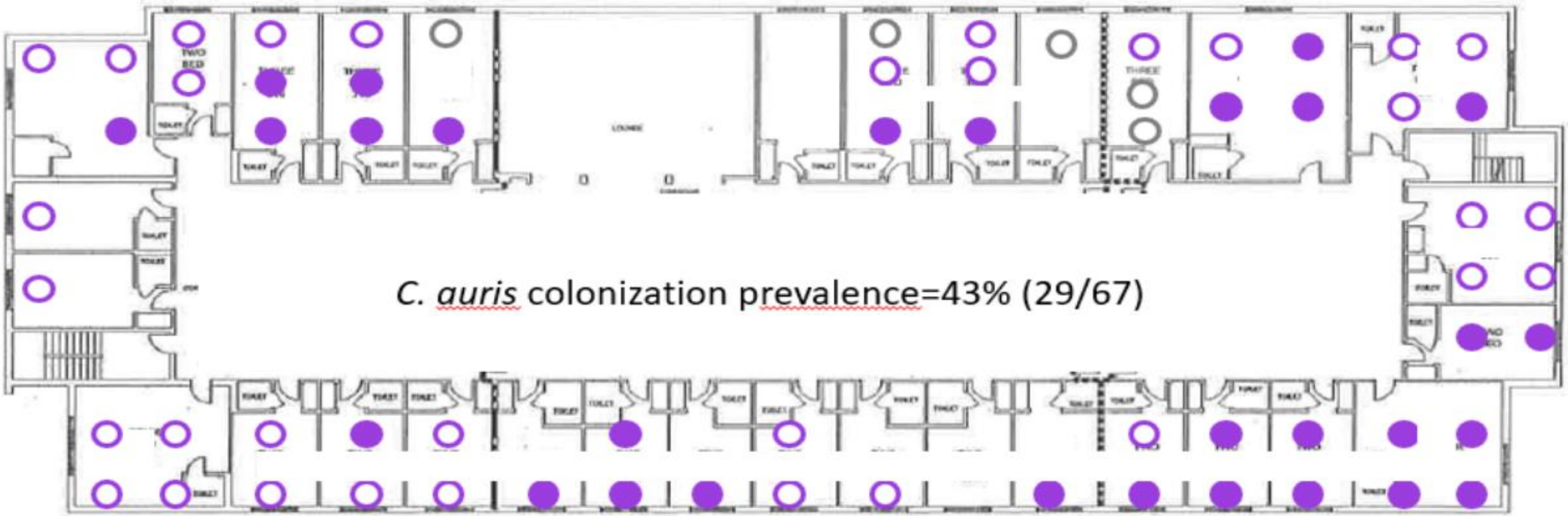
0.7%

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



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

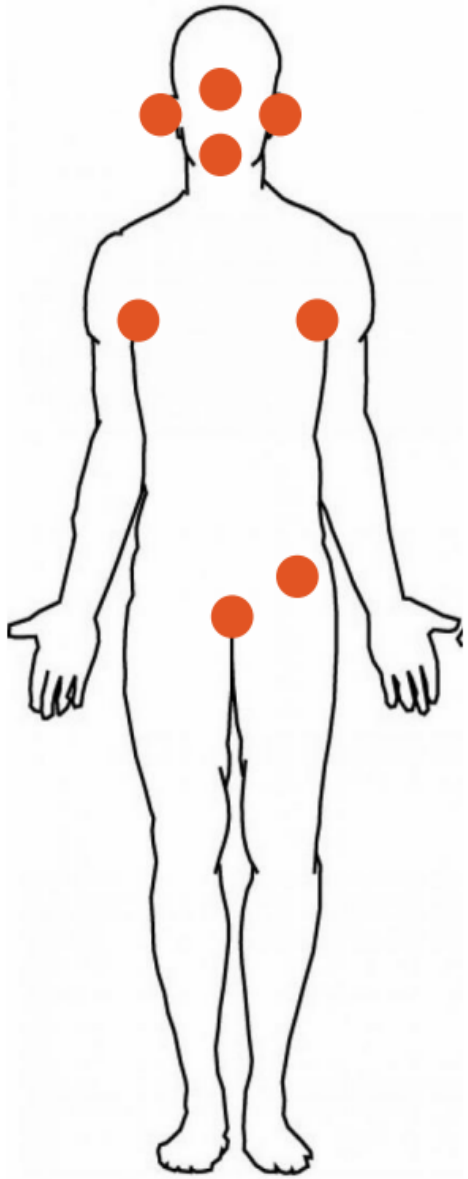
vSNF A Ventilator/Trach Floor
January 2018 *C. auris* PPS Results



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

Patients are often colonized indefinitely

- Primarily on skin, but nares and other body sites also can become colonized
- Persistent, for many months
- No currently known decolonization strategies

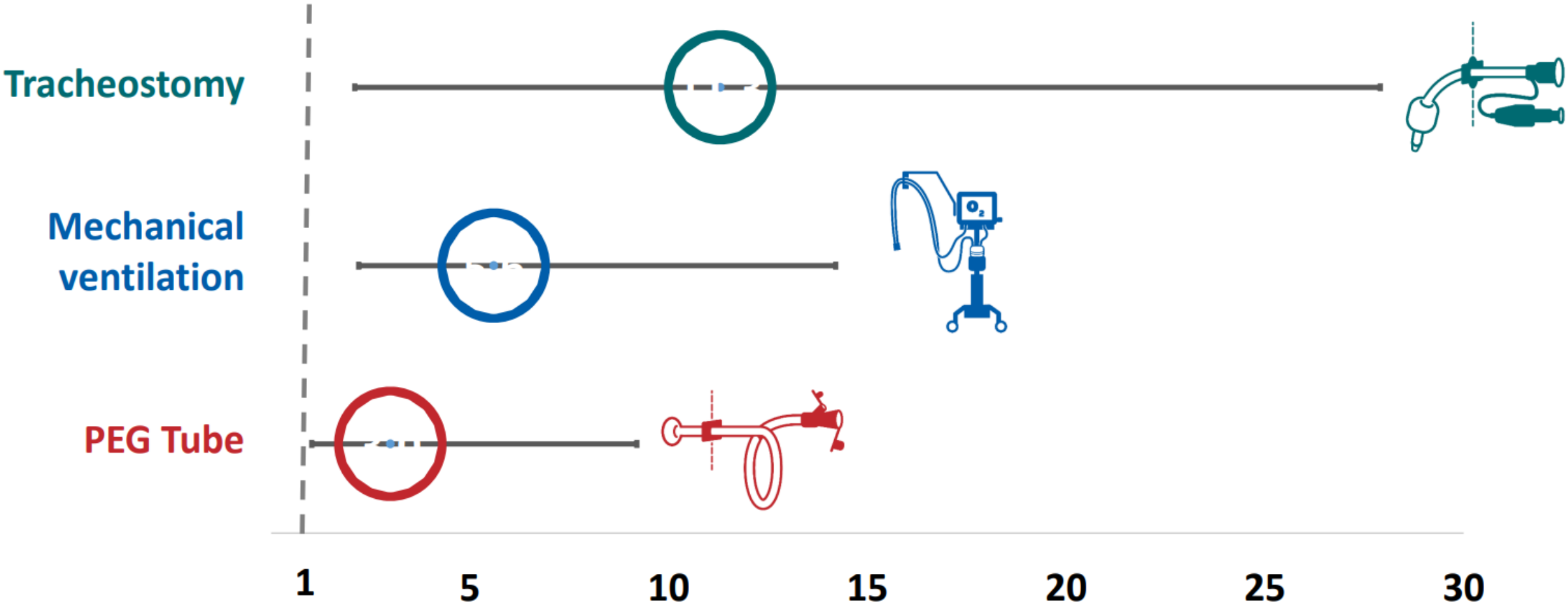


- Leads to:
  - Invasive infection
  - Transmission to others

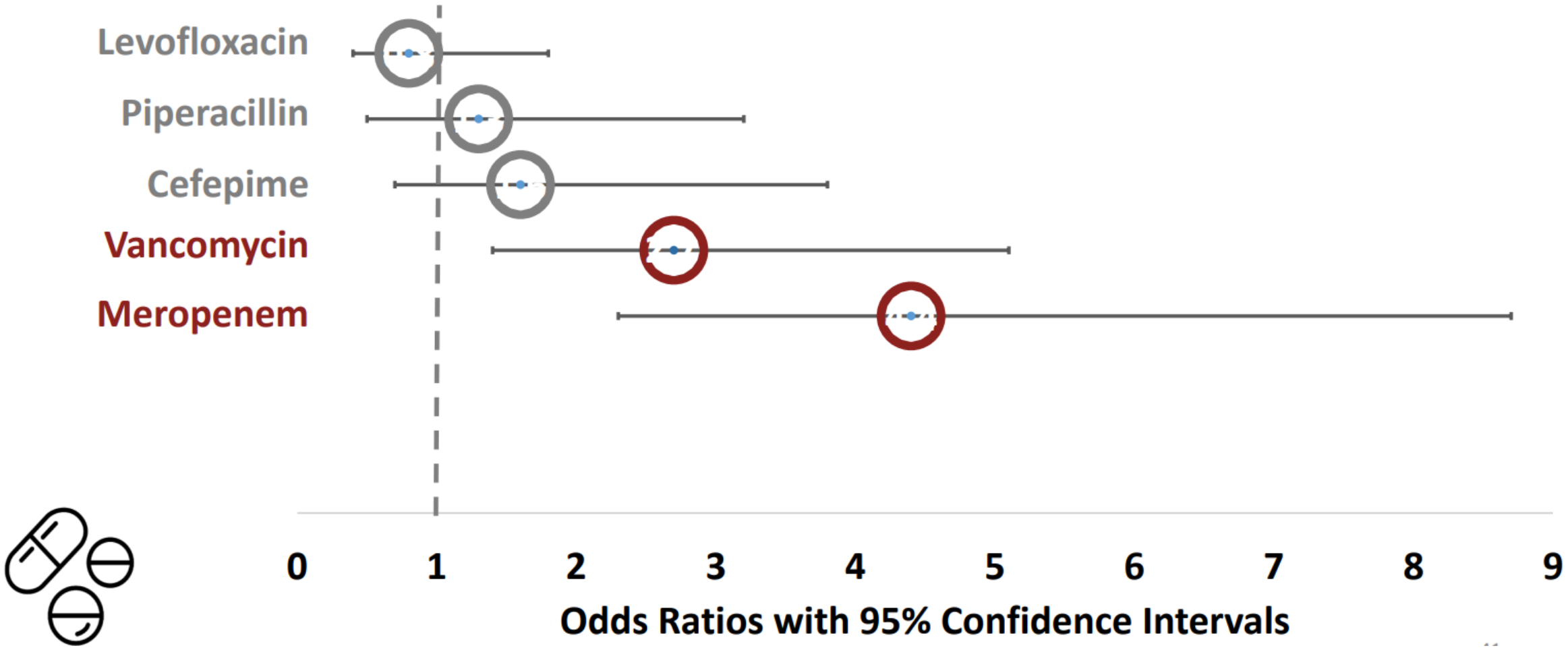
Colonization

- May be persistent and/or intermittent
- Usually lasts months to years and may be indefinite
- No well-established decolonization strategies
- Clearance testing not recommended
- May lead to invasive infection in 5 – 10% of cases
- Those with clinical infection may remain colonized even after treatment
- Can lead to transmission and subsequent outbreaks
  - High levels of shedding
  - Recontamination of surfaces within 4 hours[1]

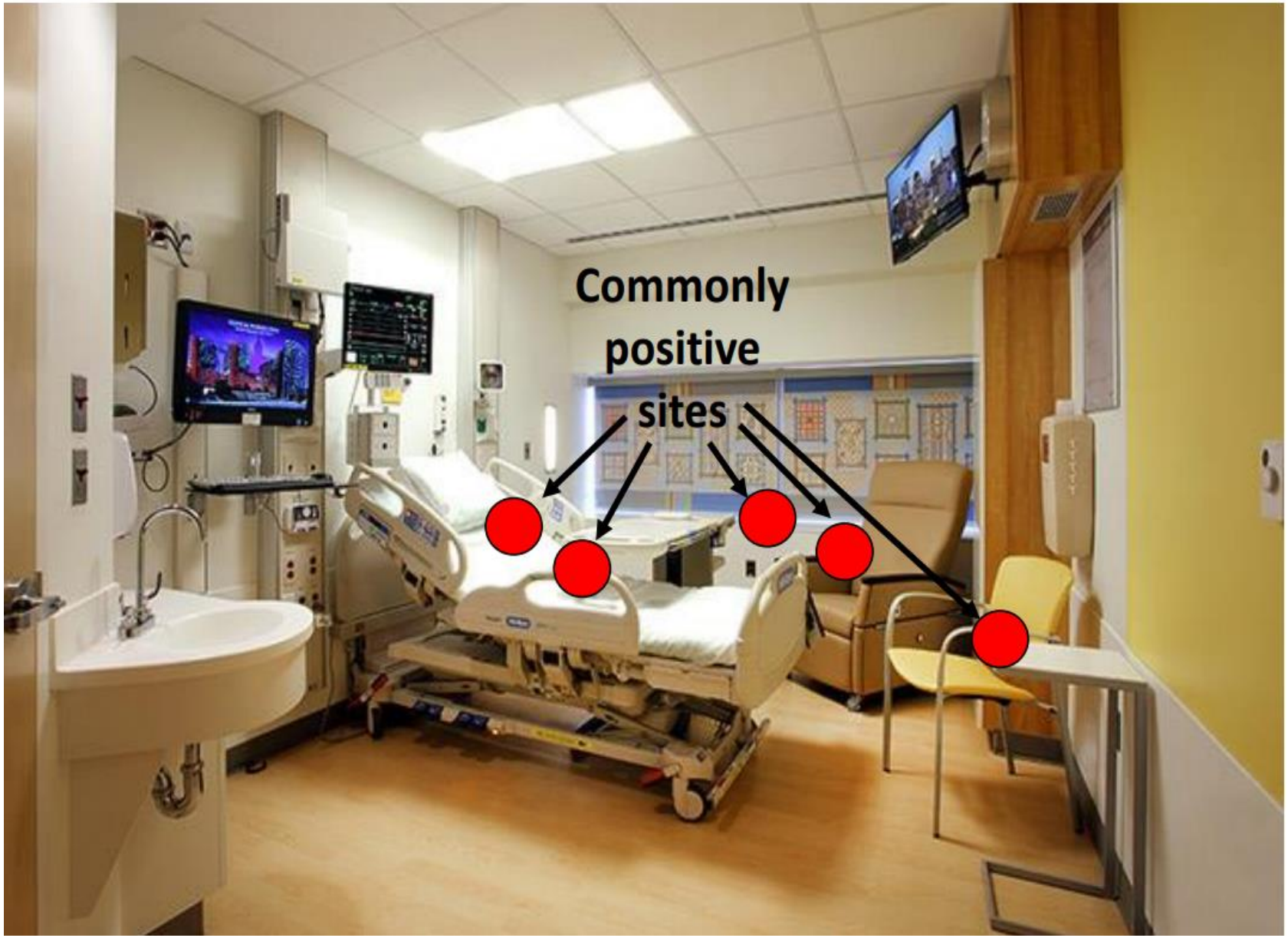
Tracheostomy, ventilation, and PEG tubes were associated with colonization.



Certain broad-spectrum antibiotics were associated with *C. auris* colonization.



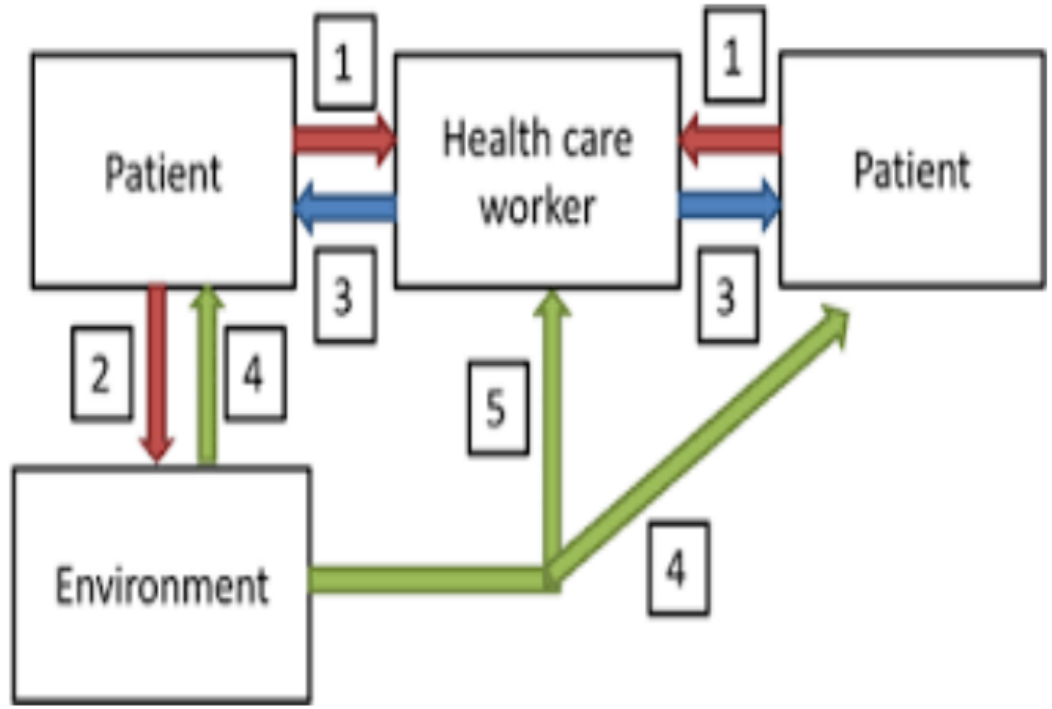
C. auris persists in the environment



- Can survive over a month
- Some common disinfectants (quaternary ammonia compounds) don't work

Mobile equipment has been heavily implicated in transmission

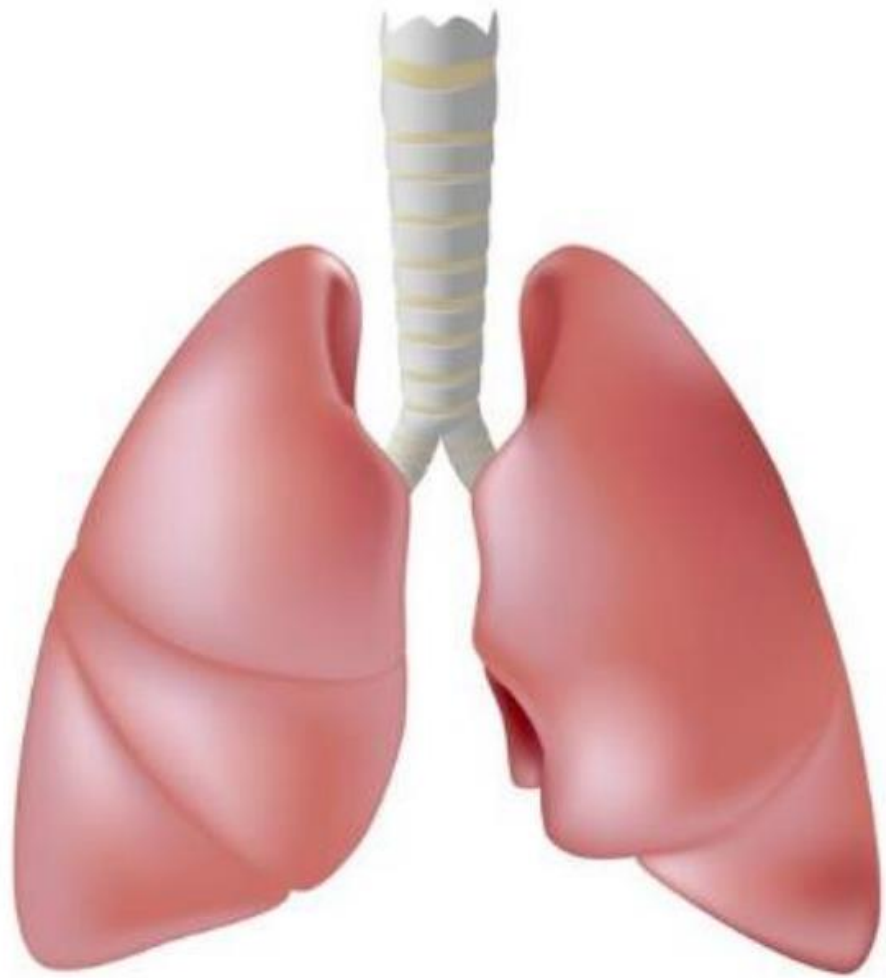
Spread of *Candida auris*



Spreads in healthcare settings

Transmission Through Organ Transplantation

- *C. auris* cultured from lungs shortly after transplant in Massachusetts
- No clear evidence of invasive *Candida* infection
- Donor lungs found to have had *C. auris* pre-transplant
- Donor from **Illinois**
- Isolate nearly identical to other Illinois isolates



C. auris - Symptoms

C. auris Infections

- *C. auris* can cause infections in different areas of body such as bloodstream, open wounds, and ears
- Most common invasive infections symptoms are fever and chills that do not improve after antibiotic treatment
- Patients with invasive infections often already sick from other medical conditions

Symptoms of a *C. auris* infection depend on where in your body the fungus infects. Some symptoms could include

- Fever.
- Chills.
- Lethargy (extreme tiredness).
- Low blood pressure.
- High heart rate (tachycardia).
- Low body temperature (hypothermia).
- Pain, pressure or feeling of fullness in your ear (*C. auris* ear infection).

• Candida auris is an emerging multi-drug resistant yeast that can cause severe invasive infections associated with high mortality.

• Candida auris can survive on surfaces and medical equipment, spread from patient to patient and lead to outbreaks in healthcare settings.

• Risk of infection or colonization with Candida auris is greatest among our most vulnerable patients. These are patients with a.) extensive healthcare exposures; b.) infected or colonized with another MDRO; c.) invasive medical devices.

• C. auris colonization lasts for years and may be indefinit

Can cause invasive infections and high mortality

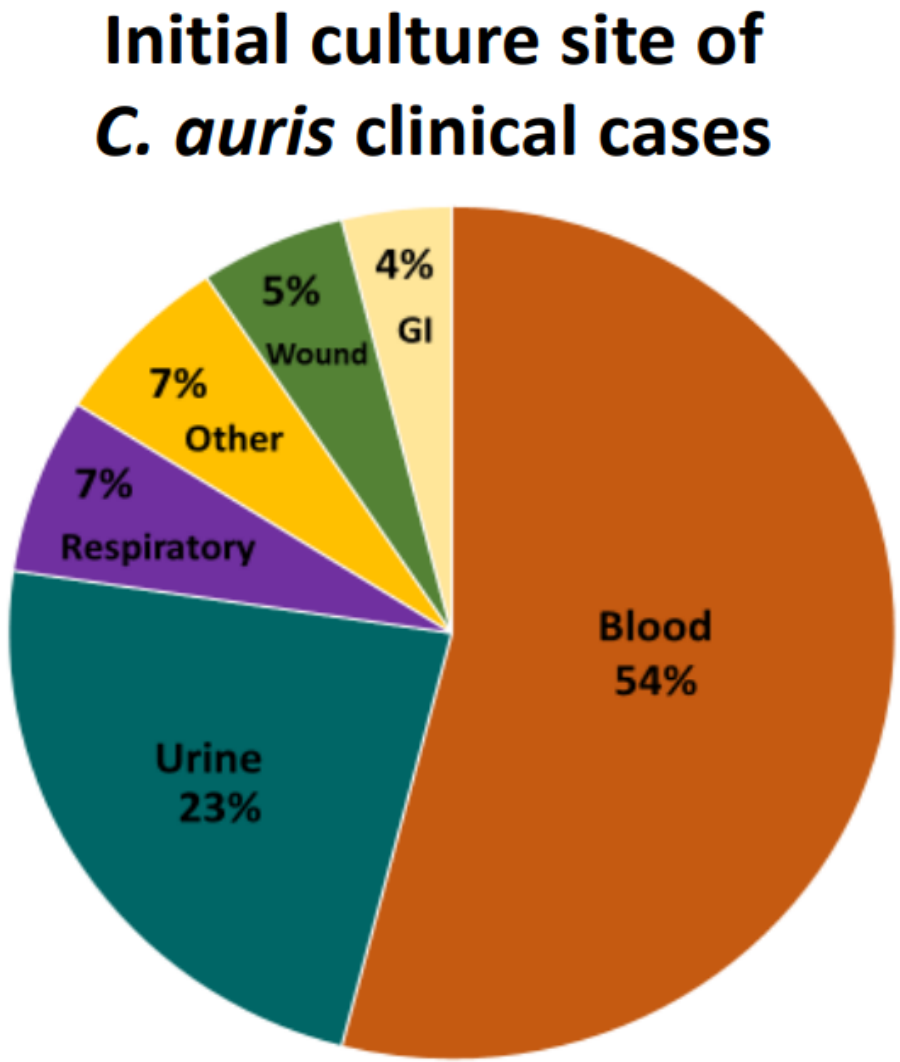
8% of colonized patients have positive clinical specimens of which half are bloodstream infections

Mortality of invasive infections is ~40% within the first 30 days

Identification

Challenges with identification

- Yeast not determined to species level in many labs, except by request
  - Sterile site isolates may only be performed by request
  - Species from non-sterile isolates often not identified



Colonization screening presents challenges

PCR or culture-based methods are available through CDC and public health labs

Few clinical labs now conducting screening using PCR

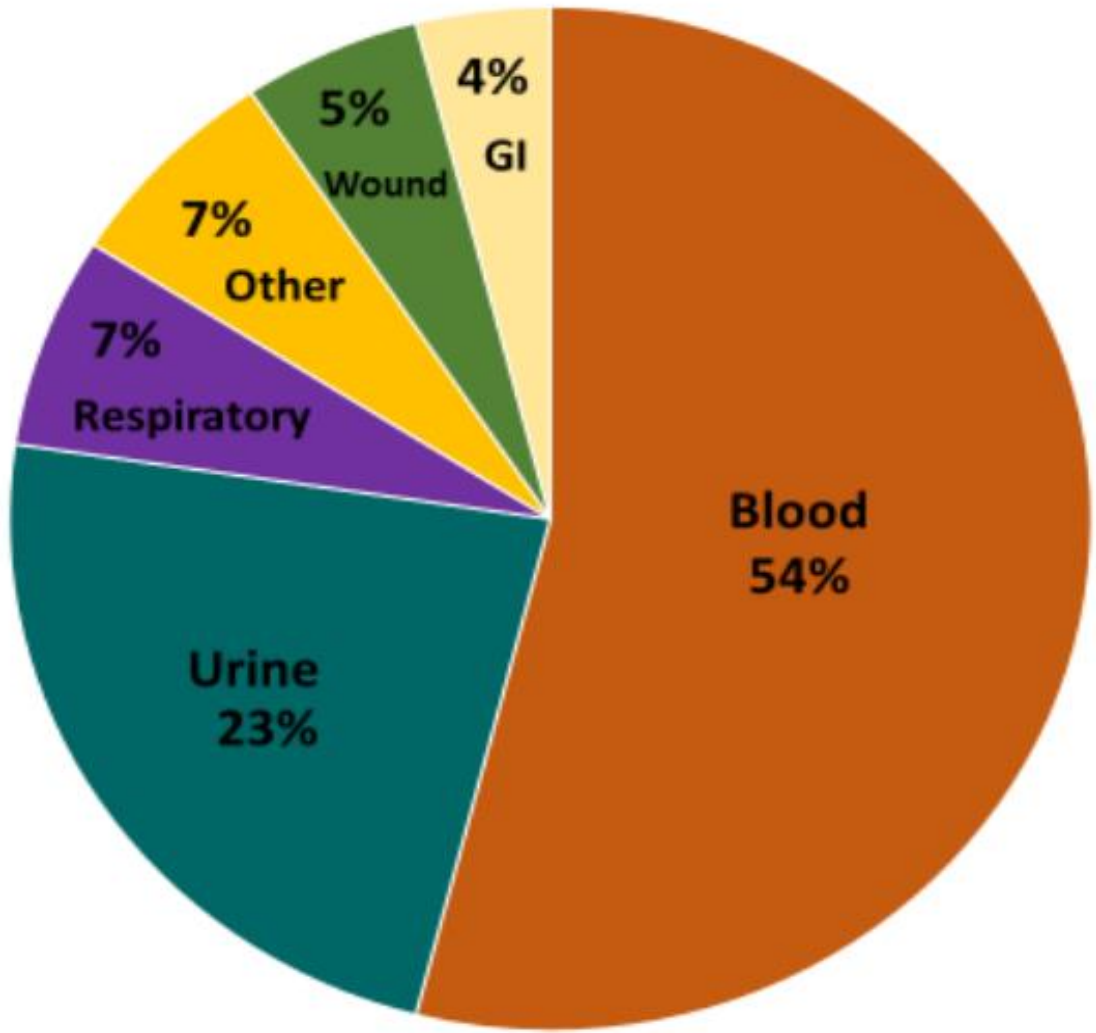
C. auris nationally notifiable

Management of C. auris

Misidentification

Identification Method	Organism *C. auris* can be misidentified as
Vitek 2 YST	*Candida haemulonii* *Candida duobushaemulonii*
API 20C	*Rhodotorula glutinis* (characteristic red color not present) *Candida sake*
BD Phoenix yeast identification system	*Candida haemulonii* *Candida catenulata*
MicroScan	*Candida famata* *Candida guilliermondii** *Candida lusitaniae** *Candida parapsilosis**
RapID Yeast Plus	*Candida parapsilosis**

Initial culture site of *C. auris* clinical cases



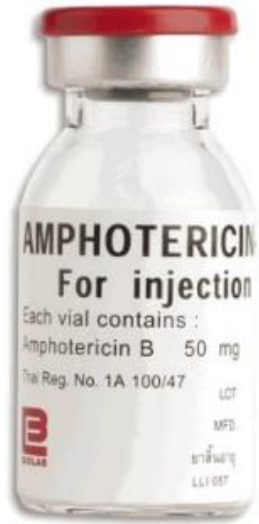
Management of C. auris

THREE CLASSES OF ANTIFUNGALS

1

Azoles

2



Polyenes

3

Echinocandins

- **Azoles** (Ex. Fluconazole, Voriconazole, Posaconazole)

- **Echinocandins** (Ex. Micafungin, Caspofungin, Anidulofungin)

- **Polyenes** (Ex. Amphotericin B)

Resistance in the U.S.

1

87.6%
Azoles

2

33.7%
Polyenes

3

1.7%
Echinocandins

- 33% multidrug resistant
- 2 pan-resistance found in 2019

CDC *C. auris* management guidance

- Echinocandins are first line treatment
- AFST on every isolate
- Repeat cultures until documented clearance for invasive sites

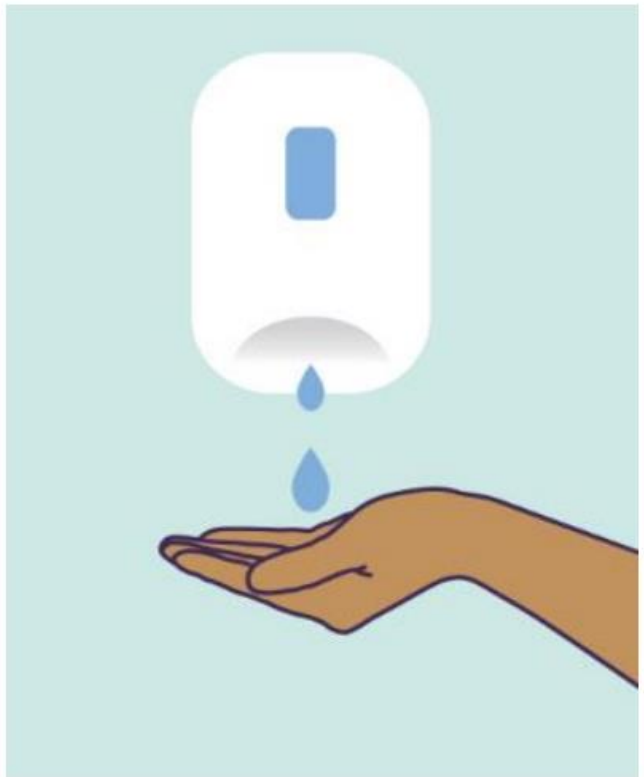
Pan-resistance – all three classes

- CDC-confirmed pan-resistant *C. auris* cases in NY
- Cases were unrelated
- Developed resistance on echinocandin treatment
  - already resistant to fluconazole and amphotericin B
- No transmission of resistance seen
- Pan-resistance has also been reported from a few other countries

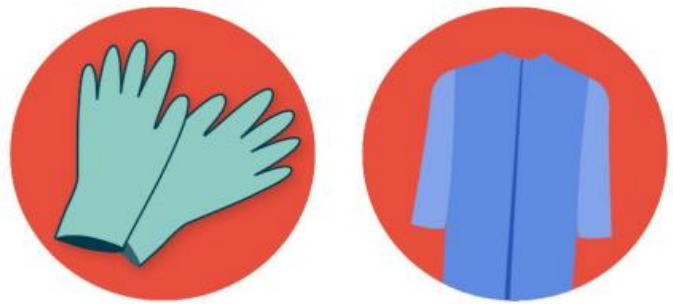
Antibiotic stewardship may be important in the prevention of *C. auris* colonization.

Infection prevention

Facility Level Prevention Strategies: Back to Basics



Hand Hygiene



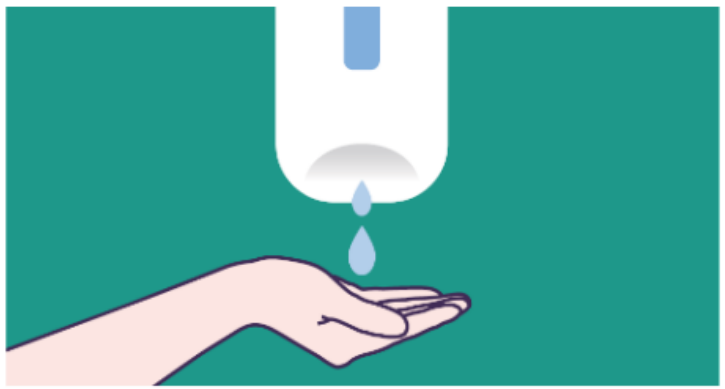
Personal Protective Equipment & Precautions

Environmental Cleaning & Disinfection

Hand Hygiene

Alcohol-based hand rub is preferred over soap and water except when hands are visibly soiled.

Using Alcohol-Based Hand Rub (ABHR)



Apply product to one hand.

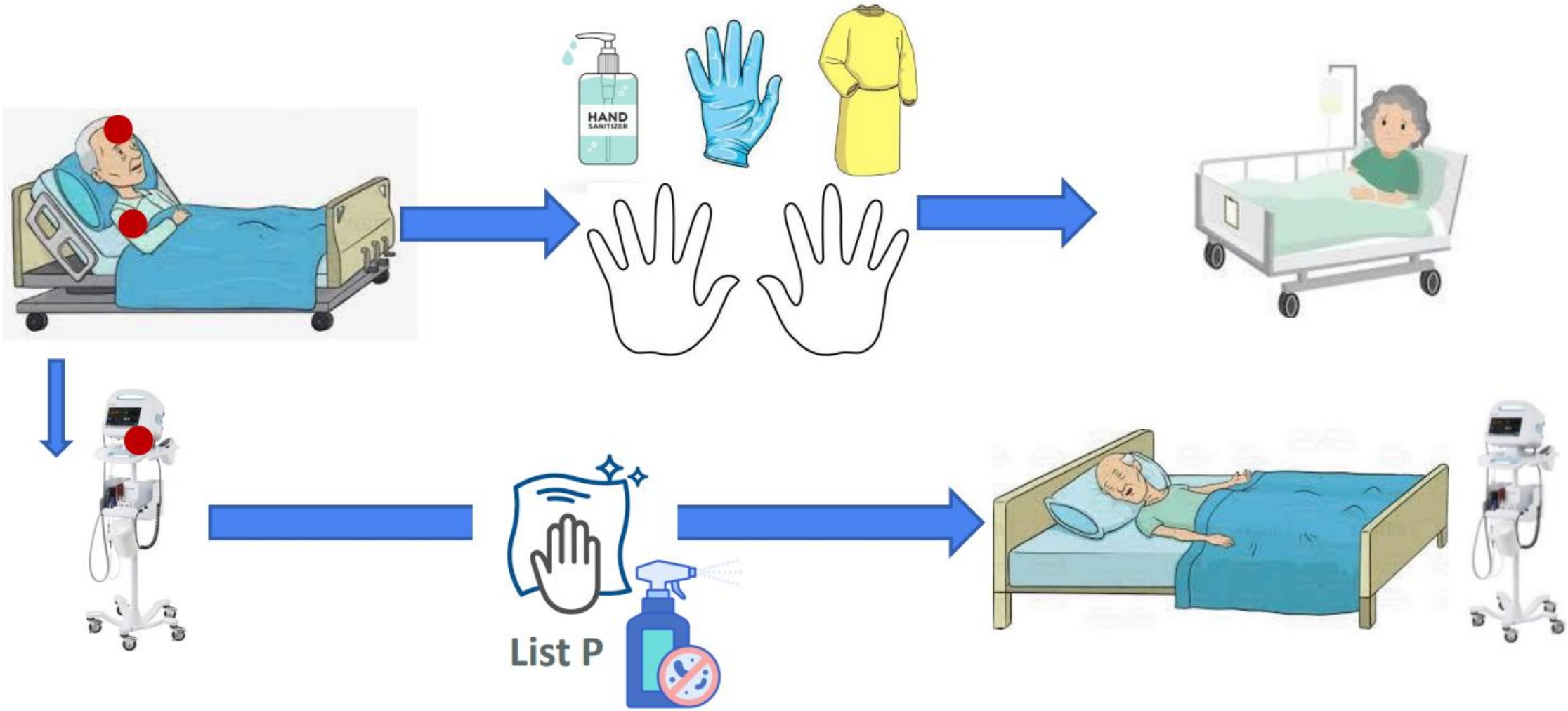
Rub hands together, covering all surfaces, until hands and fingers feel dry.

Process should take about 20 seconds.

Contact Precautions are recommended for patients colonized/infected with *C. auris*

- Gown and gloves must be worn on every room entry

C. auris Colonized Residents and Transmission

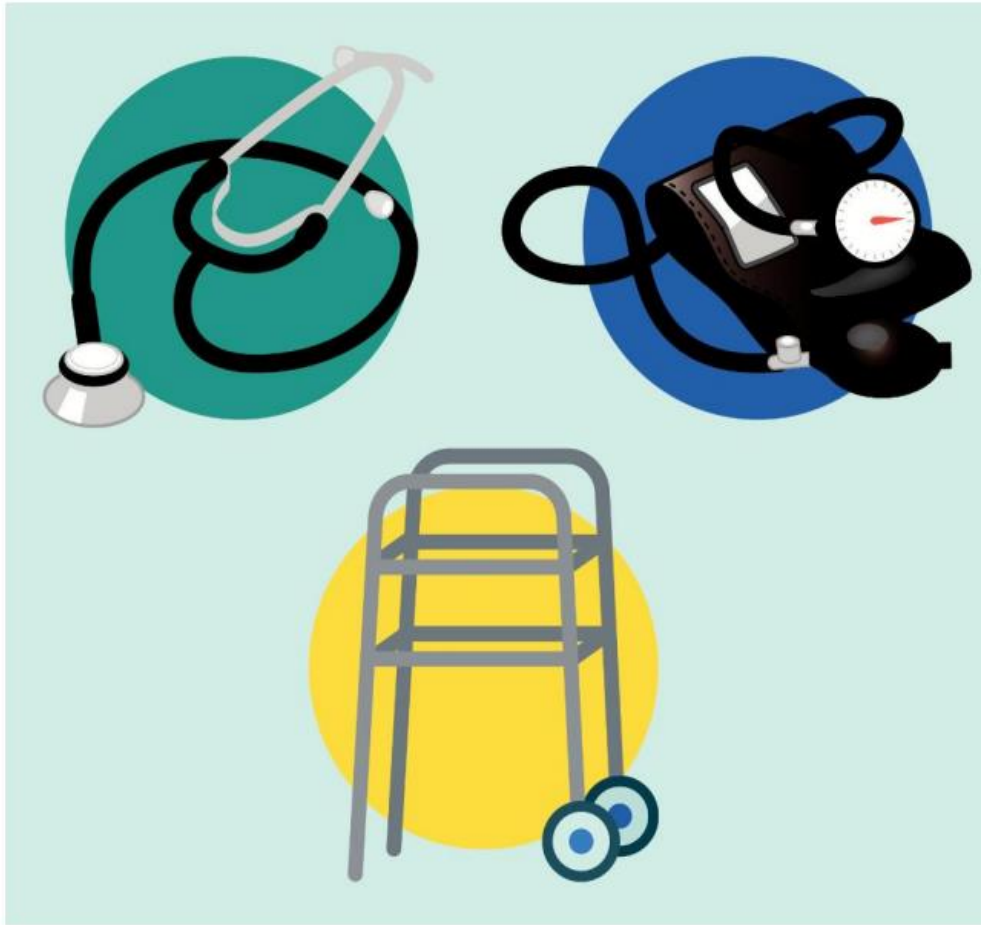


Focus on High-Touch Areas

- Bed and chair rails
- Sink and toilet
- Bedside tables
- Call light
- Remote control and phone

Cleaning and Disinfection of Shared Medical Equipment

- Shared medical equipment cleaned and disinfected prior to use with another resident
- Easy access to cleaning/disinfectant products for all staff
- “Who cleans what?”

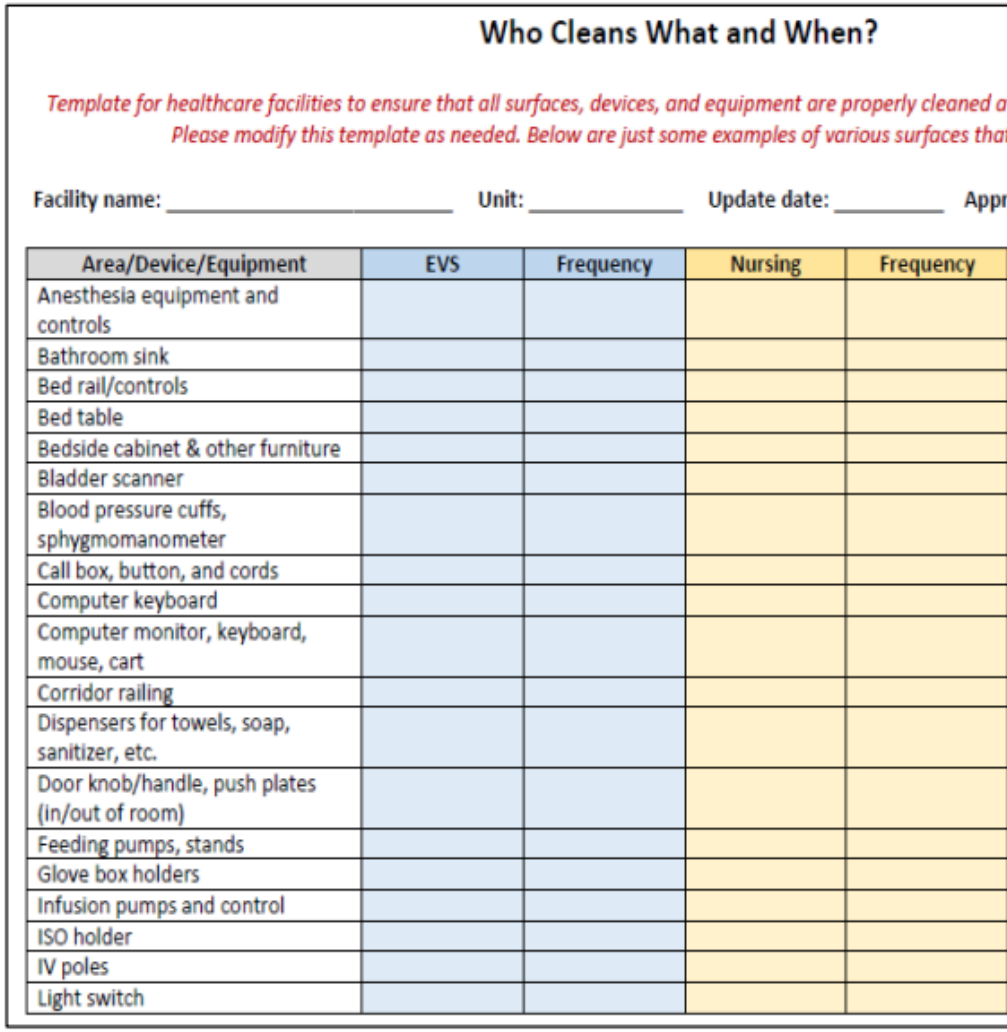


CLEANING PRACTICES

- Confirm that EPA list P products are being used on the unit. (List P: Antimicrobial Products Registered with EPA for Claims Against *Candida Auris)*
- Perform additional black light/UV spot audits to provide objective measurement of cleaning thoroughness
- Declutter patients' rooms

Establish clear responsibilities (WHO DOES WHAT) and frequencies for cleaning equipment and surfaces by EVS, nursing, respiratory therapy and other services involved in healthcare.

- Sometimes HCP don't know what they should be cleaning
- Make a list of all high-touch surfaces and equipment
- For each item indicate:
  - Frequency
  - Products to use (if different than routine)
  - Assignment to different HCP roles
- Share with all HCP with cleaning duties
    - Include both new and veteran HCP



Who Cleans What and When?

Template for healthcare facilities to ensure that all surfaces, devices, and equipment are properly cleaned a
Please modify this template as needed. Below are just some examples of various surfaces tha

Facility name: _____ Unit: _____ Update date: _____ Appr

Area/Device/Equipment	EVS	Frequency	Nursing	Frequency
Anesthesia equipment and controls				
Bathroom sink				
Bed rail/controls				
Bed table				
Bedside cabinet & other furniture				
Bladder scanner				
Blood pressure cuffs, sphygmomanometer				
Call box, button, and cords				
Computer keyboard				
Computer monitor, keyboard, mouse, cart				
Corridor railing				
Dispensers for towels, soap, sanitizer, etc.				
Door knob/handle, push plates (in/out of room)				
Feeding pumps, stands				
Glove box holders				
Infusion pumps and control				
ISO holder				
IV poles				
Light switch				

It’s new bug using old tricks

- Drug resistant, makes people sick, and spreads
- Similar to CRE, VRE, MRSA, and other drug resistant bugs
- We are still learning a lot about *C. auris*, but we also know how to control the spread of other similar germs
  - Many of the same principles can be applied to *C. auris*