Practical considerations for the design and implementation of a *Candida auris* surveillance program

Rossana Rosa MD MSc FIDSA

Infectious Diseases Specialist

Medical Director for Infectious Diseases at Horizon Health Network

Co-Chair of the Regional Infection Prevention and Control Committee Horizon Health Network

Infection Prevention and Control Department, Jackson Health System

Conflict of interest

- Diasorin - Speaker fees.

Objectives

- Review the epidemiology and clinical impact of *C. auris* colonization and infections
- Outline the practical considerations in the development and sustainment of a *C. auris* surveillance program

Why screen for *C. auris*?

C. auris is a multidrug-resistant fungus associated with high morbidity and mortality

- First identified in 2009 in Japan
- 6 clades have been identified to date
- Clade-specific patterns of antifungal resistance
- Most common (and consequential) infection is fungemia, often device-associated
- Crude mortality 30-70%

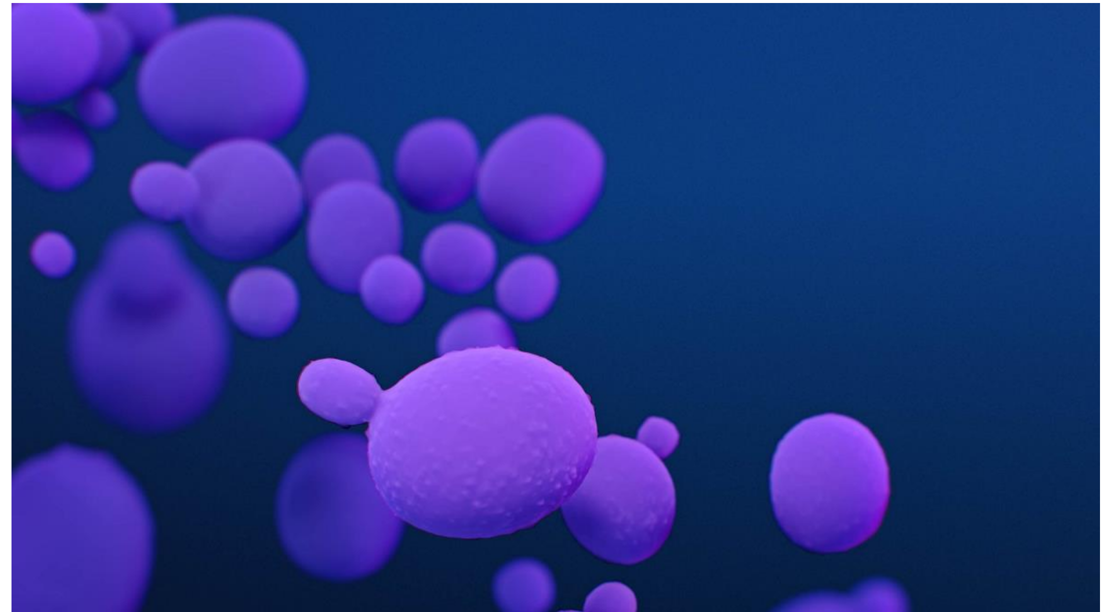


Photo credit: CDC

Jones, CR et al. JMM. 2024
Lionakis MS & Chowdhary A. NEJM 2024

C. auris colonization poses a risk for a patient and healthcare facilities

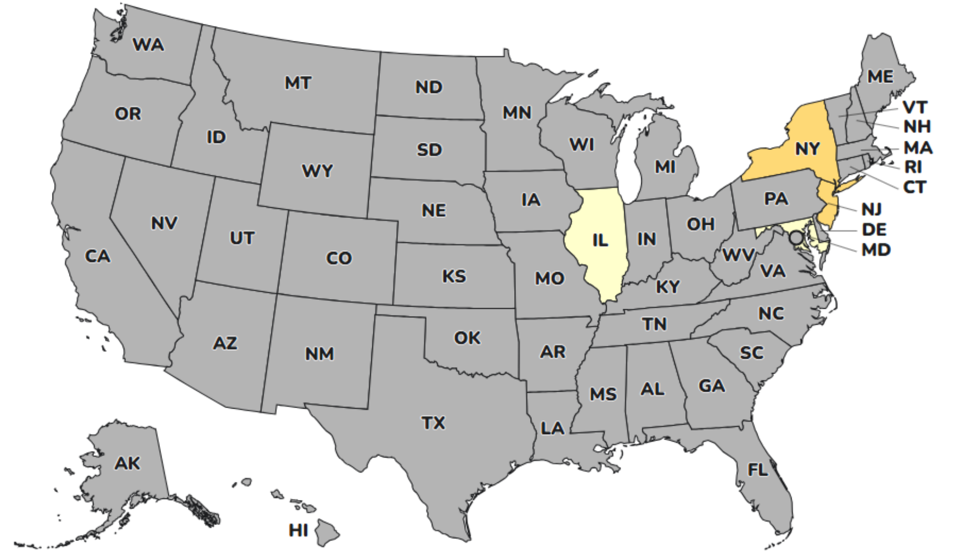
Colonization is a risk factor for invasive infection

No proven strategies for patient decolonization

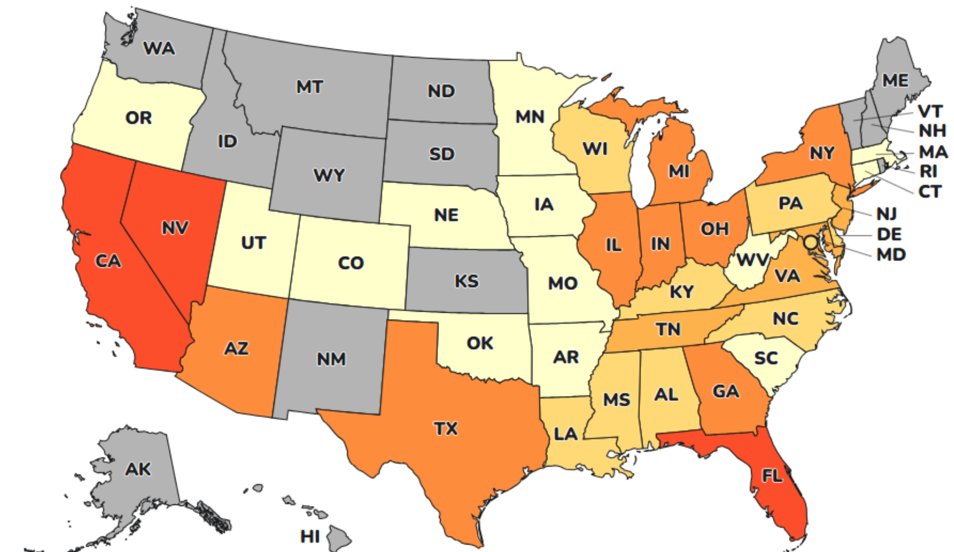
C. auris promptly contaminates the environment of colonized patients

Lionakis & Chowdary. NEJM. 2024
CDC *C. auris* infection control guidance. 2024
Sansom *et al*. CID. 2024

C. auris has rapidly spread worldwide, and in the US



In 2016, there were 50 clinical cases reported to CDC, and 1 isolate from 2013 was retrospectively reported.



In 2023, 4,514 clinical cases and 9,287 screening cases were reported to CDC.

CDC. *Tracking C. auris*.2024

Wastewater surveillance studies have identified the presence of *C. auris* in sewage ahead of clinical detection

New Clinical Cases of *C. auris* Reported in the U.S.

Select a year

2023

WA OR ID MT ND SD WY NE UT CO NV CA AZ NM KS OK TX MN IA MO AR LA WI MI IL IN OH KY TN MS AL GA FL SC NC VA WV PA NY ME VT NH MA RI CT NJ DE MD AK HI

b. Wastewater

Percentage positive wastewater samples

5 4 3 2 1 0

Fig 2 Map showing the percentage of positive wastewater samples and population normalized case numbers from NNDSS across the United States. Figure 2a shows the normalized number of cases per million in each state as reported to NNDSS during the study period. Figure 2b shows the percentage of positive wastewater samples in each of the states surveilled during the study period. Yellow represents low normalized values, while black represents high normalized values. Gray states represent areas without available data.

Zulli *et al.* mBio.2024.

Chavez J. *et al.* Emerg Infect Dis. 2024

Who should be screened for *C. auris*?

Define the population

Risk factors commonly associated with *C. auris* carriage

Patient-level characteristics

- Mechanical ventilation (tracheostomy)
- Indwelling devices (i.e., feeding tube, central lines)
- Prolonged hospitalization/complex care
- Colonization with other MDRO

Epidemiological characteristics

- Recent stay at LTACH or vSNF
- Recent stay at a facility with previous or ongoing *C. auris* transmission
- Recent stay at an acute care facility outside the US or in a part of the US with *C. auris* cases

CDC. *C. auris* Screening Recommendations for Healthcare Facilities. 2024

How should we screen for *C. auris*?

Choose a screening strategy

Consider your frequency and setting

Frequency

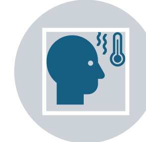
Proactive

- ✓ On admission
- ✓ +/- Defined intervals

Reactive

- ✓ After identifying a case, or an increase in cases

Setting



Patient risk-factor

- ✓ Patient-level risk factors
- ✓ Epidemiological risk factors

Unit-based

- ✓ High-risk units (e.g., ICU, burn, chronically ventilated)

CDC. *C. auris* Screening Recommendations for Healthcare Facilities. 2024

Sample *C. auris* screening form including patient-level and epidemiological risk factors

Candida Auris Screen

Has patient arrived at JHS from another healthcare facility?

○ No ◉ Yes

Has patient arrived from one of these facilities?

○ Any nursing home
○ Any long-term acute care hospital
○ Hospital A
○ Hospital B
◉ LTACH
○ Hospital C
○ Hospital D
○ Hospital E
○ None of the above

If Yes, notify on-call Infection Preventionist: and place patient on Isolation: Contact Precautions

Review Transition of Care documents on arrival - is there a known history of infection with any of the following organisms?

☐ Candida Auris
☐ IMP - Imipenemase
☑ KPC - Klebsiella Pneumoniae Carbapenemase
☐ NDM - New Delhi Metallo-beta-lactamase
☐ OXA - Oxacillinase
☐ VIM - Verona Integron-mediated Metallo
☐ other CPO - Carbapenemase Producing Organism

If Yes, notify on-call Infection Preventionist: and place patient on Isolation: Contact Enhanced

Tracheostomy or mechanical ventilation present on admission?

☐ None ☐ Tracheostomy ☐ Mechanical ventilation

For admissions to Lynn Rehabilitation Center:
Select only if patient has Tracheostomy POA and/or Mechanical Ventilation POA *and* is not coming from a JHS facility

If Yes, notify on-call Infection Preventionist: and place patient on Isolation: Contact Precautions

Note: the following question applies *ONLY* to hospitalization *outside the continental United States*

In the past 12 months, did patient stay overnight in a hospital outside the USA?

○ Yes ○ No

Country of Hospital

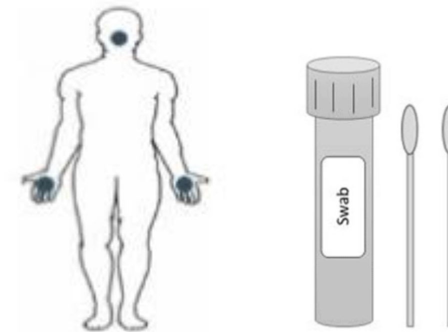
If Yes, notify on-call Infection Preventionist: and place patient on Isolation: Contact Precautions

Choose an anatomic site for sampling

Complexity of collection process, number of swabs, sample validation

- CDC currently recommends screening using a composite swab of bilateral axilla and groin

- Recent studies have shown increased percent positivity in *C. auris* tests by including anterior nares +/- hands or using these sites altogether

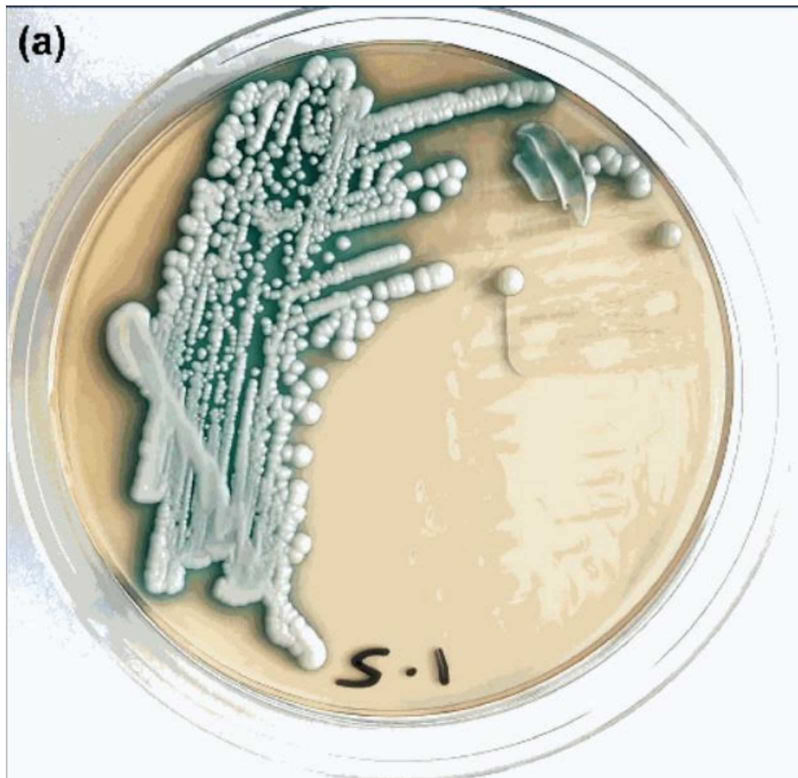


Sansom *et al*. CID. 2024
Lopez Cano *et al*. CID. 2025
CDC. *C. auris* Screening Recommendations for Healthcare Facilities. 2024

Choose a laboratory method

Trade offs: cost and TAT

Culture-based



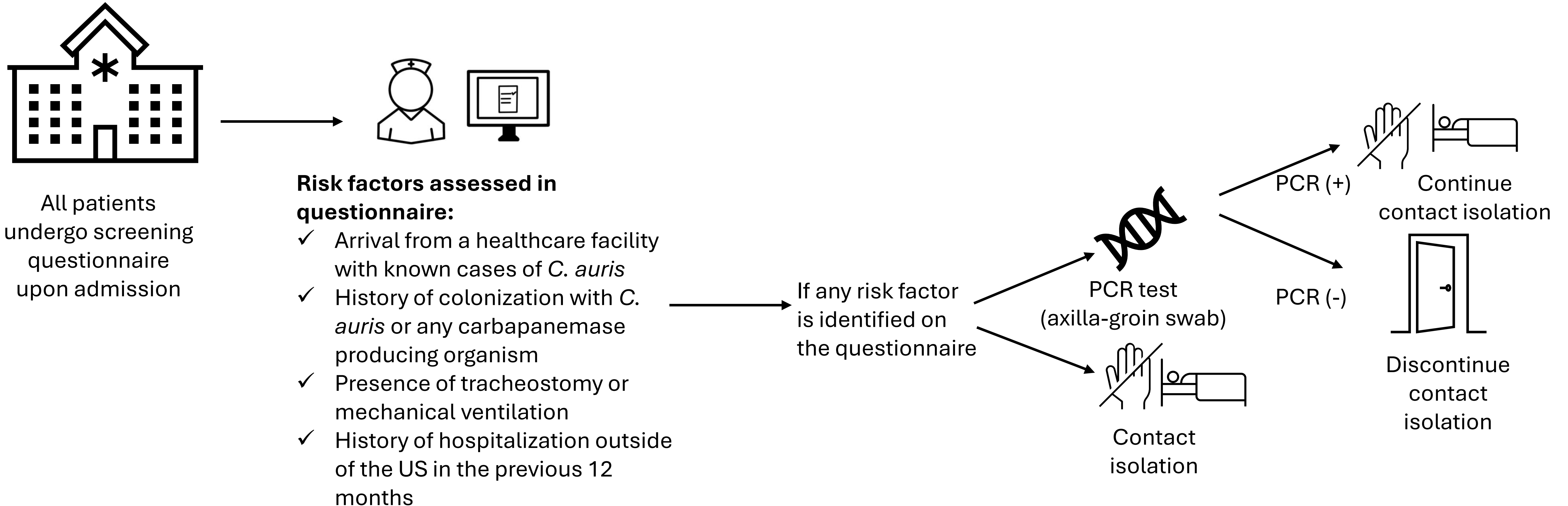
PCR-based

IVD

Lab-developed test

CDC. Guidance for Detection of *C. auris* Colonization. 2024

Our experience at Jackson Health System



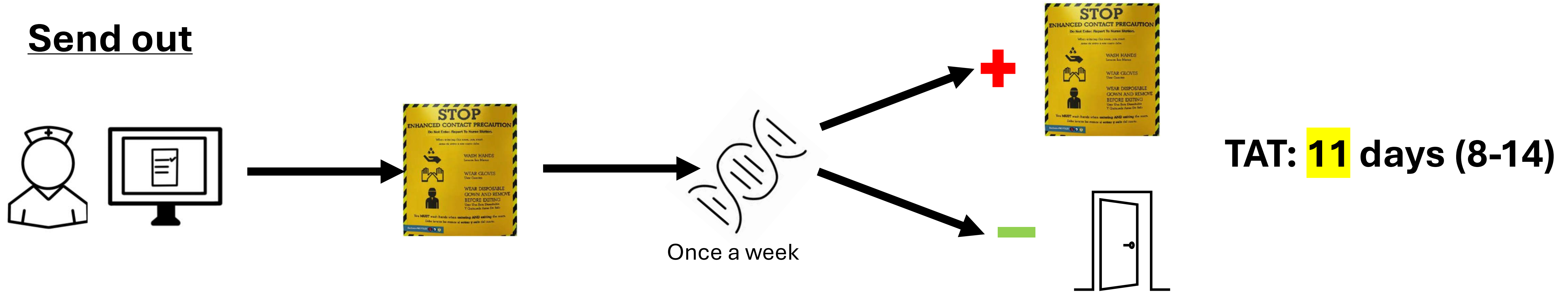
Microbiology procedures

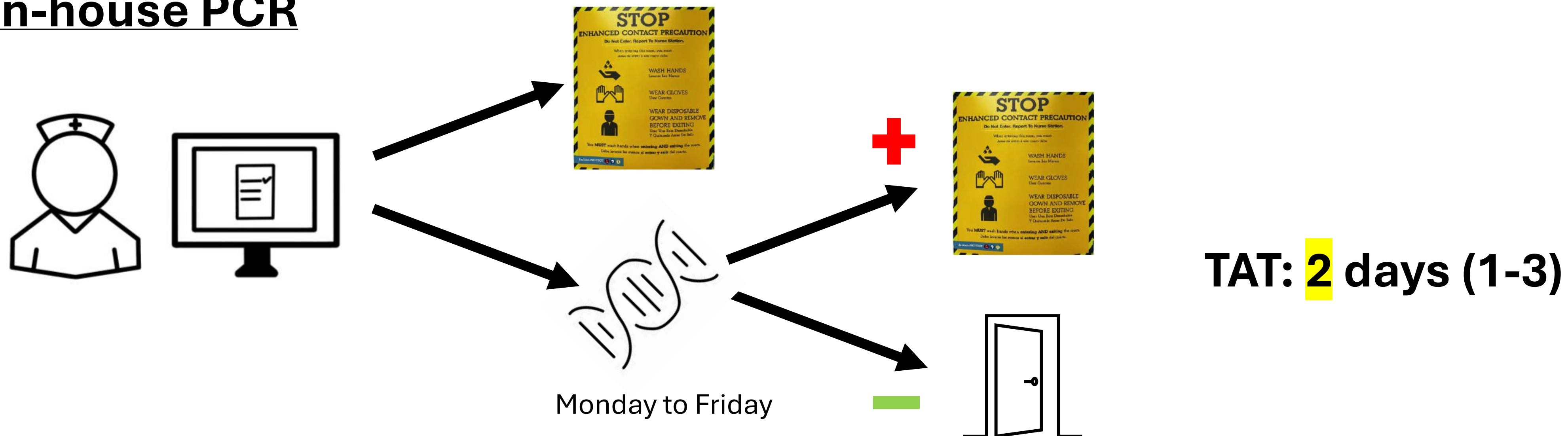
- 2019-2021:
  - Samples sent to CDC ARLN
- 2021 onwards:
  - We developed and validated the Diasorin analyte specific reagent *C. auris* for the LIAISON® MDX instrument
  - The limit of detection (LOD) was determined using isolates of *C. auris* Z485 from the ZeptoMetrix® panel
  - The LOD was estimated at 600 CFU/mL with a mean cycle threshold value of 32.97

Infection Prevention Procedures

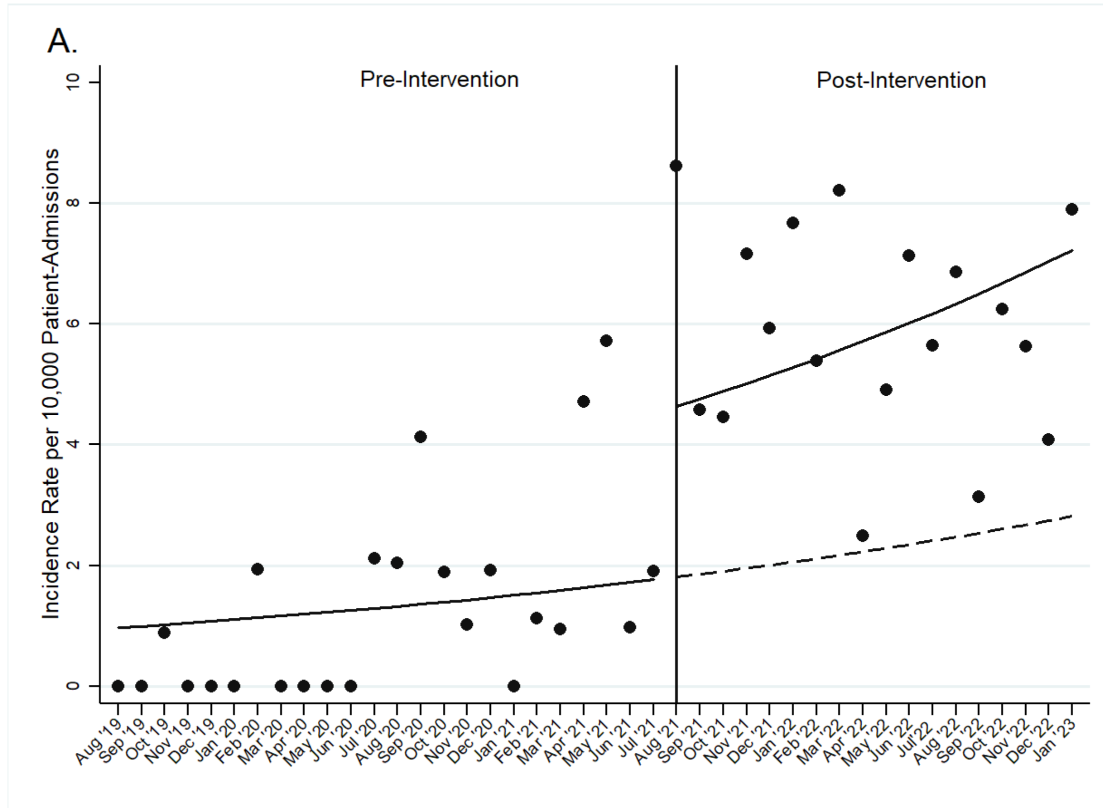
- Single room
- Gown and gloves
- Dedicated medical equipment
- Cohorting of nursing staff if possible
- Precautions discontinued if screening PCR was negative and continued throughout hospitalization if *C. auris* was detected

Send out vs. in-house PCR testing

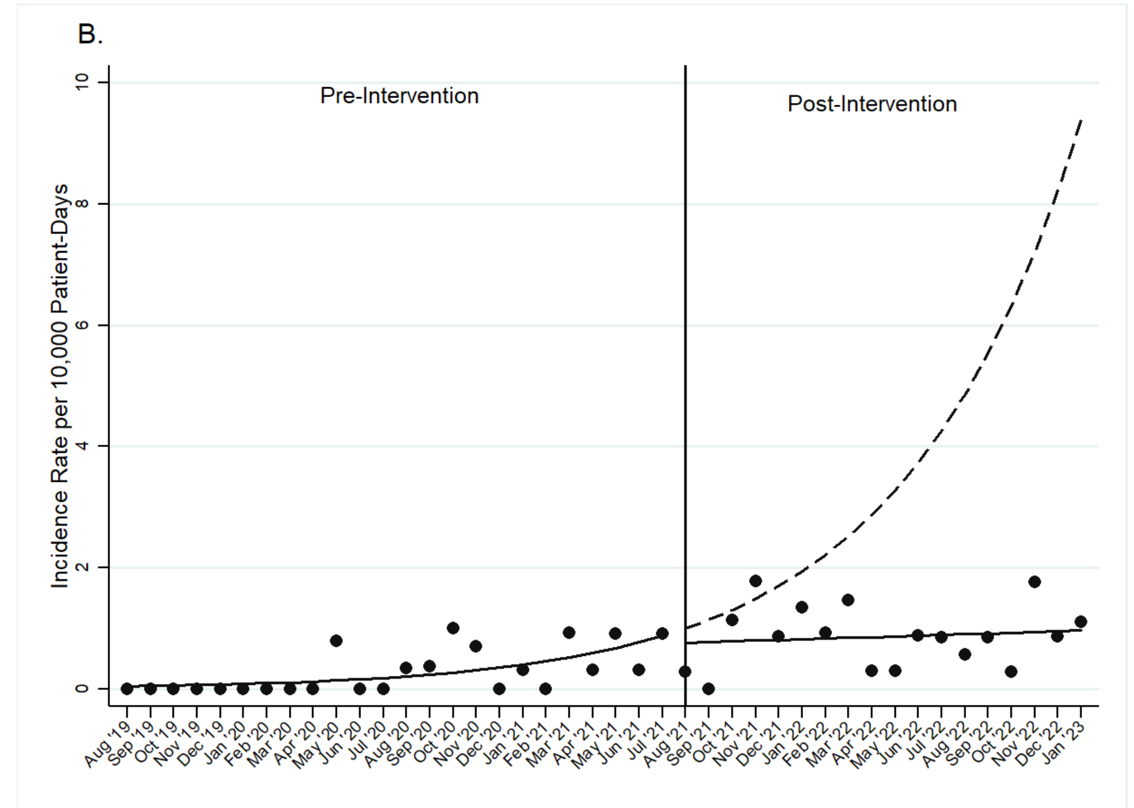




Immediately after implementing in-house PCR testing, we observed a doubling of the incidence rates of *C. auris* present on admission and compared the rates to the send-out period. The trend in incidence rates of *C. auris* hospital-onset fungemia decreased by 13%.



Interrupted time-series analysis of the trends in the monthly incidence rates of *C. auris* present on admission.

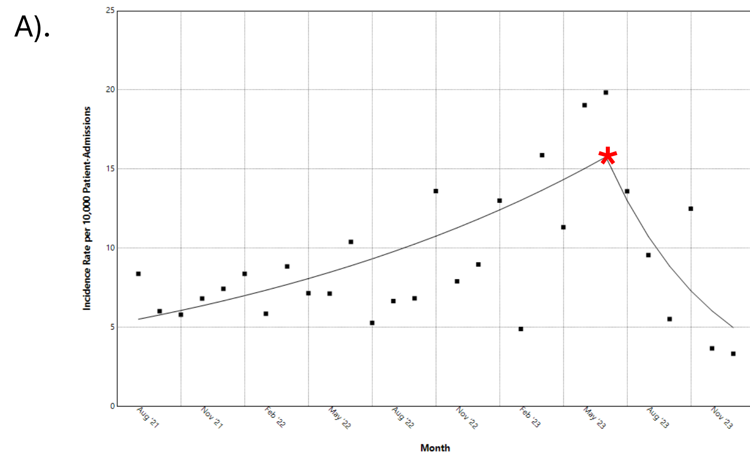


Interrupted time-series analysis of the trends in the monthly incidence rates of *C. auris* hospital-onset fungemia.

Rosa *et al*. OFID. 2023

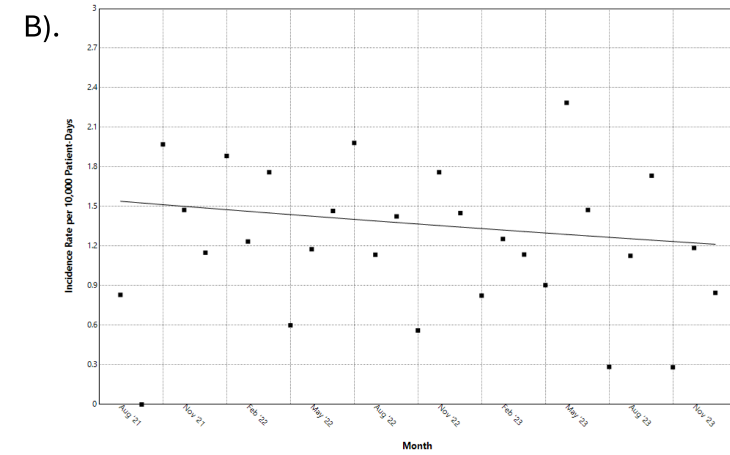
Following implementation of in-house PCR testing, as part of our screening strategy, we observed increasing incidence rates of patients with *C. auris* Present on Admission but have maintained stable rates of *C. auris* hospital-onset cultures and BSI.

A).



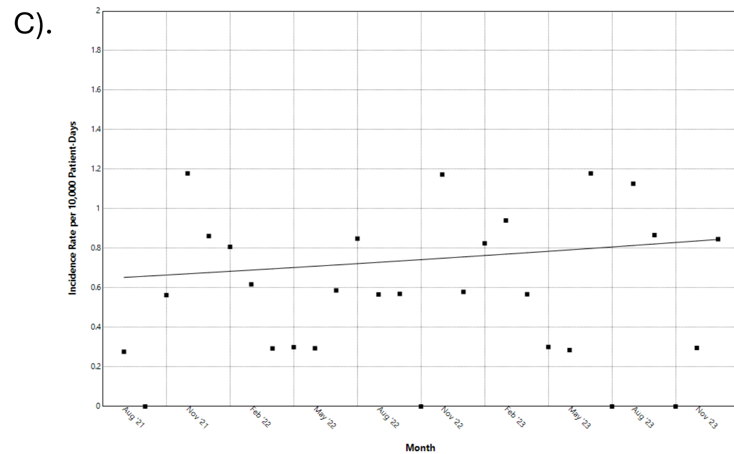
Incidence rates of *C. auris* colonization present on admission

B).



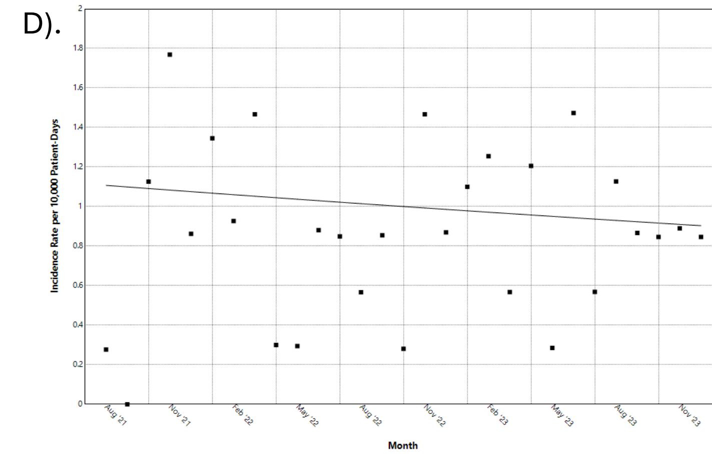
Incidence rates of *C. auris* hospital-onset clinical culture

C).



Incidence rates of *C. auris* hospital-acquired bloodstream infections

D).



Incidence rates of *C. auris* hospital-onset bloodstream infections

Rosa *et al*. ASHE accepted manuscript. 2025

Cost-savings analysis

	Pre-Intervention (PCR sent out to refence laboratory)	Post-Intervention (PCR performed in-house)
Microbiology laboratory turnaround time from admission to result report (median, IQR)	11 days (8-14)	2 days (1-3)
Microbiology laboratory costs (reagents, equipment, and labor) per test	$0	$39.50
Startup costs		$23,000.00
Duration of isolation precautions	8 days	2 days
Cost of isolation precautions per patient screened with a PCR-negative result	$335.20 - $1379.68	$123.30 - $384.42
Cost of isolating and testing 100 patients	$33,520.00 - $137,968	$13,084.20 - $41,546.28
Estimated cost-savings during the post-intervention period	$772,513.10 - $3,730,480.26	

Rosa *et al*. OFID. 2023

Summary of aspects to consider when designing a *C. auris* surveillance program

Technical aspect	Details to consider	Stakeholders (besides IPC team)
Population at risk	Local epidemiology (LTACHs, vSNFs, NH withing network) Patient-level risk factors within your facility	Infectious diseases specialist
Frequency of screening	Proactive vs reactive screening Patient-level vs unit-level risk factors On admission vs weekly	Microbiology laboratory director Nursing leadership Patient flow/placement leadership
Anatomic sampling	Bilateral axilla and groin Alternative or additional sites (anterior nares and hands)	Nursing leadership Microbiology laboratory director
Testing method (culture vs PCR)	TAT and cost	Microbiology laboratory director

Take home points

C. auris is a rapidly spreading multidrug-resistant fungus that poses a risk for patients and healthcare facilities

Prompt identification of colonized patients can guide efficient deployment of infection prevention resources

Development of a surveillance program is a multidisciplinary effort that must balance competing priorities

Thank you.

Questions?

rossana.rosa@horizonnb.ca

Bluesky: @DrRossanaRosa.bsky.social

Instagram: @DrRossanaRosa