Organización Panamericana de la Salud

Organización Mundial de la Salud

OFICINA REGIONAL PARA LAS Américas

Webinar

Recomendaciones:

- **Por favor cerrar su micrófono.**

- Serán 1 hora de presentación y 1 hora de preguntas y respuestas.

- Las preguntas deben ser por escrito, por medio del Chat o por email para:

infectioncontrol@paho.org

- La presentación estará disponible en la pagina web de OPS en 48 horas.

Gracias

Control de Infecciones para *Candida auris*, un hongo patógeno emergente

Mycotic Diseases Branch (MDB) / Division of Healthcare Quality Promotion (DHQP)
Centers for Disease Control and Prevention (CDC)
E-mail: xju7@cdc.gov / vih9@cdc.gov

Frecuentemente no queremos lidiar con las infecciones por hongos ...
¿Por qué?

Pseudallescheria

Baja sensibilidad

Anfotericina B

Scedosporium

Rhizomucor

Falla renal

Absidia

Cladophialophora

Ochronosis

Pocos kit comerciales

Rhinocladiella

Equinocandinas

Talaromyces

Toxicidad

Wangiella.

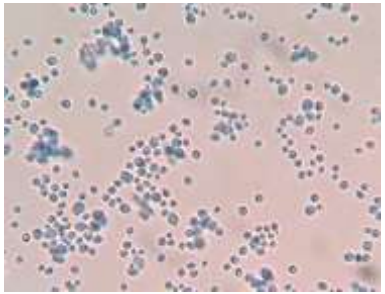
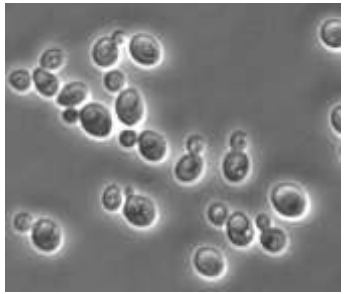
Ajellomyces

Voriconazol

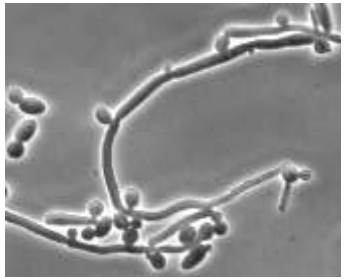
Nombres extraños, malos desenlaces, métodos diagnósticos limitados, tratamientos costosos, tratamientos tóxicos…

Candida

- *Candida* es un género de hongos unicelulares también llamados levaduras.
- La especie de *Candida* más significativa por su importancia clínica es *Candida albicans*.

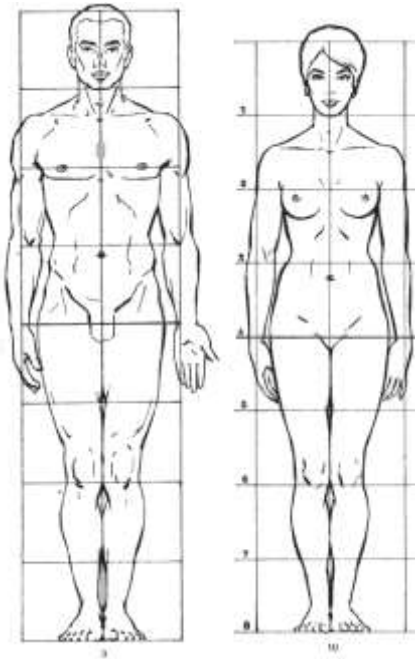







JD Sobel. Diagnosis and treatment of fungal infections. 2015, 2th ed. Cap. 8

Candidiasis



- Distribución mundial.
- Comensal en humanos.
- “Enfermedad transmitida humano a humano es rara”.
- Múltiples presentaciones clínicas:
  - Desde enfermedad superficial→ infección sistémica

JE Edwards. Principles and practice of infectious diseases. 2015, 8th ed. Cap. 258

Candidemia

Infección del torrente sanguíneo causada por *Candida spp* y asociada con la asistencia sanitaria.

- Factores de riesgo:
  - Uso de antibióticos de amplio espectro.
  - Compromiso del estado inmune.
  - Estancia prolongada en UCI.
  - Cirugía abdominal.
  - Uso de catéteres.
  - Diabetes mellitus.
- Mortalidad 30-50%.

“La enfermedad del enfermo”

JE Edwards. Principles and practice of infectious diseases. 2015, 8th ed. Cap. 258

¿Porque debemos se cuidadosos con las especies raras de microorganismos?

Muchas cosas empiezan con un correo…

Febrero del 2015

- Los colegas Pakistán preocupados por un brote de infecciones por ***Saccharomyces cerevisiae.***
- 22 aislamientos en 2 meses.
- 8 a partir de hemocultivos, 3 tejido con quemaduras, 10 orinas, 1 de punta de catéter.

Pero, no era *Saccharomyces*…

- En Pakistán fueron identificados utilizando un juego de reactivos comercial.

- La secuenciación del DNA reveló que los aislamientos eran en realidad *Candida auris.*

O una llamada…

Mayo del 2016

- Los colegas de Colombia observaron un aumento en la frecuencia de ***C. haemulonii.***
- 27 aislamientos identificados por BD Phoenix, fueron enviados a identificación molecular.
- 24 de 27 fueron ***C. auris.***

O una visita…

Agosto del 2016

- Los colegas de Panamá observaron un aumento en la frecuencia de ***C. haemulonii.***
- 14 aislamientos identificados por Vitek 2 fueron enviados a identificación molecular (CDC de Atlanta).
- Todos fueron ***C. auris.***

Primer reporte de *C. auris* año 2009

ORIGINAL ARTICLE

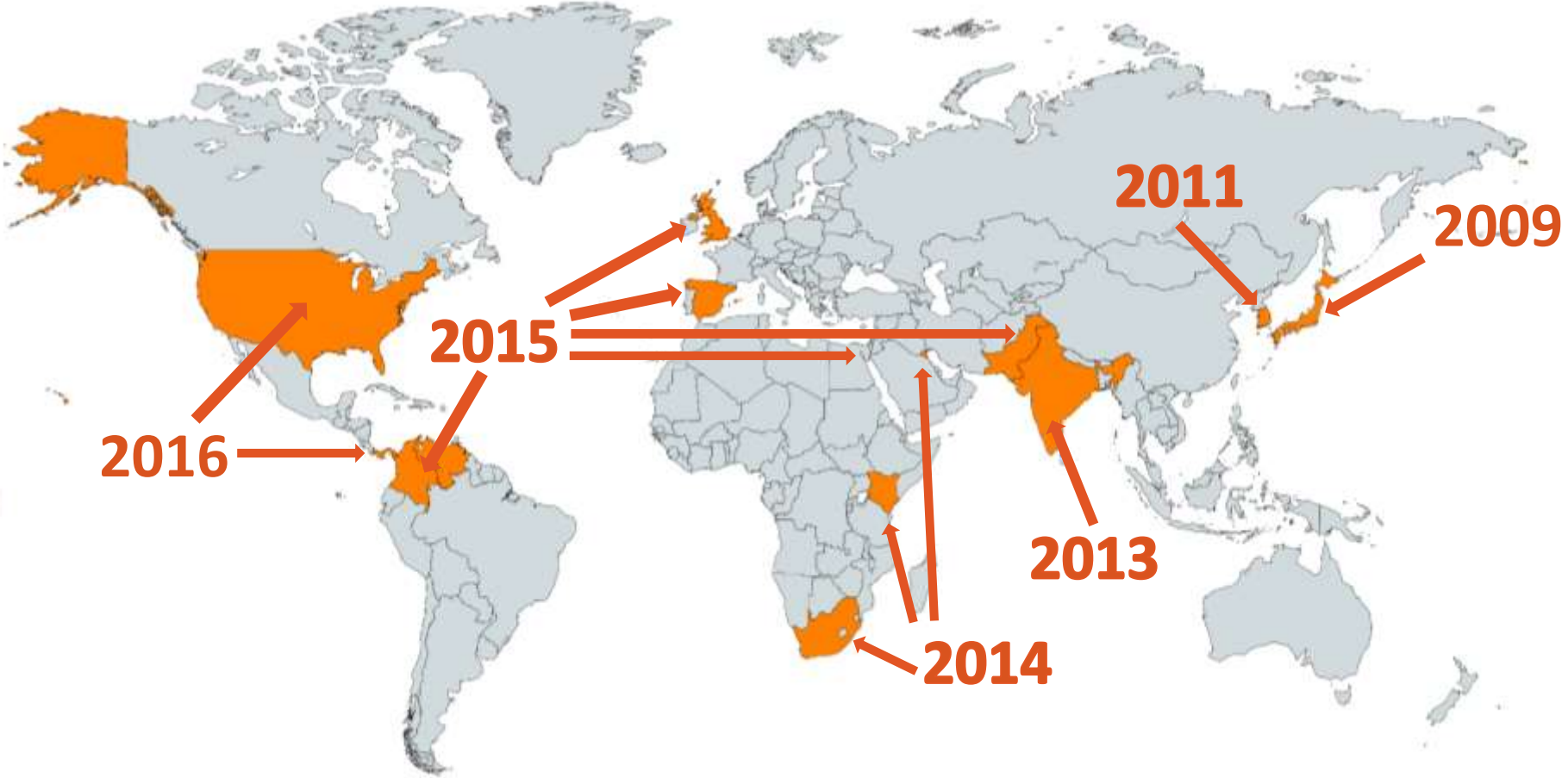
Candida auris sp. nov., a novel ascomycetous yeast isolated from the external ear canal of an inpatient in a Japanese hospital

Kazuo Satoh[1,2], Koichi Makimura[1,3], Yayoi Hasumi[1], Yayoi Nishiyama[1], Katsuhisa Uchida[1] and Hideyo Yamaguchi[1]

[1]Teikyo University Institute of Medical Mycology, 359 Otsuka, Hachioji, Tokyo 192-0395, [2]Japan Health Sciences Foundation, 13-4 Nihonbashi-Kodenmacho, Chuo-ku, Tokyo 103-0001 and [3]Genome Research Center, Graduate School of Medicine and Faculty of Medicine, Teikyo University, Otsuka 359, Hachioji, Tokyo 192-0395, Japan

Auris proviene del latín "oído"

Dispersión global de *C. auris*



No sólo ha sido causado por la mejora la detección…

- Programa de Vigilancia de Candidemia del EIP:
  - > 7.000 aislamientos del género *Candida* recolectados en los Estados Unidos entre el 2008 al 2016.
  - **No *C. auris.***
- SENTRY y ARTEMIS (colecciones privadas de 4 continentes):
  - > 30.000 aislamientos del género *Candida* entre 1996 al 2015.
  - **No *C. auris*** antes de 2009.
- Lab. Referencia de Micologia Carlos III, Madrid España:
  - > 1.500 aislamientos del género *Candida* entre 2011 al 2016, identificadas por secuenciación (ITS).
  - **No *C. auris.***

Comunicación personal de expertos

En las Américas…

Venezuela

Journal of Infection (2016) 73, 369–374

ELSEVIER

BIAMM British Infection Association

www.elsevierhealth.com/journals/jinf

First report of *Candida auris* in America: Clinical and microbiological aspects of 18 episodes of candidemia

Belinda Calvo [a], Analy S.A. Melo [b], Armindo Perozo-Mena [c], Martin Hernandez [d], Elaine Cristina Francisco [b], Ferry Hagen [e,f], Jacques F. Meis [e,f], Arnaldo Lopes Colombo [b,*]

- Primer reporte de casos en Latinoamérica.
- 18 pacientes identificados entre marzo 2012 a julio 2013.
- Todos los aislamientos fueron resistentes a FCZ y VCZ.
- 22% de mortalidad a 30 días.

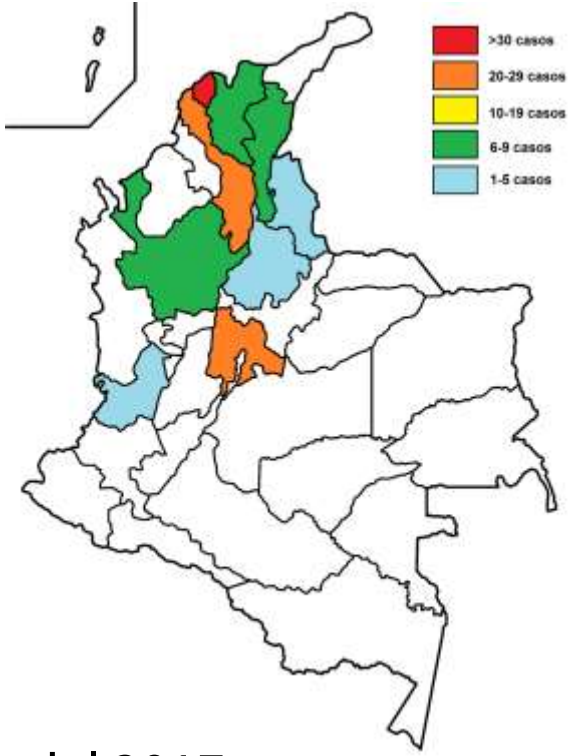
Colombia

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 23, No. 1, January 2017

Invasive Infections with Multidrug-Resistant Yeast *Candida auris*, Colombia

Soraya E. Morales-López,
Claudia M. Parra-Giraldo,
Andrés Ceballos-Garzón, Heidys P. Martínez,
Gerson J. Rodríguez, Carlos A. Álvarez-Moreno,
José Y. Rodríguez

- 17 pacientes identificados entre febrero a julio 2016.
- 10 de 17 (59%) aislamientos resistentes a FCZ.
- 35% de mortalidad a 30 días.



A Mayo del 2017:

107 casos, en 17 instituciones medicas de 9 departamentos del país.

Fuente: Lab. de Microbiologia, INS Colombia.

Datos en proceso de publicación.

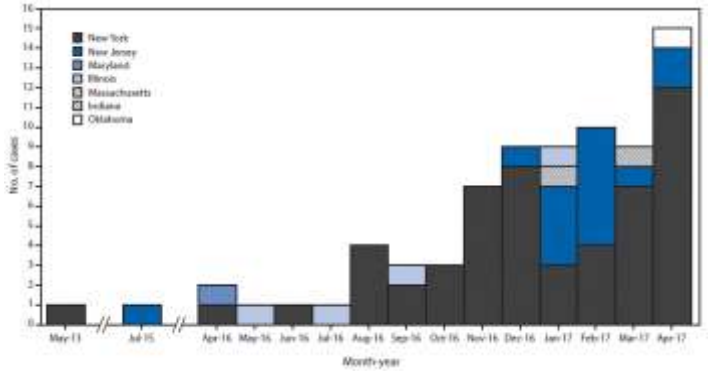
USA

MMWR / May 19, 2017 / Vol. 66 / No. 19

Ongoing Transmission of *Candida auris* in Health Care Facilities — United States, June 2016–May 2017

Sharon Tsay, MD[1,2]; Rory M. Welsh, PhD[1]; Eleanor H. Adams, MD[3]; Nancy A. Chow, PhD[1]; Lalitha Gade, MPharm[1]; Elizabeth L. Berkow, PhD[1]; Eugenie Poirot, PhD[2,4]; Emily Lutterloh, MD[3,5]; Monica Quinn, MS[3]; Sudha Chaturvedi, PhD[3,5]; Janna Kerins, VMD[2,6]; Stephanie R. Black, MD[6]; Sarah K. Kemble, MD[6]; Patricia M. Barrett, MSD[7]; Kerri Barton, MPH[8]; D.J. Shannon, MPH[9]; Kristy Bradley, DVM[10]; Shawn R. Lockhart, PhD[1]; Anastasia P. Litvintseva, PhD[1]; Heather Moulton-Meissner, PhD[11]; Alicia Shugart, MA[11]; Alex Kallen, MD[11]; Snigdha Vallabhaneni, MD[1]; Tom M. Chiller, MD[1]; Brendan R. Jackson, MD[1]

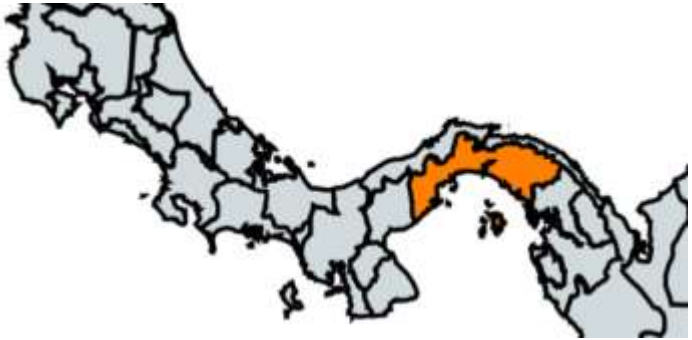
Location	Number Reported	Dates of collection
Illinois	4	May 2016 - Jan 2017
Indiana	1	Mar 2017
Maryland	1	Apr 2016
Massachusetts	1	Jan 2017
New Jersey	16	Jul 2015 - Apr 2017
New York	53	May 2013, Apr 2016 -Apr 2017
Oklahoma	1	Apr 2017



- 77 casos en 7 estados (53 en NY).
- 86% aislamientos resistentes a FCZ, 43% a Anfo B y 3% equinocandinas.

https://www.cdc.gov/fungal/diseases/candidiasis/candida-auris.html

Panamá



Confirman presencia de hongo "candida auris" en el Hospital Santo Tomás

http://www.telemetro.com/nacionales/Confirman-presencia-Hospital-Santo-Tomas_0_1015099285.html

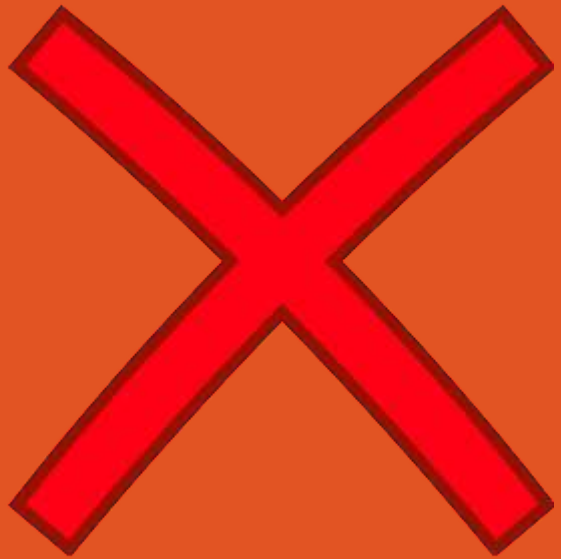
PANAMÁ

Por hongo 'Candida auris' el HST montó un cerco epidemiológico

http://elsiglo.com.pa/panama/hongo-candida-auris-monto-cerco-epidemiologico/23995733

¿Cual es el Problema?

1. Identificación errónea.
2. Resistencia a antifúngicos.
3. Trasmisión hospitalarios. (Persistentica y colonización).

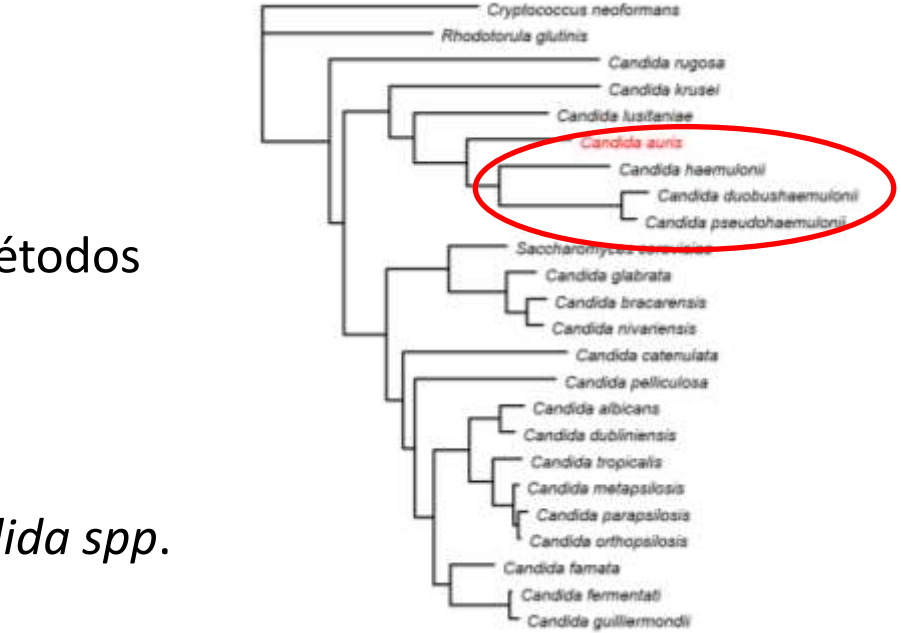


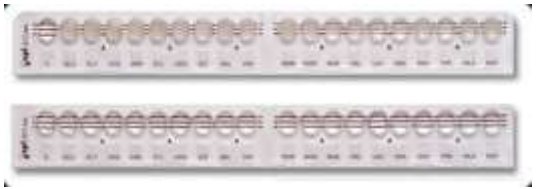
1. Identificación errónea

Identificación errónea

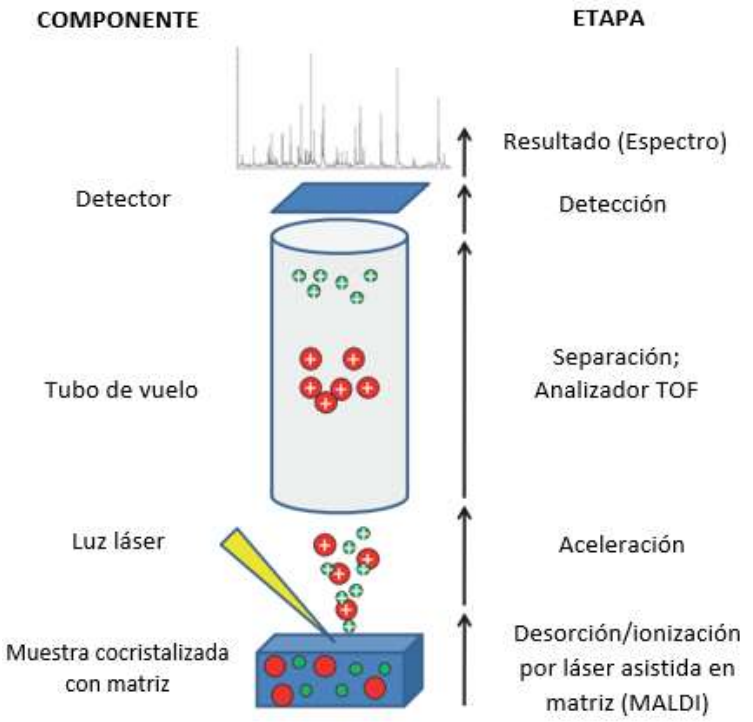
- Se confunde por otras especias con métodos fenotípicos (API, Microscan, VITEK-2).

- Las más comunes son: ***C. haemulonii***, *Rhodotorula glutinis, C. albicans, Candida spp*.





MALDI-TOF: desorción/ionización láser asistida por matriz

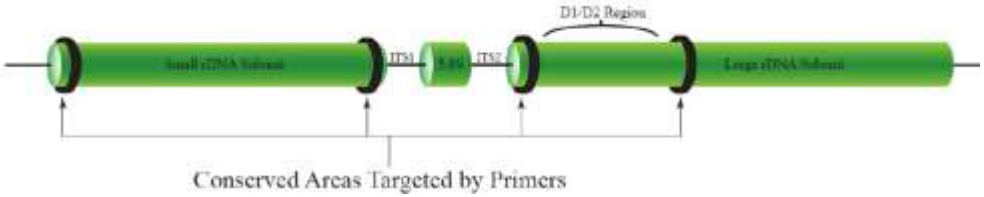


Microflex®
(Bruker)

VITEK MS®
(bioMérieux)

Identificación molecular

Secuencias blanco universales: gen que codifica el rRNA. Las regiones **ITS y D1/D2 (28S)**, son las regiones filogenéticamente mas variables (útiles para identificar especie).

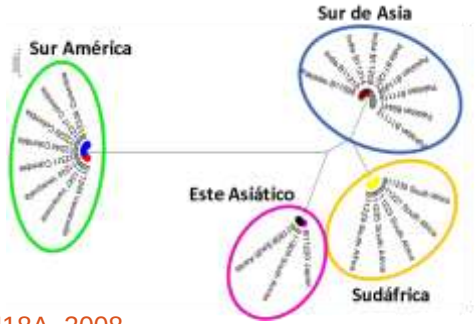


Análisis del genoma completo (WGS):

Muy diferentes entre regiones geográficas (>40K-400K SNPs)

Muy parecidos entre países de la región geográfica (<70 SNPs)

*SNPs (Single nucleotide polymorphisms)

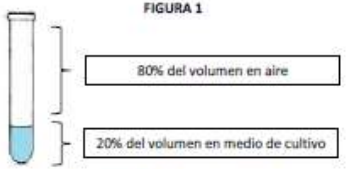


Interpretative criteria for identification of bacteria and fungi by DNA target sequencing; aproved guidelines. CLSI MM18A, 2008
Lockhart, S., et al. Clinical Infectious Dis, 2016, Oct 20

Alternativas para aproximarse a identificar *C. auris*: medio selectivo

1. Prepare el caldo y sirva este en tubos de cultivos, tenga en cuenta que el medio líquido servido no exceda el 20% del volumen total de tubo, por ejemplo: si va a utilizar tubos con un volumen de 10 mL, sirva en este 2 mL del medio líquido (Figura 1).

FIGURA 1

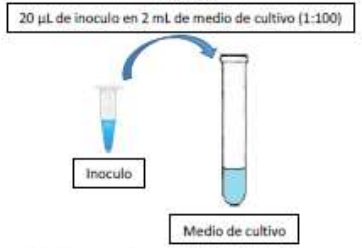


2. Utilice 3 tubos de cultivo, identificados de la siguiente manera:
   a. 1 tubo control negativo del medio: solo medio líquido.
   b. 1 tubo control negativo de microorganismo: medio con inoculo de Candida albicans.
   c. 1 tubo control positivo de microorganismo: medio con inoculo de Candida auris.

3. Preparación del inoculo:
   a. Sirva 1 mL del medio líquido en un vial estéril.
   b. Agregue 1 colonia aislada del micro organismo a cultivar en el medio.
   c. Homogenice el inoculo con ayuda de una vortex.

4. Análisis: une vez tenga preparado el inoculo, agregue este en el tubo final de cultivo en un dilución 1:100, por ejemplo: para un tubo con 2 mL de medio de cultivo, agregue a este 20 µL del inoculo (Figura 2)

FIGURA 2

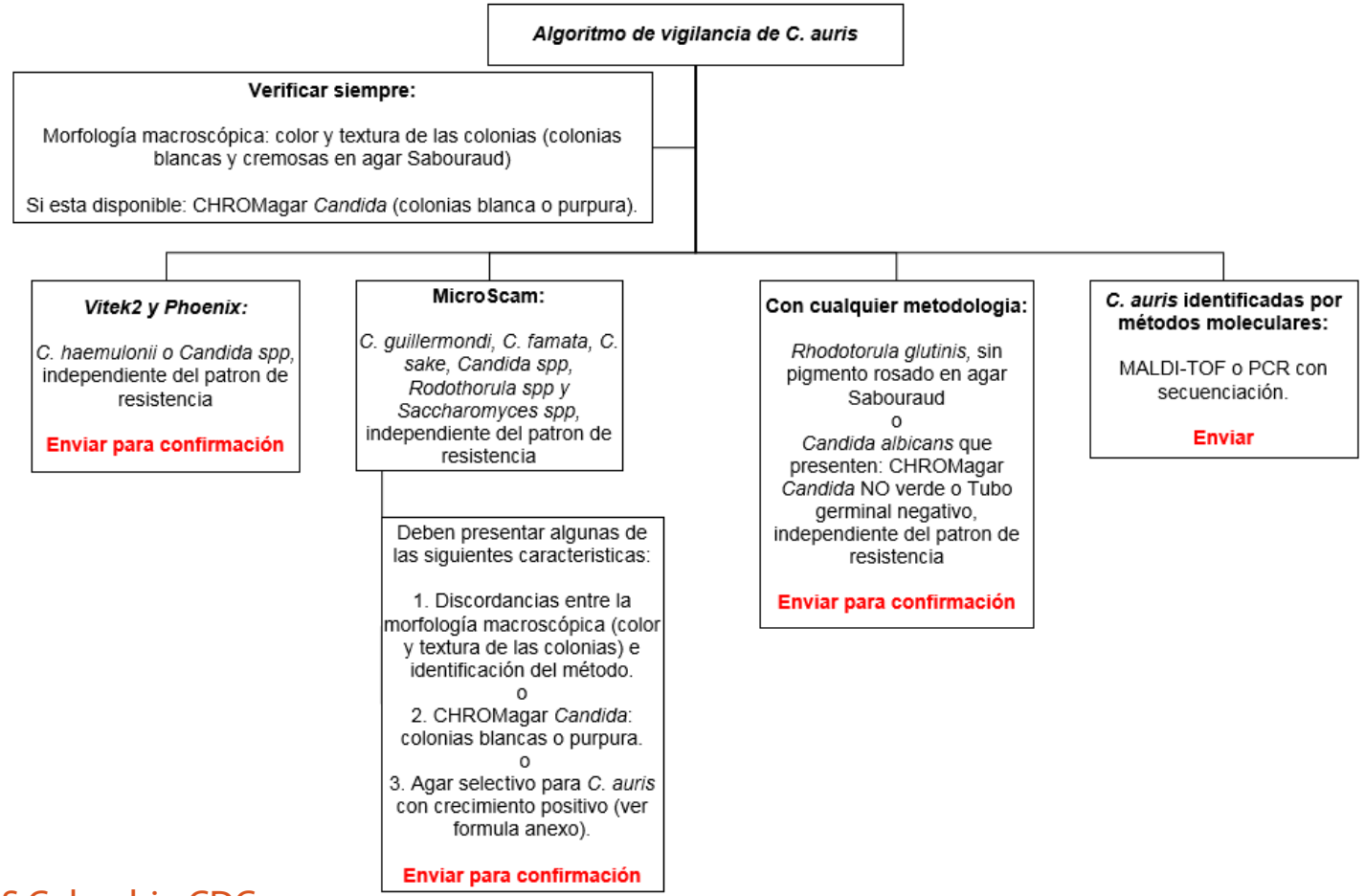


5. Incube los tubos a 40ºC con agitación 200 revoluciones por minuto, por 48 horas.
6. Pasadas 48 horas, revise los medios, la presencia de turbidez indica una prueba positiva (Figura 3). A partir del tubo positivo, cultive este en un agar Sabouraud.

FIGURA 3

7. Realice la confirmación del microorganismo aislado utilizando métodos moleculares (MALDI TOF o secuenciación).

Paciente en Unidad de Cuidados Intensivos: Aislamiento obtenido de cualquier tipo de muestra.
Paciente hospitalizado: aislamientos obtenidos de hemocultivos, orina, secreciones y otros líquidos estériles



Cortesía: INS Colombia-CDC

2. Resistencia a antifúngicos

Multidrogo resistencia en *Candida auris*

Polienos

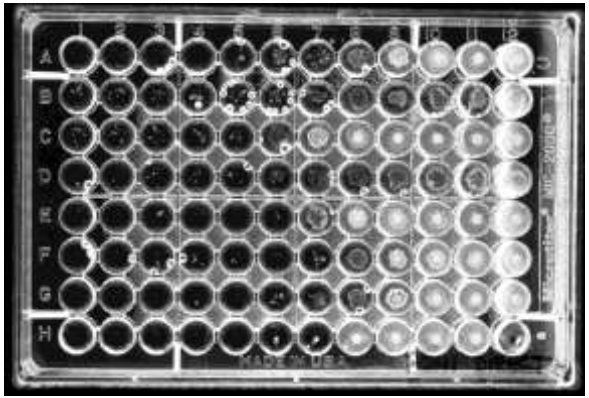
Azoles

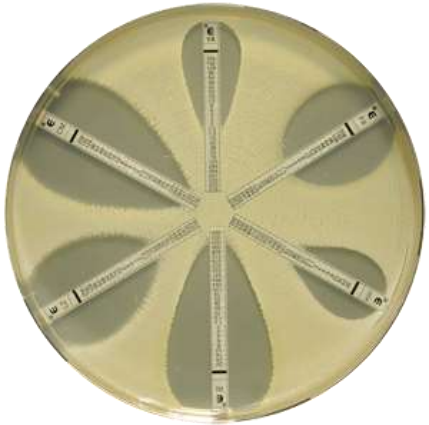
Equinocandinas

Algunos aislamientos resistentes a todas las clases de antifúngicos

Sensibilidad a antifúngicos

- 93% resistentes a fluconazol.
- 54% resistentes a voriconazol.
- 35% resistentes a anfotericina B.
- 7% resistentes a equinocandinas.
- 41% MDR.
- 4% resistentes a todas los tipos de antifungicos.





Lockhart, S., et al. Clinical Infectious Dis, 2016, Oct 20

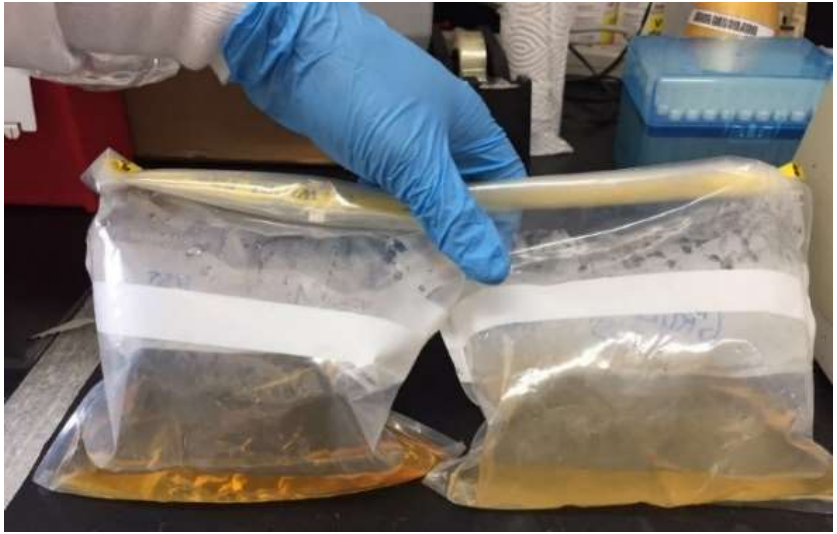
3. Trasmisión hospitalarios: colonización

Sal
(NaCl 10%)

+

Temperatura
40-42°C

Caldo selectivo

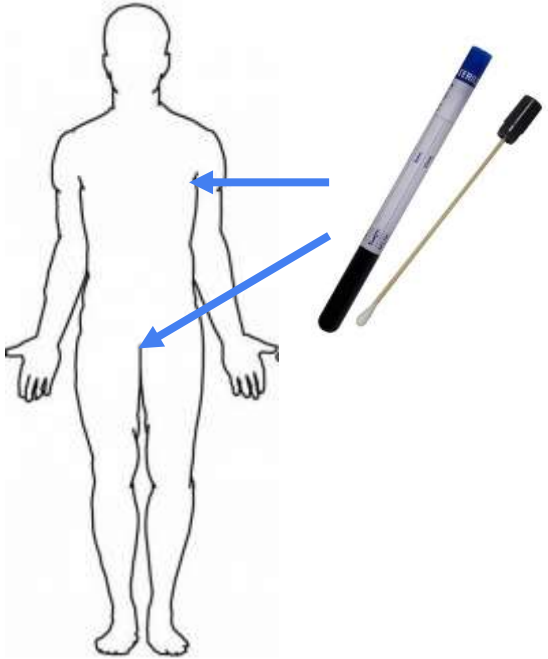


CHROMagar

C. auris (colonias blancas-rosa)

¿Como detectar *C. auris?*

Pacientes
(Tamizaje y detección)

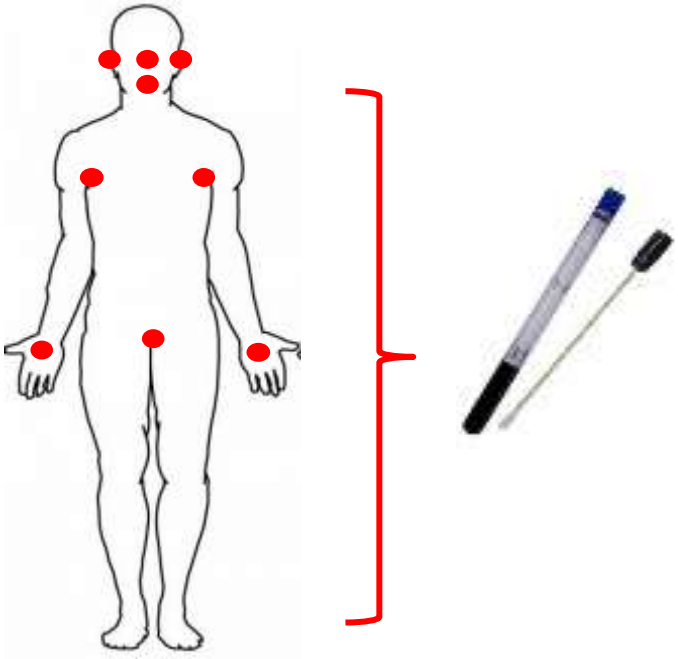


Ambientes
(Investigación en salud publica)

3M™ Sponge-Sticks

http://www.3m.com/3M/en_US/company-us/all-3m-products/~/SPGESTK-3M-Sponge-Sticks?N=5002385+3293785595&rt=rud

Resultados del muestreo de colonización en Colombia Epi-Aid: septiembre 2016



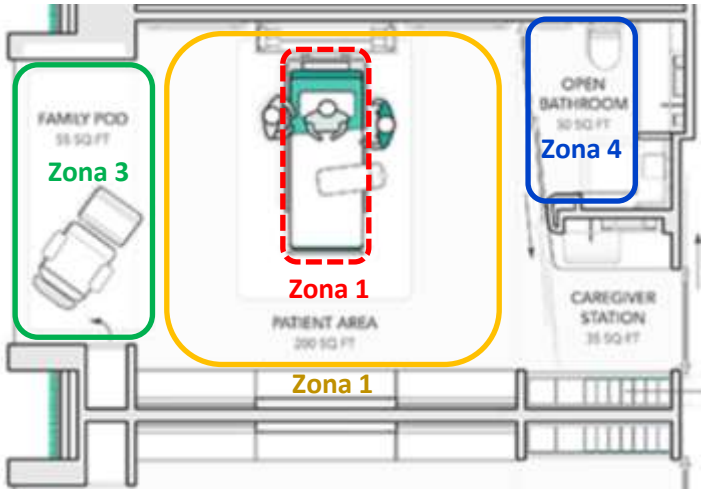
Fueron recolectadas muestras de 7 pacientes con diagnostico previo de infección por *C. auris* y 10 contactos.

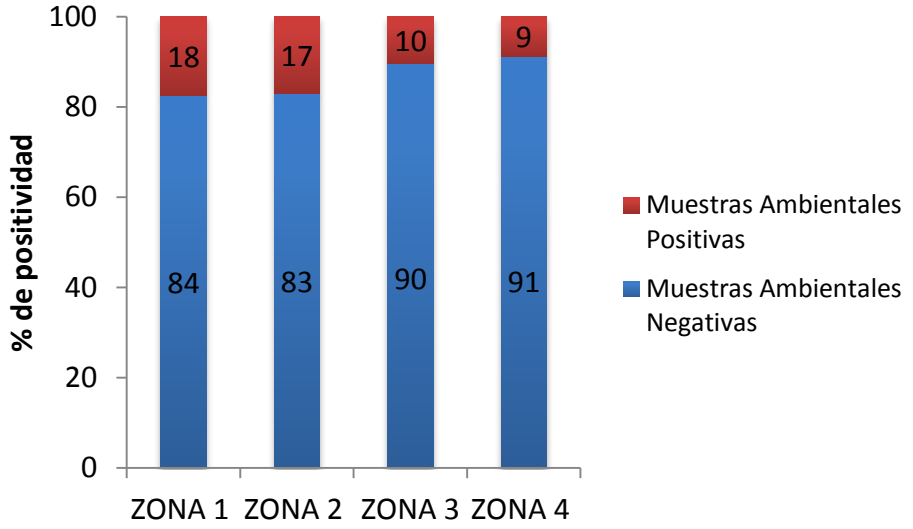
5 de 7 pacientes (**71%**) estuvieron colonizados por *C. auris.*

2 de 10 contactos (**20%**) presentaron evidencia de colonización por *C. auris.*

Fuente: Escandon et al. Resumen en cartel API Panamá 2017

Resultados del muestreo ambiental en Colombia Epi-Aid: septiembre 2016





Se aisló *Candida auris* en 40 de 255 (**16%**) muestras ambientales.

Fuente: Escandon et al. Resumen en cartel API Panamá 2017

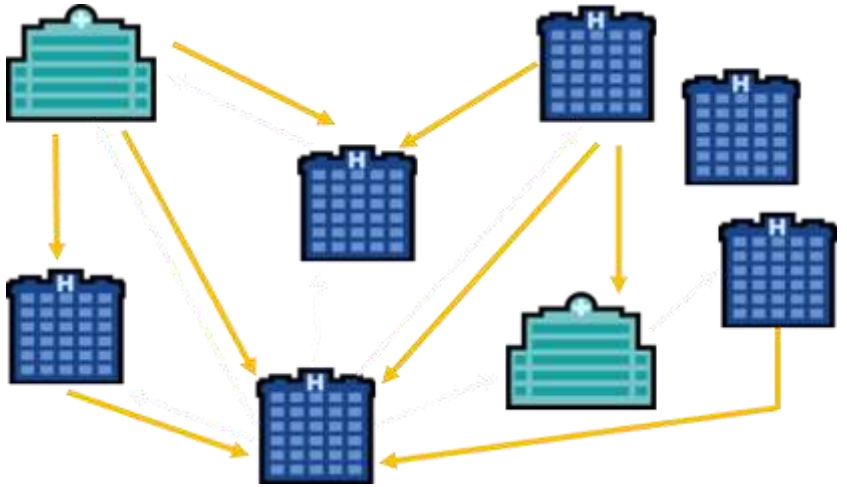
Outline – Infection control for *C. auris*

- Why should IPC personnel care about *C. auris*
- When to suspect a case
- Reviewing IPC practices for *C. auris* cases
- Screening for colonization
- Summary

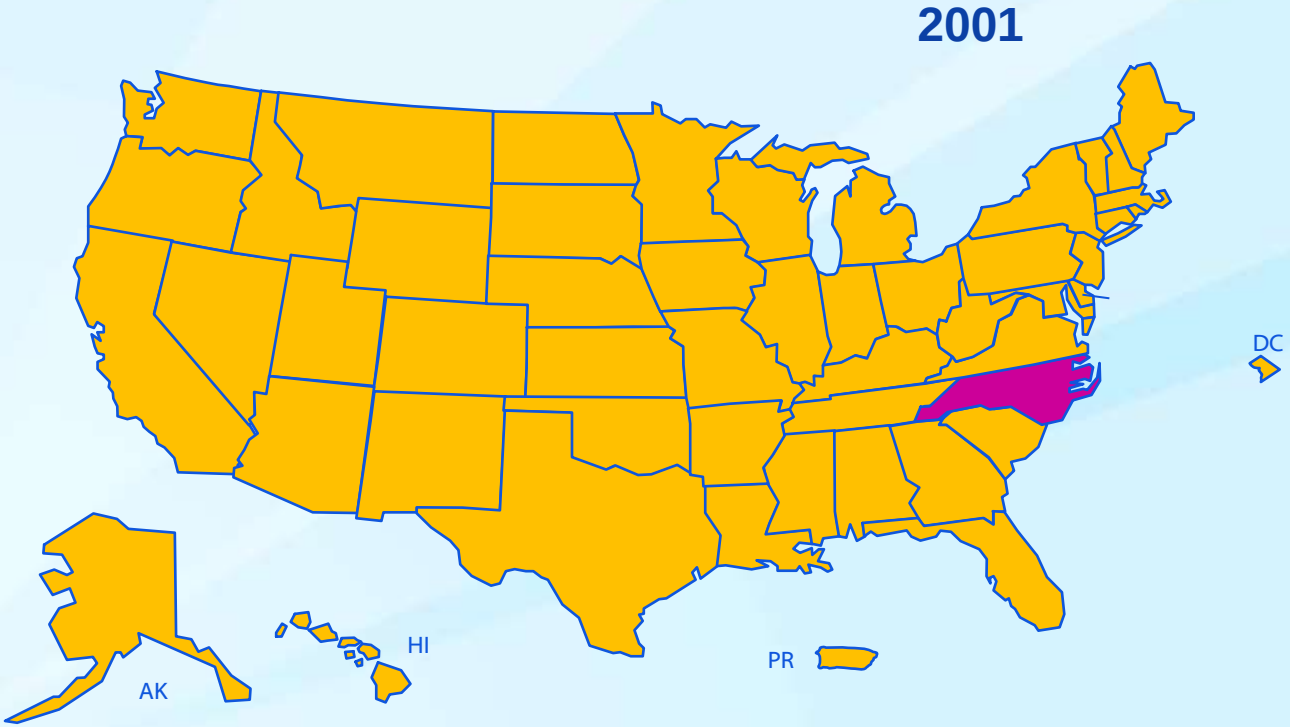
Why should IPC personnel care about *C. auris*?

C. Auris is an epidemiologically important organism

- It is a serious infection that is often multi-drug resistant
- It is difficult to identify with standard laboratory methods
- Can cause outbreaks in hospitals and spread throughout healthcare systems
- Emerging in several places around the world

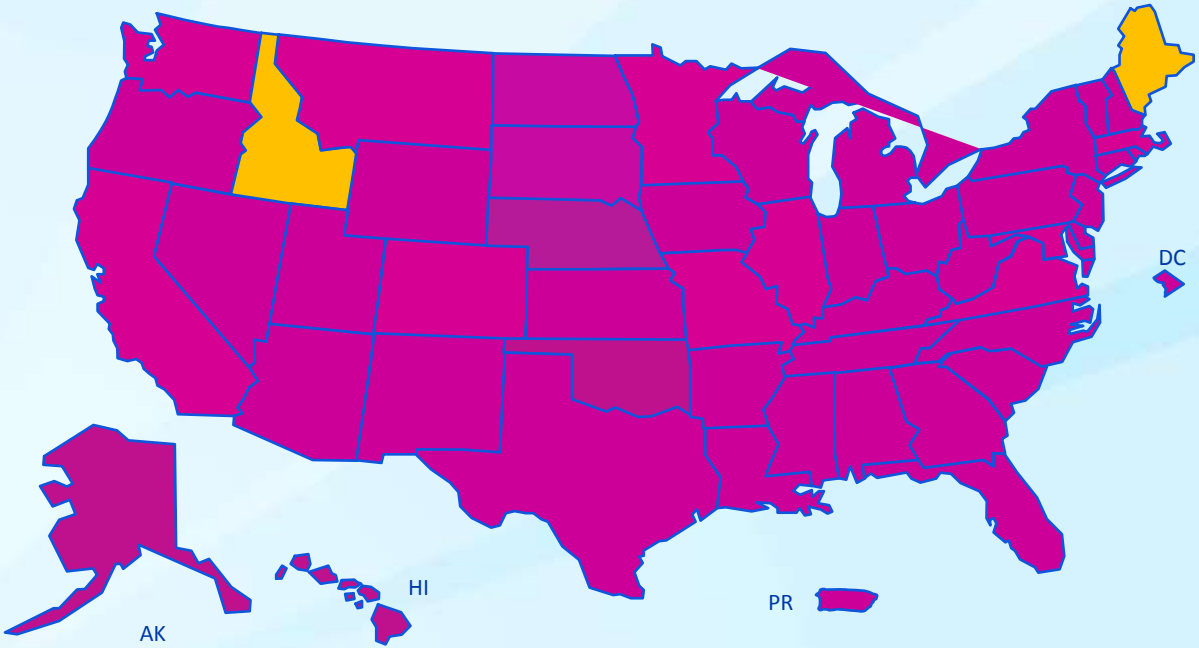


KPC-producing CRE in the United States



KPC-producing CRE in the United States

August 2016



IPC personnel are on the front lines

- Often hear about new or uncommon infections first
- Responsible for control of communicable diseases within healthcare settings
- Relationships across the hospital (e.g. Lab, cleaning services, administration, clinical services) allow for coordinated response to emerging infections
- This talk will give practical guidance on what to do if you suspect a case of *C. auris* in your hospital

How do you know if you have a case of *C. auris*?

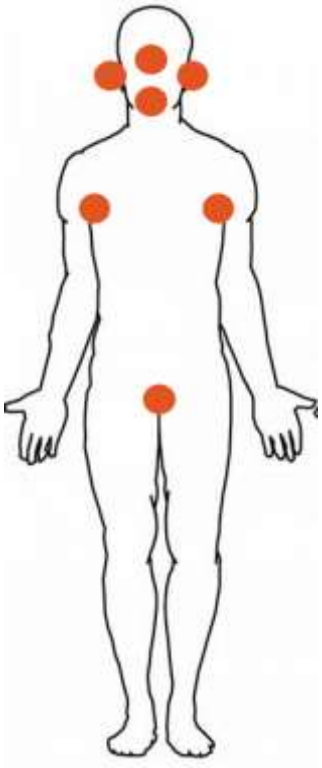
When should you suspect a case of *C. auris*

- You see new cases or an increase in rare types of yeast
  - *C. haemulonii* especially
  - *Rhodotorula glutinis,* other rare *Candida* spp
- Important to know what your lab has for identification of yeast → this informs misidentification patterns

- You have cases in other hospitals or healthcare facilities in your city
  - Patients can be colonized for long periods of time and transmit infection when admitted to your hospital

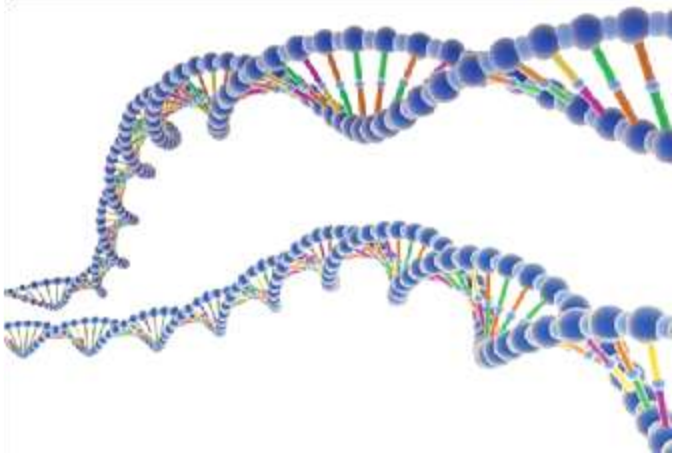
Persons with *C. auris* may be infected or colonized

- Most patients who have active infection are also colonized with *C. auris* on their skin
- Some patient who never appear sick may also be colonized with *C. auris* on their skin
- Both colonized and infected patients are at risk for transferring *C. auris* to other patients or the environment



How can you confirm infection with *C. auris?*

- Cannot be done with most commonly used identification methods, even automated identification machines (E.g. VITEK)
- Requires either
  - Sequencing the isolate
  - MALDI-TOF
- Where do these capabilities lie in your country or region? How can you access them if needed?



What IPC practices are important for patients with *C. auris*?

IPC for *C. auris*

- Remember your standard precautions! Especially:
  - Hand hygiene
  - Environmental cleaning
- Contact precautions required

Standard precautions: general

- Elements of standard precautions are the primary strategy for preventing healthcare-associated transmission of infections
- Most relevant for *C. auris* are
  - Hand hygiene
  - Environmental cleaning

Hand hygiene

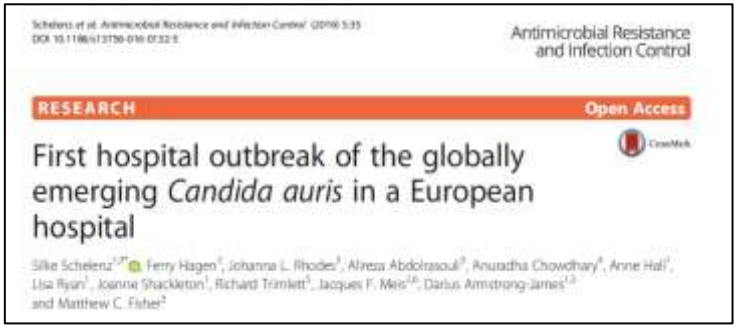
- Overall recommendations are not different for *C. auris* compared with other organisms
- Alcohol-based hand rub most effective, soap & water is an alternative
- Wash hands with soap/water when visibly dirty or contaminated with blood or bodily fluids
- Observe the 5 moments of hand hygiene

C. auris in the environment

- *C. auris* can persist in the environment of healthcare facilities for weeks
  - CDC lab showed persistence for >4 weeks on plastic surfaces
  - Some cleaning agents (e.g. quaternary ammonium compounds) are not effective
- Recommend using disinfectant effective against *Clostridium difficile* spores
  - US Environmental Protection Agency list K
  - Diluted bleach (1:10 dilution of 5.25% bleach)

Environmental cleaning

- Robust environmental cleaning and disinfection is key to reducing the burden of *C. auris* in the environment
  - Daily cleaning
  - Terminal cleaning



- Hospital outbreak of *C.* auris in the UK required aggressive environmental cleaning
  - Cleaning rooms with bleach 3x/day
  - Terminal cleaning with higher concentration of bleach
  - Use of hydrogen peroxide

Environmental cleaning considerations

- Frequency, thoroughness, methods determined by facility policy
- Aggressive daily cleaning with focus on high-touch surfaces (e.g. doorknobs, bedrails)
- Adequate number of trained cleaning staff needed
- Ensure monitoring and supervision of cleaning staff
- Environmental cleaning is critical part of IPC in a hospital!

Monitoring of terminal cleaning

- Goal of terminal cleaning -- move towards eradicating organisms from the patient environment after a patient is moved
- Monitoring of terminal cleaning can provide information on efficacy
- Can be done via
  - Observation with standardized checklists[1]
  - UV light and fluorescent dots
  - ATPase detection

[1]https://www.cdc.gov/hai/pdfs/toolkits/Environmental-Cleaning-Checklist-10-6-2010.pdf

Additional precautions for patients with *C. auris*

- Preventing transmission of *C. auris* requires more than standard precautions
- Like other multi-drug resistant organisms (MDROs), *C. auris* is transmitted by contact between people or people and the environment
- Contact precautions required for all suspected or confirmed cases of *C. auris* infection and patients who are colonized with *C. auris*

Elements of contact precautions: isolation

- Wherever possible, patients should be isolated in a single patient room
- When this is not possible – IPC personnel should assess risks associated with other placement options
  - Cohorting
  - Keeping patient with current roommate(s)
- If patient remains in multi-patient room, ensure >1 meter separation between beds

Elements of contact precautions: PPE

- All healthcare personnel, including cleaning staff, who have contact with patient or patient environment need to wear appropriate PPE
  - Gown and gloves to minimize contact with patient and environment
  - PPE should be put on upon entering the patient room or care area and discarded before exiting
  - PPE should be changed between each patient interaction
- Signage should indicate to staff and visitors that contact precautions are required

Can contact precautions ever be removed?

- Currently the duration of patient colonization with *C. auris* is unknown
- Contact precautions should not be removed if a patient is still colonized or ill with *C. auris* infection
- Safest strategy maintain contact precautions indefinitely
  - Duration of hospitalization
  - During future readmissions → flag file to ensure communication

Can patients be decolonized?

- There is currently no data on the efficacy of decolonization for patients with *C. auris* using chlorhexidine or topical antifungals

Communication

- Communication within/between health systems key to controlling *C. auris*
- Frontline staff should be aware of *C. auris* and understand what actions to take if a case is identified
  - Alert IPC focal persons
  - Initiate contact precautions
- Communicating information on *C. auris* infection or colonization whenever patients are transferred between healthcare facilities

Public health notification

- Health care professionals should contact relevant public health authorities if they suspect a case of *C. auris*
  - Monitor emergence, outbreaks, spread
  - Facilitate additional resources needed for identification, control
  - Communicate that the organism has been identified in country

Screening patients for *C. auris* colonization

Halting transmission of *C. auris*

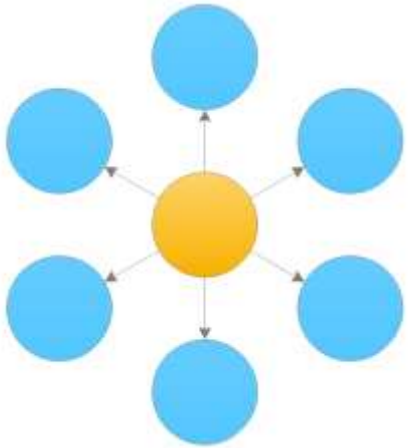
- *C. auris* can colonize patients who have no signs or symptoms of infection → transmission despite appropriate precautions for clinical cases
- Screening of asymptomatic patients can quantify the burden of colonization, halt transmission
- All screening involves swabbing skin, usually axilla and groin, of a patient and processing swabs to specifically look for *C. auris*

Screening strategies

- Screening epidemiologically-linked contacts
- Point-prevalence study of wards/units
- Active surveillance

Screening epidemiologically-linked contacts

- Epidemiologically-linked contacts of a *C. auris* case usually includes any roommates but can also include
  - Patients who shared a healthcare worker with a case
  - Patients who were roommates but were recently moved
  - Patients on the same ward as a case
- Can be done each time a new clinical case is identified
- May only be feasible if small number of incident cases



Point-prevalence survey

- Rapid way to evaluate the burden of *C. auris* in a certain area
- Screening all persons in a geographical area (e.g. ward or unit)
- May be most useful
  - In outbreak settings
  - If screening contacts yields high rates of colonization
- Can be done once or at some frequency depending on the burden of colonization found

Active surveillance

- Screening patients for *C. auris* who do not have any epidemiologic link but meet certain specified high-risk criteria
  - Patients admitted to high risk settings (e.g. ICU)
  - All admissions from hospitals with known *C.auris* patients
- Most useful in areas with high prevalence of *C. auris* or in outbreak scenarios
- Difficult to define relevant criteria given epidemiology of this infection is not well known, may differ in each country.

When to employ screening strategies?

- Selection of screening strategy depends on multiple factors
  - Burden of *C. auris* in a facility/country
  - Laboratory capacity to process additional specimens
  - Hospital capacity to screen and isolate additional patients
  - Epidemiologic capacity to plan screening strategy and interpret results
- Screening strategies do not prevent infections by themselves, they only identify unmeasured colonization
- In order to halt transmission, screening must be paired with isolation of all persons identified to be colonized with *C. auris*

What isn’t recommended

- Routine environmental sampling to determine burden of colonization
- Routine sampling of healthcare worker hands

Summary

- IPC personnel should be aware of *C. auris,* an emerging multi-drug resistant yeast
- Identification of *C. auris* is difficult and requires advanced laboratory capabilities
- *C. auris* can colonize people and the environment and persist for long periods of time
  - Hand hygiene, environmental cleaning, contact precautions key to reducing colonization, stopping transmission
- Controlling transmission may require resource-intensive screening strategies to identify unmeasured colonization

Working together we can combat *C. auris!*












Relevant links

- CDC recommendations for healthcare facilities and laboratories around *C. auris*
  - https://www.cdc.gov/fungal/diseases/candidiasis/recommendations.html
- UK outbreak paper
  - https://aricjournal.biomedcentral.com/articles/10.1186/s13756-016-0132-5
- US guidance on isolation precautions in healthcare settings
  - https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines.pdf
- US guidelines on environmental infection control in healthcare facilities
  - https://www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines.pdf
- EPA list K disinfectants
  - https://www.epa.gov/sites/production/files/2017-01/documents/20172701.listk_.pdf

Thank you!

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.

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Próximo Webinar/Next Webminar

Julio 11- 2pm (WDC)/July 11– 2pm EST

- Prevención de Infecciones de Sitio Quirúrgico/ Prevention of Surgical Site Infection

- Dr. Silvia Acosta-Gnass– Riverside County Regional Medical Center. Riverside, CA