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München
Gesundheitsreferat

C. auris Ausbruchsmanagement

Wie ein Pilz zur Gefahr wird

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Landeshauptstadt München, GSR-Infektionshygiene

Fälle von Candida auris breiten sich rasant aus.

Gegen Medikamente immun Zahl gefährlicher Pilzinfektionen steigt

Zudem kann ein allgemeines Unwohlsein sowie Trockenheit im Mund auftreten. In manchen Fällen kann aber auch ein weißer Belag, ein sogenannter Biofilm, erkennbar sein, zum Beispiel auf den Schleimhäuten im Mund. Daran lässt sich ein Pilzbefall rasch erkennen.

Am liebsten nistet sich der Erreger in Wunden ein, die ihm ermöglichen, in die Blutgefäße einzudringen. Dort kann er eine lebensgefährliche Blutstrominfektion, *eine sogenannte Pilzsepsis*, auslösen. Außerdem kann der Pilz in

> ***Wir müssen davon ausgehen, dass die Candida-auris-Fälle in Deutschland weiter zunehmen.***

Patienten einen dramatischen Verlauf, der sich über Monate hinziehen kann. „Dann muss die Prothese zuerst operativ entfernt werden, während es noch nicht möglich ist, eine neue Prothese einzusetzen", sagt Kurzai. „Dieses Risiko besteht auch für Patienten mit einem normal funktionierenden Immunsystem."

Für Gesunde ungefährlich

Gesunden Menschen setzt der Pilz sonst für gewöhnlich nicht zu. Er kann sie lediglich kolonisieren, also besiedeln, ohne eine Infektion

Berliner Tagesspiegel.de 4 Mai 2024

Candidozyma auris[6] (*C. auris*): global threat

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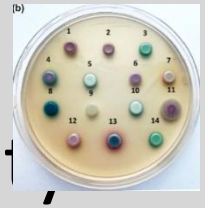
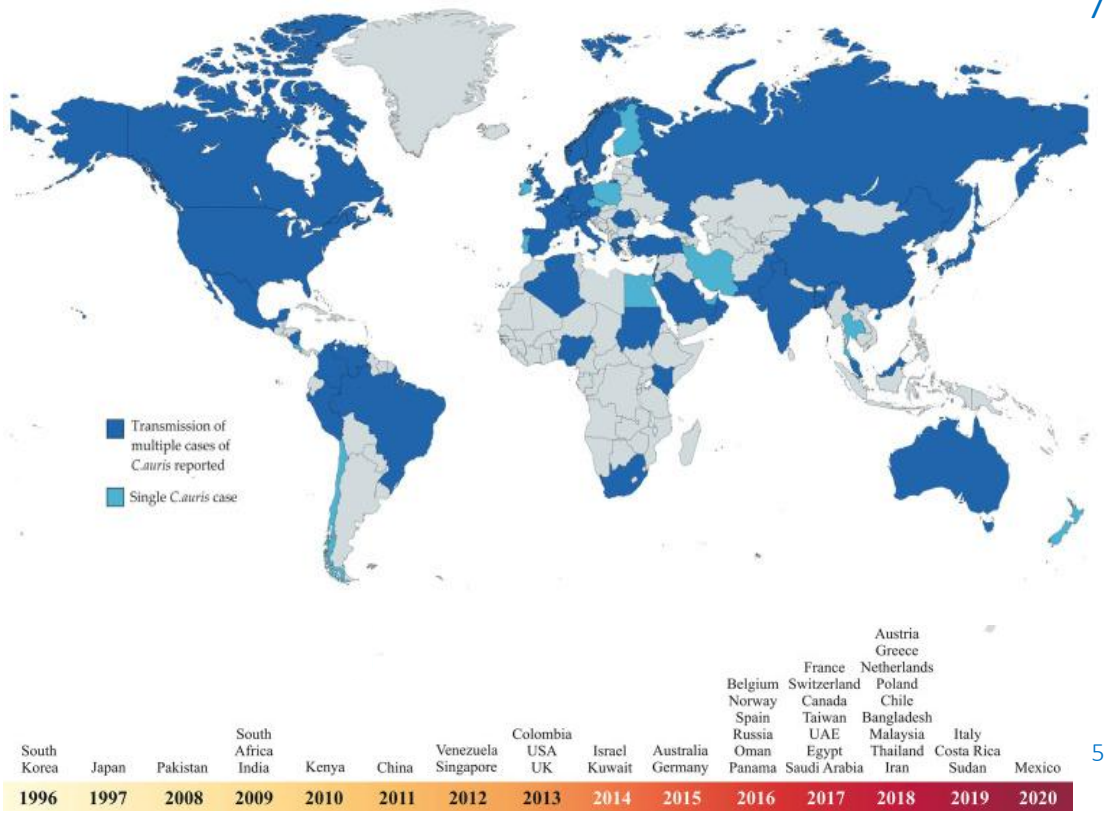
- 1st case report, Japan 2009[1,]
- 1st candidemia, Korea 2011[2]
- Retrospective 1st isolate 1996[2]
- 28-70% mortality
- Outbreak: cases 2 to >600 [4]
- Often misidentified
- Multi-resistant
- WHO: on fungal priorit[y]





1. [1].Satoh K et al.. Microbiol Immunol. 2009;53(1):41-4 [2] Lee WG et al J Clin Microbiol 2011 3. Ann Intern Med.2023;176:489-495, 4. Pathog Dis 2020:78:ftaa034, 5. J Med Microbiol. 2021 Mar; 70(3): 001318. 6. Persoonia 52, 2024: 22–43. 7. Silva I et al 2024

‘Natural’ (environmental) reservoir[6]

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- Der Mensch ist kein ‘natürlicher’ Wirt
- Marine ecosystem (sea water, beaches) (India)[5]
- Estuaries (Columbia)[10]
- Community wastewater (USA, Korea) [6,11,12]
- Dog ear/oral cavity (Spain, India)[8,9]
- Reptile: Egyptian cobra[13]
- Air borne dust (Kuwait)[11]
- Fungicide treated stored apples (India)[7]





5. mBio. 2021;12:e03181-20. 6. Environ Sci. Technol. 2023;57:1755-63, 7. mBio 2022;13(2):e0051822, 8. J Fungi 2023;9(7):720, 9. mBio 2024;15(2):e0308023, 10.Escadon 2022, 11. Irinyi 2022 12. Babler et al.2023., 13. Med Mycol 2024, Jul 4;62(7):myae056

Ausbruchpotential verschiedener C. auris Cladden

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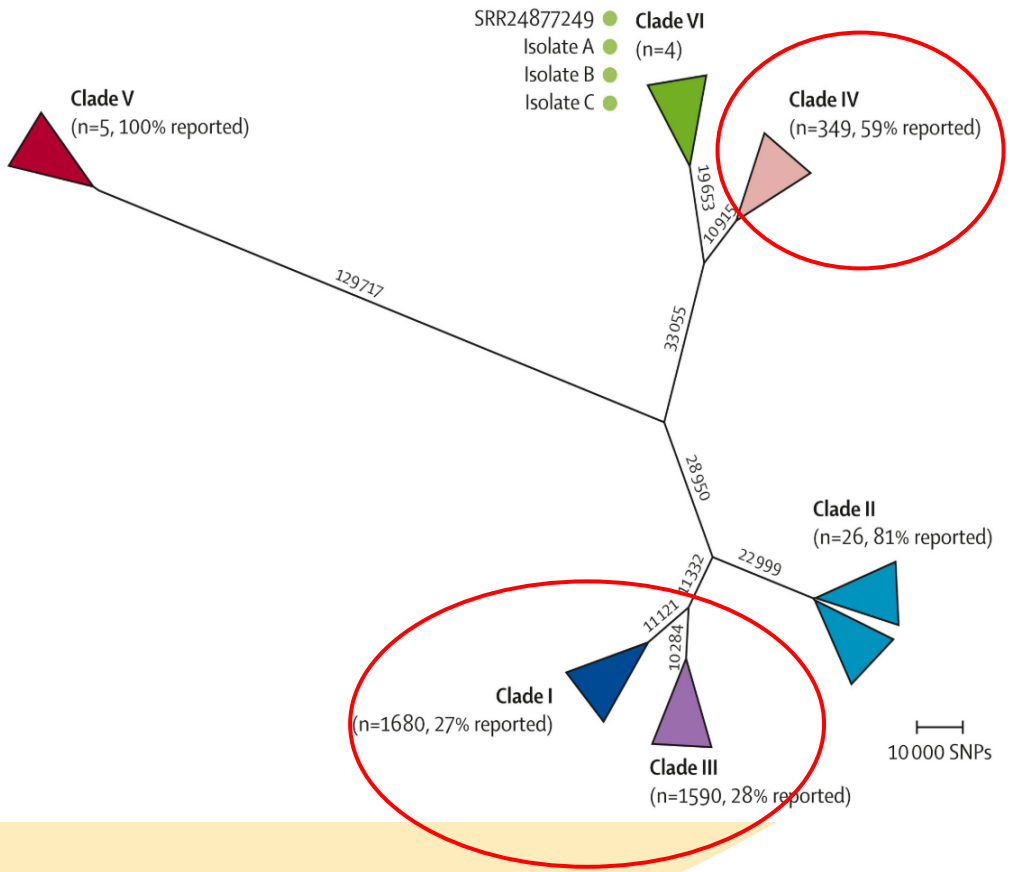
Whole-genome SNP distance among 3654 *C. auris* genomes[4]



Clade typ	Geography	Outbreak	Clinical	AMR Pattern
I	South Asia	yes	Invasive infection	Resistent
II	East Asia	No	Otomycosis	Susceptible
III	Africa	Yes	Invasive infection	Resistant
IV	South America	Yes	Invasive infection	Resistant
V	Iran	No	Otomycosis	Susceptible
VI	Indomalayan zone	No?	? Invasive infection	Susceptible?

[1] Ko et al E1035 ESCMID 2024 , [2] Chow et al. EID 2018, [3]. medRxiv 2023.08.01.23293435 8, [4]. The Lancet Microbe, 2024 Volume 5, Issue 9, 100878

Neigung zur Übertragung und Verursachung von Ausbrüchen im Krankenhaus

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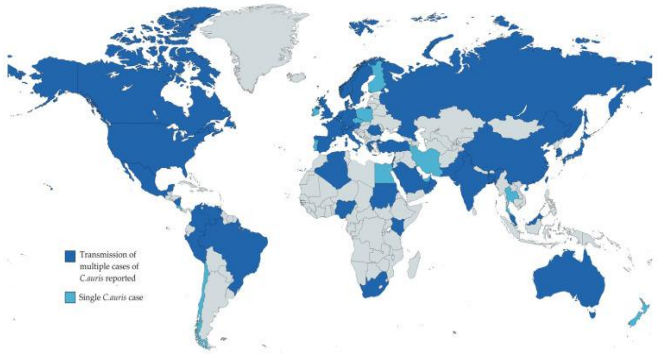
Country	Year	Impact	Reference
India	2013	Mortality 44%, candidaemia ICU, NICU	Chowdhary A et al. 3013 Lockhart et al CID 2017
Pakistan	2013	Mortality 52%, candidaemia	Lockhart et al CID 2017, Mahmood TIMM 2017
Venezuela	2012	Mortality, candidaemia	Lockhart et al CID 2017, Calvo et al. 2016
Columbia	2015/16	candidaemia, high mortality, Hands HCW pos, environmental contamination	Escandón P eta l CID 2018
South Africa	2013/14	Mortality 46%	Lockhart et al CID 2017
UK	2015/16	environmental contamination, ICU	Schelenz et al. 2015
Spain	2015/16	38.7% mortality, breakthrough candidaemia, ICU	Ruiz-Gaitan et al 2017
USA	2016	Long term care facilities	Vallabhaneni S et al MMWR 2016
Canada	2016	ICU	Schwartz et al 2017
Israel	2017	Travel S Africa, ICU,	Belkin A et al. Em Inf Dis. 2018

now in >61 countries



Silva I et al 2024

2 to >600 Fälle pro Ausbruch

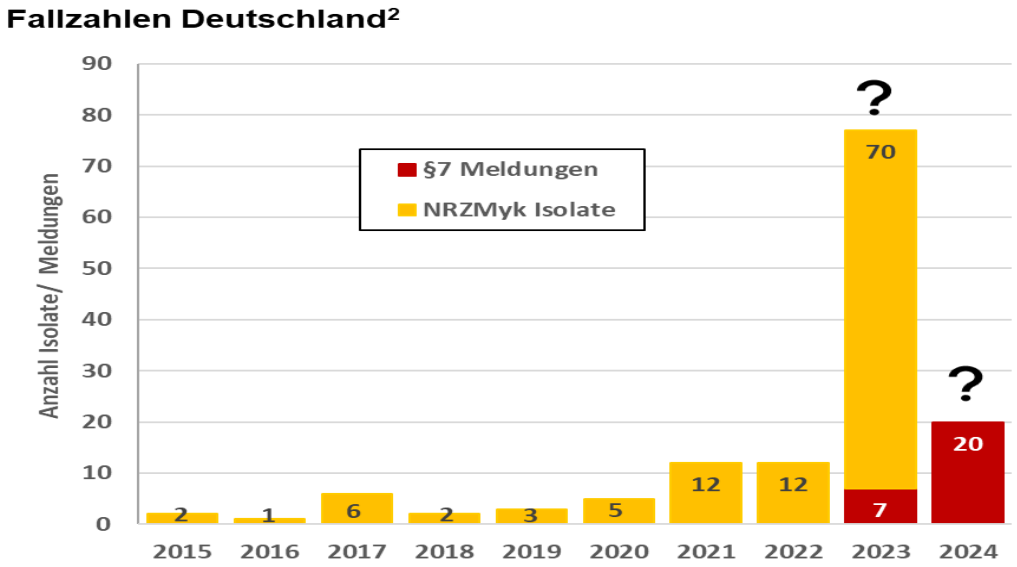
Pathog Dis 2020:78:ftaa034

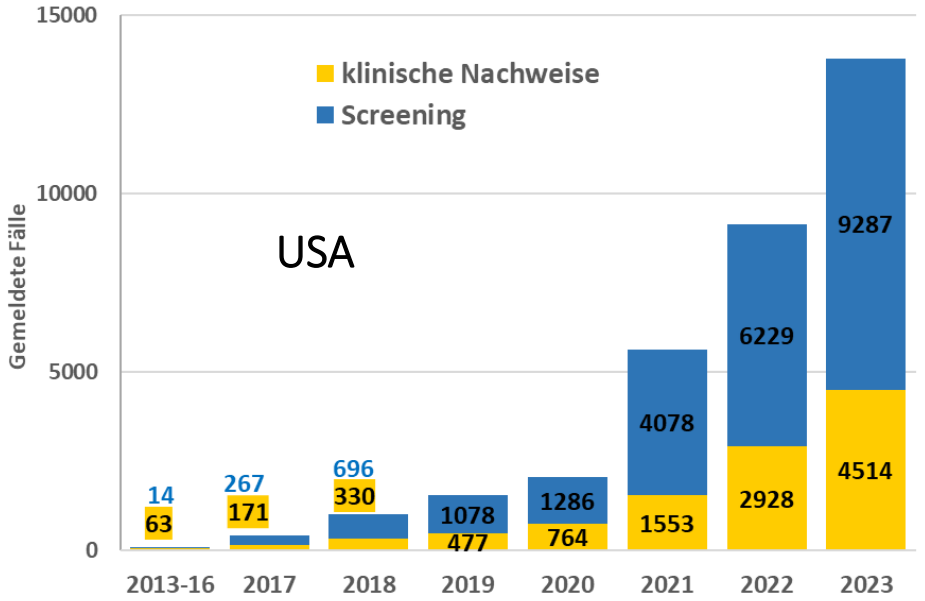
Fallzahlen nehmen zu

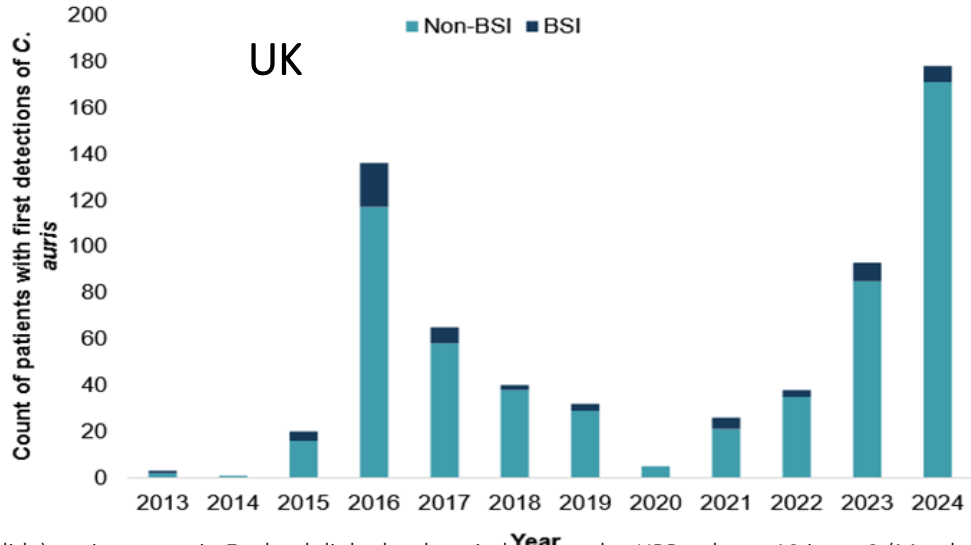
- Transmission rising dramatically
- Cases rising in post-acute care facilities

Possible reasons:

- Deficiencies in early identification of cases
- Deficiencies in implementation of infection prevention and control measure







1 Hinrichs C et al. (2022) Successful Control of Candida auris transmission in a German COVID-19 intensive care unit. Mycoses. 022;65:643–649.
2 Aldejohann AM et al. (2024) Zunahme von Candida auris in Deutschland im Jahr 2023. Epid Bull 2024;18:3-7.

1 CDC Candida auris. https://www.cdc.gov/fungal/candida-auris/tracking-c-auris.html

UK Health Security Agency. Increase in Candidozyma (Candida) auris reports in England, linked to hospital outbreaks. HPR volume 19 issue 3 (March 2025).

Was macht *C. auris* im Krankenhaus so übertragbar ?

Atributes	Impact	Reference
Prolonged **persistence** in environment (salt & thermotolerant)	>4 weeks Increased risk of exposure to patients/staff	Abdolrasouli, A et al Mycoses 2017; Kean et al., 2018
Biofilm formation (glass, fabric, plastic, wood, steel) Survival on non-porous plastic or metal	*In vitro*, prolongs biofilm eradication by antifungals (echino, azoles 512-fold) > 10 days	Larkin et al., 2017; Sherry et al., 2017, Horton et al. 2020, Romera et al., 2019, Antimicrobial stewardship & epidemiology 2024;4(Suppl S1):s90
Persistence on linen, hospital curtains	*In vitro* 7 days linen, 39 days curtains	Biswal et al 2017, Antimicrobial stewardship & epidemiology 2024;4, (Suppl S1):s90
Shedding from skin into environment	Environmental contamination	Schelenz et al 2015
Lack of effective skin decontamination products	Prolonged shedding	Abdolrasouli, A et al Mycoses 2017 Moore, G et al J. Hosp. Infect 2017
Antifungals (echinocandins) **Anti fungal resistance**	No effect on skin eradication Delay in effective treatment	Schelenz personal observation
Rapid transmissibility	Patient exposure ≥ 4hours	Schelenz personal observation
Resistant to some disinfectants (Quaternary ammonium)	Prolonged environmental contamination	Cadnum JL et al ICHE 2017
Delayed laboratory detection & surveillance (misidentification)	Delayed IPC implementations & management of cases	

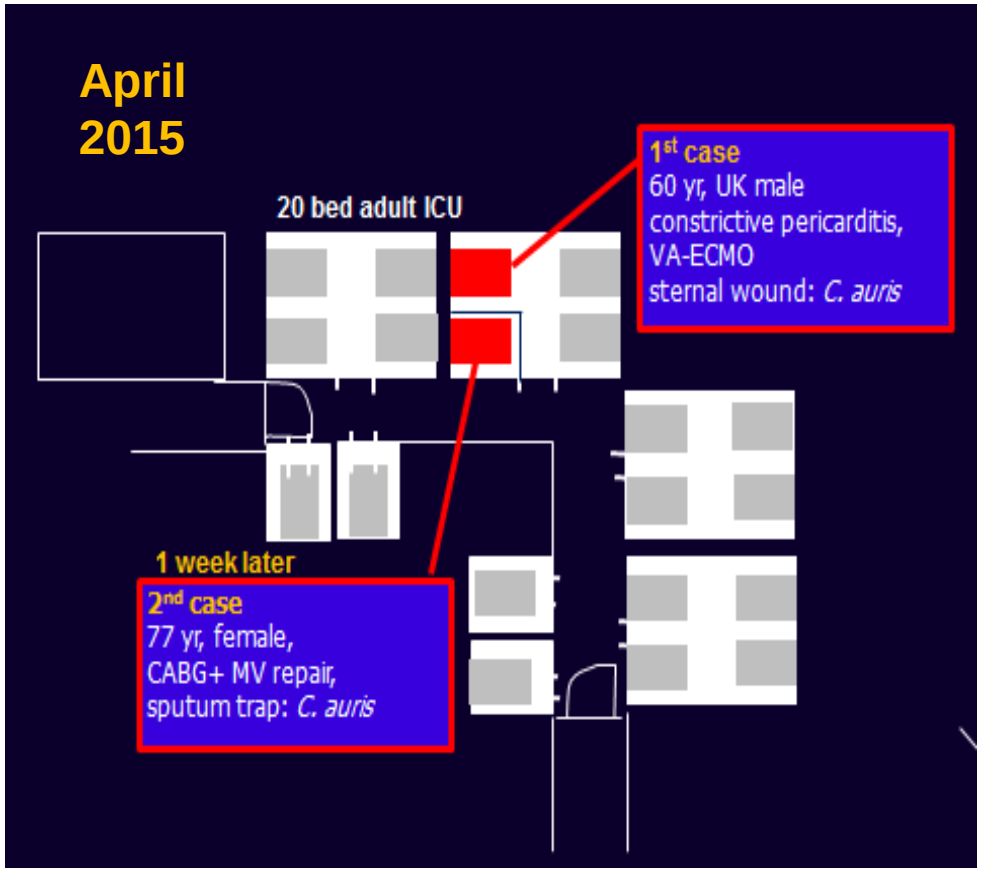
Schelenz et al. Antimicrobial Resistance and Infection Control (2016) 5:35
DOI 10.1186/s13756-016-0132-5

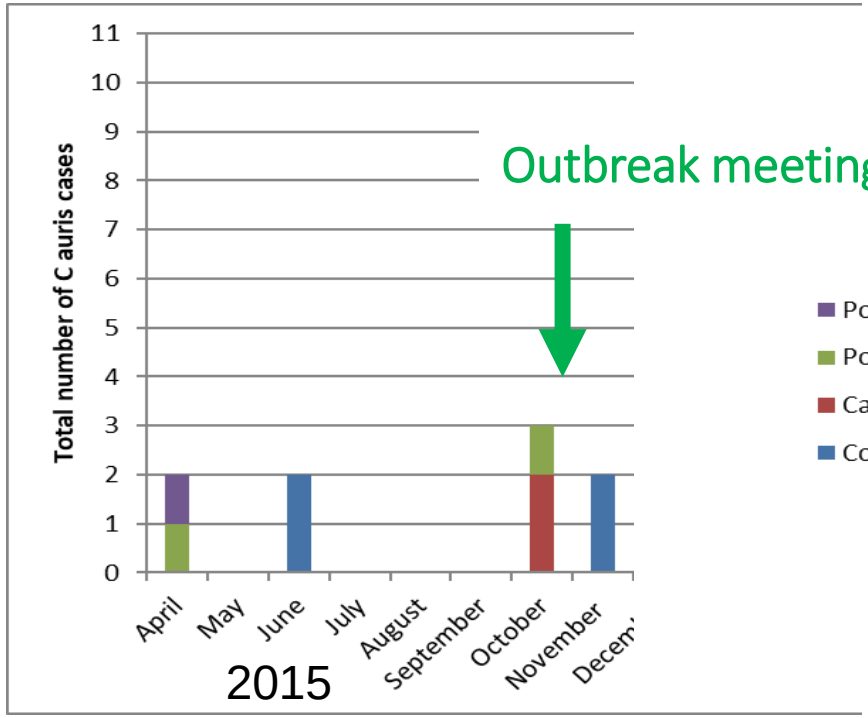
Antimicrobial Resistance and Infection Control

RESEARCH Open Access

- London Hospital
- Cardio/thoracic
- ECMO centre

First hospital outbreak of the globally emerging *Candida auris* in a European hospital





4MRGN-Klebsiella outbreak at same time

UK outbreak 2015: Initial Infection Prevention Control measure

Positive *C. auris* patients

- Isolation/cohorting
- skin 'decolonization'

Patient cont

- Iso

, G, T, urine, rectal)

gative, de-isolate)

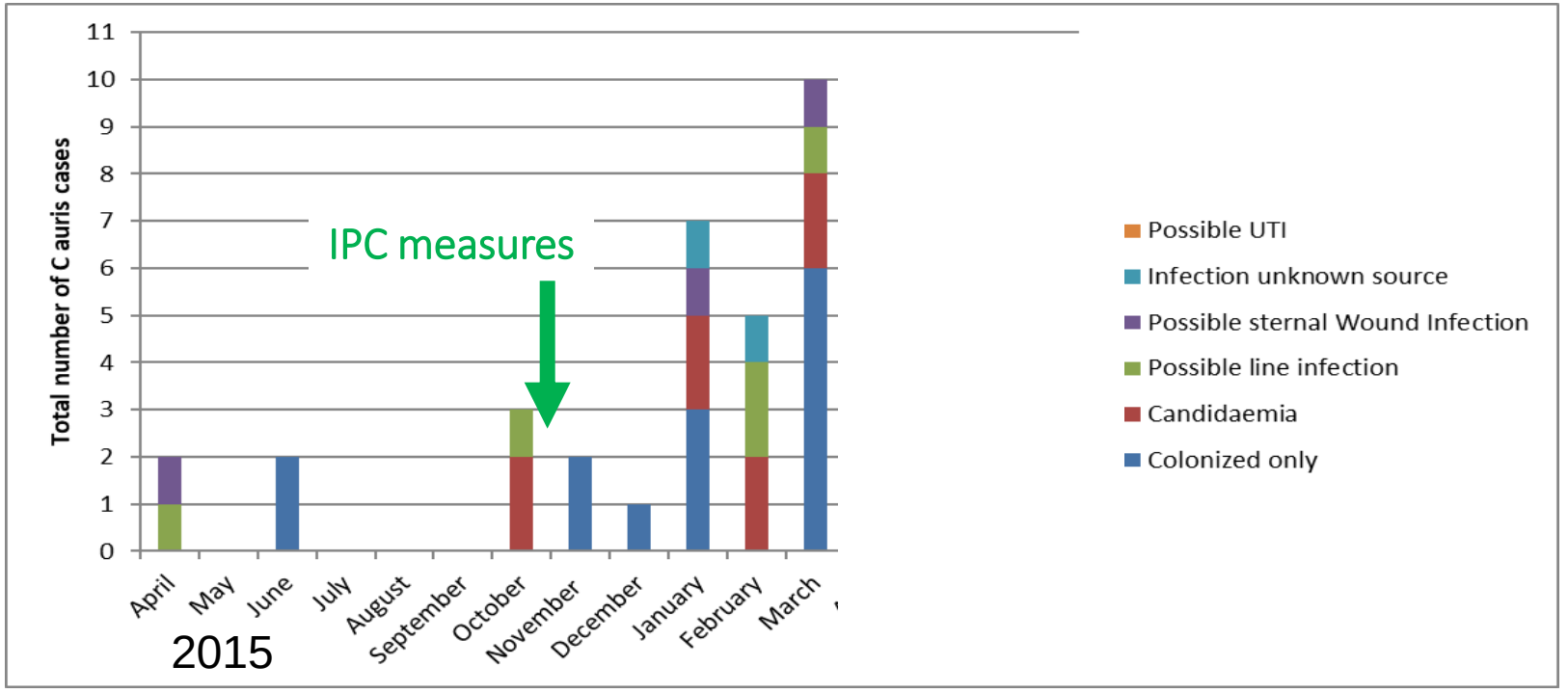
PE- Contacts & positive patients

- Long sleeved gowns, aprons (as per CRE UK policy)

Terminal clean with chlorine products

NICHT GUT GENUG!

Schelenz et al. Antimicrobial Resistance and Infection Control 2016; 5:35



How to stop INFECTIONS

?

Treatment of candidaemia

1st line echinocandin

2nd line AmphoB plus 5FC

B-D glucan monitoring

High impact IPC interventions

Prevention of infections associated with vascular access devices

- ✓ **Aseptic Non Touch –Technique**
  - ✓ vascular line insertion and line care
  - ✓ Implementation of chlorhexidine 'biopatch' line exit site

Prevention of surgical site infection - Not open wound dressings unless necessary

- ✓ Not to include dressed wounds in routine weekly *C. auris* screening

Promotion of stewardship in antimicrobial prescribing

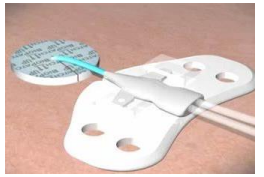
- ✓ Reduce use of antifungals (azoles)
- ✓ Monitor B D-glucan
- ✓ **Training, implementation, recording and checking (monitoring compliance!)**

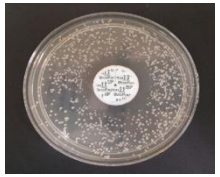
Available online at www.sciencedirect.com
Journal of Hospital Infection
journal homepage: www.elsevierhealth.com/journals/jhin
ELSEVIER

epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England

H.P. Loveday[a]*, J.A. Wilson[a], R.J. Pratt[a], M. Golsorkhi[a], A. Tingle[a], A. Bak[a], J. Browne[a], J. Prieto[b], M. Wilcox[c]

J Hospit Infect 86 S1 (2014) S1-S70



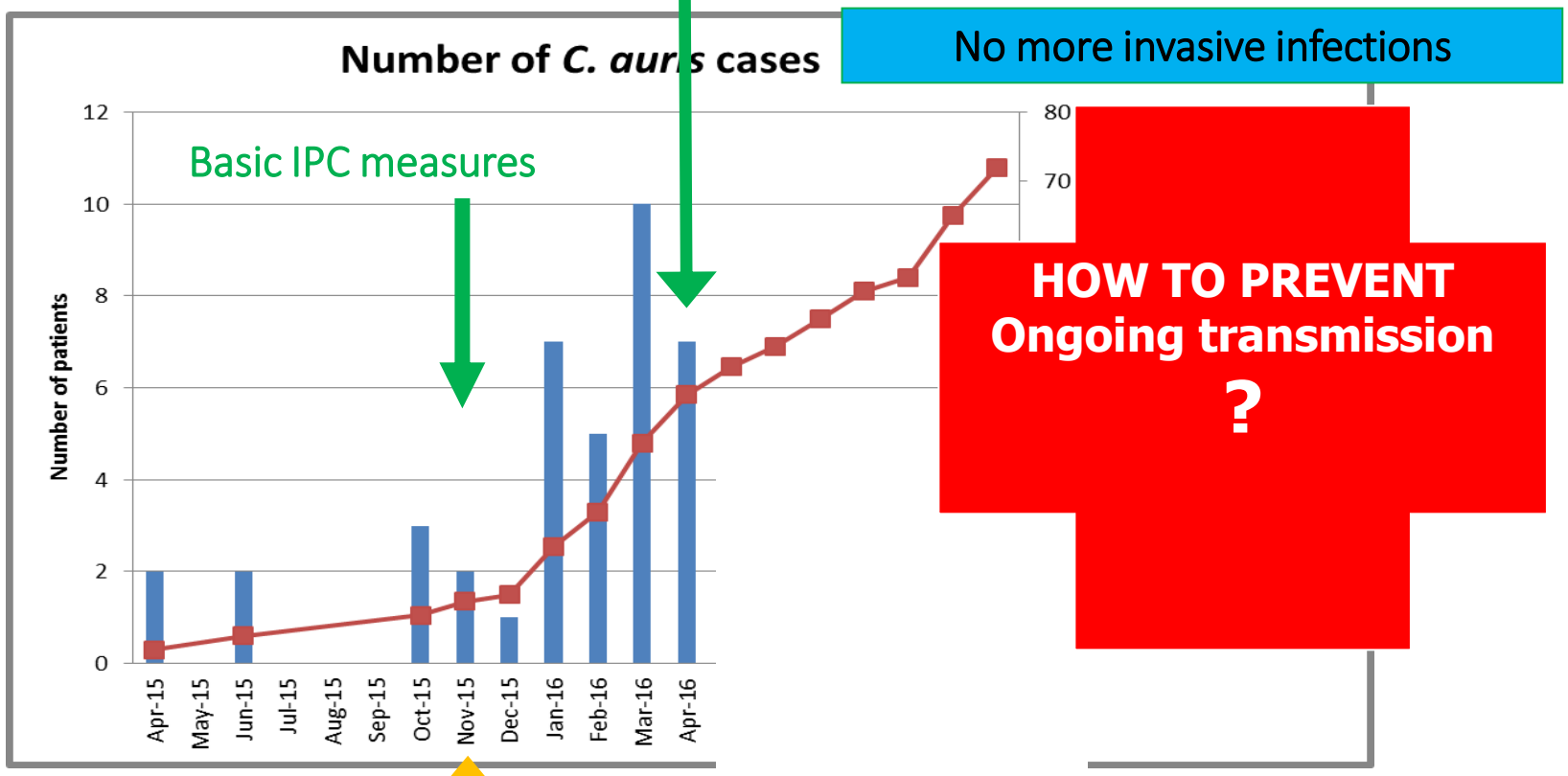


Use of 'biopatch' Chlorhexidine disks for line exit sites

Ongoing transmission…….

Implementation of
High Impact Interventions

No more invasive infections



HOW TO PREVENT Ongoing transmission ?

4MRGNKlebsiella outbreak stopped

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Health

Japanese fungus spreading in UK hospitals

15 August 2017 | Health

Share

More than 200 patients in England have been infected or contaminated with a drug-resistant fungus first found in Japan, health officials have confirmed.

Hospitals are on the lookout for further cases and are putting in place measures to help control any further spread of the fungus, *Candida auris*.

Kontamination der Umgebung und Geräte

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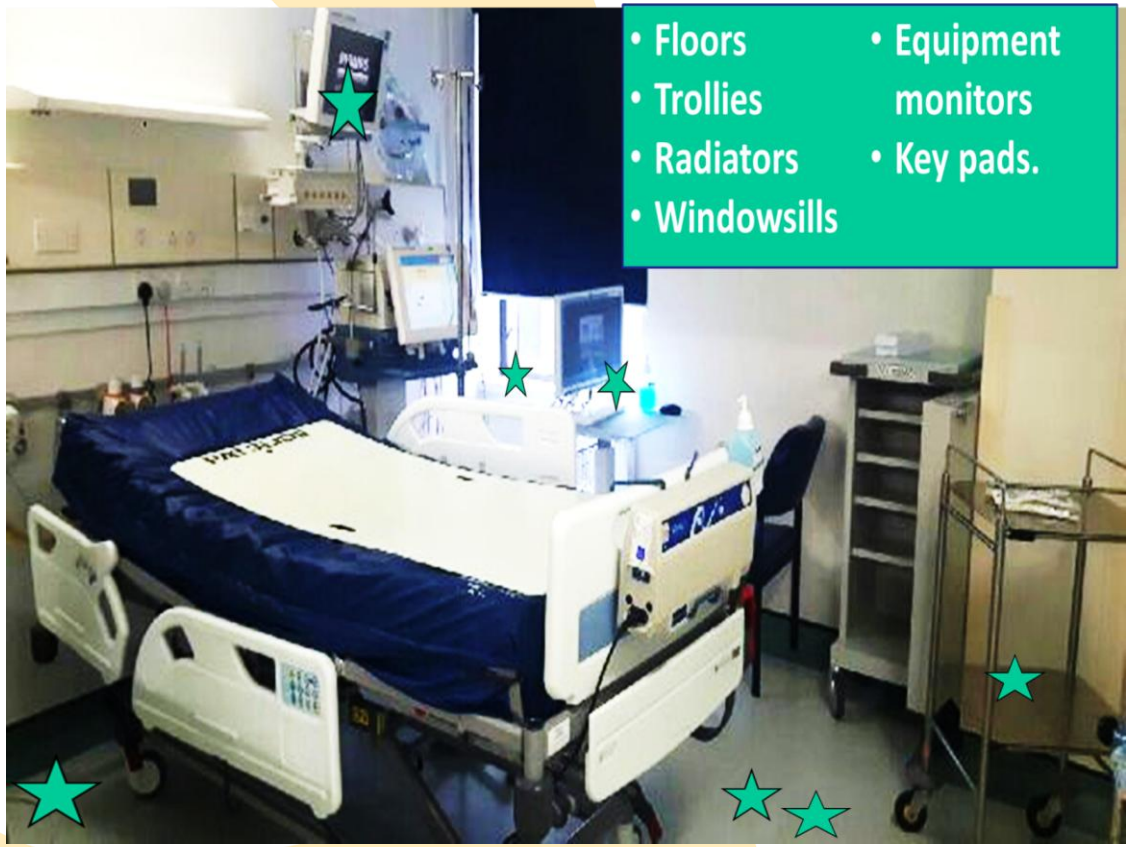
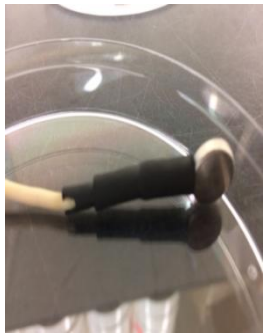


Contaminated equipment/Environment
Temperature probes
Pulse oximeter
Blood culture cuffs
Dialysis syphon ICU
Infusion pump, stands
ECG leads
non-disposable mop
mobile phone
alcohol gel dispensers
bedpans, and mop buckets
Ventilator attachment, Oxygen mask
Bed rail, key nobs, door handle
Lanyards
Ceiling air supply grilles
Medic's common telephone



Courtesy of K.Jeffery

Schelenz et al. 2015, Escandón P et al CID 2018, K Jeffrey https://doi.org/10.1101/149054, Escandón P eta l CID 2018, Eyre et al. N. Engl. J. Med. 2018; Nobrega de Almeida et al. Mycoses 2021, A. Ruiz-Gaitan TIMM 2017, Biswal et al 2017, Weber eta l. AJIC 51(2023)A22-A34, Patterson et al. 202, Didik et al. 2023, Di Lorenzo A et al. 2024 , Yadav A. et al. J Fungi 2021;7(2)

How to screen the environment/equipment?

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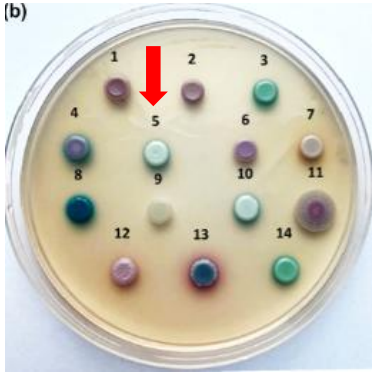
- Bacteriology swabs[1,2]
- Contact plates[2]
- Sponges, sponge sticks[2,5, 6]
- Cotton gauze (moistened) [4]
- Air sampleing[2]
- ‘Swabs better than sponges’ for *C. auris* recovery , with 8.4% and >0.1%[7]
- Culture medium (agar/broth) (Yeast Extract Peptone Dextrose, Yeast nitrogen enrichment, SAB, Brilliance Candida agar, CHROMagar, Sabouraud ulcitol agar)
- Salt SAB Enrichment broth better than CHROMagar [8]



CHROMagar Candida Plus [3]

- ➢ Sensitivity of environmental sampling remains uncertain[8]
- ➢ Transmission despite no positive swabs from environment

1. Antimicrobial stewardship & epidemiology 2024;4(Suppl S1):s90, doi:10.1017/ash.2024.230; 2. NEJM 2018;1322-31; 3. J Med Microbiol. 2024 May;73(5):001820, 4. Ruiz-Gaitán, 2018 , 5. Escandón, 2019, 6. Pacilli, 2020, 7. Furin et al ICHE 2022, 8. Welsh RM et al J Clin Microbiol 2017, 8. Silva I et al. J Fungi 2024

Effective surface decontamination: *C. auris*

High-level disinfectants and/or chemical sterilants	Strength/concentration	Proven Efficacy	Reference
Peracetic acid hydrogen peroxide <1%, acetic acid (OxyCide) Peracetic acid	1200ppm, 0.20%	≥4.1-log10 reduction	Cadnum et al. 2017 Rutala et al.2019
Hydrogen peroxide (Oxivir Tb, Clorox) Hydrogen peroxide plus peroxyacetic acid Accelerated hydrogen peroxide	0.5%, 1.4% 0.65% plus 0.14% 2%	≥4.1-log10 reduction	Cadnum et al. 2017 Rutala et al 2019 Rutala et al 2019
Vaporized hydrogen peroxide (BioQuell)	8g/peroxide/m^3		Abdolrasouli *et al*. 2017
Glutaraldehyde	2.4%	≥4.1-log10 reduction	Rutala et al 2019
Ortho-phthalaldehyde	0.55%	2.3-log10 reduction	Rutala et al 2019
Ultra violet light	(D90 value of 515 J/m2)	Clades: Venezuela, Spain and India not	Schelenz *et al.* unpublished

Low-level disinfectants and other	Strength/concentration	Proven Efficacy	Reference
Sodium hypochloride (Clorox, Chlor-clean, HazTab®)	≥ 1000 ppm 0.39-0.65%, 10%	Some viable strains on stainless steel and polyester coverslips	Cadnum *et al.* 2017 Abdolrasouli *et al.* 2017, Moore *et al.* 2017, Kean et al., 2018
Quaternary ammonium (Lysol all, Virex II 256)	0.5%		Cadnum *et al.* 2017, Biswal et al 2017
Alcohol/ Quaternary ammonium combination			
Ethyl alcohol 29.4% (Purell disinfectant)	29.4%		Cadnum *et al.* 2017
Acetic acid (White distilled vinegar)	>5% (pH 2.0)		Cadnum *et al.* 2017

EPA's Registered Antimicrobial Products effective against *Candida auris* [List P] | US EPA

Candida auris und Flächendesinfektionsmittel

Propan-1-ol 450 mg/g;
Propan-2-ol 250 mg/g;
Ethanol 47 mg/g

0,29 g
Peressigsäure

Didecyldimethylammoniumchlorid
6,93-7,128 g/100 g

Glutaral 15,2 g;
(Ethylendioxy)dimethanol 19,7 g

	Prüfprodukt 4			Prüfprodukt 5			Prüfprodukt 6*			Prüfprodukt 7		
	30 s	30 s	30 s	5 min	5 min	5 min	5 min	5 min	5 min	15 min	15 min	15 min
	97%	80%	50%	1,00%	0,50%	0,25%	80%	50%	25%	2%	1%	0,1%
C. albicans	5,53	5,68	5,68	xxx	5,34	5,34	5,30	5,30	5,30	5,36	3,25	0,16
	xxx	xxx	xxx	5,66	4,58	3,42	xxx	xxx	xxx	xxx	xxx	xxx
C. auris	6,83	6,71	6,71	xxx	0,84	0,68	6,05	6,05	6,05	6,03	6,03	<0,51
	xxx	xxx	xxx	1,63	0,72	<0,31	xxx	xxx	xxx	xxx	xxx	xxx

*muss 1:20 verdünnt werden

lg-Reduktion	≥4,0	2,00-3,99	<2,0

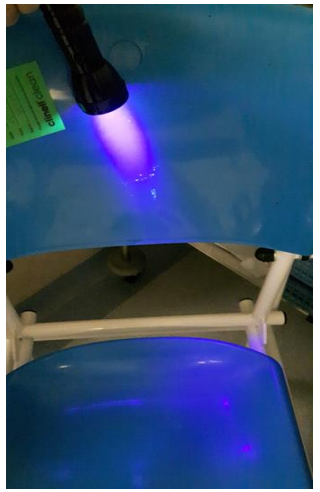
Dr. Pitten, DGKH in Essen, 16.-17.05.2025

Back to BASICS

Environmental monitoring/cleaning

Environmental Monitoring

- Regularly assess healthcare environment (remove unsuitable materials, broken, & damaged equipment, mattresses, reduce ‘clutter’)
- Reduce multi use equipment (increase single patient use)



Regularly clean

Patient rooms, equipment, ward areas

Prozess-Beobachtungen

Focus on high-touch surfaces

- Reinforce cleaning schedule

Enhanced cleaning

- 3x day 1,000 ppm (Chlor-clean)
- 3x day 1,000 ppm or chlorine dioxide wipes

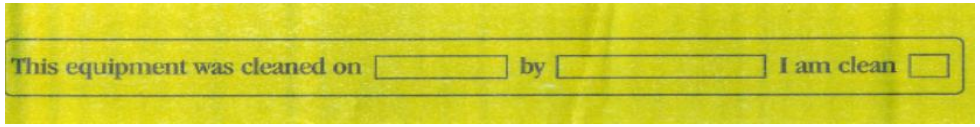
Equipment cleaning, assurance

Terminal cleaning 10,000ppm

- Chlorine based (Haztab)

Followed by H_2O_2 vaporization

Pitfalls: high staff turnover, understaffing, outsourced cleaning



Antiseptics against yeasts

Product for hand hygiene /skin decolonisation	Activity against yeast
Alcohol 70% (both iso propyl and ethyl)	*C. auris*[1]
Chlorhexidine, 0.5%-4.0% (hand wash, mouth wash, skin wash)	*C. auris* (less than a 3-log10 reduction) [1]
Povidone-iodine, 10% (skin disinfectant)	*C. auris* (less than a 3-log10 reduction) [1]
Triclosan 16 mg/L (mucous membranes, hand-wash)	*C. albicans, C.tropicalis, C parapsilosis,N. glabratus*[2]
Octenidine dihydrochloride (antiseptic for skin, moth wash, wounds, body wash)	*C. albicans, Nakaseomyces glabratus*[3,5] *C. auris*[6].

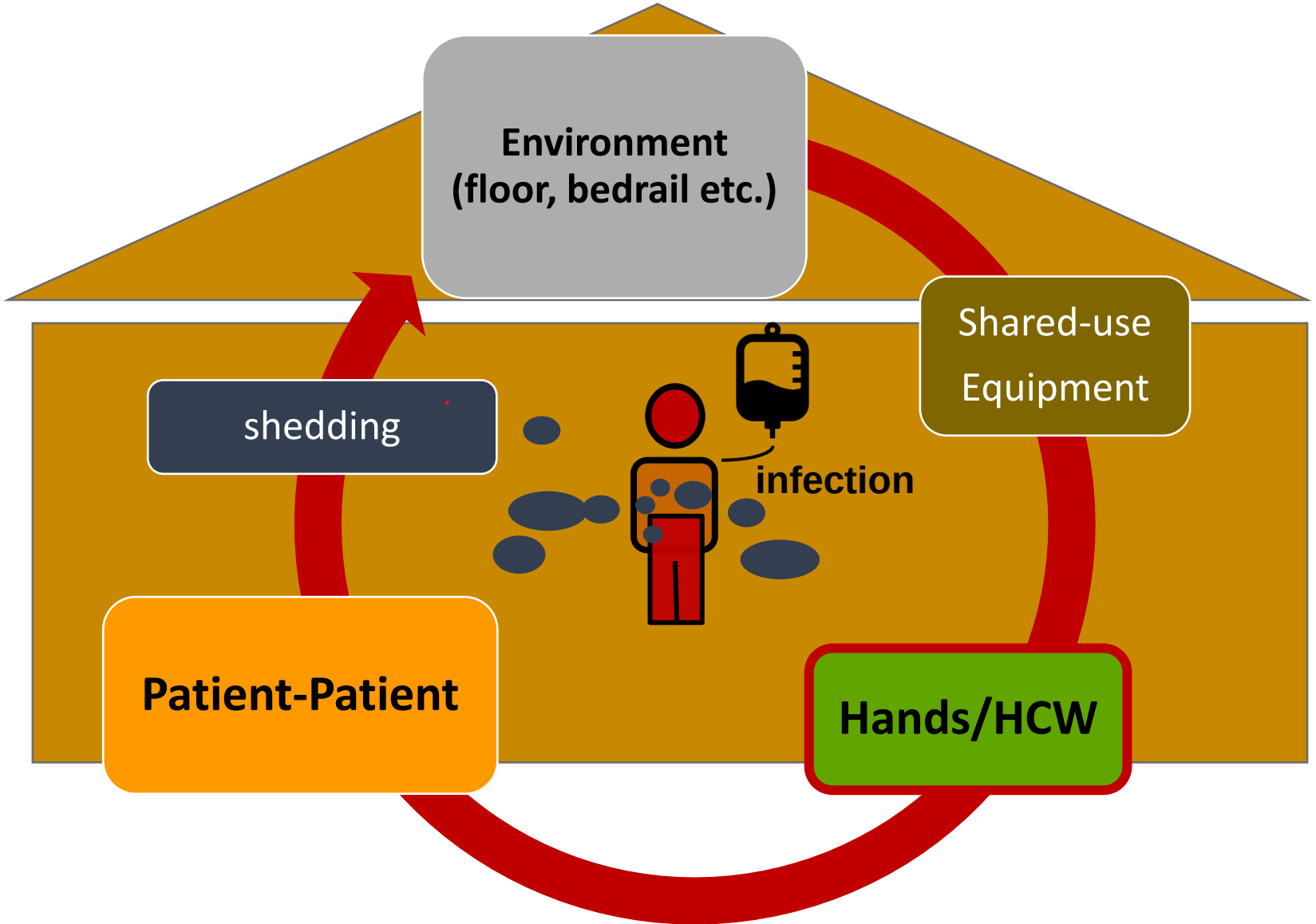
Triclosan antagonizes activity of fluconazole against *C. albicans* [2]

Triclosan and Chlorhexidine but not Octenidine reduced activity of azoles against *N. glabratus in vitro*[3,4]

Change in host microbiome may play an important role in the colonization of *C. auris* on the skin [7] – need for good antimicrobial stewardship!

1. Rutala et al. Infect Control Hosp. Epidemiol 2019;40:380:382, 2. J Dent Res 91(1):65-70, 2012. 3. Spettel K et al. PII-24 MYK2023, 4. P2960 34th ECCMID Barcelona, 5. Journal of Global Antimicrobial Resistance 29 (2022) 23–28, 6. J Hosp Infect. 2019 May;102(1):120-124. 7. Nat. Med. 2021 Aug;27(8):1401-1409

C. auris: Preventing routes of transmission, outbreaks & infections



Health Care Workers: screening	
Site positive for *C. auris*	**Reference**
Nose of nurse	Schelenz et al.
Sole healthcare worker's shoe	Escandón P eta l CID 2018
Hands HCW (doctors, nurses)	Escandón P eta l CID 2018 Biswal et al 2017
Groin HCW	Escandón P eta l CID 2018

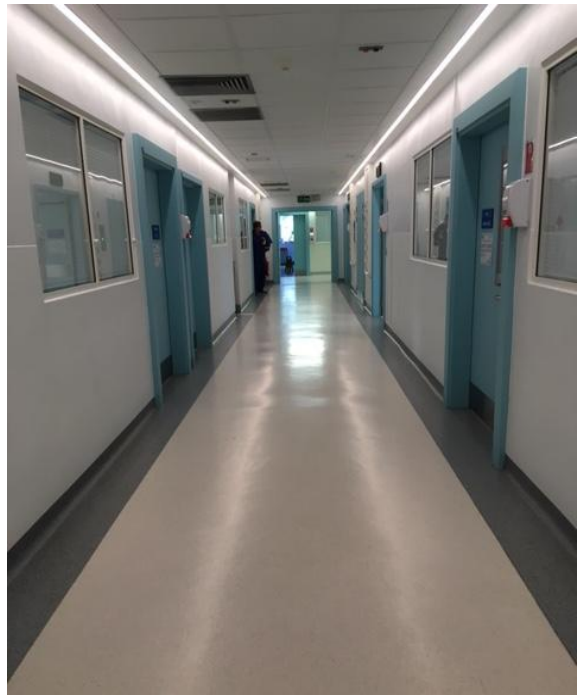
Preventing transmission

- Improve hand hygiene [2]
- Alcohol-based hand sanitizer
- Mandatory training
- Audit compliance, Feedback
- Monitor appropriate glove use!

Implementation of drastic IPC measures in 2015…

ICU ward closure/refurbishment

- ✓Moving ICU to different floor, restricted access
- ✓Dedicated staff/no ‘cross nursing’
- ✓Admission/2 x weekly screening
- ✓Restricted visitors and ‘staff’ movement
- ✓Single use items: bronchoscope, pillows…
- ✓Disposing medicines/items on discharge
- ✓Enhanced cleaning (3xday) & audit
- ✓Enhance hygiene awareness, audits
- ✓Complete refurbishment



Before **After**

- More side rooms
- Removed wooded furnishing
- Smooth surfaces
- New floor
- Declutter
- Minimal equipment in corridor

First European *C. auris* outbreak – what did we learn?

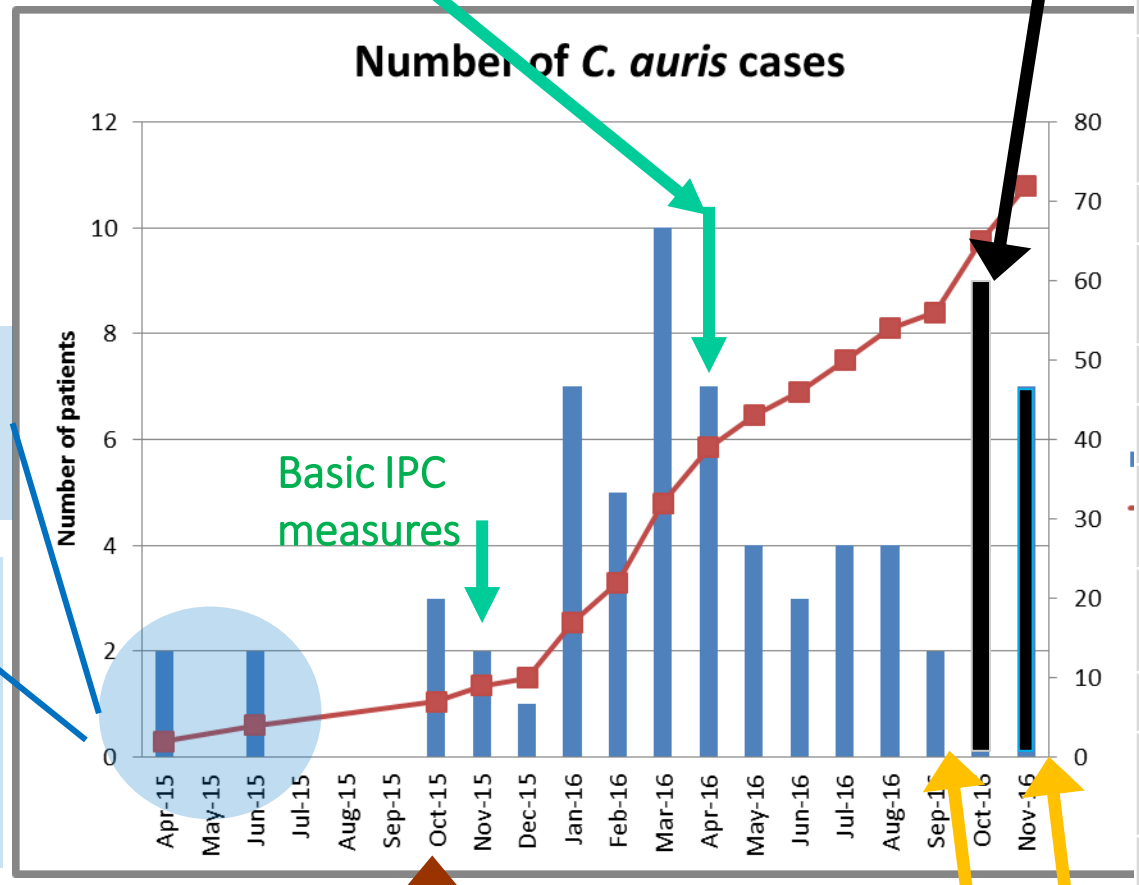
Enhanced IPC measures
High Impact Interventions

Second introduction of another *C auris* strain based on WGS

72 cases

Routine active Surveillance In ICU

Routine ID of Candida from sterile & non-sterile sites



Schelenz S. et al. 2015

***4MRGN Klebsiella* outbreak at same time**

End of outbreaks

Hygiene Maßnahmen für CA positive Patienten (UK 2024)	
Isolation	Mit eigner Nasszelle, WC/Stuhl
Persönliche Schutz Ausrüstung (PSA)	
Handschuh + Schürze	Bei Kontakt mit Patient und Zimmer
Langärmliger Schutzkittel	-Kontakt mit Haut, Blut, Körperflüssigkeiten -Betten machen
Masken/Visier	Nicht Routine
Haar Schutz Kappen	Nicht Routine (nur bei Hautschuppen Dispersion)
Handhygiene	Strikt, alkohol
Besucher	Schürze/Schutzkittel
Einmal Produkte	Thermometer, Blutdruck Manschette
Patientenbezogene Produkte	Matratzen, Kissen, Decken etc müssen dekontaminiert werden
Patienten Movement	vermeiden
Chirurgische Eingriffe	Alkohol basierte Skin Preps, Last on list
Zimmer Reinigung	2x Täglich (im Ausbruch mehrmals)
Endreinigung	1000ppm chlorine, H2O2, UV Entsorgung von Medizinprodukten

UK Health Security Agency (2025). Candidozyma auris (formerly Candida auris): guidance for acute healthcare settings. https://www.gov.uk/government/publications/candida-auris-laboratory-investigation-management-and-infection-prevention-and-control

Impact on cost & communication

Negative collateral impact of an *C. auris* outbreak:

- day to day running of clinical services compromised (bed closure, cancelled admissions and surgery)
- Staff burn out
- High cost £58k/mo[1]
- Pressure on communication (transfer of patients)
- Commitment from senior management, HCW, doctors, cleaners etc.
- Fear of ‘damaging reputation’, tendency to ‘secrecy’


The New York Times

TIMES INSIDER

Candida Auris: The Fungus Nobody Wants to Talk About

Rany Williams disinfecting a bathroom at Mount Sinai Hospital in Brooklyn during a demonstration of deep-cleaning techniques the hospital used to contain Candida auris. Hilary Swift for The New York Times

1. Taori SK. et al. JHI 2019, 79:601-11

Richtlinien / Merkblätter für Hygiene Maßnahmen: C. auris

Country	IPC guidelines
UK	UKHSA. *Candida auris*: laboratory investigation, management and infection prevention and control: UK Health Security Agency; 2024[1]
USA	CDC. CDC. Infection Prevention and Control for *Candida auris*: Centers for Disease Prevention and Control 2021[2]
Europe	ECDC. *Candida auris* in healthcare settings: European Centre for Disease Prevention and Control; 2016[3]
South Africa	COTHI. Interim guidance for management of *Candida auris* infections in South African hospitals: Centre for Opportunistic, Tropical and Hospital Infections; 2016[4]
South Africa	Federation of Infectious Diseases Societies of Southern Africa guideline: Recommendations for the detection, management and prevention of healthcare-associated *Candida auris* colonisation and disease in South Africa[7]
Australia	Diagnosis, management and prevention of *Candida auris* in hospitals: position statement of the Australasian Society for Infectious Diseases. Intern Med J. 2019;49(10):1229-43[5]
WHO	PAHO. Epidemiological Alert: Candida auris outbreaks in health care services in the context of the COVID-19 pandemic: Pan American Health Organisation (PAHO); 2021[6]
Canada	PHO. Provincial Infectious Diseases Advisory Committee Interim Guide for Infection Prevention and Control of Candida auris 2019[8]
Switzerland	Candida auris - recommendations on infection prevention and control measures in Switzerland.[9]
PAHO/WHO	Candida auris outbreaks in health care services in the context of the COVID-19 pandemic .[10]
Deutschland	Bayerisches Landesamt für Gesundheit un Lebensmittelsicherheit: https://www.lgl.bayern.de/downloads/gesundheit/hygiene/doc/lgl_merkblatt_candida_auris.pdf

1. https://www.gov.uk/government/publications/candida-auris-laboratory-investigation-managementand-infection-prevention-and-control. 2. https://www.cdc.gov/fungal/candidaauris/c-auris-infection-control.html. 3. https://www.ecdc.europa.eu/en/publications-data/candida-aurishealthcare-settings.4. https://www.nicd.ac.za/assets/files/2016-12 22%20InterimNICDRecommdtnsCAuris.pdf. 5. Intern Med J. 2019;49(10):1229-43. 6 https://iris.paho.org/bitstream/handle/10665.2/53377/EpiUpdate6February2021_eng.pdf?sequence=1&isAllowed=y. 7. Afr J Infect Dis. 2019;34(1):163. 8. https://www.publich ealthontario.ca/en/About/External-Advisory-Committees/PIDAC-IPC. 9. Swiss Med Wkly. 2020;150:w20297 10. https://iris.paho.org/bitstream/handle/10665.2/53377/EpiUpdate6February2021_eng.pdf?sequence=1&isAllowed=y

Meldepflicht in Deutschland

Landeshauptstadt München
Gesundheitsreferat

Meldepflicht seit 7 Juni 2023 :

- ✓ Direkter Nachweis aus Blut oder anderen normalerweise sterilen Substraten §7 IfSG
- ✓ Nosokomiale Ausbrüche nach §6 Abs. 3 IfSG

Meldepflicht anderer Länder:

- ✓ USA - Alle neuen positiven Screens, alle positiven klinischen Proben[1]
- ✓ UK - Alle neuen positiven Screens (Kolonisation), alle positiven klinischen Proben[2]

Problem in Deutschland:

- ➢ Kolonisierungen sind nicht Meldepflichtig
- ➢ Früherkennung von Clustern/Ausbrüchen dadurch verzögert
- ➢ Keine systematische Surveillance oder exakte Prävalenz

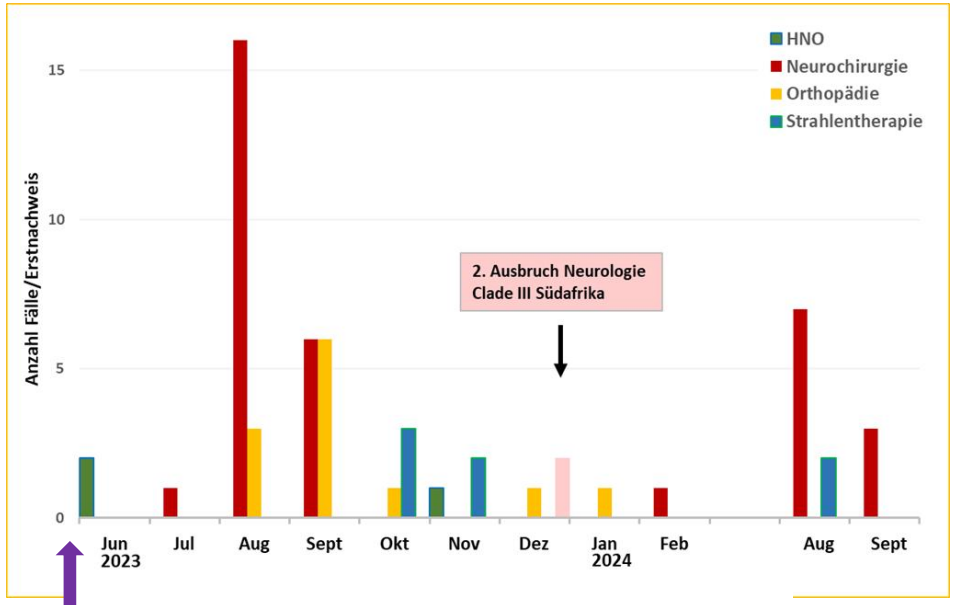
1. www.cdc.gov/candida-auris/hcp/screening-hcp/index.html
2. www.gov.uk/government/consultations/candida-auris-update-to-management-guidance/candida-auris-laboratory-investigation-management-and-infection-prevention-and-control-draft

Candida auris – Ausbruch München

Landeshauptstadt München
Gesundheitsreferat

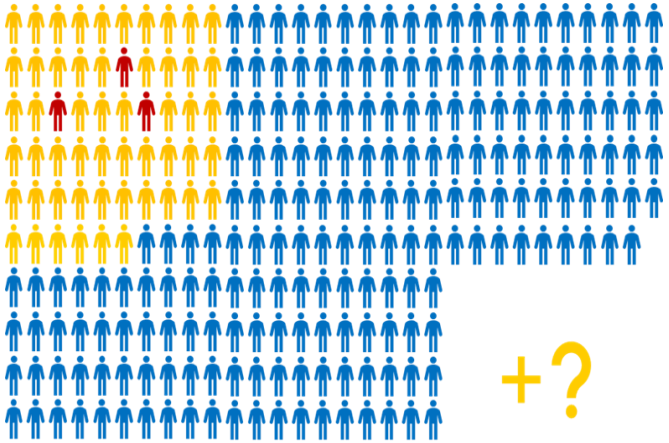
56 Fälle, 203 KP, 4 Fachbereiche

- **Index:** Juni 2023, **Clade I**
- **Infektionen 3,9%** (3 Blutstrominfektion, 3 implantat-assoziiert, 1 Otitis media)
- **Verstorben** 14,3%



Index Patient (HNO)
Nachweis Gehörgang bei Otitis externa (Zufallsbefund), Anamnese leer

49 Kolonisationen
3 Blutstrominfektionen
4 weitere Infektionen
203 Kontaktpersonen



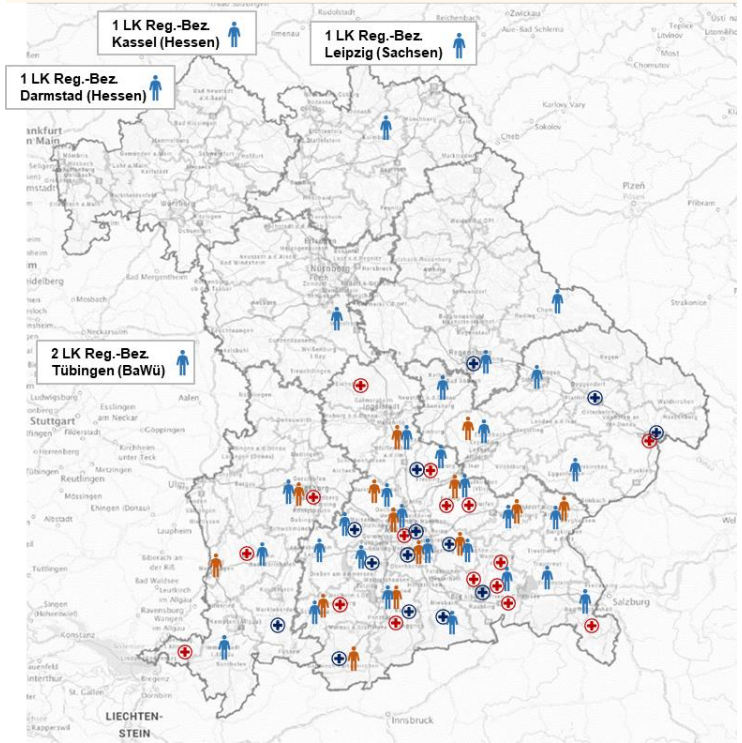
Verlegung in medizinische Einrichtungen

- **16 Kliniken in 9 Landkreisen** (20 Kolonisierte)
- **30 Kliniken in 16 Landkreisen** (42 Kontaktpersonen)

Entlassung an Wohnort

- Kolonisiert: **14 Landkreise**
- Kontaktperson: **38 Landkreise**

(neben Bayern auch BaWü, Hessen, Sachsen)

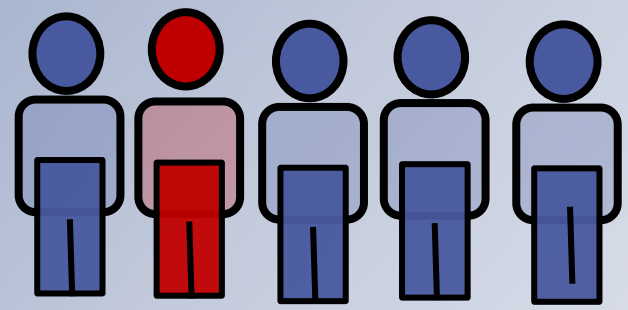


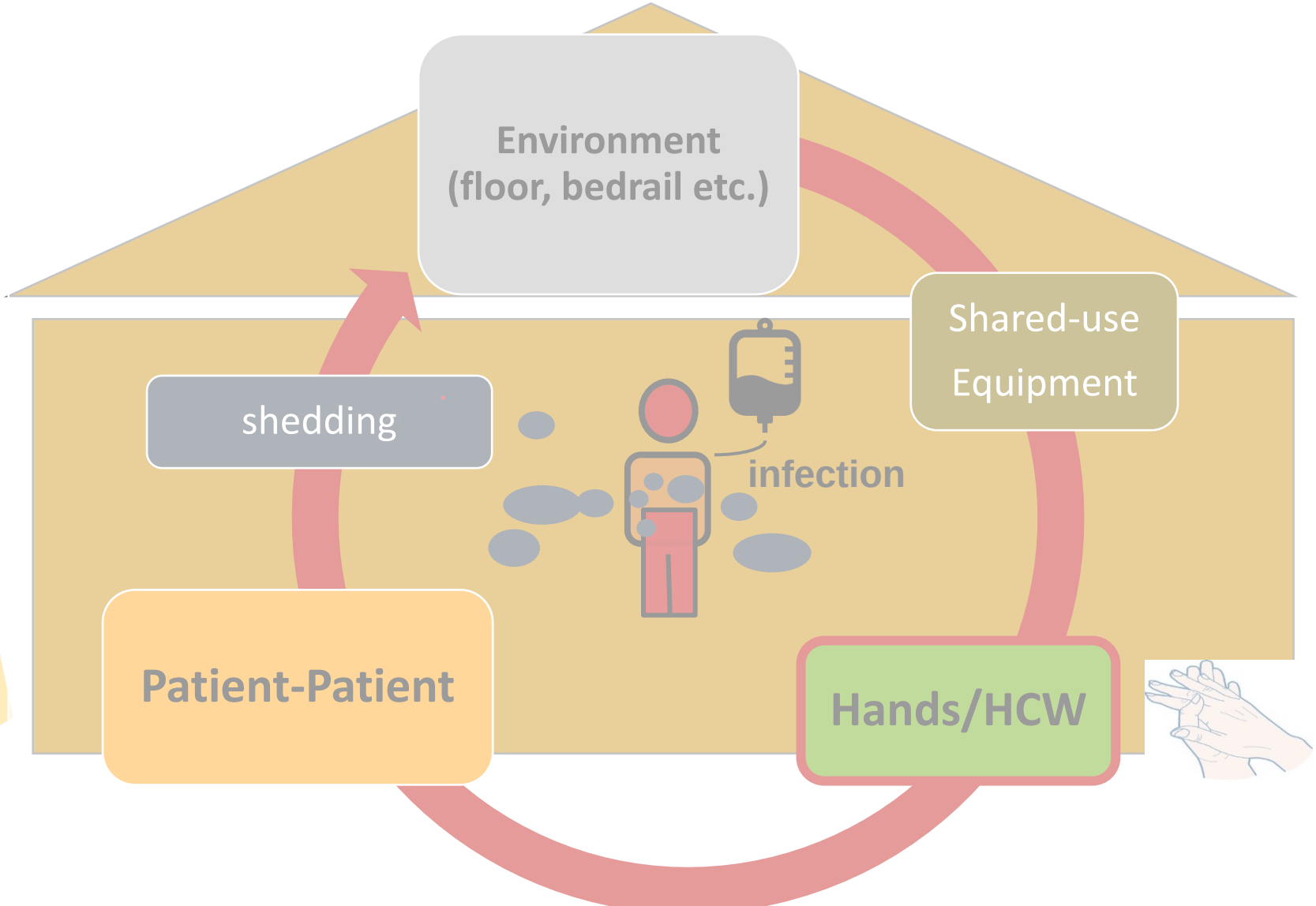
Antje Ott, Silke Schelenz - Gesundheitsreferat München, SG Infektionshygiene

Preventing routes of transmission, outbreaks & infections

Landeshauptstadt München
Gesundheitsreferat

Rechtzeitige & frühe Identifikation





Wichtige Fragen

1. Wer soll gescreened werden?
2. Wie oft soll gescreened werden?
3. Welche Körperstellen?
4. Labor Kapazität, Kosten?
5. Was machen wir mit positiven *C. auris* Patienten?
6. Was machen wir mit Kontaktpersonen?
7. Screening der Umgebung, Geräte etc.

Screening Strategien

Prevention based approach

On Admission

- To detect new introductions of *C. auris* cases
- To act early on needed IPC measures

Response-based approach

During admission

- To identify new cases resulting from a possible contact
- To assess effectiveness of IPC interventions

At Transfer/Discharge

- To inform other facility on IPC measures

Vermeidung nosokomialer Übertragung und Ausbrüchen

Umfang (scope) des Screenings

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Gesundheitsreferat

Broad approach (jeder):
bei Aufnahme, oder Point Prävalenz auf einer Station wenn einem Fall besteht

Targeted approach (Risiko adaptiert):
nur bei bestimmten Patienten z.B. Kontakt Personen, Patienten mit erhöhtem Risiko einer Besiedelung

Risiko adaptiert	Beispiel	
Epidemiologischer link mit *C. auris* (CA) positiver Person	• selbes Patientenzimmer/Einrichtungen, • gepflegt vom gleichen Personal • Mitbenutzung von mobilen medizinischen Geräten	CDC, UK, Br CDC CDC
Link zu Risiko Bereichen Episode in einer Medizinischen Einrichtung mit erhöhtem Risiko für CA	• Einrichtung mit Verdacht oder bestätigter nosokomialer Übertragung von CA • Post-akute Pflege Einrichtungen • Aufenthalt in Ländern mit hoher CA Prävalenz	CDC, UK CDC CDC, UK
Klinisches Risiko Patienten mit erhöhtem Risiko zum Erwerb von CA	• Mechanische Beatmung • Verweilkatheter, ZVK, Nasensonde, Blasenkatheter • Intensiv Station Versorgung • Langer Klinik Aufenthalt • Kolonisation mit multi-resistenten Erregern	CDC, UK UK

www.cdc.gov/candida-auris/hcp/screening-hcp/index.html

Screening: Welche Körperbereiche?

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Körperbereiche	CDC	UK	Bayern	PAHO WHO	Schweiz
Achsel (beidseitig)	✓	✓	✓	✓	✓
Leiste (beidseitig)	✓	✓	✓	✓	✓
Rektum/Stuhl probe			✓	✓	
Nase		✓		✓	✓
Rachen				✓	
Ohr					
Urin (Katheter)			✓	✓	
Wunde(n)			✓		
Perineum					
Vaginal					
Sputum/endotracheal					
Drainage Flüssigkeit					
Intravaskulärer Zugang					

Minimum Screening

C. auris Eigenschaften

- **42-45 ◦C**
- **Hohe Salzkonzentrationen (Schweiß)**
- **Biofilme**

www.gov.uk/government/consultations/candida-auris-update-to-management-guidance/candida-auris-laboratory-investigation-management-and-infection-prevention-and-control-draft
www.cdc.gov/candida-auris/hcp/screening-hcp/index.html, https://iris.paho.org/bitstream/handle/10665.2/53377/EpiUpdate6February2021_eng.pdf?sequence=1&isAllowed=y, Swiss Med Wkly. 2020;150:w20297

C. auris: Wichtige Punkte zusammengefast

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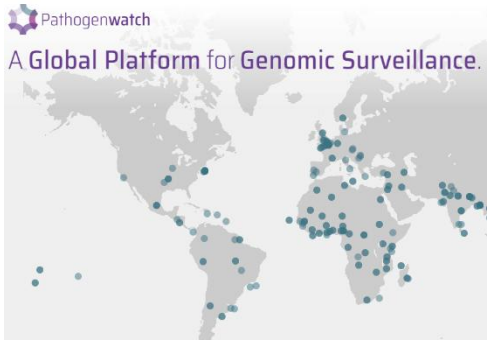
- Fälle und Ausbrüche nehmen zu
- **Surveillance**, Identifikation von Hefepilzen im Labor
- Aufnahme des *C. auris* in den **Hygieneplan aller Kliniken (screening policy)**
- **Jeder Nachweis von *C. auris* sollte aufgearbeitet werden**
- **Sofortige Isolation eines *C. auris* positiven Patienten in der Klinik**
- **Sofortige Ermittlung von Kontaktpersonen** (und Isolation)
- Rücksprache mit **Mikrobiologie Labor:** Kapazität für Screening abklären
- Kapazität für WGS, Global platform for Genomic surveillance (*C.auris*) https://pathogen.watch
- Gute **Kommunikation** (Patienten, ÖGW, Labor, Klinik und Hygiene Teams, bei Verlegung)
- **Meldung von erst Besiedelungen** an das Gesundheitsamt
- **More research**: evidence-based IPC measures, effective skin decolonization, environmental screening methods, wastewater surveillance etc.



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