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الإدارة العـامـة
لمكافحـة عــدوى المنشــآت الصحيــة

General Directorate of Infection Prevention
&
Control of Healthcare Facilities

(GDIPC)

Guidance For Candida Auris Infection Prevention and Control Measures

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Glossary :

Period of Transmission Risk	▶ The period of transmission risk is the time when a C. auris case could potentially transmit C. auris to another patient. ▶ The period is from the date of likely acquisition (as determined by the infection control until the time that the case is placed into contact precautions (or discharged or transferred)). ▶ The period of transmission risk is used for determining room contacts only.
Point Prevalence Screen (PPS)	▶ Point prevalence screening is when a census point in time is chosen to screen a cohort of patients (for example all patients on a ward on a particular date) at risk of being infected or colonised with C. auris.
Transmission Risk Area	▶ A transmission risk area (TRA) is an area (a distinct geographical area or ward) in which local transmission has been determined by the infection control to have occurred. ▶ The timeframe for the TRA is the period when transmission may have occurred plus either four consecutive weeks of negative point prevalence screens or a single negative PPS four weeks after the final patient involved in the transmission was discharged. The timeframe for the TRA is different from the period of transmission risk.
Screening	▶ A process to identify patients at risk for being colonized with antibiotic resistant organisms and, if risk factors are identified, obtaining appropriate specimens.
Infection	▶ The entry and multiplication of an infectious agent in the tissues of the host with clinical signs and symptoms.
Colonization	▶ The presence and growth of a microorganism in or on a body with growth and multiplication but without tissue invasion or cellular injury or symptoms

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Introduction:

Candida auris (C. auris) is an emerging fungus that presents a serious global health issue as it was first reported in Japan in 2009; it resistant to multiple antifungal drugs commonly used to treat Candida infections.

It identified as one of Candida species that has been associated with infection and outbreaks in healthcare facilities in various countries. C. auris has been isolated from different body sites including blood, skin, ear discharge, urogenital tract, and respiratory system. Clinically, C. auris capable of causing serious invasive fungal infections such as candidemia, pericarditis, osteomyelitis, pneumonia, and urinary tract infections.

Patients can carry C. auris somewhere on the body but not have an infection or any symptoms, this is called colonization. Colonized patients are at increased risk for developing infection. Also, patients who have a history of prolonged hospitalization, particularly, in intensive care units, attached to invasive devices such as intravenous catheters, mechanical ventilators, or have previously received antibiotics or antifungal medications, appear to be at higher risk of infection. As other organisms associated with healthcare infections, it appears to be highly transmissible between patients, from contaminated environment, and hands of healthcare workers (HCWs).

All these risk factors are highlighting the importance of instituting effective infection prevention and control approaches and enhancing the significant of early identification of C. auris in hospitalized patients. Consequently, comprehensive infection prevention and control measures are urgently required to decrease the burden of C. auris, and it is related negative outcomes. Accordingly, this document has been constructed to ensure that the healthcare facilities are prepared to identify and implement the best approved infection prevention & control recommendations regarding Candida auris.

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Risk Factors :

- A prolonged hospital stays.
- Carbapenem-Resistant Entero bacterales (CRE) positive patient (infected & colonized).
- Current or active outbreak in the healthcare facility.
- An indwelling medical device, such as a central venous catheter, urinary catheter, biliary catheter, or wound drain.
- An impaired immune system.
- Prolonged use or misuse of broad-spectrum antibiotics or antifungals drugs.
- Patients in critical care areas (ICU, NICU, PICU, Dialysis).

C.auris infections have been found in patients of all ages, from preterm infants to the elderly.

Transmission :

Candida auris is transmissible whether a patient has C. auris infection or colonization. Thus, infection prevention & control precautions are the same for patients with C. auris infection or colonization. Implementation of these practices starts with the identification of cases. Typically, C. auris spreads in hospitals and other healthcare facilities through contact with contaminated surfaces or equipment. It can also be spread from person to person due to that cases infected or colonized with C. auris that shed the fungus.

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Laboratory Identification :

Like other kinds of microbial infections, detection of Candida auris requires blood tests as well as those of other bodily fluids. While there are a number of these tests, the problem with detecting this pathogen is that it's very similar to others of the same family and can be misdiagnosed; a quick diagnosis is rarely possible.

Laboratory diagnosis via culture is the only way to diagnose C. auris infection or colonization. Clinicians and laboratories should be aware of the possibility of C. auris, especially in high-risk patients who have cultured non-albicans Candida species. Like other Candida infections, C. auris infections are usually diagnosed by culture of blood or other body fluids such as urine or respiratory secretions. However, C. auris is harder to accurately identify in the laboratory than other more common types of Candida using conventional commercial systems and can be confused with other more commonly encountered candida species. All invasive isolates should undergo antifungal susceptibility testing.

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The following aspects in regard of specimen processing must be considered:

- C. auris grows on blood agar as all other Candida species but for sub-culturing, use Sabouraud's agar.
- Growth at 40-42 C is useful to differentiate it from many other Candida species.
- CHROM agar is widely used as a differentiation medium, C. auris appear pale purple or pink colonies.
- Microscopically is indistinguishable from other Candida species, but it is germ tube negative budding yeast.
- It is commonly misidentified with other yeast (especially Candida haemulonii) in: VITEK-2 YST, API 20C, Microscan and BD phoenix yeast identification system.
- It is recommended in evidence to use specific identification system such as VITEK MS (bioMerieux, France) and MALDI Biotyper system (Bruker Corporation, USA) or by DNA sequencing of the D1/D2 domain or other evolved approved technologies.

NB: As it is a newly recognized species, laboratories are advised to update identification database in their diagnostic devices based on the approved technologies.

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Safety Considerations for Laboratory Diagnosis of Candida Auris:

- Use a biological safety cabinet (BSL2) when manipulating known or suspected C. auris isolates. C. auris can contaminate surfaces extensively, and it is difficult to eradicate.
- MOH approved high level environmental disinfectants should be used for cleaning the work area with consideration of manufacturer recommendations to avoid equipment damage.

Case Description :

To contain candida auris transmission, it is critical to perform timely identification, detection, and accordingly implementation of appropriate infection prevention and control measures.

Clinical Symptoms:

Colonization with C. auris is asymptomatic. Colonization is generally on the skin, nares, and other external body sites. However, the symptoms that appeared on the infected cases are as the following: fever, chills, sweats, and low blood pressure

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Case Identification:

Suspected Case

A person with a non-Candida albicans species isolated from a diagnostic or screening specimen.

Confirmed Case

A person with Candida auris (C. auris) isolated from a diagnostic or screening specimen irrespective of phenotypic susceptibility.

A confirmed C. auris case can be defined as the follows:

A. Clinical Confirmed C. auris Case

Person with confirmatory laboratory evidence from a clinical specimen collected for the purpose of diagnosing or treating disease in the normal course of care. This includes specimens from sites reflecting invasive infection (e.g., blood, cerebrospinal fluid) and specimens from non-invasive sites such as wounds, urine, and the respiratory tract. This does not include swabs collected for screening purposes.

B. Screening Confirmed C. auris Case

Person with confirmatory laboratory evidence from a swab collected for the purpose of screening for C. auris colonization regardless of site swabbed.

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Reporting of Confirmed Cases :

The Microbiology laboratory should notify the followings upon identification:

a) Nurse-in-Charge of the ward/unit where the patient was admitted.

b) Infection Prevention & Control Department.

c) Treating physician.

Infection Prevention & Control Department should notify the following:

- Any confirmed cases of C. auris should be reported to the General Directorate of Infection Prevention and Control (GDIPC) through the national approved electronic platform.
- All reports should be generated within 48 hours of identification through GDIPC healthcare associated infections (HAIs) outbreak notification electronic platform.

Treatment :

First-line therapy should be prescribed based on the specific susceptibility testing which should be undertaken as soon as possible. However, there is evidence that resistance can evolve quite rapidly in this species. The selection of antifungal must be based on a case-by-case basis and depending on the site of infection as well as the infectious diseases & the treating physicians' recommendations.

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Preliminary Investigation :

- Every identified case of C. auris, regardless of the degree of antimicrobial resistance, requires immediate investigation to determine the probable source of C. auris and to assess the risk of transmission within the healthcare facility.
- Risk factors for C. auris acquisition should be identified for any patient who tests positive for C. auris.
- Microbiology records should be reviewed (if possible) to determine if the patient had a previous isolate positive for C. haemulonii or other non-albicans candida that may have been misidentified.

Contact Tracing :

Contact defines as; an individual who is exposed to a case colonized or infected with C. auris in a manner that might allow transmission to occur, or an individual who is exposed to a C. auris-contaminated environment where there is an increased risk of acquisition of C. auris.

Healthcare facilities should strongly consider performing more extensive screening if there is evidence or suspicion of ongoing transmission in a healthcare facility (e.g., C. auris detected from multiple patients through contact screening or clinical cultures, increase in infections from unidentified Candida species). Contact investigation will consist of screening and identifying high-risk contacts for C. auris acquisition.

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Screening :

A. Screen patients who are:

Admitted to the critical care units and with specific risk factors to rule out Candida auris colonization:

- Patients with an indwelling medical device, such as a central venous catheter, breathing aid tubes, urinary catheter, biliary catheter, or wound drain.
- Any patient transferred from another healthcare facility OR long-term facility.
- Roommates were exposed to C. auris-positive patients for more than 48 hours.
- Individuals with current multidrug-resistant gram-negative bacteria who received healthcare outside of the Kingdom of Saudi Arabia (KSA) within the last 12 months. Patients transferred from a unit with current transmission of C.auris within the healthcare facility or recent transmission within the last 30 days.
- Carbapenem-Resistant Enterobacterales (CRE) positive patient (infected & colonized).
- Immunocompromised patient.

B. Others:

Screening is recommended in departments that are experiencing outbreaks or having an increase in the number of ongoing cases and/or colonization.

NB: In all cases, in the four weeks prior to diagnosis in the index patient, the healthcare facility should look back to see if there has been an increase in detection of Candida in the same intensive care setting or ward as this may represent unrecognized transmission.

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C. Screening of Healthcare Workers (HCWs) and the Environment:

- Routine screening of healthcare workers and the environment are not recommended unless epidemiological evidence links to transmission or indicated by the infection prevention & control (IPC) team.

Screening Sites:

- Screen for C. auris colonization using a composite swab of **the patient's bilateral axilla and groin.** Recent evidence suggest that these sites are the most common and consistent sites of colonization.
- Also consider screening the following sites (if clinically indicated or previously positive): Nares, mouth, external ear canals, urine (especially if there is a urinary catheter in-situ), Cannula entry sites, endotracheal secretions drain fluid (abdominal/pelvic/mediastinal), wounds, and rectum, these sites are usually less sensitive for colonization screening.

Rescreening of Colonization

Rescreening of C. auris colonized patients are not recommended. However, consult with the infectious disease physician and infection prevention & control department for further recommendations.

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Tailored Infection Prevention & Control Measures :

Although the dynamics of transmission of C. auris are not clearly established, C. auris is known to contaminate the immediate environment of infected or colonized patients with hypothesized onward transmission on the hands of healthcare workers or on fomites (such as shared equipment). It is essential to have commitment from hospital management , infection prevention and control (IPC), and clinical teams, in order to curb the spread of this pathogen.

The primary infection prevention & control measures for C. auris transmission in healthcare settings are:

- Strict adherence to proper hand hygiene practices.
- Application of contact-based precautions.
- Improved adherence to bundles of care for venous and urinary catheters, as well as tracheostomy care is essential.
- Enhanced environmental cleaning and disinfecting (daily and terminal cleaning) using recommended disinfectants.
- Single-patient use items such as blood pressure cuffs and stethoscope should be considered, especially in outbreak situations.
- If single use items not available, reusable equipment should be properly cleaned and disinfected with the recommended disinfectants post providing patient care, and shared mobile equipment (e.g., glucometers, blood pressure cuffs) should be focused on.

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- Limit patient transfer and if mandatory, infection prevention & control measures should be strictly applied.
- Laboratory surveillance of clinical specimens should be applied to detect additional cases.
- Specific considerations should be applied to specific healthcare department and program (dialysis and home healthcare).
- Flag “the patient's record to institute recommended infection control measures in case of readmission.
- Invasive/surgical procedures, strict adherence to care bundles including skin decolonization processes is critical to reduce the risk of invasive C. auris infection. Placing the C. auris colonized patient last on the list is recommended where feasible to enable thorough cleaning to be applied after the episode of care.

Hand Hygiene:

- Hand hygiene is one of the most effective yet simple and cheap interventions that helps in reducing the incidence of C.auris.
- Strict adherence to five moments of hand hygiene is mandatory.
- HCWs hand hygiene compliance rate should be monitored with corrective actions if compliance is not to the expected level.
- Different means of hand hygiene monitoring should be used such as (direct observation of adherence, self-reporting, and monitoring of supplies consumption).
- Alcohol-based hand sanitizer (ABHS) is the preferred hand hygiene method for C. auris when hands are not visibly soiled.

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- If hands are visibly soiled, wash with soap and water.
- Wearing gloves is not a substitute for hand hygiene.
- Education is another aspect that should be focused on as well as frequent monitoring, auditing, and feedback.
- HCWs should know the indication of hand hygiene and demonstrate the right techniques.
- Visual aids on the proper technique of handwashing and alcohol rub should be located at points of care and at hand washing stations (sinks).

Transmission-Based Precautions & Patient Placement:

- In addition to standard precautions, contact precautions are necessary to prevent the transmission of Candida auris that are likely to be transmitted from the patient or the patient's environment.
- Patients on contact precautions should be placed in a single-patient room whenever possible.
- When single rooms are not available, healthcare facilities can cohort patients with C. auris together in the same room based on the infection prevention & control recommendations.
- Healthcare facilities could also consider dedicating healthcare personnel (e.g., nurses, nursing assistants) who provide regular care to these patients during a shift.
- Isolation gowns and gloves should be used with proper donning and doffing techniques when caring for patients with C. auris or touching items.
- Remove gowns and gloves, dispose of them carefully, and perform hand hygiene when leaving the patient's room or bed.

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- Attention should be paid to remove personal protective equipment (PPEs) before leaving the patient's room or environment and avoid using the same gloves for different tasks or locations in the case of shared room.
- The door of the isolation room must remain closed.
- Appropriate English and Arabic contact isolation precaution signage should be posted clearly outside the isolation room

Patient Care Equipment:

- C. auris has been identified on mobile or reusable equipment that is shared between patients, such as glucometers, temperature probes, blood pressure cuffs, x-ray machines, nursing carts, and crash carts that is why it's advisable to use single use equipment when available or dedicated equipment to the C.auris patient.
- All healthcare workers providing patient care should be trained in and responsible for cleaning & disinfecting mobile and reusable equipment properly by using the approved MOH disinfectants (Refer to the Best Guidance for Selecting, Evaluating & Monitoring of the Infection Prevention & Control Supplies & Equipment's).

Patient Transportation:

- Limit the transportation of patients under contact isolation precautions by using portable machines such as portable x-ray machines.
- If a patient needs care or investigations in another department within a healthcare facility (including radiology, theatre, outpatient clinic etc.), the receiving department should be notified of the patient's C. auris status and advised on what precautionary measures to take prior to and during the transfer/ procedure. These patients should also be scheduled last on the list for the day, if feasible.

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- If a patient needs to be transferred to another healthcare facility, including a long-term care facility, the referring facility should ensure that the receiving facility is appropriately notified of the patient's C. auris infection or colonization status, and transfer form should be completed.
- Isolation precaution transportation card should be used during patient necessary movement.
- If the patient has dressing or wound, it should be contained and covered.
- Emergency medical services (EMS) and other healthcare providers involved in transferring such a patient need to be made aware of the status of the patient and advise on proper personal protective equipment's (PPE), as well as, disinfection of the ambulance, as deemed necessary.

Visitors:

- Entry to the patient's room should be restricted only for the responsible healthcare worker.
- Visitors to the infected or colonized C.auris patients should be avoided as possible.

Decolonization:

- C. auris decolonization not recommended in evidence. However, regular routine body washing, skin preparation for invasive procedures, and care bundles by using approved skin disinfectants should be implemented for all critical care patients.

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Duration of Transmission Based Precautions :

- Patients in healthcare facilities often remain colonized with C. auris for a long period of time lasting for several months even after an acute infection (if present) has been treated and resolved. Continue contact isolation precautions for the whole duration of all inpatient healthcare stays, including those in long-term healthcare settings.

Environmental Cleaning & Disinfection:

- C. auris can persist on surfaces in healthcare environments including both high-touch surfaces, such as bedside tables and bedrails, and surfaces further away from the patient, such as window-sills.
- Routine (at least daily or when required), and terminal cleaning and disinfection of patients rooms and other areas where patients receive care (e.g., radiology, physical therapy) should be implemented applying an appropriate disinfectant that effective against C. auris. MOH approved disinfectants (Sodium hypochlorite 1000 ppm, Hydrogen peroxide, etc.) as high-level disinfectants should be used with consideration of the manufacturer instructions (Refer to the Best Guidance for Selecting, Evaluating & Monitoring of the Infection Prevention & Control Supplies & Equipment's).
- It is preferable to use the new and evolving disinfection technologies, like ultraviolet light and hydrogen peroxide vapor/mist decontamination machines for terminal cleaning, and they should be used only post standard cleaning (Refer to the Best Practices of Environmental Health for Prevention & Control of Infections in Healthcare Facilities Guidelines).

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- Each healthcare facility needs to establish a quality monitoring tools for assessing environmental cleaning and disinfection aspects to assist the supervising HCWs' in their assessment methods and documenting the appropriateness of cleaning and disinfection activities for environmental surfaces and medical equipment.
- Environmental sampling is not recommended for routine assessment of cleaning and disinfection practices and cannot be used to confirm absence of C. auris.
- Environmental sampling could be done only to support outbreak investigations, especially when epidemiologic evidence implicates an environmental reservoir in ongoing local transmission and based on the infection prevention & control recommendations.
- Proper training for housekeepers about appropriate disinfectant concentration, required dilution, methods of cleaning & disinfection, the needed contact time of used disinfectants, the proper selection and use of personal protective equipment's (PPE) and hand hygiene must be implemented. (Refer to the Best Practices of Environmental Health for Prevention & Control of Infections in Healthcare Facilities Guidelines).

Management of Textile and Medical Waste:

- Disposable textiles such as curtains and towels should be considered with C. auris positive patients' room if available.
- There is no special reprocessing recommendation for the used linen and textiles coming from rooms with C. auris positive patients, the current policy for the healthcare textile reprocessing should be applied.
- In pediatric and neonatal units, specific attention should be paid to disposal of used nappies.

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- Medical waste coming from C. auris positive patients' rooms should be treated based on the approved national medical waste regulations.

Facilitating Adherence to Infection Prevention & Control Measures:

- Ensure that adequate supplies (i.e., hand hygiene supplies, cleaning and disinfection agents, PPEs) are available to implement and maintain appropriate infection prevention & control measures.
- Monitor the adherence to appropriate infection prevention & control practices by performing audits and providing feedback.
- Ensure that the isolation sign posted on the patient's door to alert HCWs and visitors of recommended precautions.
- Flag the patient's record to alert HCWs to institute recommended infection prevention & control practices in case of readmission.

Education & Training :

- Raising awareness and providing education to all healthcare workers is an essential to manage the C.auris infections.
- Education and practice audits to improve compliance of healthcare workers with hand hygiene, contact precautions and supervision of appropriate implementation of environmental cleaning are important supportive interventions.

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- Clinicians and ancillary health professionals (including dieticians, radiographers, physiotherapists, phlebotomists etc.) should also be trained regarding IPC recommendations. Additionally, affected patients, visitors, and family members (if permitted) should be briefed about the importance of hand hygiene and encouraged to use required personal protective equipment's.

Infection Prevention & Control Considerations in Specific Settings:

Dialysis:

- Minimize exposure to other patients by dialyzing the patient at a station with as few adjacent stations as possible (e.g., at the end or corner of the unit).
- Consider dialyzing the patient on the last shift of the day.
- Clean and disinfect the dialysis station thoroughly (e.g., chairs, side tables, machines) between patients by using MOH approved disinfectants against C. auris.
- Properly clean and disinfect reusable equipment brought to the dialysis station after each use.
- If the patient is transferred to another healthcare facility, inform the receiving facility of the patient's C. auris status in the transfer form.

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Home Healthcare:

- If possible, patients with C. auris should be schedule as the last visit of the day.
- alcohol-based hand rub should be used as the preferred method for cleaning hands when they are not visibly soiled.
- If hands are visibly soiled, hands should be washed with soap and water.
- Wearing gloves is not a substitute for hand hygiene.
- Hand hygiene should be performed when entering and leaving the patient care area.
- Gown and gloves should be used with proper donning and doffing techniques when entering the area of the house where patient care is provided.
- Remove gowns and gloves and dispose of them carefully when leaving the area.
- Reusable equipment (e.g., blood pressure cuffs) brought to the home should be cleaned and disinfected properly using approved MOH disinfectant after each use.
- If the patient needs to be admitted or referred to another healthcare facility, the receiving facility should be informed about the patient's C. auris status.

Antimicrobial Stewardship Program :

Although there is no evidence for a specific beneficial effect of antimicrobial stewardship on the emergence and spread of C. auris, it is likely that an environment with a high level of broad-spectrum antibacterial and antifungal use will favour the emergence of multidrug-resistant yeasts, such as C. auris. Therefore, the implementation of antimicrobial stewardship program effectively is likely to mitigate the risks of C. auris acquisition and transmission, as well as being an essential component of strategies to reduce antimicrobial resistance in general.

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Outbreak Management :

Early, robust action is recommended to prevent the C.auris outbreak as these can be prolonged, costly and may pose significant risk to compromised patients. Prompt notification of C. auris to the clinical and infection prevention & control teams is essential to implement infection control precautions in a timely manner and to ensure vigilance for development of infections in patients found to be colonized. For healthcare facilities that have identified C. auris, the single case should be reported immediately through GDIPC healthcare associated infections (HAIs) outbreak notification electronic platform, and a full investigation and management must be established. (Refer to GDIPC HAIs Outbreak Management Guideline, 2023).

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