Canadian Nosocomial Infection Surveillance Program
Surveillance for *Candida auris*

Contact Information

Please direct all questions to:

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National Microbiology Lab Branch (NMLB)
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Working Group

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BACKGROUND

Candida auris is an emerging multi-drug resistant (MDR) yeast that is associated with transmission in healthcare facilities. It was first isolated in Japan in 2009 and has rapidly emerged in at least 50 countries on six continents, including Canada and the United States. *C. auris* has been associated with transmission and large outbreaks in health care settings involving many patients (1, 2), where it can spread from person to person and through contact with contaminated patient environments and equipment (3). Some of the countries reporting patient transmission include Canada, the United States, India, Pakistan, the United Kingdom, South Africa, Columbia and Venezuela (4, 11). It can cause both superficial (e.g. wound and ear infections) and invasive infections with a mortality as high as 30 – 60% (5).

C. auris is often resistant to commonly used antifungals. In a study by the US Centers for Disease Control and Prevention, the resistance rates were approximately 90% to fluconazole, 35% to amphotericin B, and 7% to echinocandins. Nearly half of the strains were resistant to >2 antifungal classes (i.e. MDR) and about 4% were resistant to all three classes (5). Furthermore, resistance was also reported to develop during therapy, presumably by selection under antifungal pressure (6). *C. auris* can be difficult to identify in the routine microbiology laboratory. It is often misidentified with standard laboratory methods (Appendix 1), which may lead to inappropriate management of the patients (6, 7). MALDI with updated reference databases and rRNA sequencing can reliably identify *C. auris*.

In Canada, 51 cases of *C. auris* have been identified from 2012 to October 2023 in six provinces from blood, axilla/groin, ear, and other sites. Of the 51 isolates of *C. auris* reported to PHAC, one third were MDR. The earliest case in Canada was identified in 2012 and the isolate was susceptible. The first case of MDR *C. auris* was reported in 2017 in a patient with recent hospitalization in India. This patient was also colonized with CPE (8). In 2018, a cluster of C. auris with evidence of transmission involving four4 patients was described in British Columbia (11). The same year, a Canadian *C. auris* point prevalence study was conducted in 2018 by 21 hospitals amongst high-risk patients (9). Two isolates were found in the CPO colonized patients, representing a prevalence of 1.9% in the CPO group; however, both patients had recently received healthcare in the Indian subcontinent. The epidemiology and genomic analysis of Canadian cases identified from 2012-2019 has been described (10) as well as a small 2018 outbreak in British Columbia (11).

Much remains unknown about the epidemiology and detection of *C. auris*. In Canada, some provinces have established surveillance and CNISP began surveillance in 2019, however there still exists little data to inform screening policies for high-risk populations. We aim to understand the epidemiology and scope of this emerging fungal pathogen in order to optimize laboratory identification as well as to inform infection prevention and control programs.

OBJECTIVES

1. To identify and describe the epidemiology, risk factors and clinical outcomes of inpatients and outpatients infected or colonized with *Candida auris* in order to inform screening and infection prevention and control activities

2. To identify the potential origin and genetic relatedness of Canadian isolates by whole genome sequencing

METHODS

Site Eligibility

CNISP hospitals are eligible to participate.

Case Eligibility

Patients admitted to a participating hospital or presenting to a hospital emergency department or a hospital-based outpatient clinic with laboratory confirmation of *C. auris* from any specimen (see Appendix 1).

Data and isolate submission

Patient specimens with eligible *C. auris* isolates (as per Appendix 1: *Candida* spp. eligible for inclusion for laboratory criteria) will be identified by the hospital microbiology laboratory or its reference laboratory and sent to the NML with a minimum dataset (see Appendix 2).

If isolates are being forwarded to the NML via your Provincial Laboratory, please inform the Provincial Laboratory of the CNISP site number (e.g., 99Z) and CNISP patient PID (e.g., 99Z-YY-001) so that isolates can be linked to the patient questionnaire.

Only the first *C. auris* identified for each patient during a calendar year will be sent to the NML. If there are multiple initial isolates within a few days of each other, please send the isolate from the most invasive site[1]. However, if a colonizing isolate has already been sent, there is no need to send a second isolate, even if invasive. Sites will complete a patient questionnaire (see Appendix 3) for the first *C. auris* isolate identified during each calendar surveillance year.

For isolates sent to the NML as suspect *C. auris,* the NML will send confirmatory results via email to the site and the site will complete a patient questionnaire (see Appendix 3) if the patient is eligible.

Exposure classification

Once the patient has been identified with *C.auris*, they will be classified based on the following criteria and in accordance with the best clinical judgement of the healthcare and/or infection control practitioner (ICP).

Healthcare-associated acquired in your acute-care facility (HA-YAF)

- Patient is on or beyond calendar day 3[2] of their hospitalization and has no previous hospitalization exposure outside of Canada

OR

- Has had a healthcare exposure (inpatient or outpatient) at your facility that would have resulted in this infection or colonization (using best clinical judgement)

Healthcare-associated acquired in your acute-care facility (HA-YAF), but also has a previous healthcare exposure outside of Canada

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[1] Please use the following hierarchy as guidance for the most to least invasive site: cerebrospinal fluid (CSF), blood, other sterile sites (e.g. pleural fluid, OR swabs, tissue), bronchoalveolar lavage (BAL), sputum/endotracheal tube (ETT), wound - surgical site; wound/skin – other clinical specimen, urine, colonized site (ear, skin, stool, rectum, nares, axilla, groin).

[2] Calendar day 1 is the day of hospital admission

- Patient is on or beyond calendar day 3[2] of their hospitalization when the first specimen was obtained, but was not screened on admission, and has a previous exposure to healthcare outside of Canada

Healthcare-associated any other healthcare exposure in Canada (HA-OTHER, Canada)

- Any patient who has an infection or colonization not acquired at your facility that is thought to be associated with another healthcare exposure in Canada (e.g. another acute-care facility, long-term care, rehabilitation facility, clinic or exposure to a medical device).

Healthcare-associated acquired from any other healthcare exposure outside of Canada (HA-OTHER, outside Canada)

- Any patient who has an infection or colonization not acquired at your facility that is thought to be associated with another healthcare exposure outside of Canada (e.g. another acute-care facility, long-term care, rehabilitation facility, clinic or exposure to a medical device).

Community–associated (CA)

- No exposure to healthcare that would have resulted in this infection or colonization (using best clinical judgement) and does not meet the criteria for a healthcare-associated infection or colonization.

Case Reporting

Please submit all patient questionnaires by email to CNISP at cnisp-pcsin@phac-aspc.gc.ca OR submit under 'Web Data'. Please see Appendix 5: CNPHI Web data submission for instructions on submitting data in 'Web Data'.

Please assign a unique patient identifier as follows: CHEC site number, surveillance year then consecutive number (e.g. 99ZYY001).
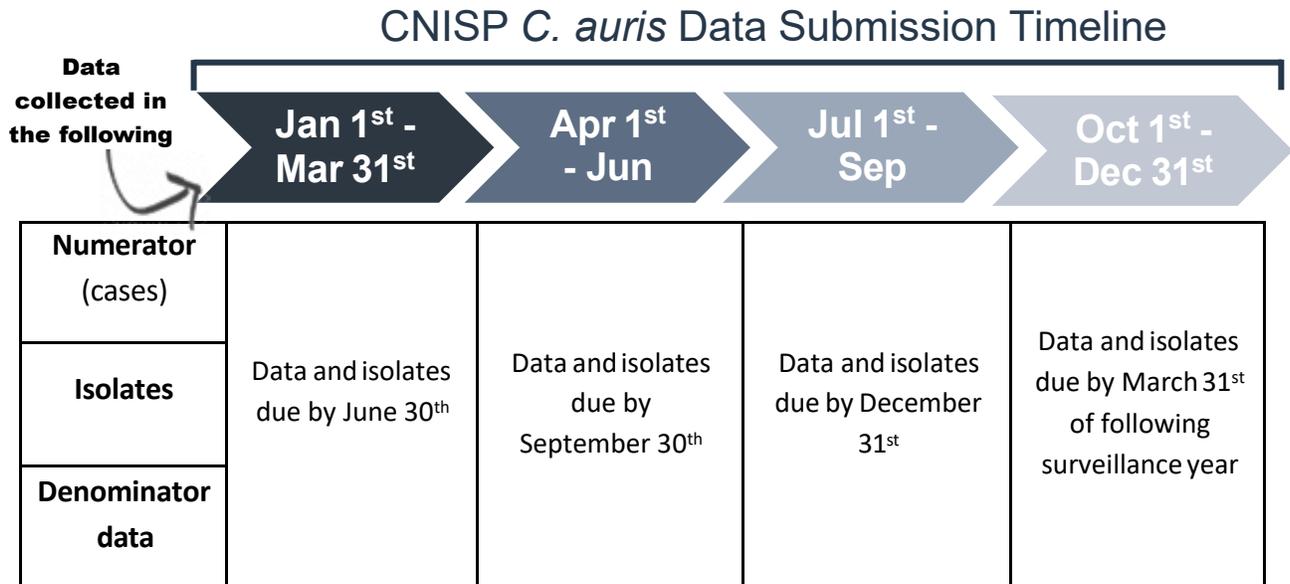

NOTE: if the same patient is identified as C. auris positive in a different surveillance year, please assign it a new unique patient identifier (e.g. 99ZYY001). If the information is available, indicate that the case was previously identified and the surveillance year of first known positive.

Laboratory Reporting

The laboratory shipping form must be included with the shipment AND emailed to the NML at nml.arni- rain.lnm@phac-aspc.gc.ca. It is important that when isolates are submitted, either directly to the NML or via your provincial lab, that they are identified as CNISP isolates otherwise they will not be included in CNISP surveillance.

Data Submission Timeline

Please submit *C. auris* data and isolates according to the following timeline:

CNISP *C. auris* Data Submission Timeline

Data collected in the following	Jan 1st - Mar 31st	Apr 1st - Jun	Jul 1st - Sep	Oct 1st - Dec 31st
Numerator (cases)	Data and isolates due by June 30th	Data and isolates due by September 30th	Data and isolates due by December 31st	Data and isolates due by March 31st of following surveillance year
Isolates				
Denominator data				

Zero Report

For every surveillance year with no cases at your hospital, a zero report must be made under 'Web Data' in CNPHI by March 31st of the following surveillance year so that years with zero counts can be differentiated from missing data. Instructions for submitting data under 'Web Data' are included in Appendix 5, or you can email CNISP at cnisp-pcsin@phac-aspc.gc.ca to indicate that your hospital does not have any cases to report for that surveillance year.

Denominator Data

Denominator data will be collected on the quarterly denominator form and submitted in CNPHI.

The data collected will include:

1) total number of patient admissions per year

2) total number of inpatient-days per year

In CNPHI, denominator data are entered via the "Profiles and Denominators" page. Since *C. auris* shares denominator data with VRE and MRSA/MSSA, a denominator for *C. auris* will automatically be created when data are entered for VRE or MRSA/MSSA.

ANALYSIS

The national and regional number of cases, descriptive epidemiology, microbiology and resistance data will be calculated each year by PHAC and NML. Regional and national rates (per 1,000 admissions and per 10,000 inpatient-days) will be calculated if sample size permits. Data will be reported through PHAC surveillance reports, presentations, publications, and published on the PHAC and/or AMMI website.

ETHICS

This surveillance project is observational and does not involve any alteration in patient care. Surveillance for healthcare associated infections is a routine component of quality assurance and patient care in Canadian healthcare institutions and therefore informed consent will not be required. All data submitted to the Public Health Agency of Canada are kept strictly confidential. Each questionnaire will be identified by a unique number and no personal identifiers will be transmitted to the Public Health Agency of Canada. This unique number will be linked to the patient's name or hospital number only at the local hospitals and will be kept strictly confidential under secure conditions.

PRIVACY

Any data released by CNISP will be in summary format and will not identify individual hospitals or people. Hospital administrators should be made aware that national reporting of aggregate data will occur.

Appendix 1- *Candida spp.* eligible for inclusion

Included in this surveillance project are all clinical or screening samples that were positive for *C. auris* by any method. Currently, *C. auris* can be identified by rRNA sequencing, Vitek MS MALDI-TOF (with either the clinical database v3.2 or later or the RUO database), or Bruker MALDI-TOF (with either the clinical database v6903 or later or the RUO database). The project also includes potential *C. auris* misidentifications or "No identification" as outlined in the Table below.

Identification method:	Identification of suspect isolates
Vitek MS MALDI using clinical database version before v3.2	*Candida haemulonii* No ID/low discrimination *Candida rugosa* (not a problem for v3.0 or later) *C. pulcherrima* (not a problem for v3.0 or later)
Bruker MALDI using clinical database version before v6903	No ID
Vitek 2 YST version 8.01	*Candida haemulonii* *Candida duobushaemulonii* *No ID/ Low discrimination*
Vitek 2 YST version before 8.01	*Candida haemulonii* *Candida duobushaemulonii* *Candida lusitaniae* *Candida famata* No ID/low discrimination
API 20C AUX	*Rhodotorula glutinis* (characteristic red color not present) *C. sake* No ID/low discrimination
API ID 32C	*Candida intermedia* *Candida sake* *Saccharomyces kluyveri*
BD Phoenix yeast identification system	*Candida haemulonii* *Candida catenulata* No ID

Appendix 2- *C. auris* Standardized Laboratory Shipping Form

Instructions

1. All fields of this form should be filled out and sent to the NML (care of Dr. Bharat) along with the patient specimens. Clearly label each specimen with their unique patient identifier.
2. Please also email this form to nml.arni-rain.lnm@phac-aspc.gc.ca on the day of shipping to allow tracking of the shipment.
3. If you are forwarding the isolate to NML via your provincial laboratory, please indicate that it is a CNISP isolate to facilitate linkage with the patient questionnaire.
4. Send isolates with this form to the following:

Send to:

Dr. Amrita Bharat National Microbiology Laboratory

1015 Arlington St., Winnipeg, Manitoba R3E 3R2 Tel: 204-789-7654

Use FedEx billing number: 6327-8173-3

Please click on the icon below to access the excel shipping form:

CNISP Laboratory
Shipping Form Cauris

Appendix 3- Patient Questionnaire for *C. auris* Surveillance

Please complete for all *C. auris* cases. Please see Appendix 4: Data Dictionary for definitions and notes.

1.	CHEC Site: _____
2.	Unique Patient ID: _____ **YY** _____(e.g. 99Z24001) *(CHEC site #)* *(year)* *(case number)*
3.	Date of birth: _____/ _____/ _____ Age _____ DD MMM YYYY □ Years □ Months □ Days
4.	Sex: □ Male □ Female □ Unknown
5a.	Date of positive culture: _____/ _____/ _____ DD MMM YYYY

5b.	Was this patient known to have *C. auris* identified in a previous surveillance year?
	□ Yes
	       • if possible, please specify surveillance year(s): _____
	       • If possible, please specify the CNISP PID (if available): _____
	□ No
	□ Unable to determine

6a.	Type of isolate: □ Clinical isolate □ Screening isolate
6b.	If **CLINICAL ISOLATE**, please indicate the site of isolation as reported by the laboratory: □ Not applicable – screening isolate □ Blood □ Sputum □ Skin/soft tissue □ Urine □ Ear swab □ Cerebrospinal fluid (CSF) □ Bronchoalveolar lavage (BAL) □ Stool □ Other, specify: _____ □ Unknown

6c.	If **SCREENING ISOLATE**, please indicate the site of isolation as reported by the laboratory: □ Not applicable □ Rectum □ Nares □ Pooled axilla and groin □ Groin □ Axilla □ Unknown □ Other, specify: _____
6d.	If **SCREENING ISOLATE,** what was the purpose of the screening? □ Not applicable, this is a clinical isolate □ Contact of a newly identified case □ Primary screening of an at-risk patient □ Other, specify: _____
7.	Is this isolate associated with an infection or colonization? □ Infection □ Colonization
8.	Other sites of clinical and screening isolates identified in the 30 days **AFTER** the first isolate *(please check all that apply):* □ None identified □ Groin □ Blood □ Cerebrospinal fluid (CSF) □ Sputum □ Bronchoalveolar lavage (BAL) □ Skin/soft tissue □ Surgical site □ Urine □ Stool □ Ear swab □ Nares □ Rectum □ Axilla □ Unknown □ Other, specify:

9.	Location of the patient in hospital on day of first positive culture?
	□ Inpatient
	  □ ICU
	  □ Medical ward
	  □ Surgical ward
	  □ Hematology-Oncology/Bone Marrow Transplant
	  □ Other, specify: _____
	□ Emergency Room (ER)
	    If the positive specimen was collected while the patient was in ER, was this patient subsequently admitted? □ Yes □ No □ Unknown
	□ Outpatient
	□ Unknown

10.	Date of admission related to current positive culture? _____/ _____/ _____ DD MMM YYYY □ Not applicable (patient not admitted)

11a.	Where was this *C. auris* acquired?
	   ❑ Healthcare-associated – acquired in your acute-care facility (HA-YAF)
	   ❑ Healthcare-associated – acquired in your acute-care facility (HA-YAF), but also has a previous healthcare exposure outside Canada
	   ❑ Healthcare-associated – acquired from any other healthcare exposure <u>in</u> Canada (HA-Other, Canada) ➜ skip to Q12
	   ❑ Healthcare-associated – acquired from any other healthcare exposure <u>outside</u> of Canada (HA-Other, outside Canada) ➜ skip to Q12
	   ❑ Community-associated (CA) ➜ skip to Q12
	   ❑ Unable to determine ➜ skip to Q12

11b.	If healthcare-associated in your facility (HA-YACF), is there evidence of any of the following modes of transmission using best clinical judgement? Please select all that apply.
	   ❑ N/A (not HA-YACF)
	   ❑ Another patient (e.g. contact tracing, contact with known *C.auris* patient)
	   ❑ Outbreak/cluster associated
	   ❑ Environmental source (e.g. bedding, bed railing, floor)
	   ❑ Medical equipment source (e.g. glucometer, blood pressure cuff, temperature probe etc.)
	   ❑ Unable to determine
	   ❑ Other potential exposure, please specify: _____

12.	Does the patient have any of the following risk factors during their hospitalization (please select all that apply):
	   □ Mechanical ventilation
	   □ Central venous catheter
	   □ Urinary catheter
	   □ Receipt of oral or IV antifungals
	   □ Unable to determine
	   □ Other, please specify:
	   □ None of the above

13a.	Does the patient have a history of travel outside of Canada in the past 12 months? □ Yes, if possible please specify the country _____ • If travelled to the United States, please specify the state: _____ □ No ➜ skip to Q14 □ Unable to determine ➜ skip to Q14
13b.	If traveled outside of Canada in the past 12 months, does the patient have a history of hospitalization or receipt of healthcare outside of Canada? □ Yes □ No □ Unable to determine

14.	Is there any evidence of international travel by a member of the household or caregiver in the 12 months prior to the patient's *C. auris* diagnosis? □ No, there is no evidence of international travel □ Yes, if possible, please specify the country:_____ • If travelled to the United States, please specify the state: _____ □ Unable to determine
15.	Is the patient known to have been colonized or infected with CPE currently or in the past? □ Yes □ No, and has been screened on this admission and tested negative □ Unknown, not screened

16.	Is there evidence the patient has pre-existing comorbidities(s)?
	
	❑ No evidence of any pre-existing comorbidity
	❑ Yes *(please check all that apply)*
	      o Diabetes
	      o Liver disease
	      o HIV infection
	      o Cancer (active)
	      o Lung disease (e.g., asthma, COPD, pneumonia)
	      o Kidney disease (include all patients on dialysis)
	      o Solid organ transplant recipient
	      o Bone marrow transplant recipient
	      o Other immunosuppression, specify
	      o Heart disease
	      o Other, specify
	      o Unknown

17.	Was the patient admitted to an ICU within 30 days of first positive culture? □ Patient was already in an ICU at the time of the positive culture was obtained □ Yes, please indicate the date of ICU admission: _____/ _____/ _____ DD MMM YYYY □ No □ Unknown

18.	What was the patient outcome 30 days after first positive culture?
	
	□ Patient alive, still in hospital
	
	□ Patient survived and discharged Date of discharge _____/ _____/ _____
	                                                 DD MMM YYYY
	
	□ Patient survived and transferred Date of transfer _____/ _____/ _____
	                                                 DD MMM YYYY
	
	□ Patient died Date of death _____/ _____/ _____
	                             DD MMM YYYY
	□ Unknown

19.	If the patient died, please indicate the relationship of *C. auris* to the death
	        □ *C. auris* was the cause of death
	        □ *C. auris* contributed to death
	        □ Death is unrelated to *C. auris*
	        □ Causality between *C. auris* and death cannot be determined

20a.	Was an antifungal susceptibility performed on an isolate from this patient? □ Yes □ No (end of questionnaire)
20b	If yes, specimen type: _____ Date collected: _____/ _____/ _____ DD MMM YYYY <table><thead><tr><th>Antifungal</th><th>Not tested</th><th>Reported result (e.g. disc diameter or MIC) with units</th></tr></thead><tbody><tr><td>Fluconazole</td><td>□</td><td></td></tr><tr><td>Itraconazole</td><td>□</td><td></td></tr><tr><td>Posaconazole</td><td>□</td><td></td></tr><tr><td>Voriconazole</td><td>□</td><td></td></tr><tr><td>Amphotericin B</td><td>□</td><td></td></tr><tr><td>Caspofungin</td><td>□</td><td></td></tr><tr><td>Micafungin</td><td>□</td><td></td></tr><tr><td>Adidulafungin</td><td>□</td><td></td></tr><tr><td>Flucytosine</td><td>□</td><td></td></tr></tbody></table>

21.	Additional comments:

Appendix 4- Data Dictionary

Definitions and notes for Appendix 3 – *C. auris* Patient Questionnaire

1. **CHEC Site #**

   This will be the three character alphanumeric number assigned to your institution. It will always begin with the two digit number assigned to your CHEC member (e.g., 08, 33) and a letter assigned by the CHEC member for that specific institution e.g., A, B, C, etc.

2. **Unique patient ID**

   The unique patient ID should consist of the three character CHEC site # (e.g., 99Z), the surveillance year the infection was identified (e.g., 24), and a consecutive number starting at 001 and continuing with each additional case. An example of the first case in an institution would be 99ZYY001. An example of the thirty-first case would be 99ZYY031, and so on.

   Note: Always label the laboratory isolate with this unique ID number.

3. **Date of birth or age**

   Please enter Day (##), Month (May) and Year (1985) in this order. If the date of birth is not available, please enter the patient's age (in years, months or days) at the time of positive culture.

4. **Sex**

   Check male, female or unknown

5a. Date of first positive culture

   Please indicate when the isolate that tested positive was collected.

5b. Was this patient known to have *C. auris* identified in a previous surveillance year?

   If this patient was identified as *C. auris* positive in a previous surveillance year, please indicate yes and if possible provide the PID so that we may link the cases.

6a. Type of isolate

   Please indicate whether the isolate was obtained as a result of a clinical specimen (e.g., blood, CSF, ear swab, etc.) or a screening isolate (e.g., admission swab, point prevalence swab, etc.)

6b. If a clinical isolate, please indicate the site of isolation

   Please indicate the site of isolation as reported by the laboratory for the clinical isolate.

6c. If a screening isolate, please indicate the site of isolation

Please indicate the site of isolation as reported by the laboratory for the screening isolate.

6d. What was the purpose for collecting the <u>screening</u> isolate?

Please indicate why the patient was screened. E.g. patient was a contact of a case (e.g., a roommate), or was identified as high risk for *C. auris* colonization (e.g., history of receipt of healthcare in the Nevada), etc.

7. Is this isolate associated with an infection or colonization?

Based on the isolate submitted, please indicate if this cases is colonized or infected. Infection is determined using the CDC/NHSN surveillance definitions and may be accessed at: http://www.cdc.gov/nhsn/PDFs/pscManual/17pscNosInfDef_current.pdf

8. Other site(s) of clinical and screening isolates identified in the 30 days AFTER the first isolate *(check all that apply)*

After the first eligible isolate was identified, please indicate all the specimen(s) in which *C. auris* was detected in subsequent clinical or screening isolates identified in the 30 days following the first eligible isolate.

9. Location of patient in hospital on day of first positive culture?

Please indicate the location of the patient at the time the specimen that yielded *C. auris* was obtained. If the patient was an inpatient, please indicate the ward the patient was on (e.g., medical, surgical, ICU). Otherwise, please indicate whether the patient was in the emergency department or was an outpatient. If the positive specimen was collected while the patient was in ER, please indicate if this patient was subsequently admitted to hospital.

10. Date of admission when current positive culture?

Please indicate the date when the patient was admitted to the hospital using this format Day (##), Month (Oct) and Year (####). For outpatients and ER patients, who were not admitted, please select 'not applicable'.

11a. Where was this *C. auris* acquired?

Please indicate whether the infection or colonization was acquired in a healthcare setting (HA) or in the community (CA) according to the following definitions and in accordance with the best clinical judgement of the healthcare and/or infection prevention and control practitioner (IPC). If the site of acquisition cannot be determined, please report as 'unable to determine'.

Healthcare-associated acquired in your acute-care facility (HA-YAF)

- Patient is on or beyond calendar day 3[2] of their hospitalization and has no previous hospitalization exposure outside of Canada

OR
- Has had a healthcare exposure (inpatient or outpatient) at your facility that would have resulted in this infection or colonization (using best clinical judgement)

Healthcare-associated acquired in your acute-care facility (HA-YAF), but also has a previous healthcare exposure outside of Canada

Patient is on or beyond calendar day 3^2 of their hospitalization when the first specimen was obtained, but was not screened on admission, and has a previous exposure to healthcare outside of Canada

Healthcare-associated any other healthcare exposure <u>in</u> Canada (HA-OTHER, Canada)

Any patient who has an infection or colonization <u>not</u> acquired at your facility that is thought to be associated with another healthcare exposure in Canada (e.g. another acute-care facility, long-term care, rehabilitation facility, clinic or exposure to a medical device).

Healthcare-associated acquired from any other healthcare exposure outside of Canada (HA-OTHER, outside Canada)

Any patient who has an infection or colonization <u>not</u> acquired at your facility that is thought to be associated with another healthcare exposure <u>outside of Canada</u> (e.g. another acute-care facility, long-term care, rehabilitation facility, clinic or exposure to a medical device).

Community–associated (CA)

- No exposure to healthcare that would have resulted in this infection or colonization (using best clinical judgement) and does not meet the criteria for a healthcare-associated infection or colonization.

11b. If healthcare-associated in your facility (HA-YAF), is there evidence of any of the following modes of transmission?

Please indicate whether there is any evidence to suggest that this patient became infected/colonized with this *C. auris* through any of the modes listed (i.e. are any of the modes of transmission suspected as potential sources of exposure?). Please use best clinical judgement when determining the mode of transmission.

12. **Does the patient have any of the following risk factors?**
    Please indicate if the patient has any of the risk factors listed during their hospitalization. Please select all that apply.

13. **Patient travel history**

    a. **Does the patient have a history of travel outside Canada in the past 12 months?**

    Please indicate if the patient has travelled outside of Canada in the 12 months prior to the date of positive culture. If yes, please specify to which country. If they patient traveled to the United States, if known, please specify to which state. If no or unable to determine, please skip to Q14.

b. If travelled outside of Canada in the past 12 months, does the patient have a history of hospitalization or receipt of healthcare outside of Canada?

If the answer to question 13a is 'Yes', please indicate to the best of your knowledge whether the patient received medical care while travelling outside Canada.

14. **Is there any evidence of international travel by a member of the household or caregiver in the 12 months prior to the other patient's *C. auris* diagnosis?**

Please indicate (if possible) whether there is any evidence of travel outside of Canada by a member of the household and/or a caregiver in the 12 months prior to the patient's *C. auris* diagnosis.

15. **Is the patient known to have been colonized or infected with CPE currently or in the past?**

Please indicate if, to your knowledge, the patient has ever had CPE (carbapenemase producing Enterobacterales) isolated from a clinical or screening specimen. If they have not, please indicate whether they were screened for CPE during this hospital admission/outpatient visit. If neither is true, select "unknown, not screened".

16. **Does the patient have any pre-existing comorbidities?**

Please indicate whether the patient has any pre-existing comorbidities. Please check all that apply.

17. **Was the patient admitted to an ICU within 30 days of first positive culture?**

Please indicate whether the patient was admitted to an ICU within 30 days of first positive culture and the date of ICU admission if applicable

18. **Patient outcome 30 days after the *C. auris* positive culture?**

Thirty days after the date of positive culture please select one of the outcome options available and the corresponding date if applicable.

19. **Relationship of *C.auris* to death**

If the patient died, please indicate if *C.auris* was the cause of death (i.e. the patient had no other condition that would have cause death during the admission); *C.auris* contributed to death (i.e. *C.auris* exacerbated an existing condition that led to the patient's death), *C.auris* was unrelated to death or unable to determine the causality between *C.auris* and death

Appendix 5 – CNPHI Web Data Submission

Under Collaboration select

Canadian Nosocomial Infection Surveillance Program

Select Web Data
(Patient questionnaires and denominator forms are kept here)

Scroll to find the patient questionnaire or denominator form you're looking for

Additional Functions

Add new record

Revision History

Date	Revisions Made
October 2019	1. Update of background 2. Added Q8 classification status (infection or colonization) 3. Added the following response option to Q9 'Hematology-Oncology/Bone Marrow Transplant' 4. Added Q14 ICU admission and Q15 30 day outcome 5. Update of Appendix 1 (table with potential misidentifications of C. auris on different ID systems) based on the latest information in the CDC table https://www.cdc.gov/fungal/candida-auris/recommendations.html
January 2021	A new question added: During this admission or in the 14 days prior to this admission, did this patient test COVID-19 positive for the first time?
January 2022	Updated working group list, PHAC/NML email address, and introduction
January 2023	Updated working group list Updates to the pt questionnaire: • Added the following response option to Q6c – pooled (axilla and groin) (note that the denominator will need to be adjusted as this response option was not available from 2019-2022). • Q8 – added a time frame to indicate subsequent isolates identified within the 30 days following identification of the first isolate • Added attributable mortality • Removed COVID-19 co-infection question Updated data dictionary
November 2023	Updated working group list Clarified isolate eligibility if multiple isolates are collected Updates to patient questionnaire • Q5b - Was the patient positive in a previous surveillance year • Q9 - Added question for patients whose positive culture was collected in ER – was this patient subsequently admitted? • Q11a - Where was the *C. auris* likely acquired (e.g. your facility, another facility in Canada, outside Canada, community) • Q11b – risk factors associated with hospitalization • Q11c – potential mode(s) of transmission • Q13a – indicate state if travelled to the United States • Q14 – added question regarding travel status of household members • Q16 – added question regarding comorbidities

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