

Canadian Nosocomial Infection Surveillance Program (CNISP)

2018 Surveillance Protocol for Carbapenemase-Producing Organisms (CPO) in CNISP Healthcare Facilities

December 20, 2017

FINAL

Working Group:

Elizabeth Bryce, Chelsey Ellis, Joanne Embree, Susy Hota, Kevin Katz (co-chair), Pamela Kibsey, Allison McGeer, Jessica Minion, Sonja Musto, Andrew Simor, Jocelyn Srigley, Kathy Suh, Geoff Taylor, Nisha Thampi, Nathalie Turgeon, Titus Wong, Christian Lavallée (co-chair), David Boyd (NML), George Golding (NML), Laura Mataseje (NML), Kanchana Amaratunga (PHAC) and Robyn Mitchell (PHAC)

Contact:

Public Health Agency of Canada

CNISP Surveillance

Fax : 613-946-0678

E-mail: cnisp.pcsin@phac-aspc.gc.ca

Mail: Public Health Agency of Canada

130 Colonnade Road, PL6504B

Ottawa, ON K1A 0K9

OBJECTIVES

1. To identify and describe the epidemiology and clinical outcomes of patients (inpatients, emergency room (ER) patients and outpatients) infected or colonized with carbapenemase-producing organisms (CPOs) (i.e. family *Enterobacteriaceae* and genus *Acinetobacter*) in participating CNISP hospitals.
2. To describe the molecular epidemiologic information of the carbapenem-resistant isolates collected, including the resistance genes present and the infecting microorganisms identified.
3. To determine the incidence of patients infected and colonized with Carbapenemase-Producing *Enterobacteriaceae* (CPE) and Carbapenemase-Producing *Acinetobacter* (CPA) in participating CNISP hospitals.
4. To provide national benchmark rates that hospitals may use for external comparison.

RATIONALE

Carbapenems are a class of beta-lactam antibiotics with broad-spectrum activity recommended as first-line therapy for severe infections caused by certain gram negative organisms and as directed therapy for organisms that are resistant to narrower spectrum antibiotics. Carbapenem resistance can be due to changes in the permeability of the organism to the antibiotic and/or the up-regulation of efflux systems that “pump” the antibiotic out of the cell, usually concomitant with the presence of an acquired extended-spectrum beta-lactamase (ESBL) or AmpC enzyme or the hyperproduction of intrinsic chromosomally – located beta-lactamase(s). More recently, resistance is increasingly due to the acquisition of enzymes that break down the carbapenems: carbapenemases. These latter subsets of carbapenem-resistant organisms are called carbapenemase-producing organisms (CPOs) and are of particular concern because of their ability to transfer resistance easily across different genera and species of bacteria. They are quickly becoming a public health problem not only because of the ability to cause healthcare acquired infections which have limited treatment options, but because of the potential for colonizing both inpatient and outpatient populations due to their ease of transmissibility, thus, creating a reservoir of bacterial resistance.

The intent of this surveillance is to describe the epidemiology and clinical outcomes of patients identified as having carbapenem resistance due to carbapenemase production. There is a specific focus on this subset of organisms that are carbapenemase producers because this type of resistance is not endemic in Canadian populations at this point in time, but is known to be associated with transmission and outbreaks in health care facilities. We need to understand the epidemiology and scope of the problem while it is still an emerging event, and identify the potential impact of CPOs on infection prevention and control programs and patient treatment strategies.

METHODOLOGY

a) Surveillance period

The surveillance period is from January 1, 2018 to December 31, 2018.

b) Eligible facilities

All CNISP hospitals are eligible to participate.

c) Eligible cases

Patients admitted to participating CNISP hospitals or a CNISP hospital emergency department or a CNISP hospital-based outpatient clinic that meets the following criteria:

- (i) Laboratory confirmation of carbapenem resistance (see **Appendix A** for laboratory criteria) in *Enterobacteriaceae* and *Acinetobacter spp.*
- (ii) Collection of positive specimen (including screening isolates) between January 1, 2018 and December 31, 2018.

d) Patient identification and data collection

Patient specimens with eligible *Enterobacteriaceae* and/or *Acinetobacter spp.* (as per **Appendix A**) will be identified by the hospital microbiology laboratory and sent to the NML with a minimum data set (**Appendix B**).

Each time an eligible *Enterobacteriaceae* or *Acinetobacter spp.* is identified by the NML as **harbouring a carbapenemase** (i.e. a CPO), the NML will send the results via email to the site and the site will complete a Patient Questionnaire (**Appendix C**) for this specimen.

All Patient Questionnaires should be submitted on a quarterly basis by email to the CNISP Surveillance Officer at cnisp.pcsin@phac-aspc.gc.ca

Please assign the unique patient identifier as follows: CHEC site number, surveillance year, CPO, then consecutive number (e.g., 07A-18CPO-001).

Note: If more than one eligible *Enterobacteriaceae* or *Acinetobacter spp.* is identified during the same admission please indicate by adding suffix A or B (etc.) to the case number (e.g. 07A-18CPO-001**A** and 07A-18CPO-001**B**).

For every new admission please assign a NEW unique patient identifier. Also, as above, if more than one eligible *Enterobacteriaceae* or *Acinetobacter spp.* is identified please indicate by adding a suffix A or B (etc.).

For patients with more than one CRE or CRA infection or colonization in the same calendar year, if possible please indicate the unique patient identifier for the previous admission. This allows CNISP to link patient data and accurately calculate rates.

e) Denominator data

Denominator data will be collected on the quarterly denominator form.

The data collected will include:

- 1) total number of patient admissions per year
- 2) total number of inpatient-days per year
- 3) total number of outpatient visits per year (if unable to provide by age category)¹
 - a. total number of Adult outpatient visits (≥ 18 years of age)
 - b. total number of Pediatric outpatient visits (<18 years of age)
- 4) total number of emergency room (ER) visits per year (if unable to provide by age category)
 - a. total number of Adult ER visits (≥ 18 years of age)
 - b. total number of Pediatric ER visits (<18 years of age)

Attached Appendices:

Appendix A. Gram-negative bacilli eligible for inclusion and laboratory criteria for determining carbapenem resistance

Appendix B. Carbapenem-Resistant Gram-Negative Bacilli Specimen Surveillance Form

Appendix C. 2018 Patient Questionnaire

Appendix D. Algorithm for CNISP 2018 CPO Surveillance

Appendix E. Carbapenem-Resistant Gram-Negative (CRGN) Organisms

Appendix F. Data dictionary – definition and notes for patient questionnaire

¹ An outpatient visit is defined as a patient who has a face to face visit or encounter with any healthcare professional in your hospital, hospital clinic or associated facility for diagnosis or treatment and does not require admission or hospitalization >24 hours (excludes ER visits).

APPENDIX A - Gram-negative bacilli eligible for inclusion and laboratory criteria for determining carbapenem resistance

Included in this surveillance project are all clinical samples collected between January 1, 2018 and December 31, 2018 that tested/screened positive for at least one potential carbapenem-resistant *Enterobacteriaceae* and/or *Acinetobacter*, using automated systems or 2016 CLSI² zone diameters and/or MIC values as listed below:

At least ONE of the following:	<i>Enterobacteriaceae</i> :	
	MIC ($\mu\text{g/ml}$)	Disk diffusion ³ (mm)
Imipenem	≥ 4	≤ 19
Meropenem	≥ 4	≤ 19
Doripenem	≥ 4	≤ 19
Ertapenem	≥ 2	≤ 18

At least ONE of the following:	<i>Acinetobacter</i> :	
	MIC ($\mu\text{g/ml}$)	Disk diffusion ⁴ (mm)
Imipenem	≥ 8	≤ 18
Meropenem	≥ 8	≤ 14
Doripenem	≥ 8	≤ 14

For eligible *Enterobacteriaceae* isolates (see above table) if a laboratory conducts CARBA-NP or a commercial equivalent, or modified CIM test (mCIM)

AND/OR

A disk-based phenotypic test, for example, MAST or ROSCO combined disk assays (we suggest the disk based test include a temocillin disk)

THEN

Send only test-positive isolates to the NML. For CARBA-NP and mCIM protocol please refer to CLSI³

Please assign the unique patient identifier as follows: CHEC site number, surveillance year, CPO, then consecutive number (e.g. 07A - 18CPO - 001).

Note 1a: If more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified during the same admission, please indicate by adding suffix A or B (etc.) to the case number (e.g. 07A-18CPO-001-A and 07A-18CPO-001-B). For every new admission please assign a NEW unique patient identifier. Also, as above, if more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified please indicate by adding a suffix A or B (etc.).

Note 1b: If the NML confirms that more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. harbouring a carbapenemase is identified during the same admission or on re-admission, the NML and CNISP will work together to figure out how to handle this case based on this algorithm:

- If the same CPO gene is found in the same patient, it will be considered as a co-infection or co-colonization.
- If a different CPO gene is found in the same patient, it will be considered as two different events.

² Clinical and Laboratory Standards Institute. 2017. Performance standards for antimicrobial susceptibility testing; 27th informational supplement, M100-S27 (January 2017). Clinical and Laboratory Standards, Wayne, PA.

³ Using a 10 μg disk of the appropriate antimicrobial

Due to the importance of the timely identification of these organisms for treatment and infection control purposes, we strongly encourage you to send isolates that meet the study definition to the NML as soon as possible – **at least once every three months**. Timely submission is especially important if you have additional evidence (phenotypic or molecular) that the isolate is harbouring a carbapenemase or if you suspect it is part of an outbreak. In addition, we strongly recommend you alert your provincial public health authorities. To avoid the NML receiving duplicate isolates, we would appreciate if you would inform us if the isolate(s) you shipped to the NML were also sent to your provincial laboratory. The provincial laboratory may also send the same isolates to the NML for testing.

All isolates that meet the protocol definitions will be submitted along with the specimen surveillance form (Appendix B) to Dr. George Golding at the address below. The turn-around time for PCR identification of a carbapenemase gene for this purpose will be a maximum of three (3) days.

Dr. George Golding
National Microbiology Laboratory
1015 Arlington St.
Winnipeg, Manitoba
R3E 3R2
Tel: 204-789-8096
Fax: 204-789-5020
Use FedEx billing number: 2299-8435-7

Email: george.golding@canada.ca

APPENDIX B – Carbapenem-Resistant Gram-Negative Bacilli Specimen Surveillance Form

Instructions: All fields of this questionnaire should be filled out and sent to the NML (care of Dr. Golding) along with the patient specimens.
The specimens should be clearly labelled with their unique patient identifier.

Important: Please email Dr. Golding the day of shipping to allow tracking of the shipment

Patient unique identifier	Hospital identifier	Gender (M/F)	Date of Birth (DD/MM/YYYY)	Hospital Admission Date (DD/MM/YYYY)	Date of first positive culture ^a (DD/MM/YYYY)	Ward ^b	Pathogen ^c	Site ^d
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						
.....18CPO..... CHEC# case#		<input type="checkbox"/> Male <input type="checkbox"/> Female						

^a The date the specimen was taken.

^b The clinical unit at the time of infection: Intensive Care Unit (ICU), Neonatal Intensive Care Unit (NICU), Medical Ward (MW), Surgical Ward (SW), Emergency (ER) or Outpatient (OP).

^c Pathogen: *Acinetobacter baumannii* (Ab), *Serratia* spp (S), *Klebsiella pneumonia* (Kp), *Enterobacter* spp. (E), *Citrobacter* spp. (C), *Proteus* spp. (P), *Morganella morganii* (Mm), *Escherichia coli* (Ec), if other, please specify on form. **Note:** If more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified during the same admission, please indicate by adding suffix A or B (etc.) to the case number (e.g., 07A-18CPO-001-A and 07A-18CPO-001-B).

^d Site specimen was isolated from: Wound (W), Surgical Incision site (SIS), Sputum/Endotracheal Secretions/BAL (S/ES/BAL), Urine (U), Blood (B), if other, please specify.

Questionnaire complete by: Name _____

Date (DD/MM/YYYY): _____

APPENDIX C – 2018 Patient Questionnaire

**Surveillance for INPATIENTS/EMERGENCY ROOM PATIENTS/OUTPATIENTS
with Carbapenemase-Producing Enterobacteriaceae (CPE) or Carbapenemase-Producing Acinetobacter
(CPA) Infection or Colonization**

NB: For outpatients, please fill in to the best of your ability

1	Have you received a confirmation from the NML that this is a CPO positive case?	<input type="checkbox"/> Yes - If yes, please complete the remainder of the questionnaire <input type="checkbox"/> No – If no, please do NOT submit this questionnaire.
2	Does this patient meet the criteria for an infection or colonization?	<input type="checkbox"/> Infection ⁵ <input type="checkbox"/> Colonization
3	CHEC site # _____	
4	Unique Patient Identifier	_____ 18CPO _____ <i>(CHEC site #) (year) (case number)</i>
5	Location of patient in hospital on day of positive CPO culture?	<input type="checkbox"/> Inpatient <input type="checkbox"/> ICU <input type="checkbox"/> NICU <input type="checkbox"/> Medical ward <input type="checkbox"/> Surgical ward <input type="checkbox"/> Other, specify _____ <input type="checkbox"/> ER <input type="checkbox"/> Outpatient <input type="checkbox"/> Other, specify _____ <input type="checkbox"/> Unknown
6	Date of birth _____/_____/_____ <i>dd mmm yyyy</i>	OR Age _____ <input type="checkbox"/> Years <input checked="" type="checkbox"/> Months <input type="checkbox"/> Days
7	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
8	Date of admission when current CPO was identified	_____/_____/_____ <i>dd mmm yyyy</i>
9	Type of positive CPO isolate	<input type="checkbox"/> Screening isolate <input type="checkbox"/> Clinical isolate <input type="checkbox"/> Blood isolate
10	Date of positive culture <i>(Specimen collection date from which the positive organism was isolated)</i>/...../..... <i>dd mmm yyyy</i>

⁵ Infection is determined using the 2017 CDC/NHSN surveillance definitions for specific infections, and in accordance with the best judgment of the healthcare practitioner. These criteria can be accessed at [URL:www.cdc.gov/nhsn/PDFs/pscManual/17pscNosInfDef_current.pdf](http://www.cdc.gov/nhsn/PDFs/pscManual/17pscNosInfDef_current.pdf)

11	<p>Organism isolated</p> <p><i>PLEASE CHECK ONLY ONE ORGANISM⁹</i></p>	<input type="checkbox"/> <i>Acinetobacter</i> spp. <input type="checkbox"/> <i>Serratia</i> spp. <input type="checkbox"/> <i>Klebsiella pneumoniae</i> <input type="checkbox"/> <i>Enterobacter</i> spp. <input type="checkbox"/> <i>Escherichia coli</i> <input type="checkbox"/> <i>Proteus</i> spp. <input type="checkbox"/> <i>Morganella morganii</i> <input type="checkbox"/> <i>Citrobacter</i> spp. <input type="checkbox"/> <i>Other, specify</i> _____
12	<p>Site(s) of isolation</p> <p><i>Check ALL that apply</i></p> <p><i>(Anatomic site(s) from which this positive organism was isolated)</i></p>	<input type="checkbox"/> Blood <input type="checkbox"/> Sputum <input type="checkbox"/> Skin/soft tissue <input type="checkbox"/> Urine <input type="checkbox"/> Surgical site <input type="checkbox"/> Stool/rectal swab <input type="checkbox"/> <i>Other, specify:</i> _____
13a	<p>Where was CPO acquired?</p>	<input type="checkbox"/> HA ⁴ (your facility) <input type="checkbox"/> HA (Other Canadian healthcare exposure) <input type="checkbox"/> HA (Other healthcare facility outside of Canada) <input type="checkbox"/> Community-Associated <input type="checkbox"/> Unable to determine
13b	<p>If healthcare-associated (your facility), is there evidence of any of the following modes of transmission?</p> <p><i>Please select all that apply</i></p>	<input type="checkbox"/> Sink <input type="checkbox"/> Drain <input type="checkbox"/> <i>Other environment exposure, specify:</i> _____ <input type="checkbox"/> <i>Device (e.g. ERCP) specify :</i> _____ <input type="checkbox"/> <i>Another patient, if possible please specify the unique PID</i> _____ <input type="checkbox"/> <i>Other exposure, specify:</i> _____ <input type="checkbox"/> Unknown
14a	<p>Is there any evidence of international travel in the 12 months prior to CPO diagnosis?</p>	<input type="checkbox"/> No, there is no evidence of international travel <input type="checkbox"/> Yes, specify where travelled to _____ <input type="checkbox"/> Unable to determine
14b	<p>If travelled internationally, is there evidence the patient received medical care where they travelled to?</p>	<input type="checkbox"/> Yes, there is evidence that the patient sought medical care while on international travel. <input type="checkbox"/> No, there is no evidence that the patient sought medical care while on international travel <input type="checkbox"/> Unable to determine

⁴HA = healthcare associated

APPENDIX D: ALGORITHM for CNISP 2018 CPO SURVEILLANCE

Patient admitted to any ward/department of your hospital (including outpatients & emergency department patients) and identified with carbapenem-resistant *Enterobacteriaceae* AND / OR *Acinetobacter*

NO

Excluded from surveillance

YES

Isolate(s) is/are eligible for surveillance (identified by the hospital laboratory)

Enterobacteriaceae spp.

–MIC ≥ 4 $\mu\text{g/ml}$ to at least one of: Imipenem, Meropenem, Doripenem and/or MIC of ≥ 2 $\mu\text{g/ml}$ to Ertapenem OR Disk diffusion of ≤ 19 mm for at least one of: Imipenem, Meropenem, Doripenem, and/or ≤ 18 mm to Ertapenem

Acinetobacter spp.

– MIC ≥ 8 $\mu\text{g/ml}$ to at least one of: Imipenem, Meropenem, Doripenem OR Disk diffusion for Imipenem ≤ 18 mm & Meropenem & Doripenem ≤ 14 mm

Note: If laboratories are conducting phenotypic carbapenemase-specific testing in addition to the above guidelines, please see Appendix A comments.

NO

Excluded from surveillance

YES

Fill the "CRGN SPECIMEN SURVEILLANCE FORM" (Appendix B) & send it together with the isolate(s) to the NML (care of Dr. Golding)

Dr. George Golding
National Microbiology Laboratory
1015 Arlington St.
Winnipeg, Manitoba R3E 3R2

Tel: 204-789-8096; Fax: 204-789-5020
Use FedEx billing number: 2299-8435-7
Email george.golding@canada.ca

PCR detection (by NML) of isolated *Enterobacteriaceae* spp. and/or *Acinetobacter* spp. for the presence of a carbapenemase

If a carbapenemase is detected

NO

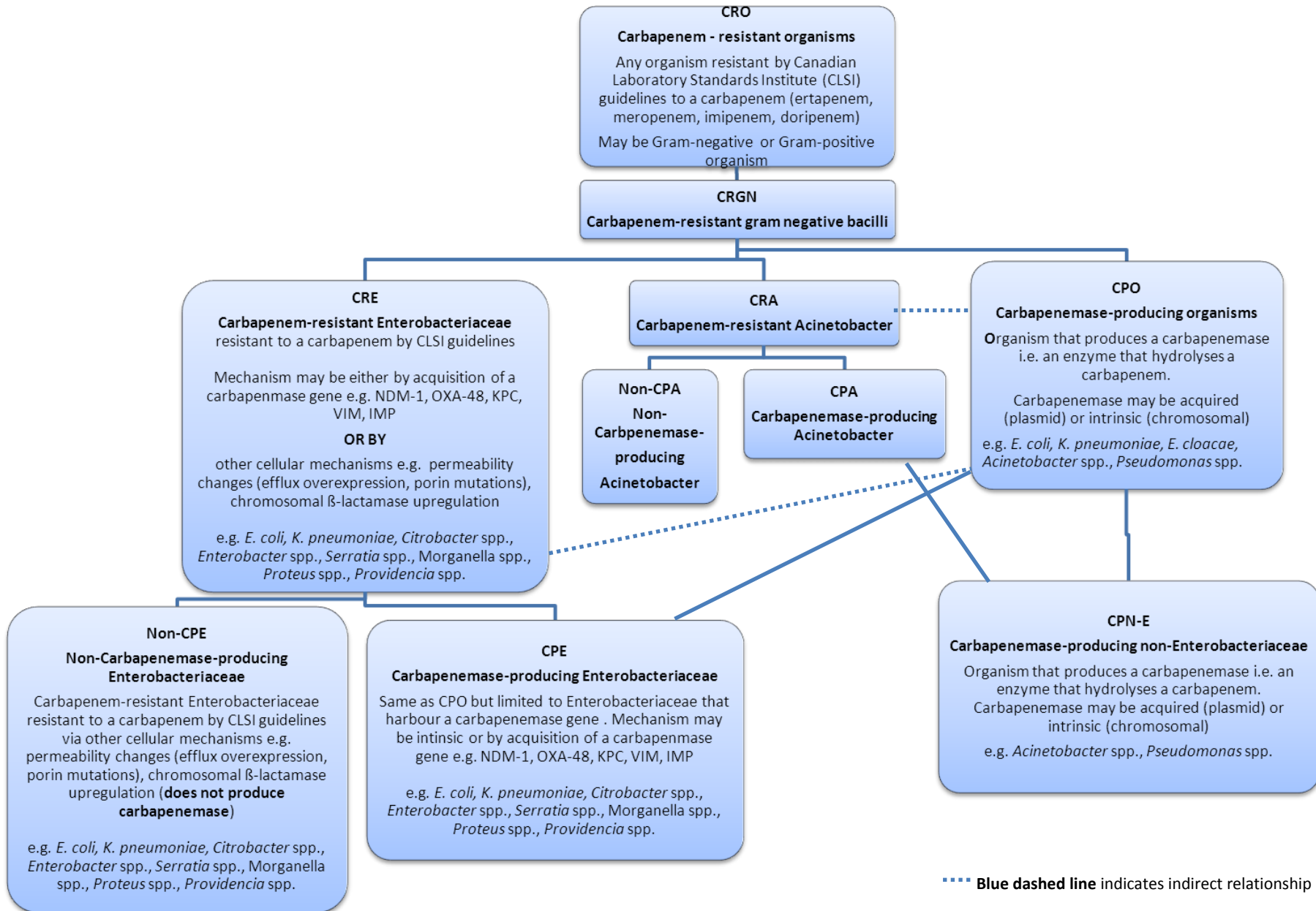
The NML sends a report of all PCR results to the CHEC site

YES

The NML sends a report of all PCR results to the CHEC site

CHEC site completes the "PATIENT QUESTIONNAIRE" (Appendix C) for all CPE and CPA infections and colonizations & sends to CNISP.

APPENDIX E: Carbapenem-Resistant Gram-Negative (CRGN) Organisms



APPENDIX F - Data Dictionary - Definitions and notes for Patient Questionnaire (Appendix C)

1. Have you received a confirmation from the NML that this is a CPO positive case?

Please complete the questionnaire if you have received a confirmation from the NML that this case is CPO positive. If no confirmation has been received from the NML stating the case is CPO positive, please do NOT complete this questionnaire.

2. Does this patient meet the criteria for an infection or colonization?

Infection is determined using the 2017 CDC/NHSN surveillance definitions for specific infections **AND** in accordance with the best judgment of the infection control and/or healthcare practitioner.

These criteria can be accessed at URL:

http://www.cdc.gov/nhsn/PDFs/pscManual/17pscNosInfDef_current.pdf

3. CHEC Site

This will be the **3-character** alphanumeric number assigned to your institution. It will always begin with the two digit number assigned to your CHEC member e.g., 07, 15, and a letter assigned by the CHEC member for that specific institution e.g., A, B, C, etc. The CHEC site # for each institution should always be the same for all the CHEC/CNISP surveillance projects and will always have all three alphanumeric digits reported as the CHEC site #, e.g., 07A, 15A.

4. Unique patient identifier

The unique patient identifier should consist of the 3 character CHEC site # (e.g., 07A), the surveillance year the infection occurred in (e.g., 18), and a consecutive number starting at 001 and continuing on with each additional case. An example of the first case in an institution would be 07A-CPO18-001. An example of the thirty-fifth case would be 07A-CPO18-035, and so on.

If more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified during the same admission please indicate by adding suffix A or B (etc.) to the case number (e.g. 07A-18CPO-001A and 07A-18CPO-001B).

For every new admission please assign a NEW unique patient identifier. As above if more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified please indicate by adding a suffix A or B (etc).

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

5. Location of patient in hospital on day of positive CPO culture?

Please indicate the location of the patient at the time the positive culture for CPO 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.

6. Date of birth

Please enter Day (##), Month (May) and Year (1973) 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.

7. Gender

Check male or female gender as appropriate.

8. Date of admission when current CPO was identified

Please indicate the date when the patient was admitted to the hospital, ER or outpatient department using this format Day (##), Month (May) and Year (1973).

9. Type of first positive CPO isolate

Please indicate whether the isolate was obtained as a result of screening, a clinical isolate (wound, surgical site, respiratory etc.) or a blood culture

10. Date of positive culture

For the current admission, please indicate when the isolate that tested CPO positive was collected.

11. Organism isolated

Please select the organism isolated as reported by the laboratory. If more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified during the same admission, please complete a new questionnaire and indicate by adding suffix A or B (etc.) to the case number (e.g. 07A-18CPO-001A and 07A-18CPO-001B).

12. Site(s) of isolation

Please indicate the type of specimen(s) in which this CPO was detected. Please check ALL that apply.

13a. Where CPO acquired?

Please indicate whether the infection 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 (HA) your facility:

- Patient is on or beyond calendar day 3⁵ of their hospitalization

Healthcare-associated (HA) other Canadian healthcare exposure:

- Exposure to any healthcare setting (other than your facility) including another acute-care facility, long-term care, rehabilitation facilities or clinics OR exposure to medical devices in the previous 12 months⁶.

Healthcare-associated (HA) other healthcare facility outside of Canada

- Exposure to any healthcare setting outside of Canada including another acute-care facility, long-term care, rehabilitation facilities or clinics OR exposure to medical devices in the previous 12 months⁶.

Community-associated (CA):

- Infection identified on admission to hospital (calendar day 1 = day of hospital admission) and/or the day after admission (day 2).

AND

- Has no prior hospital, long-term care admission or other exposure to a healthcare setting (rehab, clinics) in the past 12 months⁶.

AND

⁵Calendar day 1 is the day of hospital admission

⁶ Consideration should be given to the frequency and nature of exposure to a medical device and/or healthcare setting. For example, pediatric patients with clinic visits for otitis media, asthma, well-baby etc., in the previous 12 months may or may not be considered as HA while pediatric patients with clinic visits that involved invasive procedures or day surgery may be more likely to be considered HA. Adult patients attending dialysis, receiving chemotherapy, outpatient visits involving invasive procedures or day surgery may be more likely to be considered HA compared to adult patients with occasional outpatient or community health clinic visits.

- Has no reported use of medical devices.

AND

- Did not meet the criteria for HA

13b. If healthcare-associated (your facility), 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 CPO through any of the modes listed. If contact with another patient, please specify the unique patient ID of this patient.

14a. Is there any evidence of international travel in the 12 months prior to CPO diagnosis?

Please indicate if the patient has travelled internationally in the 12 months prior to the date of positive culture.

14b. If travelled internationally, is there evidence the patient received medical care where they travelled to?

If answered 'yes' to question 14a, please indicate (if possible) whether the patient received medical care while travelling internationally.

16. Does the patient have any underlying medical conditions?

Please indicate whether the patient has any underlying medical conditions – if yes, check all that apply.

Note: Q17 & Q18 are only to be completed for infected cases

17. Was ICU admission required due to complications associated with CPO infection?

Please indicate whether the patient required admission to ICU as a result of complications associated with acquiring a CPO infection.

18. Patient outcome 30 days after positive CPO culture?

Thirty days after the date of positive culture please select one of the options available

19. Previous unique patient ID

For patients with more than one CPE or CPA infection or colonization reported in the same calendar year, if possible, please indicate the previous unique patient ID of this patient.

Revision History

June 3, 2014 - added response 'unable to determine' to Q8 "Where CPO acquired?" – now Final v2

June 9, 2014 - corrected numbering of questions – now Final v3

July 15, 2014 - added ER visits to denominator data collection – was already added to separate 'quarterly denominator form' – now Final v4

October 30, 2014 - Began making changes to homogenize CNISP protocol formatting

December 15, 2014 - Updated the unique patient ID for multiple organisms and/or re-admission to reflect previous nomenclature (i.e. adding suffix A or B).

December 30, 2014 - Updated Q8 to include 'other Canadian healthcare facility' and 'other healthcare facility outside of Canada'. Changed wording of Q13 to clarify evidence of transmission.

2015 - Question Q13 "Is there any evidence that this was a nosocomial-acquired case?" was removed in the 2015 protocol.

October 28, 2015 - Question 15c related to what medical procedure patients were subjected to if they received medical care abroad has been removed.

November 2017 - Added Q13b regarding possible sources/modes of transmission

- Added Q19 - for patients with more than one CPE or CPA infection or colonization in a calendar year, please report the PID of the previous case

- Project name updated to CPO surveillance. Note: reflected in PID format

- Update to PID format: For multiple pathogens, infections, colonizations etc. within same the admission use the same PID with suffix A, B, C etc. **NEW** – use a new PID for a new admission.

- Updated healthcare and community-associated definitions to standardize with MRSA and VRE protocols