Canadian Nosocomial Infection Surveillance Program (CNISP)

2017 Surveillance Protocol for Carbapenem-Resistant Gram-Negatives (CRGN) in CNISP Healthcare Facilities

December 29, 2017

FINAL

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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 microorganisms (CPOs) (i.e. family *Enterobacteriaceae* and *genus Acinetobacter*) in participating CNISP hospitals[1].
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 Organisms (CPO) including 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, the up-regulation of efflux systems that "pump" the antibiotic out of the cell, and more recently, due to the hyperproduction of enzymes that break down the carbapenems. This latter subset 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 that are CPOs 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.

As this surveillance collects all isolates identified as carbapenem resistant gram negative (CRGN) organisms (See Appendix E for a chart detailing the relationship of CPO, CRE, CRA to CRGN) in participating CNISP hospitals and only epidemiologic data for CPOs, for organisms identified as CRE and CRA, only incidence rates can be calculated with no detailed epidemiological information.

[1] CPO rates will be calculated only for inpatients.

METHODOLOGY

a) Surveillance period

The surveillance period is from January 1, 2017 to December 31, 2017.

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 specified Gram-negative organisms in *Enterobacteriacae* and *Acinetobacter spp*.

(ii) Collection of first positive specimen (including screening isolates) between January 1, 2017 and December 31, 2017.

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 (electronically, by mail, or fax) to the CNISP Surveillance Officer:

Phone: 613-301-5021
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

Please assign the unique patient identifier as follows: CHEC site number, surveillance year, CRGN, then consecutive number (e.g., 07A-17CRGN-001).

Note: If more than one eligible *Enterobacteriaceae* or *Acinetobacter* spp. is identified during the same admission or on re-admission (Appendix B), please complete a new questionnaire and indicate by adding suffix A or B (etc.) to the case number (eg. 07A-17CRGN-001-**A** and 07A-17CRGN-001-**B**).

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)[2]

    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 2017 Patient Questionnaire
Appendix D Algorithm for CNISP 2017 CRGN Surveillance
Appendix E Carbapenem-Resistant Gram-Negative (CRGN) Organisms
Appendix F Data dictionary – definition and notes for patient questionnaire

[2] 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, 2017 and December 31, 2017 that tested/screened positive for at least one potential carbapenem-resistant ***Enterobacteriacae*** **and/or** ***Acinetobacter,*** using automated systems or 2016 CLSI[3] zone diameters and/or MIC values as listed below:

At least ONE of the following:	***Enterobacteriaceae:***	
	MIC (*µg/ml*)	Disk diffusion[4] (*mm*)
Imipenem	≥ 4	≤ 19
Meropenem	≥ 4	≤ 19
Doripenem	≥ 4	≤ 19
Ertapenem	≥ 2	≤ 18

At least ONE of the following:	***Acinetobacter:***	
	MIC (*µg/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

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 protocol please refer to CLSI[3]

Please assign the unique patient identifier as follows: CHEC site number, surveillance year, CRGN, then consecutive number (e.g., 07A - 17CRGN - 001).

Note 1a: If more than one eligible *Enterobacteriacae* or *Acinetobacter* spp. is identified during the same admission or on re-admission, please complete a new questionnaire (Appendix B) and indicate by adding suffix A or B (etc.) to the case number (eg. 07A-17CRGN-001-**A** and 07A-17CRGN-001-**B**).

Note 1b: If the NML confirms that more than one eligible *Enterobacteriacae* 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.

[3] Clinical and Laboratory Standards Institute. 2016. Performance standards for antimicrobial susceptibility testing; 25th informational supplement, M100-S27 (December 2016). Clinical and Laboratory Standards, Wayne, PA.

[4] 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@phac-aspc.gc.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]
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						
…………17CRGN……………. *CHEC#* *case#*		☐ Male ☐ Female						

[a] The date the specimen was taken.
[b] The clinical unit at the time of Gram-negative infection: Intensive Care Unit (ICU), Neonatal Intensive Care Unit (NICU), Medical Ward (MW), Surgical Ward (SW).
[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 *Enterobacteriacae* or *Acinetobacter* spp. is identified during the same admission or on re-admission, please complete a new questionnaire and indicate by adding suffix A or B (etc.) to the case number (e.g., 07A-17CRGN-001-**A** and 07A-17CRGN-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):** ______________________

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APPENDIX C – 2017 Patient Questionnaire

Surveillance for INPATIENTS/EMERGENCY ROOM PATIENTS/OUTPATIENTS with PCR confirmed Carbapenemase-Producing Organism (CPO) 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?	□ Yes - If yes, please complete the remainder of the questionnaire □ No – If no, please do **NOT** submit this questionnaire.
2	Does this patient meet the criteria for an **infection**[5]?	□ Yes □ No
3	CHEC site # _____	
4	Unique Patient Identifier	_____ 17CRGN _____ *(CHEC site #) (year) (case number)*
5	Location of patient in hospital on day of first positive CPO culture?	□ Inpatient □ ICU □ Medical ward □ Surgical ward □ Other, specify _____ □ ER □ Outpatient □ Other, specify _____ □ Unknown
6	Date of birth _____/_____/_____ *dd mmm yyyy*	**OR** Age _____ □ Years □ Months □ Days
7	Gender	□ Male □ Female
8	Date of admission when current CPO was identified	_____/_____/_____ *dd mmm yyyy*
9	Type of first positive CPO isolate	□ Screening isolate □ Clinical isolate □ Blood isolate
	Where was CPO acquired?	□ Healthcare-associated[6]

[5] Infection is determined using the 2015 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

[6] HA = Specimen collected > 3 days after admission to healthcare facility (i.e. on or after calendar day 4. Calendar day 1 is the day of admission).

10		□ Your facility □ Other Canadian healthcare exposure[7] □ Other healthcare facility outside of Canada □ Community-Associated[8] □ Unable to determine
11	Date of positive culture *(Date of sampling of the specimen from which the positive organism was isolated)*	……/……/…… *dd mmm yyyy*
12	Organism isolated *PLEASE CHECK ONLY **ONE** ORGANISM*[9]	□ *Acinetobacter* spp. □ *Serratia* spp. □ *Klebsiella pneumoniae* □ *Enterobacter* spp. □ *Escherichia coli* □ *Proteus* spp □ *Morganella morganii* □ *Citrobacter spp*. □ *Other, specify* _____
13	Site(s) of isolation *Check ALL that apply* *(Anatomic site(s) from which this positive organism was isolated)*	□ Blood □ Sputum □ Skin/soft tissue □ Urine □ Surgical site □ Stool/rectal swab □ Other, specify: _____
14	Is there any evidence of transmission from another patient within your facility?	□ Yes, if possible specify unique patient ID of index case _____ □ No □ Unable to determine
15a	Is there any evidence of international travel in the 12 months prior to CPO diagnosis?	□ No, there is **no** evidence of international travel □ Yes, specify where travelled to _____ □ Unable to determine
15b	If travelled internationally, is there evidence the patient received medical care where they travelled to?	□ Yes, there is evidence that the patient sought medical care while on international travel. □ No, there is **no** evidence that the patient sought medical care while on international travel □ Unable to determine

[7] Healthcare-associated (acquired in any other healthcare facility or setting) = Exposure to any healthcare setting (including acute-care, lon-term care, psychiatric, or rehabilitation facility or clinic (dialysis, outpatient) in the previous 12 months. Consideration should be given to the frequency and nature of exposure to a healthcare setting. For example, pediatric patients with clinic visits in the previous 12 months may or may not be considered as HA.

[8] CA = Specimen collected as an outpatient or an inpatient ≤ 3 days after admission to healthcare facility (i.e. on calendar day 1, 2 or 3. Calendar day 1 is day of admission).
These categorizations of HA & CA are based on the Jan 2014 NHSN MDRO LabID event reporting and can be accessed at this URL: www.cdc.gov/nhsn/PDFs/pscManual/12pscMDRO_CDADcurrent.pdf

[9] If more than one eligible *Enterobacteriacae* or *Acinetobacter* spp. is identified during the same admission or on re-admission, please complete a new questionnaire and indicate by adding suffix A or B (etc.) to the case number (eg. 07A-17CRGN-001-**A** and 07A-17CRGN-001-**B**).

16	Is there evidence the patient has underlying medical condition(s)? Check **all** that apply	□ No evidence of any underlying medical condition □ Yes *(please check all that apply)* □ Diabetes □ Liver disease □ HIV infection □ Cancer (active) □ Lung disease (e.g., asthma, COPD) □ Kidney disease (include all patients on dialysis) □ Solid organ transplantation □ Bone marrow transplantation □ Other immunosuppression, specify _____ □ Heart disease □ Other, specify _____ □ Unknown
17	**Note**: Only complete this question for **infected** cases Was ICU admission required due to complications associated with CPO **infection**?	□ Yes □ No □ N/A – patient was already in ICU □ Unknown □ Not an infection
18	**Note**: Only complete this question for infected cases Patient outcome **30 days** after positive CPO diagnosis?	□ 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* □ Not an infection

Please send all completed questionnaires to:

CNISP Surveillance
Phone: 613-301-5021
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

APPENDIX D: ALGORITHM for CNISP 2016 CRGN SURVEILLANCE

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

NO → **Excluded from surveillance**

YES

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

Enterobacteriacae spp.
–MIC ≥4 µg/ml to at least one of: Imipenem, Meropenem, Doripenem and/or MIC of ≥2 µg/ml to Ertapenem OR Disk diffusion of ≤19 mm for at least one of: Imipenem, Meropenem, Doripenem, and/or ≤18mm to Ertapenem

Acinetobacter spp.
– MIC ≥8 µg/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 carbepenemase-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. MULVEY)

Dr. Michael Mulvey
National Microbiology Laboratory
1015 Arlington St.
Winnipeg, Manitoba R3E 3R2
Tel: 204-789-2133; Fax: 204-789-5020
Use FedEx billing number: 2299-8435-7
Email: Michael mulvey@phac-aspc.gc.ca

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

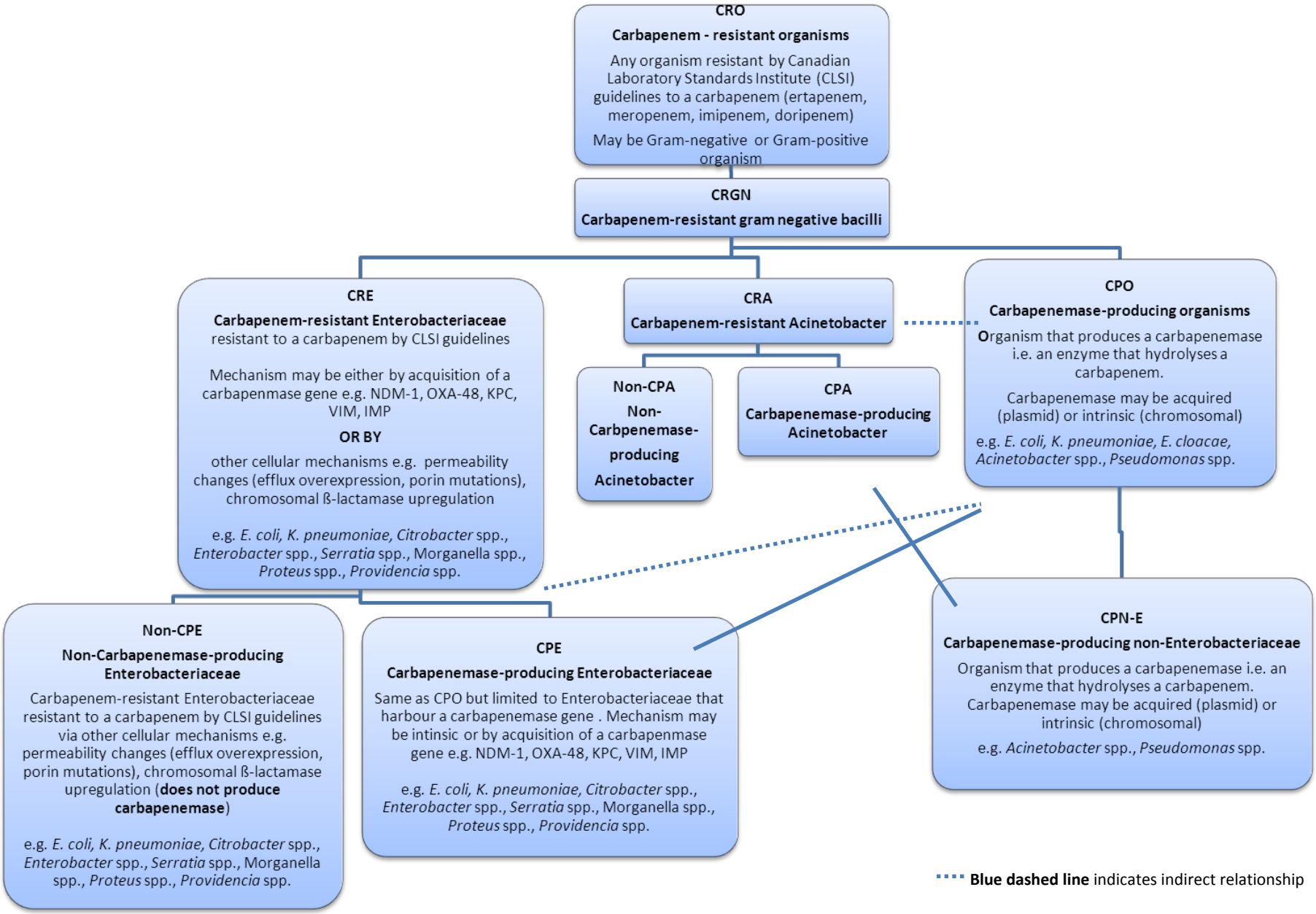
If a carbapenemase is detected

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 fills the "PATIENT QUESTIONNAIRE" (**Appendix C**) & sends it to PHAC
Note: If the same CPO gene is found in the same patient, NML and CNISP will consider it as a co-infection or co-colonization, while if a different CPO gene is found in the same patient, it will be considered as two different events.

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 remainder of 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?
Infection is determined using the 2015 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

For example, the '2015 CDC/NHSN surveillance definitions for specific infections' states that for upper respiratory tract infection (URTI), pharyngitis, laryngitis, epiglottitis the patient must meet at least 1 of the following 3 criteria:

1. Patient has at least 2 of the following signs or symptoms: fever (>38°C), erythema of pharynx*, sore throat*, cough*, hoarseness*, or purulent exudate in throat* **and** at least 1 of the following:
a. organisms cultured from the specific site
b. organisms cultured from blood
c. positive laboratory test on blood or respiratory secretions
d. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
e. physician diagnosis of an upper respiratory infection.
* With no other recognized cause
2. Patient has an abscess seen on direct examination, during an invasive procedure, or during a histopathologic examination.
3. Patient ≤1 year of age has at least 2 of the following signs or symptoms: fever (>38°C core), hypothermia (<37°C core), apnea*, bradycardia*, nasal discharge*, or purulent exudate in throat* **and** at least 1 of the following:
a. organisms cultured from the specific site
b. organisms cultured from blood
c. positive laboratory test on blood or respiratory secretions
d. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
e. physician diagnosis of an upper respiratory infection
* With no other recognized cause

If the patient meets the criteria for infection, please complete the remainder of this questionnaire.
If the case does NOT meet the criteria for infection, please do NOT complete this questionnaire.

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
This number should never be longer than 8 characters. The 10 characters should consist of the 3 character

CHEC site # (e.g., 07A), the surveillance year the infection occurred in (e.g., 15), 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-17-001. An example of the thirty-fifth case would be 07A-17-035, and so on.

If more than one eligible *Enterobacteriacae* or *Acinetobacter* spp. is identified during the same admission or on re-admission, please complete a new questionnaire and indicate by adding suffix A or B (etc.) to the case number (eg. 07A-17CRGN-001-**A** and 07A-17CRGN-001-**B**).

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

5. Location of patient in hospital on day of first positive CPO culture?
Please indicate the location of the patient at the time the first positive culture for CPO was obtained, If the patient was an impatient please indicate the ward the patient was on (e.g., medical, surgical, med/surg, ICU). Otherwise please indicate whether the patient was in the emergency department or was an outpatient.

6. Date of birth
Please enter Day (26), Month (May) and Year (1973) in this order. Please write out the month (eg Jan, Mar, Aug etc.). 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 (26), Month (May) and Year (1973). Please write out the month (eg Jan, Mar, Aug etc.).

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. 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. If the site of acquisition cannot be determined, report as 'unable to determine'.

Determination of acquisition is based on the January 2014 CDC/NHSN Multidrug resistant organism (MDRO) LabID event reporting. The criteria can be accessed at this URL:
www.cdc.gov/nhsn/PDFs/pscManual/12pscMDRO_CDADcurrent.pdf

Categorizing MDRO LabID events are based on the date admitted to the facility and the date the specimen was collected.

If the specimen was collected > 3 days after admission to the healthcare facility (i.e. on or after calendar day 4 (calendar day 1 is the day of admission) then it is considered healthcare-associated. If the specimen was collected as an outpatient or an inpatient ≤ 3 days after admission to the healthcare facility (i.e. on calendar day 1, 2, or 3. Calendar day 1 is day of admission) then it is considered community-associated.

11. Date of positive culture
For the current admission, please indicate when the first isolate that tested CPO positive was sampled.

12. Organism isolated
Please select the organism isolated as reported by the laboratory. If more than one eligible *Enterobacteriacae* or *Acinetobacter* spp. is identified during the same admission or on re-admission, please complete a new questionnaire and indicate by adding suffix A or B (etc.) to the case number (eg. 07A-16CRGN-001-**A** and 07A-16CRGN-001-**B**).

13. Site(s) of isolation
Please indicate the type of specimen(s) in which this CPO was detected. Please check all that apply.

14. Is there any evidence of transmission from another patient within your facility?
Please indicate whether there is any evidence to suggest whether this patient became infected/colonized with this CPO through contact with another patient. If yes, please specify the unique patient ID of the case this patient is directly linked to.

15a. 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.

15b. If travelled internationally, is there evidence the patient received medical care where they travelled to?
If answered 'yes' to question 15a, 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 <u>infected</u> 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.

18. Patient outcome 30 days after first positive CPO culture?
Thirty days after the date of first positive culture please select one of the options available

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 7, 2016