



Canadian Nosocomial Infection Surveillance Program

**2017 SURVEILLANCE FOR HEALTHCARE ACQUIRED CEREBROSPINAL FLUID SHUNT
ASSOCIATED INFECTIONS**

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FINAL

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2017 SURVEILLANCE FOR HEALTHCARE ACQUIRED CEREBROSPINAL FLUID SHUNT ASSOCIATED INFECTIONS

I. OBJECTIVES

1. To determine the incidence of cerebrospinal fluid (CSF) shunt infections in patients of all ages admitted to Canadian hospitals participating in the CNISP.
2. To describe the microbiologic epidemiology of CSF shunt infections in all patients with:
 - a. New shunts and/or;
 - b. Revisions to an existing internalize shunt.

II. METHODOLOGY

A. Surveillance design

Ongoing, prospective surveillance for cases of CSF shunt surgery-associated infections (CSF shunt SSI) following placement of an internalized CSF shunt, or revision or other surgical manipulation of an existing shunt. The total number of surgical procedures is the denominator for the rate of infections. As for other hospital associated SSI, events are attributed to the date of surgery.

B. Inclusion & exclusion criteria

Hospitals which are part of the CNISP network that are able to perform year-round surveillance for CSF shunt-associated infection and are able to document the number of surgical placements of shunts are eligible to participate in this surveillance program.

Inclusion criteria

- Person of any age admitted to CNISP hospital with placement or revision of CSF shunting device.
- Infection occurs within one year of surgery

Exclusion criteria:

- Patients with transcutaneous or external shunting devices or non-shunting devices (e.g. Ommaya reservoir) are not eligible for enrollment
- Patients whose CSF was culture-positive (bacterial or fungal) at the time of placement of the shunt are not eligible for enrollment
- If the device associated with the positive culture was not placed at the hospital where the infection was identified, the hospital should not report the infection
- If the surgery occurred more than 12 months before the infection was identified

D. Numerator data

A CSF shunt infection (CSF-SSI case) is defined as:

An internalized CSF shunting device is in place **AND** a bacterial or fungal pathogen(s) is isolated from the cerebrospinal fluid **AND** is associated with at least **ONE** of the following:

- a) fever (temperature $\geq 38^{\circ}\text{C}$),
OR
- b) neurological signs or symptoms,
OR
- c) abdominal signs or symptoms,
OR
- d) signs or symptoms of shunt malfunction or obstruction

Relapse vs. new infection

Re-infection of a shunt is an infectious episode occurring after diagnosis of a CSF shunt infection and/or completion of antibiotic therapy with a CSF bacterial or fungal isolate *different* from the previous infection. Such a patient would be eligible to be counted as a new CSF shunt-associated infection.

Relapse of a shunt infection is an infectious episode occurring within 1 month of completion of therapy with an isolate of the same genus. This event is NOT eligible to be counted as a new CSF shunt-associated infection.

E. Data collection and reporting

Patients with a CSF shunt associated infection will be identified through review of positive CSF cultures from the microbiology laboratory. Once a positive culture is identified, a chart (health record) review will be conducted to determine if the device associated with that culture was placed at the hospital where the infection was identified and that the surgery occurred in the previous 12 months.

Each time an infection is identified a patient questionnaire will be completed (Appendix A). All completed forms will be emailed the CNISP account at the address below. Please keep copies for your records. If it is not possible to email questionnaires, forms can be submitted by fax or hard copy mail.:

Analysis

It is noted that the NHSN criteria for SSI include infections presenting within 90 days (rather than one year) after CSF shunt surgery. As of 2017, for an undetermined period, we will continue to capture infections occurring to one year and compare the rates to infections

presenting at three months. This comparison will allow CNISP to estimate the number of CSF SSI cases (if any) that will not be captured if we reduced the post-surgery surveillance period to 90 days.

Infection rates will be described according to age (pediatric v adult), region, clinical presentation time relative to surgery, new device v revision and infecting micro-organism and antimicrobial susceptibility results.

Please submit data to:

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

Public Health Agency of Canada

CNISP Surveillance Officer

Phone: 613-301-5021

Fax : 613-946-0678

Mail: Public Health Agency of Canada

130 Colonnade Road, PL6504B

Ottawa, ON K1A 0K9

F. Denominator data

Each participating facility will submit (Appendix C):

- The number of surgical placements for new CSF shunts for pediatric (< 18 years) and adult (\geq 18 years) cases.
- The number of surgical revisions to existing CSF shunts for pediatric (< 18 years) and adult (\geq 18 years) cases.

Denominator data is submitted once yearly to CNISP by March 31, 2018.



Appendix A – 2017 CSF shunt patient questionnaire

1. CHEC Site: _____		2. Unique Patient ID: _____ 17 _____ <small>(CHEC site #) (year) (case number)</small>	
3. Date of birth _____/_____/_____ <small>(dd/mmm/yyyy) e.g. 17/Jan/2003</small>		OR Age _____ <input type="checkbox"/> Years <input type="checkbox"/> Months <input type="checkbox"/> Days	
4. Gender <input type="checkbox"/> Male <input type="checkbox"/> Female			
5. Pathogen(s) isolated from CSF (please check all that apply): <input type="checkbox"/> <i>Alpha hemolytic Streptococcus</i> <input type="checkbox"/> <i>Propionibacterium species</i> <input type="checkbox"/> <i>Coagulase negative Staphylococcus spp</i> <input type="checkbox"/> <i>Pseudomonas aeruginosa</i> <input type="checkbox"/> <i>Haemophilus influenza type B</i> <input type="checkbox"/> <i>Escherichia coli</i> <input type="checkbox"/> <i>Corynebacterium species</i> <input type="checkbox"/> <i>Staphylococcus aureus</i> <input type="checkbox"/> Other, please specify: _____ <input type="checkbox"/> MSSA <input type="checkbox"/> MRSA If gram negative rod: ESBL <input type="checkbox"/> Yes <input type="checkbox"/> No Carbapenem resistant <input type="checkbox"/> Yes <input type="checkbox"/> No			
6. Date of CSF shunt procedure _____/_____/_____ <small>(dd/mmm/yyyy) e.g. 17/Jan/2017</small>			
7. Date positive CSF culture was obtained _____/_____/_____ <small>(dd/mmm/yyyy) e.g. 17/Jan/2017</small>			
8. The shunt surgery was: (please check one the following): <input type="checkbox"/> revision of an existing internal shunt <input type="checkbox"/> placement of entirely new shunt			
9. Type of CSF shunt inserted was: (please check one the following): <input type="checkbox"/> VP (ventriculoperitoneal) <input type="checkbox"/> LP (lumbo-peritoneal) <input type="checkbox"/> VA (ventriculoatrial) <input type="checkbox"/> Other (please specify): _____			

10. Please indicate the organism(s) susceptibility/resistance for any of the following antimicrobials/anti-fungals listed below:(R for resistant, S for susceptible, I for intermediate)

Genus species of organism:	Organism 1:	Organism 2:	Organism 3:
Amikacin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Amphotericin B	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Ampicillin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Amoxicillin-clavulanic acid	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Caspofungin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Cefazolin (Ancef)	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Cephalexin (Keflex)	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Cefepime	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Cefotaxime	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Ceftriaxone	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Cefuroxime	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Ciprofloxacin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Clindamycin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Cloxacillin / Oxacillin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Ertapenem	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Fluconazole	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Gentamicin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Imipenem	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Levofloxacin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Linezolid	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Meropenem	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Micafungin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Moxifloxacin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Penicillin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Piperacillin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Piperacillin-tazobactam	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Rifampin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Ticarcillin-clavulanic acid	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Trimethoprim-sulfamethoxazole	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Tobramycin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Vancomycin	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Voriconazole	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Other, specify: _____	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S
Other, specify: _____	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S	<input type="checkbox"/> R <input type="checkbox"/> I <input type="checkbox"/> S

SURVEILLANCE FOR HEALTHCARE ACQUIRED CEREBROSPINAL FLUID SHUNT ASSOCIATED INFECTIONS

Appendix B - Instructions on Completing Patient Questionnaire (Appendix A)

Q1. 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.

Q2. Unique patient identifier

This number should never be longer than 8 characters. The 8 characters should consist of the 3 character CHEC site # (e.g., 09A), the surveillance year (e.g., 17), 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 09A17001. An example of the thirty-fifth case would be 09A17035, and so on. Use the same number with a lower case letter at the end if >1 SSI occurs following the same surgery (e.g., 07A17001a).

Note: Please do not include dashes as separators in between the sets of characters

Q3. Date of birth (DOB)

Please enter Day (##), Month (May) and Year (1947) in this order. If the date of birth is not available please enter the patient's age (in years, months or days).

Q4. Gender

Check male or female gender as appropriate.

Q5. Pathogen(s) isolated

Please list all microorganisms isolated for the CSF shunt infection as reported by the laboratory. If 'other' pathogen is checked, please specify the organism in the text field.

Note: MSSA = methicillin sensitive Staphylococcus aureus and MRSA = methicillin resistant Staphylococcus aureus.

Q6. Date of CSF shunt procedure

Please enter Day (##), Month (May) and Year (2017) in this order.

Q7. Date positive CSF culture was obtained

Please enter the date the positive CSF culture was obtained Day (##), Month (May) and Year (2017).

Q8. Type of shunt surgery

Please indicate whether the surgery was for the revision of an existing internal shunt or the placement of an entirely new shunt. If an existing shunt is completely removed and a new device is placed at the same time, please check revision of an existing shunt. Please check only ONE box.

Q9. Type of CSF shunt inserted

Please indicate the type of CSF shunt system inserted (i.e. ventriculoperitoneal, ventriculoatrial, lumbo-peritoneal shunt or other). If other, please specify in the text field.

Q10. Antibigram results

Please indicate the organism(s) susceptibility/resistance.
(S = Susceptible, I = Intermediate or R = Resistant) to the antibiotics tested.



Appendix C – 2017 CSF shunt denominator form

CHEC #: _____

Surveillance period (e.g. Jan 1, 2016 to Dec 31, 2017): _____

Please provide the following number of surgical placements for the calendar year (e.g. January 1, 2017 to December 31, 2017):

	< 18 years of age	≥ 18 years of age	Total
Number of surgical placements of <u>new</u> CSF shunts			
Number of surgical <u>revisions</u> to existing CSF shunts placements			
Total			

Please send your completed form by March 31, 2017 by e-mail to:

Public Health Agency of Canada

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

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If the form cannot be emailed please send by fax or hardcopy by regular mail. Please ensure copies are kept at the CNISP site.