Canadian Nosocomial Infection Surveillance Program

SURVEILLANCE FOR HEALTHCARE ASSOCIATED CEREBROSPINAL FLUID SHUNT ASSOCIATED INFECTIONS

FINAL
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SURVEILLANCE FOR HEALTHCARE ASSOCIATEDED CEREBROSPINAL FLUID SHUNT ASSOCIATED INFECTIONS

I. OBJECTIVES

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

II. METHODOLOGY

A. Surveillance design

Ongoing, prospective surveillance for infections following placement of an internalized CSF shunt or revision or other surgical manipulation of an existing shunt.

B. Inclusion & exclusion criteria

Eligible CNISP hospitals are those able to perform year-round surveillance for CSF shunt-associated infections, and are able to document the number of surgical placements and revisions of shunts.

Patient inclusion criteria

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

Patient exclusion criteria:

- Patients with transcutaneous or external shunting devices or non-shunting devices (e.g. Ommaya reservoir).
- Patients whose CSF was culture positive (bacterial or fungal) at the time of placement of the shunt.
- Infections in which the device associated with the positive organism was not placed at the hospital where the infection was identified, i.e. the hospital should not report the infection.

C. Surveillance period

Infections that develop within 12 months of the shunt procedure will be included.

D. Numerator data

A CSF shunt infection is defined as:

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

a) fever (temperature ≥38º C),
OR
b) neurological signs or symptoms,
OR
c) abdominal signs or symptoms,
OR
d) signs or symptoms of shunt malfunction or obstruction

The date of the infection is assigned to the date of procedure.

Relapse vs. new infection

Re-infection of a shunt is defined as 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. Denominator data

The denominator for the shunt infection rate is the number of shunt surgeries at the site.
Each participating facility will submit (Appendix C):

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

F. Data collection and reporting

Patients with a CSF shunt-associated infection will be identified through review of positive CSF organisms from the microbiology laboratory. Once a positive organism is identified, a chart (health record) review will be conducted to determine if the device associated with that organism 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 (Appendix A) will be completed.

Please email patient questionnaires and denominator data to CNISP at phac.cnisp-pcsin.aspc@canada.ca by March 31st for previous year's data (e.g. 2019 data are due by March 31, 2020). Cases may also be reported as they are identified if the data collection form is complete.

Ensure that no identifying data is on the form and that each page has the participant study number.

Please use the following subject line : CNISP CSF Shunt HAI project – data collection form.

Appendix A – CSF shunt patient questionnaire

1. CHEC Site: _____ 2. Unique Patient ID: _____ YY _____
(CHEC site #) *(surveillance year)* *(case number)*

3. Date of birth _____/_____/_____ OR Age _____
(dd/mmm/yyyy) □ Years □ Months □ Days

4. Sex □ Male □ Female

5. Pathogen(s) isolated from CSF (please check all that apply):

□ *Alpha hemolytic Streptococcus*
□ *Coagulase negative Staphylococcus spp*
□ *Haemophilus influenza type B*
□ *Corynebacterium* species
□ Other, please specify: _____

□ *Propionibacterium species*
□ *Pseudomonas aeruginosa*
□ *Escherichia coli*
□ *Staphylococcus aureus*
□ MSSA □ MRSA

6a. Method of identification □ Culture □ Molecular method – see 6b.

6b. Please specify the type of molecular method: _____

7. Date of CSF shunt procedure _____/_____/_____
(dd/mmm/yyyy)

8. Date organism was obtained from CSF _____/_____/_____
(dd/mmm/yyyy)

9. The shunt surgery was: (please check **one** the following):

□ revision of an existing internal shunt

□ placement of entirely new shunt

10. Type of CSF shunt inserted was: (please check **one** the following):

□ VP (ventriculoperitoneal) □ LP (lumbo-peritoneal)

□ VA (ventriculoatrial) □ Other (please specify): _____

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

Please specify the organism:	Organism 1: _____	Organism 2: _____
Amikacin	□ R □ I □ S	□ R □ I □ S
Amphotericin B	□ R □ I □ S	□ R □ I □ S
Ampicillin	□ R □ I □ S	□ R □ I □ S
Amoxicillin-clavulanic acid	□ R □ I □ S	□ R □ I □ S
Caspofungin	□ R □ I □ S	□ R □ I □ S
Cefazolin (Ancef)	□ R □ I □ S	□ R □ I □ S
Cephalexin (Keflex)	□ R □ I □ S	□ R □ I □ S
Cefepime	□ R □ I □ S	□ R □ I □ S
Cefotaxime	□ R □ I □ S	□ R □ I □ S
Ceftriaxone	□ R □ I □ S	□ R □ I □ S
Cefuroxime	□ R □ I □ S	□ R □ I □ S
Ciprofloxacin	□ R □ I □ S	□ R □ I □ S
Clindamycin	□ R □ I □ S	□ R □ I □ S
Cloxacillin / Oxacillin	□ R □ I □ S	□ R □ I □ S
Ertapenem	□ R □ I □ S	□ R □ I □ S
Erythromycin	□ R □ I □ S	□ R □ I □ S
Fluconazole	□ R □ I □ S	□ R □ I □ S
Gentamicin	□ R □ I □ S	□ R □ I □ S
Imipenem	□ R □ I □ S	□ R □ I □ S
Levofloxacin	□ R □ I □ S	□ R □ I □ S
Linezolid	□ R □ I □ S	□ R □ I □ S
Meropenem	□ R □ I □ S	□ R □ I □ S
Micafungin	□ R □ I □ S	□ R □ I □ S
Moxifloxacin	□ R □ I □ S	□ R □ I □ S
Penicillin	□ R □ I □ S	□ R □ I □ S
Piperacillin	□ R □ I □ S	□ R □ I □ S
Piperacillin-tazobactam	□ R □ I □ S	□ R □ I □ S
Rifampin	□ R □ I □ S	□ R □ I □ S
Ticarcillin-clavulanic acid	□ R □ I □ S	□ R □ I □ S
Trimethoprim-sulfamethoxazole	□ R □ I □ S	□ R □ I □ S
Tobramycin	□ R □ I □ S	□ R □ I □ S
Vancomycin	□ R □ I □ S	□ R □ I □ S
Voriconazole	□ R □ I □ S	□ R □ I □ S
Other, specify: _____	□ R □ I □ S	□ R □ I □ 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

Please assign a unique patient identifier as follows: CHEC site number, surveillance year then consecutive number (e.g., 07AYY001). Use the same number with a lower case letter at the end if >1 SSI occurs following the same surgery (e.g., 07AYY001a).

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. Sex

Check male or female sex as appropriate.

Q5. Pathogen(s) isolated

Please list all microorganisms isolated from the CSF 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.

Q6a. Method of identification

Please indicate if the organism was identified by culture or a molecular method.

Q6b. Molecular method

If identified by molecular method, please indicate the method used (e.g. PCR).

Q7. Date of CSF shunt procedure

Please enter Day (##), Month (May) and Year (2018) in this order.

Q8. Date positive CSF organism was obtained

Please enter the date the positive CSF organism was obtained Day (##), Month (May) and Year (2018).

Q9. 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 placement of a new shunt. Please check only ONE box.

Q10.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.

Q11. Antibiogram results

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

Appendix C – CSF shunt denominator form

CHEC site #: _____

Surveillance period: January 1 – December 31, _____
(surveillance year)

Please provide the following number of surgical placements for the surveillance period year

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

For the surveillance year specified above, were there zero (0) cases reported for your site?
□ Yes □ No

Please send your completed form by March 31st of the following surveillance year to: phac.cnisp-pcsin.aspc@canada.ca

Appendix D – CNISP CSF shunt-associated infection record

Note: This is a resource/tool for sites to assist with record keeping. It is not a requirement for sites to use this table. Please feel free to modify as needed. Please do **NOT** send to CNISP.

Patient unique identifier	Sex (M/F)	Date of Birth (DD/MM/YYYY)	Procedure Date (DD/MM/YYYY)	Date positive organism (DD/MM/YYYY)	Date patient questionnaire sent to CNISP	Recorder initials
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					
…………YY……………. *CHEC#* *case#*	□ Male □ Female					

Revision history

November 2017 - Question regarding method of identification (e.g. culture or molecular) was added
- Option to indicate zero cases reported on denominator form
- Included a tool to assist sites with record keeping (Appendix D)

December 2018
- Removed surveillance year as protocol will no longer be updated annually