Canadian Nosocomial Infection Surveillance Program

SURVEILLANCE OF SURGICAL SITES INFECTIONS FOLLOWING HIP AND KNEE ARTHROPLASTY

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SURVEILLANCE OF SURGICAL SITE INFECTIONS FOLLOWING HIP AND KNEE ARTHROPLASTY

I. OBJECTIVES

To establish ongoing surveillance of complex[1] surgical site infections (SSIs) following hip and knee arthroplasty within the CNISP hospital network.

II. METHODOLOGY

A. Surveillance design:

Ongoing, prospective surveillance of complex[1] SSIs following hip or knee arthroplasty.

B. Inclusion & exclusion criteria:

All hospitals that are part of the CNISP network and perform hip and knee arthroplasty procedures.

Inclusions:

- Patient must be admitted to the hospital on the day of procedure.
- Primary total, hemi and other (e.g. unicondylar) arthroplasties will be included in the surveillance.
- Only clean procedures will be included in the surveillance.

Exclusions:

- Revisions and resurfacings.
- Surgeries in which the patient died in the operating room or within 24 hours of surgery.
- Surgeries where the skin incision is not entirely closed at procedure's end.
- Superficial infections.

C. Surveillance period:

Infections that develop within 90 days (3 months) of procedure will be included and reported retrospectively based on the date of procedure.

D. Numerator data:

The primary outcome measure is a healthcare associated complex[1] SSI following hip arthroplasty or knee arthroplasty. Please complete a patient questionnaire (Appendix A) when an infection is identified. The definitions used to classify SSIs as deep incisional or organ space can be found in Appendix B.

E. Denominator data:

Each participating facility will submit the number of procedures for total, hemi and other hip arthroplasties and total, hemi and other knee arthroplasties. Please complete a denominator form (Appendix C).

[1] Complex surgical site infections include deep and organ space infections

F. Data collection and reporting:

Patients with a complex[1] SSI following either a hip arthroplasty or a knee arthroplasty may be identified through the following methods:

- Review of microbiology laboratory results
- Review of patient charts
- Review of physician notes
- Review of re-operation records
- Review of emergency visit records
- Review of clinic visit records (e.g. orthopedic clinic)
- Infection prevention and control rounds
- Review of pharmacy reports
- Review of readmissions

Please submit data quarterly as follows:

- Cases from January 1st through March 31st: submit to CNISP by June 30th
- Cases from April 1st through June 30th: submit to CNISP by September 30th;
- Cases from July 1st through September 30th: submit to CNISP by December 31st
- Cases from October 1st through December 31st: submit to CNISP by March 31st of the following year

Please enter/upload all data to CNPHI: www.cnphi-rcrsp.ca

When entering data into CNPHI, please ensure that the case is entered into the correct surveillance year based on the date of procedure and NOT the date the infection was identified (e.g. procedure Dec 20, 2018; infection identified Jan 17, 2019 – this is a 2018 case).

For any quarter with no cases at your site, a zero report must be made in the CNPHI HK-SSI module so that quarters with zero counts can be differentiated from missing data.

[1] Complex surgical site infections include deep and organ space infections

Appendix A – HIP & KNEE SSI PATIENT QUESTIONNAIRE

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

3. Age _____ (years)

4. Sex ☐ Male ☐ Female

5. Postal code (first 3 digits) _____

6a. Procedure (please select **one** of the following):

☐ Hip – total arthroplasty ☐ Hip – hemi arthroplasty

☐ Knee - total arthroplasty ☐ Knee – hemi arthroplasty

☐ Other (e.g. unicondylar) : _____

6b. Please select the number of joints replaced during the procedure: ☐ One ☐ Two ☐ Unknown

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

8. Date infection was identified _____/_____/_____
(dd/mmm/yyyy)

9. Does this patient have or meet the criteria for (please check one the following):

☐ DEEP incisional SSI

☐ ORGAN/SPACE SSI

10. Date of admission _____/_____/_____
(dd/mmm/yyyy)

11. Date of discharge _____/_____/_____
(dd/mmm/yyyy)

12a. Re-admission for management of SSI? ☐ Yes ☐ No

12b. If yes, date of re-admission _____/_____/_____
(dd/mmm/yyyy)

12c. If yes, date of discharge (from re-admission) _____/_____/_____
(dd/mmm/yyyy)

13a. Revision surgery ☐ Yes ☐ No

13b. If yes, date of revision surgery #1 _____/_____/_____
(dd/mmm/yyyy)

13c. If yes, date of revision surgery #2 _____/_____/_____
(dd/mmm/yyyy)

14. What was the outcome 30 days post SSI identification?

☐ Patient discharged or transferred alive, please specify date: _____/_____/_____
(dd/mmm/yyyy)

☐ Patient still alive and in hospital

☐ Patient died, please specify date: _____/_____/_____
(dd/mmm/yyyy)

☐ Unknown

15. Did the patient receive antibiotic prophylaxis?	Ordered: ☐ Yes ☐ No ☐ Data not available Administered: ☐ Yes ☐ No ☐ Data not available

16. 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)

Genus species of organism:	Organism1: _____	Organism 2: _____	Organism 3: _____
Amikacin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Amphotericin B	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Ampicillin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Amoxicillin-clavuanc acid	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Caspofungin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Cefazolin (Ancef)	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Cephalexin (Keflex)	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Cefepime	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Cefotaxime	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Ceftriaxone	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Cefuroxime	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Ciprofloxacin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Lindamycin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Cloxacillin / Oxacillin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Ertapenem	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Fluconazle	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Gentamicin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Imieem	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Levofloxacin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Linezolid	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Meropenem	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Micafungin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Moxifloxacin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Penicillin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Piperacilli	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Piperacillin-tazobactam	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Rifampin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Ticarcilln-clavulanc acid	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Trimethoprim-sulfamethoxazole	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Tobramycin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Vancomycin	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Voriconazole	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S
Other, specify:	□ R □ I □ S	□ R □ I □ S	□ R □ I □ S

☐ Specimen not collected ☐ Organism not identified, no growth

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

1. 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.

2. Unique patient identifier

The 8 characters should consist of the 3 character CHEC site # (e.g., 09A), the surveillance year (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 09A19001. An example of the thirty-fifth case would be 09A19035, 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., 07A19001a.

3. 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.

4. Sex

Check male or female sex as appropriate.

5. Postal code (first 3 digits)

Please indicate the patient's residential postal code (first 3 digits).

5a. Procedure

Please indicate the procedure as either primary or hemi hip arthroplasty (THA) or primary or hemi knee arthroplasty (TKA).

5b. Procedure

Please indicate the number of joints replaced during the procedure.

6. Date of procedure

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

7. Date infection was identified

Please enter the date that the infection was identified Day (##), Month (May) and Year (2019). The date the infection was identified may be defined as the onset date of infection, the date of positive culture or the date of diagnosis.

8. Category of SSI

Please select **one** of the following types of infection: deep incisional SSI or organ/space SSI. Note that all procedures included in this surveillance projects involve an implant. Superficial incisional SSI are no longer reportable.

A **deep incisional SSI** must meet the following criterion:

Infection occurs within 90 days and the infection appears to be related to the operative procedure and involves deep soft tissues (e.g., facial and muscle layers) of the incision and the patient has at least **ONE** of the following:

a) Purulent drainage from the deep incision but not from the organ/space component of the surgical site
b) Deep incision that spontaneously dehisces or is deliberately opened by the surgeon and is culture-positive or not cultured when the patient has at least one of the following signs or symptoms: fever (>38°C), or localized pain or tenderness. A culture-negative finding does not meet this criterion.
c) An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
d) Diagnosis of a deep incisional SSI by a surgeon or attending physician.

An **organ/space SSI** must meet the following criterion:

Infection occurs within 90 days and the infection appears to be related to the operative procedure and infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure and patient has at least **ONE** of the following:

a) Purulent drainage from a drain that is placed through a stab wound into the organ/space.
b) Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.
c) An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
d) Diagnosis of an organ/space SSI by a surgeon or attending physician.

9. Date of admission

Please indicate the date when the patient was admitted to the hospital.

10. Date of discharge

Please indicate the date when the patient was discharged from the hospital.

11a. Re-admission for management of SSI

Please indicate if the patient was re-admitted for a surgical site infection.

11b. Date of re-admission

If the patient was re-admitted, please indicate the date of re-admission.

11c. Date of discharge (from re-admission)

If the patient was re-admitted, please indicate the data of discharge.

12a. Revision surgery

Please indicate if the patient had a revision surgery.

12b. Date(s) of revision surgery

If the patient had a revision surgery, please indicate the date of procedure. If they had more than one revision, please report dates for all procedures.

13. Outcome at 30 days

Please indicate what the patient's outcome was at 30 days following the identification of the SSI.

14. Did the patient receive antibiotic prophylaxis

Please indicate if the patient received (ordered and administered) antibiotic prophylaxis prior to their surgery.

15. Antibiogram results

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

Please list all microorganism(s) identified for the infection as reported by the laboratory. If a specimen was not collected, please list "specimen not collected'. If a specimen was collected but an organism was not identified, please specify "organism not identified no growth". If *Staphylococcus aureus* is identified, please specify if it is MRSA or MSSA. Similarly, if Enterococci is identified, please specify if it is VRE or not.

Appendix C – HIP & KNEE DENOMINATOR FORM

CHEC #: _____

Surveillance period (e.g. Jan 1, 2019 to Mar 31, 2019): _____

Please provide the total number of procedures for the surveillance period specified above.

	Hip arthroplasties		
	Total	Hemi	Other
Total procedures			

	Knee arthroplasties		
	Total	Hemi	Other
Total procedures			

Please enter/upload data to CNPHI: www.cnphi-rcrsp.ca

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Appendix D - Instructions on Completing Denominator Form (Appendix C)

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.

Please enter/upload data to CNPHI: www.cnphi-rcrsp.ca

Revision History

Jan 20, 2015 – Update to the surveillance period from 12 months to 90 days. Only infections that develop within 90 days of procedure are to be reported.
Dec 3, 2015 – Question 11 related to pathogen(s) identified has been removed as this will be captured under new Question 12 related to antibiogram results by pathogen. Question 12b on type, dose and time of prophylactic antibiotic(s) was removed.
October 14, 2017 – Updated protocol to reflect quarterly reporting for infections and denominator data into CNPHI.
October 30, 2017 – The following updates were made to the protocol for 2018:

- Risk stratification was removed (ASA score, procedure start and end time).
- Discontinue surveillance for superficial infections.
- Added the following clinical outcomes: length of stay (admission and discharge dates), re-admission, revision surgeries and 30-day outcome.
- Removed question on repeat intra-operative dose of antibiotics given for surgeries lasting $\geq$ 4 hours (Q14b).
- Under type of procedure, 'other' response option added.

Oct 18, 2018

- Added postal code (first 3 digits) to patient questionnaire.
- Removed references to calendar year.