

Canadian Nosocomial Infection Surveillance Program

2017 SURVEILLANCE OF SURGICAL SITES INFECTIONS FOLLOWING TOTAL HIP AND KNEE ARTHROPLASTY

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FINAL

Working Group: E. Henderson, M. John, I. Davis, S. Dunford, C. Lemieux, S. Smith, M. Vearncombe, K. Amaratunga (PHAC), S. Alexandre (PHAC)

Chair: Needed

Contact:

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

130 Colonnade road, PL6504B

Ottawa, ON K1A 0K9

2017 SURVEILLANCE OF SURGICAL SITE INFECTIONS FOLLOWING TOTAL HIP AND KNEE ARTHROPLASTY

I. OBJECTIVES

- 1. To establish ongoing surveillance of surgical site infections following total hip and knee arthroplasty within the CNISP hospital network
- 2. To determine risk stratified surgical site infection rates among CNISP hospitals and Canadian benchmark rates following total hip and knee arthroplasty.

II. METHODOLOGY

A. <u>Surveillance design</u>:

Ongoing, prospective surveillance of surgical site infections following total hip or knee arthroplasty.

B. Inclusion & exclusion criteria:

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

Inclusions:

- Primary total and hemiarthroplasties will be included in the surveillance.
- Only clean procedures will be included in the surveillance.

Exclusions:

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

C. Surveillance period:

The surveillance will include all total hip and knee arthroplasty procedures. 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 surgical site infection following total hip arthroplasty (THA) or total knee arthroplasty (TKA). The definitions used to classify SSIs as superficial, deep incisional or organ space can be found in appendix B.

Each participating site will submit cases to CNISP 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

E. Denominator data:

Each participating facility will submit the number of procedures for total and hemi hip arthroplasties and total and hemi knee arthroplasties risk stratified using the NHSN Study risk stratification (i.e. ASA score, duration of surgery and surgical classification) annually (Appendix C).

F. Data collection and reporting:

Patients with a surgical site infection following either a THA or a TKA 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. ortho clinic)
- Infection prevention and control rounds
- Review of pharmacy reports
- Review of readmissions

Each time a SSI is identified a patient questionnaire will be completed (Appendix A) and sent to CNISP by email, mail or fax.



Appendix A – 2017 HIP & KNEE PATIENT QUESTIONNAIRE

1. CHEC Site: 2. Unique	Patient ID:17 (CHEC site #) (year) (case number)	
3. Date of birth/ OR (dd/mmm/yyyy) e.g. 17/Jan/1945	Age	
4. Gender		
5a. Procedure (please select <u>one</u> of the following):		
 ☐ Hip – total arthroplasty ☐ Knee - total arthroplasty ☐ Knee - total arthroplasty 		
5b. Please select one of the following: One knee or hip	☐ Two knees or hips ☐ Unknown	
6. Date of procedure/(dd/mmm/yyyy) e.g. 17/Jan/2017		
7. Date infection was identified/(dd/mmm/yyyy) e.g. 17/Jan/2017		
8. ASA score		
9a. Procedure start time (e.g. 14:50) Not available	9b. Procedure end time (e.g. 14:50) Not available	
10. Does this patient have or meet the criteria for (please check one the following):		
SUPERFICIAL incisional SSI		
DEEP incisional SSI		
ORGAN/SPACE SSI		

CHEC Site:		Unique Patient ID:		
11a. Did the patient receive antibio	otic prophylaxis?	Ordered: Yes No Data not available Administered: Yes No Data not available		
11b. Repeat intra-operative dose of antibiotics given for surgeries lasting ≥ 4 hours (6 hours for vancomycin)				
12. Please indicate the organism(s)			imicrobials/anti-fungals	
Genus species of organism:	Organism1:	Organism 2:	Organism 3:	
Amikacin	□R□I□S	□ R □ I □ S		
Amphotericin B	□R □I □S	\Box R \Box I \Box S	□R□I□S	
Ampicillin	□R□I□S	□ R □ I □ S	□R□I□S	
Amoxicillin-clavulanic acid	□R□I□S	□ R □ I □ S	□R□I□S	
Caspofungin	□R □I □S	□R □I □S	\Box R \Box I \Box S	
Cefazolin (Ancef)	□R □I □S	□R □I □S	\Box R \Box I \Box S	
Cephalexin (Keflex)	□R□I□S	□ R □ I □ S	□R□I□S	
Cefepime	□R □I □S	□R □I □S	\Box R \Box I \Box S	
Cefotaxime	□R □I □S	□ R □ I □ S	$\square R \square I \square S$	
Ceftriaxone	□R □I □S	\square R \square I \square S	$\square R \square I \square S$	
Cefuroxime	□R □I □S	\square R \square I \square S	$\square R \square I \square S$	
Ciprofloxacin	$\square R \square I \square S$	$\square R \square I \square S$	$\square R \square I \square S$	
Clindamycin	□R □I □S	\square R \square I \square S	$\square R \square I \square S$	
Cloxacillin / Oxacillin	$\square R \square I \square S$	$\square R \square I \square S$	$\square R \square I \square S$	
Ertapenem	□R □I □S	□R□I□S	□R□I□S	
Fluconazole	□R□I□S	$\square R \square I \square S$	$\square R \square I \square S$	
Gentamicin	□R □I □S	□R□I□S	□R□I□S	
Imipenem	□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	
Piperacillin	□R □I □S	□ R □ I □ S	$\square R \square I \square S$	

Piperacillin-tazobactam	$\square R \square I \square S$	□R□I□S	$\Box R \Box I \Box S$
Rifampin	$\square R \square I \square S$	$\square R \square I \square S$	$\Box R \Box I \Box S$
Ticarcillin-clavulanic acid	$\square R \square I \square S$	$\square R \square I \square S$	$\square R \square I \square S$
Trimethoprim-sulfamethoxazole	$\square R \square I \square S$	$\square R \square I \square S$	$\square R \square I \square S$
Tobramycin	$\square R \square I \square S$	$\square R \square I \square S$	$\Box R \Box I \Box S$
Vancomycin	$\square R \square I \square S$	$\square R \square I \square S$	$\square R \square I \square S$
Voriconazole	$\square R \square I \square S$	$\square R \square I \square S$	$\square R \square I \square S$
Other, specify:	□ R □ I □ S	□R □I □S	□ R □ I □ S
Other, specify:	□R □I □S	□R □I □S	□ R □ I □ S

Please send your completed forms by March 31, 2017 by mail, fax or e-mail to:

Public Health Agency of Canada

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E-mail: cnisp.pcsin@phac-aspc.gc.ca
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SURVEILLANCE FOR SURGICAL SITE INFECTIONS FOLLOWING TOTAL HIP AND KNEE ARTHROPLASTY

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

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., 16), 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

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. Gender

Check male or female gender as appropriate.

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 procedure as either one hip or knee arthroplasty or two hips or knees arthroplasty.

6. Date of procedure

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

7. Date infection was identified

Please enter the date that the infection was identified Day (##), Month (May) and Year (2017). 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. ASA score

Please check the appropriate American Society of Anesthesiology (ASA) score.

Assessment by the anaesthesiologist of the patient's preoperative physical condition using the American Society of Anaesthesiologist' (ASA) Classification of Physical Status. Patient is assigned one of the following which is used as one element of the SSI Basic Risk Index:

- 1 Normally healthy patient
- 2 Patient with mild systemic disease
- 3 Patient with severe systemic disease that is not incapacitating
- 4 Patient with an incapacitating systemic disease that is a constant threat to life
 - 5 Moribund patient who is not expected to survive for 24 hours with or without the operation

9. Start and end time of procedure

Please indicate the start and end time of procedure. The start of procedure is defined as the time of incision or cut-time. The start time will be used to calculate the number of minutes prior to incision that the patient received antibiotics. Please report time using the 24 hour clock format (e.g. 14:50).

10. Category of SSI

Please select <u>one</u> of the following types of infection: superficial incisional SSI, deep incisional SSI or organ/space SSI. Note that all procedures included in this surveillance projects involve an implant.

A <u>superficial incisional SSI</u> must meet the following criterion:

Infection occurs within 30 days after the operative procedure and involves only skin and subcutaneous tissue of the incision and at least **ONE** of the following:

- a) Purulent drainage from the superficial incision.
- b) Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
- c) At least **ONE** of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat and the superficial incision is deliberately opened by surgeon, and is culture-positive or not cultured. A culture-negative finding does not meet this criterion.
- d) Diagnosis of superficial incisional SSI by the surgeon or attending physician.

A <u>deep incisional SSI</u> 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 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.

11a. Did the patient receive antibiotic prophylaxis?

Please indicate if the patient received antibiotic prophylaxis prior to their surgery.

11b. Type, dose and timing of antibiotic prophylaxis

If the patient received antibiotic prophylaxis, please indicate the type, the dose and time that the antibiotics were administered. Please report all times using the 24 hour clock format (e.g. 14:50).

11c. Repeat intra-operative dose of antibiotics

Please indicate if the patient received a repeat intra-operative dose of antibiotics given for surgeries lasting \geq 4 hours or 6 hours for vancomycin.

12. Antibiogram results

Please indicate the organism(s) susceptibility/resistance. (S = Susceptible, I = Intermediate or R = Resistant) to the antibiotics tested. Please list all microorganism(s) identified for the infection as reported by the laboratory. If a specimen is not taken, please list "specimen not collected'. 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

Surveillance period (e.g. Jan 1, 2017 to Dec 31, 2017):						
Please provide the total number of procedures for the calendar year (e.g. January 1, 2017 to December 31, 2017):						
	Hip arthroplasties		Knee arthroplasties			
	Total	Hemi	Total	Hemi		
SSI risk index score 0						
SSI risk index score 1						
SSI risk index score 2						
Unknown risk index score						
Total						

Please send your completed form by March 31, 2018 by mail, fax or e-mail to:

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CHEC #:

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

SSI risk index

A score used to predict a surgical patient's risk of acquiring a surgical site infection. To calculate the total score, sum the scores for the factors present. The total score ranges from 0 to 3.

Risk factor	Score
American Society of Anaesthesiologists' (ASA) score of 3, 4, or 5	1
An operation lasting longer than 120 minutes for hip arthroplasty and 119 minutes for knee arthroplasty*	1
An operation classified as contaminated or dirty	1

^{*}Edwards JR, Peterson KD, Mu Y, et al. National Healthcare Safety Network (NHSN) report: Data summary for 2006 through 2008, issued December 2009. *Am J Infect Control* 2009; 37:783-805.

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.