**Appendix: Supplementary Information**

Supplementary Table 1: Comparison of the data collection methods of IPC and NSQIP

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| --- | --- | --- |
| **THR and TKR SSI** | **IPC** | **NSQIP** |
| **Surgeries defined by** | ICD-10 –CA codes: 1.VA.53.XXXX (THR) and 1.VG.53.XXXX (TKR) | CPT codes: T27130 (THR) and T27447 (TKR) |
| **Follow-up period** | 90-days; for the matched analysis, only SSIs identified by 30-days were included in this analysis | 30-days |
| **Denominator** | All primary, clean, elective THR and TKR | Sampled THR and TKR cases |
| **Numerator** |
| Source of organisms for superficial SSIs | Aseptically-obtained specimen from the superficial incision or subcutaneous tissue by a culture or non-culture-based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing  | Aseptically obtained culture of fluid or tissue from the superficial incision |
| If superficial incision is deliberately opened by a surgeon, attending physician or other designee…. | Meets criteria for superficial SSI if culture or non-culture-based test is positive (per above), OR if test is not sent but has localized pain/swelling/erythema/heat | Meets criteria for superficial SSI regardless if testing is performed |
| Symptoms included in a superficial SSI diagnosis | Localized pain, erythema | Pain, redness |
| Deep incision criteria | Deep incision that spontaneously dehisces, or is deliberately opened or **aspirated** | Deep incision spontaneously dehisces or is deliberately opened |
| Additional criteria used to meet a deep SSI | Not in NHSN | Diagnosis of a deep incision SSI by a surgeon or attending physician OROrgan/Space SSI draining through the deep layers of the incision |
| Terminology used to describe organ/space | Involves any part of the body deeper than the fascial/muscle layers that is opened or manipulated during the operative procedure | Involves any of the anatomy (e.g., organs or spaces), other than the incision, which was opened or manipulated during the operation |
| Additional criteria used to meet an organ space SSI | Must meet at least one criterion for a specific organ/space infection site listed in Table 3 | Diagnosis of an organ/space SSI by a surgeon or attending physician |
| **Collection Methods** | All surgeries are abstracted by ABJHI using ICD-10 CA codes and sent to IPC for inclusion. Case detection can involve reviewing microbiology laboratory results, patient charts (including: observation of the incision, physician record and pharmacy data), re-operation records, readmissions, ER visit records, clinic visit records and an administrative discharge data review | Trained surgical clinical reviewers abstract 30-d data of cases identified for sampling |
| **Data origin** | Mainly inpatient data but cases may be detected at three points in time: While admitted in an AHS/Covenant Health facility following THR or TKR, when seen in the emergency department or readmitted to an AHS/Covenant Health facility following discharge from the surgery stay or orthopedic surgeon reports following THR or TKR. | Inpatient, outpatient and outside facility data. Surgical clinical reviewers use telephone calls and letters to complete data collection |
| **Audit** | No standardized audit process but case examples are brought forward for discussion at monthly data quality forums | Formal audit process – selected hospitals are audited annually |
| **Report Period** | Quarterly  | Bi-annually |

IPC: Infection Prevention and Control; NSQIP: National Surgical Quality Improvement Program; THR: Total Hip Replacements; TKR: Total Knee Replacements; SSI: Surgical Site Infection; ICD-10-CA: International Classification of Diseases-10th edition-Canada; CPT: Common Procedure Type; NHSN: National Healthcare Safety Network; ABJHI: Alberta Bone and Joint Health Institute; AHS: Alberta Health Services

Supplementary Table 2: Records excluded from IPC and NSQIP database, September 2015 – March 2018

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Data Elements** | **Hospital 1** | **Hospital 2** | **Hospital 3** | **Hospital 4** | **Overall** |
| **THR** | **TKR** | **THR** | **TKR** | **THR** | **TKR** | **THR** | **TKR** | **THR + TKR** |
| **IPC** |
| Number of original records | 1,285 | 1,974 | 693 | 997 | 608 | 1,006 | 372 | 700 | 7,635 |
| Number of duplicate records excluded, n (%)\* | 18 (1.4) | 49 (2.5) | 5 (0.7) | 7 (0.7) | 1 (0.2) | 5 (0.5) | 0 (0.0) | 1 (0.1) | 86 (1.1) |
| Total IPC records | 1,267 | 1,925 | 688 | 990 | 607 | 1,001 | 372 | 699 | 7,549 |
| **3,192** | **1,678** | **1,608** | **1,071** | **7,549** |
| **NSQIP** |
| Number of original records | 243 | 310 | 206 | 273 | 271 | 390 | 147 | 249 | 2,089 |
| Unknown “side” code | - | - | 8 | 8 | 5 | 5 | 5 | 5 | 362 |
| Side code starts with “L” or “R” and Principal Operative Procedure has text “Hemi” or “hemi” | - | - | 3 | 0 | 1 | 0 | 0 | 0 | 4 |
| Number of duplicate records excluded n (%)1 | 1  | 6 | 1 | 0 | 0 | 3 | 0 | 1 | 12 |
| Number of records excludedn (%) | 1 (0.4) | 6 (1.9) | 12 (5.8) | 8 (2.9) | 6 (2.2) | 8 (2.1) | 5 (3.4) | 6 (2.4) | 52 (2.5) |
| Total NSQIP records | 242 | 304 | 194 | 265 | 265 | 382 | 142 | 243 | 2,037 |
| **546** | **459** | **647** | **385** | **2,037** |

IPC: Infection Prevention and Control; NSQIP: National Surgical Quality Improvement Program; THR: Total Hip Replacements, TKR: Total Knee Replacements; L: Left; R: Right

1Duplicate records were excluded if birth year, gender, facility code, surgery type, surgery side and surgery date were identical

2excludes Hospital 1