**Supplemental Digital Content Table 1 – Codes used to identify peripheral nerve blocks**

|  |  |  |
| --- | --- | --- |
| **Code** | **Source** | **Description** |
| G260 | OHIP | Major plexus block |
| G060 | OHIP  | Major peripheral nerve block |
| G061 | OHIP  | Minor peripheral nerve block |
| 1BS11 | NACRS | Anaesthetization, nerve(s) of pelvis, hip and thigh  |
| Anesthesia technique code | NACRS | Peripheral nerve block |
| OHIP: Ontario Health Insurance Plan; NACRS: National Ambulatory Care Reporting System |

Validation citation:

Hamilton GM, Ramlogan R, Lui A, McCartney CJL, Abdallah F, McVicar J, McIsaac DI: Peripheral Nerve Blocks for Ambulatory Shoulder Surgery. Anesthesiology 2019; 131 (6); 1254

**Supplemental Digital Content Table 2 – Surgery codes**

|  |  |
| --- | --- |
| **Surgery Code** | **Description** |
| 1SQ53 | Implantation of internal device, pelvis |
| 1VA53 | Implantation of internal device, hip joint |
| 1VA74 | Fixation, hip joint |
| 1VC74 | Fixation, femur |

Validation citation:

Juurlink DN, Croxford R, Chong A, Austin P, Tu J, Laupacis A: Canadian Institute for Health Information Discharge Abstract Database : A Validation Study ICES Investigative Report June 2006 Canadian Institute for Health Information Discharge Abstract Database : 2006

**Supplemental Digital Content Table 3 – Codes used to identify potentially nerve block attributable safety outcomes**

|  |  |  |
| --- | --- | --- |
| **Event** | **Source** | **Codes** |
| Fall-related injury | DAD (Type 2) | Two-digit codes T0, T1, T8, T9 and Three-digit code T79, S12, S22, S32, S42, S52, S62, S72, S82, S92,T02, T08, T10, T12 |
| Seizure | DAD (Type 2) | G40.6, G40.5, G40.8, G40.9, G41.X |
| Cardiac arrest | DAD (Type 2) | FLAG\_HEART\_RESUS, I47.2, I49.0, I46.0, I46.1, I46.9 |
| Nerve injury | OHIP | G455-G456 or G466/G457  |
| OHIP: Ontario Health Insurance Plan; NACRS: National Ambulatory Care Reporting System |

Validation citations:

Bruin ML De, Hemel NM van, Leufkens HGM, Hoes AW: Hospital discharge diagnoses of ventricular arrhythmias and cardiac arrest were useful for epidemiologic research. J Clin Epidemiol 2005; 58:1325–9

Kee VR, Gilchrist B, Granner MA, Sarrazin NR, Carnahan RM: A systematic review of validated methods for identifying seizures, convulsions, or epilepsy using administrative and claims data. Pharmacoepidemiol Drug Saf 2012; 21 Suppl 1:183–93

Brand CA, Sundararajan V: A 10-year cohort study of the burden and risk of in-hospital falls and fractures using routinely collected hospital data. Qual Saf Heal Care 2010; 19

**Supplemental Digital Content Table 4 – Codes defining patient safety incidents**

|  |
| --- |
| **Hospital-acquired infections**  |
| A02.0, A02.1, A04.4, A04.5, A04.7, A04.8, A04.9, A08.0, A08.1, A41.0, A41.1, A41.2, A41.4, A41.50, A41.51, A41.52, A41.58, A41.80, A41.88, A41.9, A49.0, B30.9, B37.3, B37.4, B37.7, B37.80, B37.81, B95.6, B95.7, B95.8, B96.1, B96.2, B96.4, B96.5, B96.81, B96.88, B97.4, G00.3, J15.0, J15.1, J15.2, J15.5, J15.6, J15.9, J18.1, J21.0, J85.3, J86.0, J86.9, J95.01, K65.0, N39.0, N99.51, O75.30, O85.00, O86.00, O86.10, O86.20, O86.30, O86.80, P36.0, P36.1, P36.2, P36.3, P36.4, P36.8, P36.9, P38, R57.2, T81.4, T82.6, T82.7, T83.5, T83.6, T84.53, T84.54, T84.60, T84.61, T84.63, T84.64, T84.65, T84.68, T84.7, T85.7, T87.42, T87.46, T87.47, T87.48 |
| **Decubitus ulcer**  |
| L89.0, L89.1, L89.2, L89.3, L89.8, L89.9 |
| **Endocrine and metabolic complications (electrolyte abnormalities, diabetes, etc.)** |
| E10.10, E10.63, E10.64, E11.0, E11.10, E11.11, E11.63, E11.64, E13.63, E14.63, E15, E16.0, E27.2, E89.1, E89.2, E89.3, G37.2, T50.3 |
| **Venous thromboembolic events**  |
| I26.0, I26.9, I80.1, I80.2, I82.2, O87.102 |
| **Cardiac complications**  |
| I20.0, I20.1, I20.88, I20.9, I21.0, I21.1, I21.2, I21.3, I21.4, I21.9, I22.0, I22.1, I22.8, I22.9, I46.1, I46.9, I47.2, I48.1, I49.00, I49.01, I50.0, I50.1, I50.9, J81, O74.20, S26.811, T82.0, T82.1, T82.2, T82.5, T82.6, T82.7, T82.8, T82.9 |
| **Respiratory complications**  |
| J15.0, J15.1, J15.2, J15.5, J15.6, J15.9, J18.1, J21.0, J38.01, J38.02, J38.09, J69.0, J69.8, J85.3, J86.0, J86.9, J94.2, J95.00, J95.01, J95.02, J95.03, J95.08, J95.1, J95.2, J95.5, J95.80, J95.81, J95.88, J95.9, J96.0, S20.2, S22.200, S22.300, S22.400, S22.410, S22.490, S27.000, S27.001, S27.100, S27.200, S27.300, S27.310, T17.3, T17.4, T17.5, T17.8, T17.9, T71, T79.7, T81.81 |
| **Hemorrhagic events**  |
| D62, D68.3, J94.2, J95.00, O71.701, O71.704, O71.801, O72.00, O72.10, O72.20, O90.20, P12.0, S06.4, S06.5, S06.6, S27.100, S27.200, S27.300, S36.090, S36.091, S36.150, S36.151, S36.800, S36.810, S37.000, S37.300, T79.2, T81.0 |
| **Drug-related adverse events**  |
| D68.3, E16.0, E88.3, H91.0, I95.2, O74.50, T36.0, T36.1, T36.5, T36.8, T36.9, T37.8, T38.0, T38.3,T39.0, T39.1, T39.3, T39.8, T40.2, T40.3, T40.4, T40.6, T41.2, T41.3, T42.0, T42.1, T42.4, T42.6,T427, T43.0, T43.2, T43.4, T43.5, T43.8, T44.5, T44.7, T45.0, T45.1, T455, T457, T45.8, T46.0, T46.1, T46.2, T46.4, T46.5, T47.4, T48.0, T48.6, T49.0, T50.1, T50.2, T50.9, T80.8, T80.9, T81.80, T88.2, T88.3, T88.6 |
| **Adverse events related to fluid management**  |
| E86.0, E86.8, E87.7, G37.2, T50.3, T80.8, T80.9 |
| **Complications directly related to surgery** |
| H59.80, M96.6, O75.401, O75.40, O86.00, O90.00, S26.811, S27.001, S36.091, S36.151, S36.411, S36.461, S37.111, S37.211, S37.311, T81.0, T81.1, T81.2, T81.3, T81.52, T81.58, T81.59, T81.6, T81.81, T81.88, T81.9 |
| **Traumatic injuries (nonprocedural) arising in hospital**  |
| S01.00, S01.01, S01.10, S01.20, S01.30, S01.40, S01.50, S01.70, S01.80, S01.90, S02.000, S02.100, S02.200, S02.300, S02.480, S02.490, S02.5, S02.890, S03.0, S05.0, S05.1, S05.8, S05.9, S06.0, S06.1, S06.25, S06.35, S06.4, S06.5, S06.6, S06.85, S06.9, S09.0, S09.8, S09.9, S10.1, S10.9, S13.48, S14.38, S20.2, S20.4, S20.8, S22.200, S22.300, S22.400, S22.410, S22.490, S27.000, S27.100, S27.200, S27.300, S27.310, S27.810, S27.860, S30.0, S30.1, S30.80, S30.81, S30.88, S30.9, S31.200, S31.400, S32.100, S32.400, S32.500, S32.700, S32.800, S33.5, S35.1, S35.2, S35.5, S36.090, S36.150, S36.460, S36.610, S36.810, S37.000, S37.090, S37.110, S37.190, S37.210, S37.290, S37.300, S37.310, S37.390, S37.610, S39.08, S39.8, S39.9, S40.0, S40.8, S40.9, S41.10, S41.11, S42.010, S42.020, S42.090, S42.190, S42.200, S42.210, S42.220, S42.280, S42.290, S42.300, S42.390, S42.400, S42.480, S43.000, S43.090, S43.100, S46.00, S46.08, S49.7, S49.8, S49.9, S50.0, S50.1, S50.7, S50.8, S50.9, S51.00, S51.01, S51.70, S51.80, S51.90, S52.000, S52.100, S52.300, S52.500, S52.580, S52.590, S52.600, S52.800, S59.8, S59.9, S60.0, S60.2, S60.7, S60.8, S60.9, S61.00, S61.70, S61.80, S61.90, S62.000, S62.500, S62.690, S62.800, S63.100, S63.59, S69.8, S69.9, |
| S70.0, S70.1, S70.8, S70.9, S71.10, S71.11, S72.000, S72.010, S72.080, S72.090, S72.100, S72.190, S72.200, S72.300, S72.410, S72.420, S72.490, S72.800, S72.900, S73.000, S73.090, S74.18, S75.0, S79.9, S80.0, S80.1, S80.7, S80.8, S80.9, S81.00, S81.01, S81.80, S81.81, S81.90, S81.91, S82.000, S82.100, S82.200, S82.300, S82.400, S82.500, S82.600, S82.800, S82.890, S83.6, S89.8, S89.9, S90.0, S90.1, S90.3, S90.7, S90.8, S90.9, S91.00, S91.10, S91.20, S91.30, S92.000, S92.300, S92.400, S92.500, S93.49, S99.8, S99.9, T00.1, T00.8, T00.9, T09.0, T11.0, T11.1, T13.0, T13.1, T14.0, T14.9, T20.0, T20.2, T21.0, T21.1, T21.2, T21.3, T22.0, T22.4, T23.0, T23.2, T24.0, T24.2, T25.0, T25.2, T71, T79.2, T79.6, T79.7 |
| **Anesthesia-related complications**  |
| O29.50, O74.20, O74.30, O74.50, O74.60, O74.80, O89.40, O89.50, O89.80, T41.2, T41.3, T88.2, T88.3, T88.4, T88.5 |
| **Delirium**  |
| F05.0, F05.1, F05.8, F05.9 |
| **Central nervous system complications**  |
| E11.0, E15, F05.0, F05.1, F05.8, F05.9, G00.3, G37.2, G97.2, O74.30, O89.40, S06.0, S06.1, S06.25, S06.35, S06.4, S06.5, S06.6, S06.85, S06.9 |
| **Gastrointestinal**  |
| A02.0, A04.4, A04.5, A04.7, A04.8, A04.9, A08.0, A08.1, B37.80, B37.81, K22.3, K65.0, K91.0, K91.3, S27.810, S27.860, S36.150, S36.151, S36.411, S36.460, S36.461, S36.610, T18.1, T18.2, T18.3, T18.9, T28.2, T85.5 |
| **Severe events proximally threatening to life or to major vital organs** |
| G37.2, I21.0, I21.1, I21.2, I21.3, I21.4, I21.9, I22.0, I22.1, I22.8, I22.9, I26.0, I46.1, I46.9, I47.2, |
| I49.00, I49.01, J96.0, K22.3, K65.0, O74.20, O74.30,  |

Validation citations:

Southern DA, Burnand B, Droesler SE, Flemons W, Forster AJ, Gurevich Y, Harrison J, Quan H, Pincus HA, Romano PS, Sundararajan V, Kostanjsek N, Ghali WA: Deriving ICD-10 Codes for Patient Safety Indicators for Large-scale Surveillance Using Administrative Hospital Data. Med Care 2017; 55:252–60

McIsaac DI, Hamilton GM, Abdulla K, Lavallée LT, Moloo H, Pysyk C, Tufts J, Ghali WA, Forster AJ: Validation of new ICD-10-based patient safety indicators for identification of in-hospital complications in surgical patients: a study of diagnostic accuracy. BMJ Qual Saf 2019; ePub ahead:bmjqs-2018-008852

**Supplemental Digital Content Table 5 – Primary regression model and calibration plot**

|  |  |  |  |
| --- | --- | --- | --- |
| **Effect** | **OR** | **LCL** | **UCL** |
| PNB (vs none) | 1.05 | 0.97 | 1.15 |
| Male (vs female) | 1.33 | 1.25 | 1.41 |
| Lowest income quintile (ref) | 1.00 | . | . |
| 2nd income quintile | 1.01 | 0.93 | 1.10 |
| 3rd income quintile | 1.08 | 0.99 | 1.17 |
| 4th income quintile | 1.02 | 0.93 | 1.12 |
| 5th income quintile | 1.02 | 0.93 | 1.12 |
| Rural (vs urban( | 1.31 | 1.20 | 1.44 |
| No surgery (no ASA score) (ref) | 1.00 | . | . |
| ASA 1 or 2 | 2.17 | 1.87 | 2.52 |
| ASA 3 | 1.19 | 1.05 | 1.34 |
| ASA 4 or 5 | 1.38 | 1.23 | 1.55 |
| Previous hospitalization (vs none) | 0.82 | 0.76 | 0.89 |
| Resource utilization band 1 or 2 (ref) | 1.00 | . | . |
| Resource utilization band 3 | 1.03 | 0.73 | 1.46 |
| Resource utilization band 4 | 1.52 | 1.08 | 2.13 |
| Resource utilization band 5 | 2.97 | 2.12 | 4.17 |
| No previous ED visits (ref) | 1.00 | . | . |
| 1 ED visit | 1.05 | 0.97 | 1.13 |
| >1 ED visit | 1.02 | 0.94 | 1.10 |
| Fixation, femur (ref) | 1.00 | . | . |
| Implantation of internal device, pelvis | 0.58 | 0.25 | 1.34 |
| Implantation of internal device, hip joint | 0.93 | 0.87 | 0.99 |
| Fixation, hip joint | 0.73 | 0.67 | 0.80 |
| Pre-admission nursing home (vs not) | 0.45 | 0.41 | 0.50 |
| Diabetes with complications | 1.02 | 0.94 | 1.11 |
| Diabetes without complications | 0.94 | 0.86 | 1.03 |
| Heart failure | 1.35 | 1.24 | 1.47 |
| Hypertension without complications | 1.02 | 0.96 | 1.09 |
| Hypertension with complications | 0.94 | 0.74 | 1.19 |
| Chronic pulmonary disease | 0.91 | 0.84 | 0.99 |
| Demenria | 0.93 | 0.83 | 1.03 |
| Cerebrovascular disease | 0.82 | 0.72 | 0.94 |
| Chronic renal disease | 0.84 | 0.72 | 0.97 |
| Dialysis | 1.49 | 1.21 | 1.85 |
| Primary cancer | 0.89 | 0.79 | 1.00 |
| Metastatic cancer | 0.89 | 0.72 | 1.10 |
| Peripheral vascular disease | 1.01 | 0.86 | 1.19 |
| Liver disease | 1.03 | 0.82 | 1.29 |
| Peptic ulcer disease | 0.92 | 0.74 | 1.14 |
| Rheumatic disease | 0.85 | 0.64 | 1.12 |
| Hemiplegia or hemiparesis | 1.10 | 0.81 | 1.48 |
| Atrial fibrillation or flutter | 0.95 | 0.86 | 1.05 |
| Venous thromboembolism | 0.52 | 0.37 | 0.73 |
| Cardiac valve disease | 0.97 | 0.85 | 1.11 |
| Disease of the pulmonary circulation | 5.54 | 4.97 | 6.17 |
| Coagulopathy | 1.49 | 1.31 | 1.71 |
| Obesity | 1.38 | 1.09 | 1.75 |
| Weight loss | 1.13 | 0.98 | 1.31 |
| Blood loss anemia | 1.39 | 1.30 | 1.49 |
| Deficiency anemia | 0.92 | 0.68 | 1.27 |
| Alcohol abuse | 1.10 | 0.94 | 1.28 |
| Drug abuse | 0.74 | 0.51 | 1.07 |
| Psychoses | 0.96 | 0.71 | 1.28 |
| Depression | 1.12 | 0.98 | 1.28 |
| Age (linear segment) | 1.01 | 1.00 | 1.01 |
| Age (RCS segment 1) | 1.00 | 0.99 | 1.00 |
| Age (RCS segment 2) | 1.02 | 1.00 | 1.03 |
| Age (RCS segment 3) | 0.98 | 0.96 | 1.00 |
| Frailty index linear (best MFP fit) | 1.59 | 0.90 | 2.81 |
| Year linear (best MFP fit) | 0.98 | 0.97 | 0.99 |
|  |  |  |  |

