Prospective validation of a randomised trial of unicompartmental and total knee replacement: real word evidence from the OHDSI network

**Version:** 1.0

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# List of abbreviations

ATC Anatomic Therapeutic Chemical

CYCLOPS Cyclic coordinate descent for logistic, Poisson and survival analysis

SNOMED Systematized Nomenclature of Medicine

OHDSI Observational Health Data Sciences and Informatics

OMOP Observational Medical Outcomes Partnership

T Target cohort

C Comparator cohort

O Outcome cohort

PS Propensity Scores

LASSO Least absolute shrinkage and selection operator

CI Confidence Interval

# Abstract

In this study we aim to estimate the real-world outcomes for individuals eligible for the TOPKAT randomized trial of unicompartmental and total knee replacement, considering the effect of procedure choice on both post-operative complications and long-term health outcomes. Routinely-collected data will be used in the analysis, combined using tools developed by the Observational Health Data Sciences and Informatics (OHDSI) network. Risks of post-operative complications (venous thromboembolism (VTE), infection, readmission, and mortality) will be considered over the 60 days following surgery. Opioid use, as a proxy measure for persistent pain, will be assessed from 91 to 365 days after surgery, and risk of revision will be considered over the five years following surgery. Cox models will be estimated for each of the events of interest. Propensity score matching will be used to balance comparator groups in terms of observed factors, and estimates will be recalibrated based on negative control outcomes to minimize residual confounding.

# Amendments and Updates

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0 | 14 December 2018 | P. Ryan | Initial draft, based on group decisions at OHDSI Oxford Study-a-thon |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Milestones

|  |  |
| --- | --- |
| Milestone | Planned / Estimated Date |
| Start of analysis | 14 December 2018 |
| End of analysis | 9 January 2019 |
| Presentation of results | 10 January 2019 |

# Rationale and Background

Up to 50% of knee replacements could be either be a unicompartmental, where only the affected compartment of the joint is replaced, or total, where all the compartments of the joint are replaced.[1] The alternative procedures have different advantages and disadvantages and there is currently little consensus as to which is preferable.

Unicompartmental knee replacement is a less invasive procedure with a shorter time in surgery and overall length of stay compared to total knee replacement. Previous observational studies have found that those undergoing unicompartmental knee replacement have a lower risk of perioperative complications.[2] Patient reported outcomes appear to be better following unicompartmental knee replacement.[3,4] However, those who received a unicompartmental knee replacement are generally more likely to undergo a revision surgery than those who received a total knee replacement.[2]. Although this may be due to differences in thresholds for revision,[5] it has limited the uptake of unicompartmental knee replacement with around 8% of patients in the UK currently receiving a unicompartmental knee replacement.[6]

With individuals receiving unicompartmental knee replacement generally younger and healthier than those receiving total knee replacement,[2] it is unclear whether previous findings are due to differences in the procedures themselves or the patients undergoing them (i.e. confounding by indication). The Total or Partial Knee Arthroplasty Trial (TOPKAT) trial, which is close to completion, will help to clarify some of the uncertainty and has been designed to test the effect of procedure choice on self-reported pain and function.[7] Secondary outcomes include perioperative complications and risk of revision, however the trial is not powered to identify differences in these.

Where a trial is not feasible, ethical, or timely, an analysis of routinely collected data which emulates the ‘target trial’ can be used to answer the same causal question.[8] Even if the target trial is undertaken, an analysis using routinely collected data can be used to consider to assess whether the efficacy seen in a trial translates into effectiveness in real world practice and to assess secondary outcomes with sufficient sample size to elucidate true differences between the comparators.

# Research Questions and Objectives

## Research Questions

We will compare the risk of short-term adverse events (venous thromboembolism, post-operative infection, and mortality) and longer-term effectiveness (risk of revision and prescription of opioids) after unicompartmental and total knee replacement emulating TOPKAT as a target trial.

# Research methods

## Study Design

This study will be a set of retrospective, observational, new-user cohort studies. By ‘retrospective’ we mean the study will use data already collected at the start of the study. By ‘observational’ we mean no intervention will take place in the course of this study. By ‘new-user’ we mean we will only analyze the first exposure of a subject to the treatment of interest. By ‘cohort study’ we mean two cohorts, a target and comparator cohort, will be followed from index date (start of first exposure) to some end date, and assessed for the occurrence of the outcomes of interest.

## Data Source(s)

The analyses will be performed across a network of observational healthcare databases. All databases have been transformed into the OMOP Common Data Model, version 5. The complete specification for OMOP Common Data Model, version 5 is available at: <https://github.com/OHDSI/CommonDataModel>. The following databases will be included in this analysis following successful feasibility and passing all study diagnostics:

* IBM MarketScan Commercial Claims and Encounters (CCAE)
* IBM MarketScan Medicare Supplemental Beneficiaries (MDCR)
* IBM MarketScan Multi-state Medicaid (MDCD)
* Optum ClinFormatics (Optum)
* <<add others who agree to participate>>

### IBM MarketScan Commercial Claims and Encounters (CCAE)

IBM Health MarketScan® Commercial Claims and Encounters Database (CCAE) represent data from individuals enrolled in United States employer-sponsored insurance health plans. The data includes adjudicated health insurance claims (e.g. inpatient, outpatient, and outpatient pharmacy) as well as enrollment data from large employers and health plans who provide private healthcare coverage to employees, their spouses, and dependents. Additionally, it captures laboratory tests for a subset of the covered lives. This administrative claims database includes a variety of fee-for-service, preferred provider organizations, and capitated health plans.

### IBM MarketScan Medicare Supplemental Beneficiaries (MDCR)

IBM Health MarketScan® Medicare Supplemental and Coordination of Benefits Database (MDCR) represents health services of retirees in the United States with primary or Medicare supplemental coverage through privately insured fee-for-service, point-of-service, or capitated health plans. These data include adjudicated health insurance claims (e.g. inpatient, outpatient, and outpatient pharmacy). Additionally, it captures laboratory tests for a subset of the covered lives.

### IBM MarketScan Multi-state Medicaid (MDCD)

IBM Health MarketScan® Multi-State Medicaid Database (MDCD) adjudicated US health insurance claims for Medicaid enrollees from multiple states and includes hospital discharge diagnoses, outpatient diagnoses and procedures, and outpatient pharmacy claims as well as ethnicity and Medicare eligibility. Members maintain their same identifier even if they leave the system for a brief period however the dataset lacks lab data. [For further information link to RWE site for IBM MDCD.

### Optum ClinFormatics (Optum)

Optum Clinformatics Extended DataMart is an adjudicated US administrative health claims database for members of private health insurance, who are fully insured in commercial plans or in administrative services only (ASOs), Legacy Medicare Choice Lives (prior to January 2006), and Medicare Advantage (Medicare Advantage Prescription Drug coverage starting January 2006). The population is primarily representative of commercial claims patients (0-65 years old) with some Medicare (65+ years old) however ages are capped at 90 years. It includes data captured from administrative claims processed from inpatient and outpatient medical services and prescriptions as dispensed, as well as results for outpatient lab tests processed by large national lab vendors who participate in data exchange with Optum. This dataset also provides date of death (month and year only) for members with both medical and pharmacy coverage from the Social Security Death Master File (however after 2011 reporting frequency changed due to changes in reporting requirements) and location information for patients is at the US state level.

## Study population

Study cohorts will be created using ATLAS using previously tested parameters and code lists implemented in previously conducted analyses of OMOP-mapped US claims data. Individuals who received underwent either total or unicompartmental knee replacement will be identified. We will use the date of unicompartmental or total knee replacement as the index date for the study. For the primary analysis, patients will be required to have at least 1 year of continuous observation in THIN prior to their index date.

Those individuals who would have been eligible to participate in TOPKAT will be included. We will therefore exclude patients using selected criteria of the TOPKAT trial,[7] at any time before index date: below the age of 40; history of prior knee arthroplasty, knee fracture, knee surgery except diagnostic procedures; rheumatoid arthritis; inflammatory arthropathies; septic arthritis. In addition, based on conditions recorded within 365 days before index date: pathologies of foot, hip, or spine.

## Exposures

In this study, we are interested in comparisons between target cohort of persons with unicompartmental knee replacement and a comparator cohort of persons with total knee replacement. We apply inclusion criteria to emulate TOPKAT trial. The full specifications for exposure cohorts are below. Additional sensitivity analyses will be perform to not exclude patients with symptomatic hip, spinal or foot pathology (criteria #7-9) from both the target and comparator cohort.

### Patients with unicompartmental knee replacement

[OD4] Patients with unicompartmental knee replacement

Initial Event Cohort

People having any of the following: 

* a procedure of [Oxford studyathon] Unicompartmental knee arthroplasty12
  + for the first time in the person's history

with continuous observation of at least 365 days prior and 0 days after event index date, and limit initial events to: **earliest event per person.**

Inclusion Rules

Inclusion Criteria #1: Age ge 40

Having all of the following criteria:

* with the following event criteria:
  + with age >= 40

Inclusion Criteria #2: has no prior knee replacement surgery or history of knee replacement any time prior

Having all of the following criteria:

* exactly 0 occurrences of a procedure of [Oxford studyathon] Total knee arthroplasty11

where event starts between all days Before and 0 days Before index start date

* and exactly 0 occurrences of a procedure of [Oxford studyathon] Unicompartmental knee arthroplasty12

where event starts between all days Before and 1 days Before index start date

* and exactly 0 occurrences of a procedure of [Oxford studyathon] Revision of knee arthroplasty 5

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of a procedure of [Oxford studyathon] History of knee replacement codes3

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of an observation of [Oxford studyathon] History of knee replacement codes3

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #3: No prior other knee surgery any time prior

Having all of the following criteria:

* exactly 0 occurrences of a procedure of [Oxford studyathon] Any knee surgery2

where event starts between all days Before and 1 days Before index start date

Inclusion Criteria #4: no knee fracture on or any time prior

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Knee fracture4

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #5: has no rheumatoid arthritis or other inflammatory arthropathies on or any time prior

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Rheumatoid arthritis or other inflammatory arthropathies6

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #6: No septic arthritis on or any time prior

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Septic arthritis7

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #7: Does not have symptomatic hip pathology

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Symptomatic hip pathology10

where event starts between 365 days Before and 0 days After index start date

Inclusion Criteria #8: Does not have symptomatic spinal pathology

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Symptomatic back pathology8

where event starts between 365 days Before and 0 days After index start date

Inclusion Criteria #9: Does not have symptomatic foot pathology

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Symptomatic foot pathology9

where event starts between 365 days Before and 0 days After index start date

Inclusion Criteria #10: Has no other exclusion related to prior knee or ligament injury

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford StudyAthon day4] Additional exclusions for prior knee and ligament related issues1

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of a procedure of [Oxford StudyAthon day4] Additional exclusions for prior knee and ligament related issues1

where event starts between all days Before and 0 days After index start date

Limit qualifying cohort to: **earliest event per person.**

End Date Strategy

No end date strategy selected. By default, the cohort end date will be the end of the observation period that contains the index event.

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 0 days.

Appendix 1: Concept Set Definitions

1. [Oxford StudyAthon day4] Additional exclusions for prior knee and ligament related issues

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 45476199 | [SO]Anterior horn of lateral meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45459301 | [SO]Anterior horn of medial meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45472852 | [SO]Lateral meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45429420 | [SO]Medial meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45476197 | [SO]Meniscus(wrist) | Spec Anatomic Site | Read | NO | NO | NO |
| 45482830 | [SO]Posterior horn of lateral meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45466118 | [SO]Posterior horn of medial meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45463884 | [X]Other meniscus derangements | Condition | Read | NO | NO | NO |
| 4232079 | Acute injury of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 40484136 | Acute injury of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 45443951 | Acute meniscal tear, lateral | Condition | Read | NO | NO | NO |
| 4012747 | Acute meniscal tear, lateral | Condition | SNOMED | NO | NO | NO |
| 45928192 | acute meniscal tear, lateral | Condition | CIEL | NO | NO | NO |
| 4016403 | Acute meniscal tear, lateral, anterior horn | Condition | SNOMED | NO | NO | NO |
| 45437332 | Acute meniscal tear, lateral, anterior horn | Condition | Read | NO | NO | NO |
| 45510617 | Acute meniscal tear, lateral, bucket handle tear | Condition | Read | NO | NO | NO |
| 4017802 | Acute meniscal tear, lateral, bucket handle tear | Condition | SNOMED | NO | NO | NO |
| 4011661 | Acute meniscal tear, lateral, horizontal cleavage | Condition | SNOMED | NO | NO | NO |
| 45434025 | Acute meniscal tear, lateral, horizontal cleavage | Condition | Read | NO | NO | NO |
| 45517415 | Acute meniscal tear, lateral, peripheral detachment | Condition | Read | NO | NO | NO |
| 4017803 | Acute meniscal tear, lateral, peripheral detachment | Condition | SNOMED | NO | NO | NO |
| 45504001 | Acute meniscal tear, lateral, posterior horn | Condition | Read | NO | NO | NO |
| 45470899 | Acute meniscal tear, lateral, radial | Condition | Read | NO | NO | NO |
| 4011660 | Acute meniscal tear, lateral, radial | Condition | SNOMED | NO | NO | NO |
| 4151087 | Acute meniscal tear, medial | Condition | SNOMED | NO | NO | NO |
| 45523929 | Acute meniscal tear, medial | Condition | Read | NO | NO | NO |
| 45941368 | acute meniscal tear, medial | Condition | CIEL | NO | NO | NO |
| 45494089 | Acute meniscal tear, medial, anterior horn | Condition | Read | NO | NO | NO |
| 4015855 | Acute meniscal tear, medial, anterior horn | Condition | SNOMED | NO | NO | NO |
| 4015856 | Acute meniscal tear, medial, bucket handle tear | Condition | SNOMED | NO | NO | NO |
| 45464124 | Acute meniscal tear, medial, bucket handle tear | Condition | Read | NO | NO | NO |
| 45474159 | Acute meniscal tear, medial, horizontal cleavage | Condition | Read | NO | NO | NO |
| 4012746 | Acute meniscal tear, medial, horizontal cleavage | Condition | SNOMED | NO | NO | NO |
| 4012745 | Acute meniscal tear, medial, peripheral detachment | Condition | SNOMED | NO | NO | NO |
| 45447264 | Acute meniscal tear, medial, peripheral detachment | Condition | Read | NO | NO | NO |
| 45494090 | Acute meniscal tear, medial, posterior horn | Condition | Read | NO | NO | NO |
| 4012744 | Acute meniscal tear, medial, posterior horn | Condition | SNOMED | NO | NO | NO |
| 4011659 | Acute meniscal tear, medial, radial | Condition | SNOMED | NO | NO | NO |
| 45430737 | Acute meniscal tear, medial, radial | Condition | Read | NO | NO | NO |
| 2719660 | Addition to lower extremity fracture orthosis, adjustable motion knee joint, lerman type | Device | HCPCS | NO | NO | NO |
| 2719658 | Addition to lower extremity fracture orthosis, drop lock knee joint | Device | HCPCS | NO | NO | NO |
| 2719659 | Addition to lower extremity fracture orthosis, limited motion knee joint | Device | HCPCS | NO | NO | NO |
| 46272764 | Allotransplantation of meniscus | Procedure | SNOMED | NO | NO | NO |
| 4094168 | Anterior cruciate instability | Condition | SNOMED | NO | NO | NO |
| 4082561 | Anterior cruciate ligament brace | Device | SNOMED | NO | NO | NO |
| 4080658 | Anterior horn of lateral meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4130587 | Anterior horn of longitudinal segment of meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4080480 | Anterior horn of medial meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4131633 | Anterior third of longitudinal segment of meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4119997 | Arthroscopic meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4076596 | Arthroscopic partial lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45469423 | Arthroscopic partial lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 45452480 | Arthroscopic partial medial meniscectomy | Procedure | Read | NO | NO | NO |
| 4076595 | Arthroscopic partial medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4261074 | Arthroscopic reduction of bicondylar fracture of proximal tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 4205780 | Arthroscopic reduction of fracture of tibial plateau with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 45512575 | Arthroscopic repair lateral meniscus | Procedure | Read | NO | NO | NO |
| 45425949 | Arthroscopic repair medial meniscus | Procedure | Read | NO | NO | NO |
| 45512574 | Arthroscopic total lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 4076597 | Arthroscopic total lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4079532 | Arthroscopic total medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45515969 | Arthroscopic total medial meniscectomy | Procedure | Read | NO | NO | NO |
| 45422690 | Arthroscopic trimming of lateral meniscus | Procedure | Read | NO | NO | NO |
| 4085381 | Arthroscopic trimming of lateral meniscus | Procedure | SNOMED | NO | NO | NO |
| 4085380 | Arthroscopic trimming of medial meniscus | Procedure | SNOMED | NO | NO | NO |
| 45512576 | Arthroscopic trimming of medial meniscus | Procedure | Read | NO | NO | NO |
| 45435928 | Arthroscopic trimming of meniscus | Procedure | Read | NO | NO | NO |
| 4149603 | Arthroscopic trimming of meniscus | Procedure | SNOMED | NO | NO | NO |
| 4185047 | Arthroscopically aided anterior cruciate ligament augmentation | Procedure | SNOMED | NO | NO | NO |
| 4292075 | Arthroscopically aided anterior cruciate ligament reconstruction | Procedure | SNOMED | NO | NO | NO |
| 4208524 | Arthroscopically aided anterior cruciate ligament repair | Procedure | SNOMED | NO | NO | NO |
| 2106052 | Arthroscopically aided anterior cruciate ligament repair/augmentation or reconstruction | Procedure | CPT4 | NO | NO | NO |
| 4224970 | Arthroscopically aided posterior cruciate ligament augmentation | Procedure | SNOMED | NO | NO | NO |
| 4286791 | Arthroscopically aided posterior cruciate ligament reconstruction | Procedure | SNOMED | NO | NO | NO |
| 4077907 | Arthroscopically aided posterior cruciate ligament repair | Procedure | SNOMED | NO | NO | NO |
| 2106053 | Arthroscopically aided posterior cruciate ligament repair/augmentation or reconstruction | Procedure | CPT4 | NO | NO | NO |
| 2106055 | Arthroscopically aided repair of large osteochondritis dissecans lesion, talar dome fracture, or tibial plafond fracture, with or without internal fixation (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 45890091 | Arthroscopically aided treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, with or without manipulation | Procedure | CPT4 | NO | NO | NO |
| 2105996 | Arthroscopically aided treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, with or without manipulation; with internal or external fixation (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 2105995 | Arthroscopically aided treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, with or without manipulation; without internal or external fixation (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 2105998 | Arthroscopically aided treatment of tibial fracture, proximal (plateau); bicondylar, includes internal fixation, when performed (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 2105997 | Arthroscopically aided treatment of tibial fracture, proximal (plateau); unicondylar, includes internal fixation, when performed (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 4305585 | Arthroscopy of knee with lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4026220 | Arthroscopy of knee with lateral meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 4229117 | Arthroscopy of knee with medial and lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4337357 | Arthroscopy of knee with medial and lateral meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 4313585 | Arthroscopy of knee with medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4170536 | Arthroscopy of knee with medial meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 4225263 | Arthroscopy of knee with meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 2106016 | Arthroscopy, knee, diagnostic, with or without synovial biopsy (separate procedure) | Procedure | CPT4 | NO | NO | NO |
| 2106033 | Arthroscopy, knee, surgical; abrasion arthroplasty (includes chondroplasty where necessary) or multiple drilling or microfracture | Procedure | CPT4 | NO | NO | NO |
| 2106015 | Arthroscopy, knee, surgical; meniscal transplantation (includes arthrotomy for meniscal insertion), medial or lateral | Procedure | CPT4 | NO | NO | NO |
| 2106034 | Arthroscopy, knee, surgical; with meniscectomy (medial AND lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed | Procedure | CPT4 | NO | NO | NO |
| 2106035 | Arthroscopy, knee, surgical; with meniscectomy (medial OR lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed | Procedure | CPT4 | NO | NO | NO |
| 2106037 | Arthroscopy, knee, surgical; with meniscus repair (medial AND lateral) | Procedure | CPT4 | NO | NO | NO |
| 2106036 | Arthroscopy, knee, surgical; with meniscus repair (medial OR lateral) | Procedure | CPT4 | NO | NO | NO |
| 2105048 | Arthrotomy with meniscus repair, knee | Procedure | CPT4 | NO | NO | NO |
| 4214724 | Arthrotomy with open meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 45888318 | Arthrotomy, with excision of semilunar cartilage (meniscectomy) knee | Procedure | CPT4 | NO | NO | NO |
| 2104990 | Arthrotomy, with excision of semilunar cartilage (meniscectomy) knee; medial AND lateral | Procedure | CPT4 | NO | NO | NO |
| 2104989 | Arthrotomy, with excision of semilunar cartilage (meniscectomy) knee; medial OR lateral | Procedure | CPT4 | NO | NO | NO |
| 37116549 | Avulsion of cruciate ligament insertion | Condition | SNOMED | NO | NO | NO |
| 42535136 | Bilateral chronic derangement of meniscus of knees | Condition | SNOMED | NO | NO | NO |
| 44836183 | Bucket handle tear of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251295 | Bucket handle tear of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 77067 | Bucket handle tear of lateral meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45950834 | Bucket Handle Tear of Lateral Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 4138283 | Bucket handle tear of medial meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 36251296 | Bucket handle tear of medial meniscus of knee | Condition | MedDRA | NO | NO | NO |
| 1573885 | Bucket-handle tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15583 | Bucket-handle tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45540992 | Bucket-handle tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545845 | Bucket-handle tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45608517 | Bucket-handle tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15582 | Bucket-handle tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45598925 | Bucket-handle tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545844 | Bucket-handle tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589237 | Bucket-handle tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15584 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45545846 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45550628 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589238 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573881 | Bucket-handle tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15571 | Bucket-handle tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45584390 | Bucket-handle tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45584391 | Bucket-handle tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45594078 | Bucket-handle tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15570 | Bucket-handle tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45565023 | Bucket-handle tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45565024 | Bucket-handle tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45555443 | Bucket-handle tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15572 | Bucket-handle tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584392 | Bucket-handle tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579531 | Bucket-handle tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584393 | Bucket-handle tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15562 | Bucket-handle tear of unspecified meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45598921 | Bucket-handle tear of unspecified meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45560135 | Bucket-handle tear of unspecified meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45555442 | Bucket-handle tear of unspecified meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15561 | Bucket-handle tear of unspecified meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45540988 | Bucket-handle tear of unspecified meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45569863 | Bucket-handle tear of unspecified meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45608514 | Bucket-handle tear of unspecified meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15563 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584387 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45594077 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584388 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 4200138 | Campbell operation on anterior cruciate ligament | Procedure | SNOMED | NO | NO | NO |
| 37108629 | Chronic rupture of anterior cruciate ligament of left knee | Condition | SNOMED | NO | NO | NO |
| 37117151 | Chronic rupture of anterior cruciate ligament of right knee | Condition | SNOMED | NO | NO | NO |
| 37108630 | Chronic rupture of posterior cruciate ligament of left knee | Condition | SNOMED | NO | NO | NO |
| 37108627 | Chronic rupture of posterior cruciate ligament of right knee | Condition | SNOMED | NO | NO | NO |
| 45766762 | Closed bicondylar fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4018353 | Closed fracture dislocation of knee joint | Condition | SNOMED | NO | NO | NO |
| 4176010 | Closed fracture of bone of knee joint | Condition | SNOMED | NO | NO | NO |
| 4172917 | Closed fracture of condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 45767614 | Closed fracture of epiphyseal plate of distal tibia | Condition | SNOMED | NO | NO | NO |
| 45767625 | Closed fracture of epiphyseal plate of proximal tibia | Condition | SNOMED | NO | NO | NO |
| 4211657 | Closed fracture of lower leg | Condition | SNOMED | NO | NO | NO |
| 4199590 | Closed fracture of lower limb | Condition | SNOMED | NO | NO | NO |
| 40491340 | Closed fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 4177534 | Closed fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4134330 | Closed fracture of tibial tuberosity | Condition | SNOMED | NO | NO | NO |
| 435666 | Closed fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 4016109 | Closed fracture proximal tibia, bicondylar | Condition | SNOMED | NO | NO | NO |
| 4015992 | Closed fracture proximal tibia, lateral condyle | Condition | SNOMED | NO | NO | NO |
| 4015991 | Closed fracture proximal tibia, medial condyle | Condition | SNOMED | NO | NO | NO |
| 4015631 | Closed fracture spine, tibia | Condition | SNOMED | NO | NO | NO |
| 4017670 | Closed fracture subluxation of knee joint | Condition | SNOMED | NO | NO | NO |
| 45427384 | Closed fracture-dislocation, knee joint | Condition | Read | NO | NO | NO |
| 45447278 | Closed fracture-subluxation, knee joint | Condition | Read | NO | NO | NO |
| 4181319 | Closed osteochondral fracture of proximal tibia | Condition | SNOMED | NO | NO | NO |
| 4077777 | Closed reduction of fracture of knee | Procedure | SNOMED | NO | NO | NO |
| 45492621 | Closed reduction of fracture of knee | Procedure | Read | NO | NO | NO |
| 4232558 | Closed reduction of fracture of plafond of tibia | Procedure | SNOMED | NO | NO | NO |
| 2105187 | Closed treatment of intercondylar spine(s) and/or tuberosity fracture(s) of knee, with or without manipulation | Procedure | CPT4 | NO | NO | NO |
| 2105184 | Closed treatment of tibial fracture, proximal (plateau); with or without manipulation, with skeletal traction | Procedure | CPT4 | NO | NO | NO |
| 2105183 | Closed treatment of tibial fracture, proximal (plateau); without manipulation | Procedure | CPT4 | NO | NO | NO |
| 40664491 | Collagen meniscus implant procedure for filling meniscal defects (e.g., cmi, collagen scaffold, menaflex) | Procedure | HCPCS | NO | NO | NO |
| 45420927 | Complete tear ulnar-carpal meniscus | Condition | Read | NO | NO | NO |
| 4018622 | Complete tear ulnar-carpal meniscus | Condition | SNOMED | NO | NO | NO |
| 4019069 | Complete tear, knee, anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4019068 | Complete tear, knee, posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 1573887 | Complex tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15589 | Complex tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45560141 | Complex tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45589239 | Complex tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560142 | Complex tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15588 | Complex tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45608520 | Complex tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608521 | Complex tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560140 | Complex tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15590 | Complex tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45608522 | Complex tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45589241 | Complex tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589240 | Complex tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573883 | Complex tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15577 | Complex tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45550627 | Complex tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45540991 | Complex tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45555444 | Complex tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15576 | Complex tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45584395 | Complex tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45598924 | Complex tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584396 | Complex tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15578 | Complex tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45608516 | Complex tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45555445 | Complex tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45569865 | Complex tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 73872 | Congenital deformity of knee joint | Condition | SNOMED | NO | NO | NO |
| 45510353 | Congenital discoid meniscus | Condition | Read | NO | NO | NO |
| 4321833 | Congenital discoid meniscus | Condition | SNOMED | NO | NO | NO |
| 45929767 | Congenital Discoid Meniscus | Condition | CIEL | NO | NO | NO |
| 45761722 | Cruciate-retaining total knee prosthesis | Device | SNOMED | NO | NO | NO |
| 4170311 | Current knee cartilage tear | Condition | SNOMED | NO | NO | NO |
| 75389 | Current tear of lateral cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45929506 | Current Tear of Lateral Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 45940580 | Current Tear of Medial Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 80242 | Current tear of medial cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 4117230 | Cyst of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45523675 | Cyst of lateral meniscus | Condition | Read | NO | NO | NO |
| 45470624 | Cyst of medial meniscus | Condition | Read | NO | NO | NO |
| 4115689 | Cyst of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 1570427 | Cystic meniscus | Condition | ICD10CM | NO | NO | NO |
| 45606171 | Cystic meniscus | Condition | ICD10 | NO | NO | NO |
| 1570432 | Cystic meniscus, anterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45606174 | Cystic meniscus, anterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45543527 | Cystic meniscus, anterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45572398 | Cystic meniscus, anterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570429 | Cystic meniscus, anterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45538714 | Cystic meniscus, anterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606173 | Cystic meniscus, anterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45553121 | Cystic meniscus, anterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570434 | Cystic meniscus, other lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45601389 | Cystic meniscus, other lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606175 | Cystic meniscus, other lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591778 | Cystic meniscus, other lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570431 | Cystic meniscus, other medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45582092 | Cystic meniscus, other medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45548361 | Cystic meniscus, other medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45557830 | Cystic meniscus, other medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570433 | Cystic meniscus, posterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45572399 | Cystic meniscus, posterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45577200 | Cystic meniscus, posterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45533786 | Cystic meniscus, posterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570430 | Cystic meniscus, posterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45572397 | Cystic meniscus, posterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45591777 | Cystic meniscus, posterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45601388 | Cystic meniscus, posterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45567499 | Cystic meniscus, unspecified lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606172 | Cystic meniscus, unspecified lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45543525 | Cystic meniscus, unspecified lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45572396 | Cystic meniscus, unspecified medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45596527 | Cystic meniscus, unspecified medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45543526 | Cystic meniscus, unspecified medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570428 | Cystic meniscus, unspecified meniscus | Condition | ICD10CM | NO | NO | NO |
| 45596528 | Cystic meniscus, unspecified meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45548359 | Cystic meniscus, unspecified meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548360 | Cystic meniscus, unspecified meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 4083551 | Deficiency of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4035606 | Deficiency of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4331318 | Degeneration of cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45932748 | Degeneration of Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 4209095 | Degeneration of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 37108999 | Degenerative rupture of lateral meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 37108998 | Degenerative rupture of lateral meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 42535061 | Degenerative rupture of medial meniscus of bilateral knees | Condition | SNOMED | NO | NO | NO |
| 37108883 | Degenerative rupture of medial meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 37108884 | Degenerative rupture of medial meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 36251297 | Derangement of anterior horn of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 44836184 | Derangement of anterior horn of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 433288 | Derangement of anterior horn of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45920959 | Derangement of Anterior Horn of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 46273519 | Derangement of anterior horn of lateral meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 1570440 | Derangement of anterior horn of lateral meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45538715 | Derangement of anterior horn of lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45591780 | Derangement of anterior horn of lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45572401 | Derangement of anterior horn of lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 42535139 | Derangement of anterior horn of lateral meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 42539201 | Derangement of anterior horn of lateral meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 44832639 | Derangement of anterior horn of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251298 | Derangement of anterior horn of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 435904 | Derangement of anterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45945212 | Derangement of Anterior Horn of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 46273520 | Derangement of anterior horn of medial meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 1570437 | Derangement of anterior horn of medial meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45601390 | Derangement of anterior horn of medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45596529 | Derangement of anterior horn of medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45567500 | Derangement of anterior horn of medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 76786 | Derangement of knee | Condition | SNOMED | NO | NO | NO |
| 437954 | Derangement of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 36251299 | Derangement of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 44821130 | Derangement of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 45938954 | Derangement of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 46273645 | Derangement of lateral meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 44832640 | Derangement of lateral meniscus, unspecified | Condition | ICD9CM | NO | NO | NO |
| 36251300 | Derangement of lateral meniscus, unspecified | Condition | MedDRA | NO | NO | NO |
| 77066 | Derangement of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45929281 | Derangement of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 46273646 | Derangement of medial meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 45954774 | Derangement of Meniscus | Condition | CIEL | NO | NO | NO |
| 75346 | Derangement of meniscus | Condition | SNOMED | NO | NO | NO |
| 46270434 | Derangement of meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 45591779 | Derangement of meniscus due to old tear or injury | Condition | ICD10 | NO | NO | NO |
| 1570435 | Derangement of meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 37109000 | Derangement of meniscus of bilateral knee joints | Condition | SNOMED | NO | NO | NO |
| 42535732 | Derangement of meniscus of knee joint due to and following old injury of knee | Condition | SNOMED | NO | NO | NO |
| 37108882 | Derangement of meniscus of left knee joint | Condition | SNOMED | NO | NO | NO |
| 37117647 | Derangement of meniscus of right knee joint | Condition | SNOMED | NO | NO | NO |
| 44823355 | Derangement of meniscus, not elsewhere classified | Condition | ICD9CM | NO | NO | NO |
| 1570442 | Derangement of other lateral meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45562679 | Derangement of other lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45553123 | Derangement of other lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45553124 | Derangement of other lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570439 | Derangement of other medial meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45582093 | Derangement of other medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45533788 | Derangement of other medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45562678 | Derangement of other medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 44826879 | Derangement of posterior horn of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251302 | Derangement of posterior horn of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 433556 | Derangement of posterior horn of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45941348 | Derangement of Posterior Horn of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 46270397 | Derangement of posterior horn of lateral meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 1570441 | Derangement of posterior horn of lateral meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45538716 | Derangement of posterior horn of lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45567501 | Derangement of posterior horn of lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591781 | Derangement of posterior horn of lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 42535137 | Derangement of posterior horn of lateral meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 42535138 | Derangement of posterior horn of lateral meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 44830330 | Derangement of posterior horn of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251303 | Derangement of posterior horn of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 75051 | Derangement of posterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45945211 | Derangement of Posterior Horn of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 46273647 | Derangement of posterior horn of medial meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 45935106 | derangement of posterior horn of medial meniscus due to old tear or injury | Condition | CIEL | NO | NO | NO |
| 1570438 | Derangement of posterior horn of medial meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45596530 | Derangement of posterior horn of medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45577201 | Derangement of posterior horn of medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45586922 | Derangement of posterior horn of medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 37109001 | Derangement of posterior horn of medial meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 37117799 | Derangement of posterior horn of medial meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 45548362 | Derangement of unspecified lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45553122 | Derangement of unspecified lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45543528 | Derangement of unspecified lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45562676 | Derangement of unspecified medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45533787 | Derangement of unspecified medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548363 | Derangement of unspecified medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570436 | Derangement of unspecified meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45562677 | Derangement of unspecified meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45586921 | Derangement of unspecified meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548364 | Derangement of unspecified meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45510352 | Discoid lateral meniscus | Condition | Read | NO | NO | NO |
| 4115691 | Discoid lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45606759 | Discoid meniscus | Condition | ICD10CM | NO | NO | NO |
| 45572400 | Discoid meniscus (congenital) | Condition | ICD10 | NO | NO | NO |
| 45935116 | discoid meniscus (congenital) unspecified site | Condition | CIEL | NO | NO | NO |
| 45507127 | Discoid meniscus - congenital | Condition | Read | NO | NO | NO |
| 4035416 | Discoid meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45930545 | discoid meniscus of knee | Condition | CIEL | NO | NO | NO |
| 4094470 | Dislocated knee with lateral meniscus tear | Condition | SNOMED | NO | NO | NO |
| 4094322 | Dislocated knee with medial meniscus tear | Condition | SNOMED | NO | NO | NO |
| 4152377 | Disorders of musculoskeletal implants and repairs | Condition | SNOMED | NO | NO | NO |
| 45429306 | Endoscopic meniscectomy of knee NEC | Procedure | Read | NO | NO | NO |
| 45462607 | Endoscopic meniscectomy operations | Procedure | Read | NO | NO | NO |
| 45449128 | Endoscopic partial meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 4124557 | Endoscopic partial meniscectomy of knee | Procedure | SNOMED | NO | NO | NO |
| 45465969 | Endoscopic total meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 2105005 | Excision of lesion of meniscus or capsule (eg, cyst, ganglion), knee | Procedure | CPT4 | NO | NO | NO |
| 4308109 | Excision of meniscus of acromioclavicular joint | Procedure | SNOMED | NO | NO | NO |
| 4237222 | Excision of meniscus of sternoclavicular joint | Procedure | SNOMED | NO | NO | NO |
| 46237424 | Excruciating pain | Meas Value | LOINC | NO | NO | NO |
| 40481169 | Extracapsular repair of tear of anterior cruciate ligament using suture stabilization and fiber tape implant | Procedure | SNOMED | NO | NO | NO |
| 4265432 | Finding of tear meniscus | Condition | SNOMED | NO | NO | NO |
| 45888842 | Fracture and/or Dislocation Procedures on the Femur (Thigh Region) and Knee Joint | Procedure | CPT4 | NO | NO | NO |
| 4136572 | Fracture dislocation of knee joint | Condition | SNOMED | NO | NO | NO |
| 4018352 | Fracture dislocation or subluxation knee | Condition | SNOMED | NO | NO | NO |
| 45527402 | FRACTURE KNEE CAP | Condition | OXMIS | NO | NO | NO |
| 4177207 | Fracture of condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 42536717 | Fracture of lateral condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 4185758 | Fracture of lower leg | Condition | SNOMED | NO | NO | NO |
| 42536718 | Fracture of medial condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 440543 | Fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 4180747 | Fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4083802 | Fracture of tibial spine | Condition | SNOMED | NO | NO | NO |
| 4070301 | Fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 4136689 | Fracture subluxation of knee joint | Condition | SNOMED | NO | NO | NO |
| 45494104 | Fracture-dislocation or subluxation knee | Condition | Read | NO | NO | NO |
| 4306815 | High tear meniscus | Condition | SNOMED | NO | NO | NO |
| 46270087 | History of allotransplantation of meniscus | Observation | SNOMED | NO | NO | NO |
| 4179397 | History of reconstruction of anterior cruciate ligament tear | Observation | SNOMED | NO | NO | NO |
| 4115690 | Horizontal cleavage tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45500379 | Horizontal cleavage tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45493775 | Horizontal cleavage tear of medial meniscus | Condition | Read | NO | NO | NO |
| 4115688 | Horizontal cleavage tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 40479768 | Injury of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 40485073 | Injury of cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 4335808 | Injury of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 36251477 | Knee fracture | Condition | MedDRA | NO | NO | NO |
| 4079526 | Knee joint operation | Procedure | SNOMED | NO | NO | NO |
| 37585264 | Knee meniscectomy | Procedure | MedDRA | NO | NO | NO |
| 4162266 | Knee meniscus part | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4185116 | Knee meniscus structure | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 45423829 | Lateral meniscus derangement | Condition | Read | NO | NO | NO |
| 45423830 | Lateral meniscus derangement NOS | Condition | Read | NO | NO | NO |
| 45503730 | Lateral meniscus derangement unspecified | Condition | Read | NO | NO | NO |
| 4162267 | Lateral meniscus part | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4000804 | Lateral meniscus structure | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 45477225 | Lateral meniscus, anterior horn derangement | Condition | Read | NO | NO | NO |
| 45510351 | Lateral meniscus, posterior horn derangement | Condition | Read | NO | NO | NO |
| 4157180 | Lateral wire repair of ruptured anterior cruciate ligament | Procedure | SNOMED | NO | NO | NO |
| 4353286 | Ligament of meniscus of knee joint | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4310283 | Low tear meniscus | Condition | SNOMED | NO | NO | NO |
| 45440373 | Medial meniscus derangement | Condition | Read | NO | NO | NO |
| 45513759 | Medial meniscus derangement NOS | Condition | Read | NO | NO | NO |
| 45420663 | Medial meniscus derangement, unspecified | Condition | Read | NO | NO | NO |
| 45493774 | Medial meniscus, anterior horn derangement | Condition | Read | NO | NO | NO |
| 45487229 | Medial meniscus, posterior horn derangement | Condition | Read | NO | NO | NO |
| 42890621 | Meniscal degeneration | Condition | MedDRA | NO | NO | NO |
| 4124560 | Meniscal reattachment | Procedure | SNOMED | NO | NO | NO |
| 4118456 | Meniscal suture | Procedure | SNOMED | NO | NO | NO |
| 42739928 | Meniscal transplantation, medial or lateral, knee (any method) | Procedure | CPT4 | NO | NO | NO |
| 45525540 | MENISCECTOMY | Procedure | OXMIS | NO | NO | NO |
| 45482640 | Meniscectomy of temporomandibular joint | Procedure | Read | NO | NO | NO |
| 36570733 | Meniscitis | Condition | MedDRA | NO | NO | NO |
| 4332935 | Meniscus | Observation | SNOMED | NO | NO | NO |
| 46333168 | MENISCUS 6 - meniscus 6 liquid | Drug | NDC | NO | NO | NO |
| 46362072 | MENISCUS 6 SPECIAL ORDER - meniscus 6 special order pellet | Drug | NDC | NO | NO | NO |
| 42889621 | Meniscus cyst | Condition | MedDRA | NO | NO | NO |
| 45493776 | Meniscus derangement NEC | Condition | Read | NO | NO | NO |
| 45772374 | Meniscus forceps | Device | SNOMED | NO | NO | NO |
| 4200758 | Meniscus glaucopis | Observation | SNOMED | NO | NO | NO |
| 43053902 | Meniscus injury | Condition | MedDRA | NO | NO | NO |
| 45759013 | Meniscus knife | Device | SNOMED | NO | NO | NO |
| 36211093 | Meniscus lesion | Condition | MedDRA | NO | NO | NO |
| 37585262 | Meniscus of knee removal | Procedure | MedDRA | NO | NO | NO |
| 37520655 | Meniscus operation | Procedure | MedDRA | NO | NO | NO |
| 45758671 | Meniscus prosthesis | Device | SNOMED | NO | NO | NO |
| 37520656 | Meniscus removal | Procedure | MedDRA | NO | NO | NO |
| 45759006 | Meniscus retractor | Device | SNOMED | NO | NO | NO |
| 36251311 | Meniscus rupture | Condition | MedDRA | NO | NO | NO |
| 45771117 | Meniscus screw, bioabsorbable | Device | SNOMED | NO | NO | NO |
| 4100308 | Meniscus stable | Condition | SNOMED | NO | NO | NO |
| 42892026 | Meniscus tear | Condition | MedDRA | NO | NO | NO |
| 36251304 | Meniscus tear of knee | Condition | MedDRA | NO | NO | NO |
| 4102282 | Meniscus unstable | Condition | SNOMED | NO | NO | NO |
| 42536715 | Metaphyseal fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 45460357 | Multiple tears of lateral meniscus | Condition | Read | NO | NO | NO |
| 4117229 | Multiple tears of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 4115057 | Multiple tears of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45467199 | Multiple tears of medial meniscus | Condition | Read | NO | NO | NO |
| 75623 | Old anterior cruciate ligament disruption | Condition | SNOMED | NO | NO | NO |
| 4116762 | Old bucket handle tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45487230 | Old bucket handle tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45940018 | Old Bucket Handle Tear of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 45927607 | Old Bucket Handle Tear of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 45443655 | Old bucket handle tear of medial meniscus | Condition | Read | NO | NO | NO |
| 44825690 | Old bucket handle tear of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251305 | Old bucket handle tear of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 75046 | Old bucket handle tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 4079723 | Old capsular, collateral ligament and cruciate damage to knee | Condition | SNOMED | NO | NO | NO |
| 4117235 | Old complete tear anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4117237 | Old complete tear posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 72406 | Old disruption of ligament of knee other than collateral AND/OR cruciate ligaments | Condition | SNOMED | NO | NO | NO |
| 4115061 | Old partial tear anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4117236 | Old partial tear posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 77069 | Old posterior cruciate ligament disruption | Condition | SNOMED | NO | NO | NO |
| 4183876 | Old rupture of cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45940016 | Old Rupture of Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 45937480 | old tear of lateral meniscus | Condition | CIEL | NO | NO | NO |
| 4148489 | Old tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45513760 | Old tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45443656 | Old tear of medial meniscus | Condition | Read | NO | NO | NO |
| 4149920 | Old tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 4117231 | Old tear of meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 4148018 | Old tear of posterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45453642 | Old tear of posterior horn of medial meniscus | Condition | Read | NO | NO | NO |
| 45437071 | Old torn meniscus of knee | Condition | Read | NO | NO | NO |
| 4019163 | Open division anterior cruciate ligament knee | Condition | SNOMED | NO | NO | NO |
| 4016811 | Open division posterior cruciate ligament knee | Condition | SNOMED | NO | NO | NO |
| 4012286 | Open fracture dislocation of knee joint | Condition | SNOMED | NO | NO | NO |
| 4175990 | Open fracture of bone of knee joint | Condition | SNOMED | NO | NO | NO |
| 4134332 | Open fracture of tibial condyles | Condition | SNOMED | NO | NO | NO |
| 40490388 | Open fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4134331 | Open fracture of tibial tuberosity | Condition | SNOMED | NO | NO | NO |
| 441979 | Open fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 4015633 | Open fracture proximal tibia, bicondylar | Condition | SNOMED | NO | NO | NO |
| 4016110 | Open fracture proximal tibia, lateral condyle | Condition | SNOMED | NO | NO | NO |
| 4009617 | Open fracture proximal tibia, medial condyle | Condition | SNOMED | NO | NO | NO |
| 4012453 | Open fracture spine, tibia | Condition | SNOMED | NO | NO | NO |
| 4017671 | Open fracture subluxation of knee joint | Condition | SNOMED | NO | NO | NO |
| 45490755 | Open fracture-dislocation, knee joint | Condition | Read | NO | NO | NO |
| 45453956 | Open fracture-subluxation, knee joint | Condition | Read | NO | NO | NO |
| 4117107 | Open lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4114025 | Open medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4343671 | Open meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45502553 | Open meniscectomy of knee NEC | Procedure | Read | NO | NO | NO |
| 45472714 | Open meniscectomy operations | Procedure | Read | NO | NO | NO |
| 4154622 | Open operation on knee meniscus | Procedure | SNOMED | NO | NO | NO |
| 4079271 | Open partial lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45435927 | Open partial lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 45435926 | Open partial medial meniscectomy | Procedure | Read | NO | NO | NO |
| 4079530 | Open partial medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 40479729 | Open reduction of bicondylar fracture of tibia | Procedure | SNOMED | NO | NO | NO |
| 40478965 | Open reduction of bicondylar fracture of tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 4258122 | Open reduction of fracture of plafond of tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 40485420 | Open reduction of fracture of proximal tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 45476067 | Open repair lateral meniscus | Procedure | Read | NO | NO | NO |
| 4076186 | Open repair lateral meniscus | Procedure | SNOMED | NO | NO | NO |
| 4076592 | Open repair medial meniscus | Procedure | SNOMED | NO | NO | NO |
| 45482690 | Open repair medial meniscus | Procedure | Read | NO | NO | NO |
| 45499216 | Open total lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 4076185 | Open total lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4076184 | Open total medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45479397 | Open total medial meniscectomy | Procedure | Read | NO | NO | NO |
| 45486015 | Open total meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 4190333 | Open total meniscectomy of knee | Procedure | SNOMED | NO | NO | NO |
| 2105188 | Open treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, includes internal fixation, when performed | Procedure | CPT4 | NO | NO | NO |
| 2105186 | Open treatment of tibial fracture, proximal (plateau); bicondylar, with or without internal fixation | Procedure | CPT4 | NO | NO | NO |
| 2105185 | Open treatment of tibial fracture, proximal (plateau); unicondylar, includes internal fixation, when performed | Procedure | CPT4 | NO | NO | NO |
| 4343454 | Operation on meniscus of the knee | Procedure | SNOMED | NO | NO | NO |
| 21498943 | Ortho-Knee: Cartilage repair/restoration (Autologous Chondrocyte Implantation (ACI); Microfracture; Osteochondral Allograft Transplantation; Osteochondral Autograft Transplantation (OATs)) | Meas Value | LOINC | NO | NO | NO |
| 21498746 | Ortho-Knee: Meniscal surgery (arthroscopic debridement, excision (menisectomy), or repair) | Meas Value | LOINC | NO | NO | NO |
| 21498602 | Ortho-Knee: Meniscal transplantation Allograft | Meas Value | LOINC | NO | NO | NO |
| 45437333 | Other acute meniscus tear | Condition | Read | NO | NO | NO |
| 44826878 | Other and unspecified derangement of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251306 | Other and unspecified derangement of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 36251307 | Other derangement of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 44830331 | Other derangement of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 1570443 | Other meniscus derangements | Condition | ICD10CM | NO | NO | NO |
| 45586923 | Other meniscus derangements | Condition | ICD10 | NO | NO | NO |
| 1570448 | Other meniscus derangements, anterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45567505 | Other meniscus derangements, anterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45577202 | Other meniscus derangements, anterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45582094 | Other meniscus derangements, anterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570445 | Other meniscus derangements, anterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45543529 | Other meniscus derangements, anterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45567504 | Other meniscus derangements, anterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45596531 | Other meniscus derangements, anterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570450 | Other meniscus derangements, other lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45548367 | Other meniscus derangements, other lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45538717 | Other meniscus derangements, other lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45567506 | Other meniscus derangements, other lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570447 | Other meniscus derangements, other medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45543530 | Other meniscus derangements, other medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606176 | Other meniscus derangements, other medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45533789 | Other meniscus derangements, other medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570449 | Other meniscus derangements, posterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45557832 | Other meniscus derangements, posterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45582095 | Other meniscus derangements, posterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45596532 | Other meniscus derangements, posterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570446 | Other meniscus derangements, posterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45601394 | Other meniscus derangements, posterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45601393 | Other meniscus derangements, posterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548366 | Other meniscus derangements, posterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45601391 | Other meniscus derangements, unspecified lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45557831 | Other meniscus derangements, unspecified lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591782 | Other meniscus derangements, unspecified lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45567502 | Other meniscus derangements, unspecified medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45586924 | Other meniscus derangements, unspecified medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591783 | Other meniscus derangements, unspecified medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570444 | Other meniscus derangements, unspecified meniscus | Condition | ICD10CM | NO | NO | NO |
| 45548365 | Other meniscus derangements, unspecified meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45601392 | Other meniscus derangements, unspecified meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45567503 | Other meniscus derangements, unspecified meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 2005886 | Other repair of the cruciate ligaments | Procedure | ICD9Proc | NO | NO | NO |
| 44832788 | Other tear of cartilage or meniscus of knee, current | Condition | ICD9CM | NO | NO | NO |
| 1573888 | Other tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15592 | Other tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45589242 | Other tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45574744 | Other tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45598926 | Other tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15591 | Other tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45594080 | Other tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545847 | Other tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560143 | Other tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15593 | Other tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584398 | Other tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45594081 | Other tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45540995 | Other tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573884 | Other tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15580 | Other tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45555446 | Other tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579535 | Other tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45536193 | Other tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15579 | Other tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45603747 | Other tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579534 | Other tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45579533 | Other tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15581 | Other tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45560138 | Other tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45594079 | Other tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560139 | Other tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15565 | Other tear of unspecified meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45603743 | Other tear of unspecified meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45550624 | Other tear of unspecified meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45569864 | Other tear of unspecified meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15564 | Other tear of unspecified meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45579530 | Other tear of unspecified meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45603742 | Other tear of unspecified meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589236 | Other tear of unspecified meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15566 | Other tear of unspecified meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45574742 | Other tear of unspecified meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545843 | Other tear of unspecified meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45550625 | Other tear of unspecified meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 45450336 | Parrot beak tear of posterior horn of lateral meniscus | Condition | Read | NO | NO | NO |
| 4115058 | Parrot beak tear of posterior horn of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 4115056 | Parrot beak tear of posterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45460356 | Parrot beak tear of posterior horn of medial meniscus | Condition | Read | NO | NO | NO |
| 45465968 | Partial meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 4118455 | Partial meniscectomy of knee | Procedure | SNOMED | NO | NO | NO |
| 4018502 | Partial tear, knee, anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4016560 | Partial tear, knee, posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 73571 | Pathological fracture | Condition | SNOMED | NO | NO | NO |
| 40483848 | Pathological fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 45766967 | Pathological fracture of tibia due to neoplastic disease | Condition | SNOMED | NO | NO | NO |
| 45767002 | Pathological fracture of tibia due to secondary osteoporosis | Condition | SNOMED | NO | NO | NO |
| 45463820 | Peripheral detachment of lateral meniscus | Condition | Read | NO | NO | NO |
| 4117228 | Peripheral detachment of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 4116759 | Peripheral detachment of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45453641 | Peripheral detachment of medial meniscus | Condition | Read | NO | NO | NO |
| 1573886 | Peripheral tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15586 | Peripheral tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45540993 | Peripheral tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45603748 | Peripheral tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45550629 | Peripheral tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15585 | Peripheral tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45536194 | Peripheral tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608518 | Peripheral tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45536195 | Peripheral tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15587 | Peripheral tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584397 | Peripheral tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608519 | Peripheral tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45540994 | Peripheral tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573882 | Peripheral tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15574 | Peripheral tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45560137 | Peripheral tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579532 | Peripheral tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584394 | Peripheral tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15573 | Peripheral tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45540990 | Peripheral tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45550626 | Peripheral tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45598923 | Peripheral tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15575 | Peripheral tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45603745 | Peripheral tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608515 | Peripheral tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45603746 | Peripheral tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 37200832 | Periprosthetic fracture around internal prosthetic knee joint | Condition | ICD10CM | NO | NO | NO |
| 37200837 | Periprosthetic fracture around internal prosthetic left knee joint | Condition | ICD10CM | NO | NO | NO |
| 37200838 | Periprosthetic fracture around internal prosthetic left knee joint, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 37200840 | Periprosthetic fracture around internal prosthetic left knee joint, sequela | Condition | ICD10CM | NO | NO | NO |
| 37200839 | Periprosthetic fracture around internal prosthetic left knee joint, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 37200833 | Periprosthetic fracture around internal prosthetic right knee joint | Condition | ICD10CM | NO | NO | NO |
| 37200834 | Periprosthetic fracture around internal prosthetic right knee joint, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 37200836 | Periprosthetic fracture around internal prosthetic right knee joint, sequela | Condition | ICD10CM | NO | NO | NO |
| 37200835 | Periprosthetic fracture around internal prosthetic right knee joint, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 4097460 | Posterior cruciate instability | Condition | SNOMED | NO | NO | NO |
| 4079783 | Posterior cruciate ligament brace | Device | SNOMED | NO | NO | NO |
| 4194654 | Primary repair of torn ligament and capsule of knee, cruciate | Procedure | SNOMED | NO | NO | NO |
| 4300069 | Primary repair of torn ligament of knee, cruciate | Procedure | SNOMED | NO | NO | NO |
| 4116764 | Radial tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45450337 | Radial tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45420664 | Radial tear of medial meniscus | Condition | Read | NO | NO | NO |
| 4116760 | Radial tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 4198771 | Recent injury of posterior cruciate ligament | Observation | SNOMED | NO | NO | NO |
| 44782814 | Recent rupture of posterior cruciate ligament | Observation | SNOMED | NO | NO | NO |
| 4343907 | Reconstruction of anterior cruciate ligament of knee | Procedure | SNOMED | NO | NO | NO |
| 4343674 | Reconstruction of anterior cruciate ligament of knee joint | Procedure | SNOMED | NO | NO | NO |
| 4310053 | Reconstruction of anterior cruciate ligament using hamstring graft | Procedure | SNOMED | NO | NO | NO |
| 4346964 | Reconstruction of posterior cruciate ligament of knee joint | Procedure | SNOMED | NO | NO | NO |
| 45530527 | REDUCTION CLOSED FRACTURE KNEE | Procedure | OXMIS | NO | NO | NO |
| 4207985 | Reduction of closed intercondylar spine fractures of knee | Procedure | SNOMED | NO | NO | NO |
| 37585263 | Removal of meniscus of knee | Procedure | MedDRA | NO | NO | NO |
| 4147773 | Repair of knee cruciate ligaments | Procedure | SNOMED | NO | NO | NO |
| 4343904 | Repair of meniscus | Procedure | SNOMED | NO | NO | NO |
| 4346963 | Repair of posterior cruciate ligament of knee joint | Procedure | SNOMED | NO | NO | NO |
| 2105051 | Repair, primary, torn ligament and/or capsule, knee; collateral and cruciate ligaments | Procedure | CPT4 | NO | NO | NO |
| 2105050 | Repair, primary, torn ligament and/or capsule, knee; cruciate | Procedure | CPT4 | NO | NO | NO |
| 4035417 | Rupture of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4188487 | Rupture of cruciate ligaments | Condition | SNOMED | NO | NO | NO |
| 4035418 | Rupture of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4133015 | Sprain of anterior cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 74189 | Sprain of cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 4133016 | Sprain of posterior cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 45507308 | Sprain ulnar-carpal meniscus | Condition | Read | NO | NO | NO |
| 4273446 | Stability of meniscus - finding | Condition | SNOMED | NO | NO | NO |
| 40482293 | Stress fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 4313458 | Tear meniscus height | Observation | SNOMED | NO | NO | NO |
| 45931752 | Tear Meniscus Knee | Condition | CIEL | NO | NO | NO |
| 36251309 | Tear of lateral cartilage or meniscus of knee, current | Condition | MedDRA | NO | NO | NO |
| 44834002 | Tear of lateral cartilage or meniscus of knee, current | Condition | ICD9CM | NO | NO | NO |
| 4119146 | Tear of lateral meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45931581 | Tear of Lateral Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 44832787 | Tear of medial cartilage or meniscus of knee, current | Condition | ICD9CM | NO | NO | NO |
| 36251310 | Tear of medial cartilage or meniscus of knee, current | Condition | MedDRA | NO | NO | NO |
| 4116323 | Tear of medial meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45943625 | Tear of Medial Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 4035415 | Tear of meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45951693 | tear of meniscus of knee, unspecified | Condition | CIEL | NO | NO | NO |
| 45555441 | Tear of meniscus, current | Condition | ICD10 | NO | NO | NO |
| 1573879 | Tear of meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 1573880 | Tear of unspecified meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 45884943 | Times when pain is horrible or excruciating | Meas Value | LOINC | NO | NO | NO |
| 45913999 | Torn meniscus | Condition | CIEL | NO | NO | NO |
| 74124 | Traumatic arthropathy | Condition | SNOMED | NO | NO | NO |
| 4189458 | Traumatic arthropathy of lower extremity | Condition | SNOMED | NO | NO | NO |
| 4114604 | Traumatic arthropathy-knee | Condition | SNOMED | NO | NO | NO |
| 15568 | Unspecified tear of unspecified meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45584389 | Unspecified tear of unspecified meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45540989 | Unspecified tear of unspecified meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560136 | Unspecified tear of unspecified meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15567 | Unspecified tear of unspecified meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45603744 | Unspecified tear of unspecified meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45536191 | Unspecified tear of unspecified meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45536190 | Unspecified tear of unspecified meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15569 | Unspecified tear of unspecified meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45536192 | Unspecified tear of unspecified meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45598922 | Unspecified tear of unspecified meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45574743 | Unspecified tear of unspecified meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |

2. [Oxford studyathon] Any knee surgery

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4119997 | Arthroscopic meniscectomy | Procedure | SNOMED | NO | YES | NO |
| 45887571 | Arthroscopy, knee, surgical | Procedure | CPT4 | NO | YES | NO |
| 45889153 | Surgical Procedures on the Femur (Thigh Region) and Knee Joint | Procedure | CPT4 | NO | YES | NO |

3. [Oxford studyathon] History of knee replacement codes

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 759927 | History of arthroplasty of left knee | Observation | SNOMED | NO | YES | NO |
| 759925 | History of arthroplasty of right knee | Observation | SNOMED | NO | YES | NO |
| 44805615 | History of knee replacement | Observation | SNOMED | NO | YES | NO |
| 42534919 | History of prosthetic unicompartmental arthroplasty of left knee | Observation | SNOMED | NO | YES | NO |
| 42535692 | History of revision of left total knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 42538988 | History of revision of right total knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 37119225 | History of right unicondylar knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 43530649 | History of total knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 2105130 | Removal of prosthesis, including total knee prosthesis, methylmethacrylate with or without insertion of spacer, knee | Procedure | CPT4 | NO | YES | NO |

4. [Oxford studyathon] Knee fracture

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4176010 | Closed fracture of bone of knee joint | Condition | SNOMED | NO | YES | NO |
| 4136572 | Fracture dislocation of knee joint | Condition | SNOMED | NO | YES | NO |
| 4177025 | Fracture of patella | Condition | SNOMED | NO | YES | NO |
| 4175990 | Open fracture of bone of knee joint | Condition | SNOMED | NO | YES | NO |

5. [Oxford studyathon] Revision of knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 45495901 | Conversion to hybrid total knee replacement NEC | Procedure | Read | NO | YES | NO |
| 43018821 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Femoral Surface, Left | Procedure | ICD10PCS | NO | YES | NO |
| 43019580 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Femoral Surface, Right | Procedure | ICD10PCS | NO | YES | NO |
| 2884349 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Left | Procedure | ICD10PCS | NO | YES | NO |
| 2886872 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Right | Procedure | ICD10PCS | NO | YES | NO |
| 43019648 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Tibial Surface, Left | Procedure | ICD10PCS | NO | YES | NO |
| 43020030 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Tibial Surface, Right | Procedure | ICD10PCS | NO | YES | NO |
| 4079528 | Revision cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076190 | Revision cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076874 | Revision hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 40484058 | Revision of hybrid prosthetic replacement of knee joint using cement | Procedure | SNOMED | NO | YES | NO |
| 44512521 | Revision of hybrid prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 4090451 | Revision of knee arthroplasty | Procedure | SNOMED | NO | YES | NO |
| 4106397 | Revision of knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44514814 | Revision of one component of total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 4076750 | Revision of resurfacing arthroplasty | Procedure | SNOMED | NO | YES | NO |
| 4058591 | Revision of total knee arthroplasty, all components | Procedure | SNOMED | NO | YES | NO |
| 45890559 | Revision of total knee arthroplasty, with or without allograft | Procedure | CPT4 | NO | YES | NO |
| 44514812 | Revision of total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 4076590 | Revision uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076872 | Revision uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 42872576 | Conversion to hybrid total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4138871 | Conversion from cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076600 | Conversion from cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 42872539 | Conversion from hybrid total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076602 | Conversion from hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44514795 | Conversion from previous cemented total prosthetic replacement of knee joint | Procedure | OPCS4 | NO | YES | NO |
| 40484529 | Conversion from previous hybrid prosthetic replacement of knee joint using cement | Procedure | SNOMED | NO | YES | NO |
| 44512518 | Conversion from previous hybrid prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 44514809 | Conversion from previous total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 44514802 | Conversion from previous uncemented total prosthetic replacement of knee joint | Procedure | OPCS4 | NO | YES | NO |
| 4138873 | Conversion from uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076601 | Conversion from uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079652 | Conversion to cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44512520 | Conversion to hybrid prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 40484500 | Conversion to hybrid prosthetic replacement of knee joint using cement | Procedure | SNOMED | NO | YES | NO |
| 4079395 | Conversion to hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44514804 | Conversion to total prosthetic replacement of knee joint not using cement | Procedure | OPCS4 | NO | YES | NO |
| 44514797 | Conversion to total prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 44514811 | Conversion to total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 4079268 | Conversion to uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079654 | Conversion to uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |

6. [Oxford studyathon] Rheumatoid arthritis or other inflammatory arthropathies

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 74125 | Inflammatory polyarthropathy | Condition | SNOMED | NO | YES | NO |
| 255891 | Lupus erythematosus | Condition | SNOMED | NO | YES | NO |
| 80809 | Rheumatoid arthritis | Condition | SNOMED | NO | YES | NO |
| 254443 | Sjögren's syndrome | Condition | SNOMED | NO | YES | NO |
| 134442 | Systemic sclerosis | Condition | SNOMED | NO | YES | NO |

7. [Oxford studyathon] Septic arthritis

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4167984 | Bacterial arthritis | Condition | SNOMED | NO | YES | NO |

8. [Oxford studyathon] Symptomatic back pathology

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 194133 | Low back pain | Condition | SNOMED | NO | YES | NO |
| 4134121 | Lumbar radiculopathy | Condition | SNOMED | NO | YES | NO |
| 4346975 | Lumbar spondylosis | Condition | SNOMED | NO | YES | NO |
| 4048684 | Lumbosacral spondylosis | Condition | SNOMED | NO | YES | NO |
| 4066600 | Multiple-level thoracic spondylosis without myelopathy | Condition | SNOMED | NO | YES | NO |
| 4169580 | Pain in spine | Condition | SNOMED | NO | YES | NO |
| 37016165 | Prolapse of lumbar intervertebral disc without radiculopathy | Condition | SNOMED | NO | YES | NO |
| 37016164 | Prolapse of thoracic intervertebral disc without radiculopathy | Condition | SNOMED | NO | YES | NO |
| 444263 | Radiculitis | Condition | SNOMED | NO | YES | NO |
| 4133643 | Thoracic back pain | Condition | SNOMED | NO | YES | NO |

9. [Oxford studyathon] Symptomatic foot pathology

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 37108991 | Arthropathy of bilateral feet | Condition | SNOMED | NO | YES | NO |
| 37117073 | Fibromatosis of plantar fascia of bilateral feet | Condition | SNOMED | NO | YES | NO |
| 4169905 | Foot pain | Condition | SNOMED | NO | YES | NO |
| 36570145 | Foot pain | Condition | MedDRA | NO | YES | NO |
| 36516950 | Plantar fasciitis | Condition | MedDRA | NO | YES | NO |

10. [Oxford studyathon] Symptomatic hip pathology

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4170554 | Hip pain | Condition | SNOMED | NO | YES | NO |
| 36570677 | Trochanteric bursitis | Condition | MedDRA | NO | YES | NO |
| 4297894 | Trochanteric bursitis | Condition | SNOMED | NO | YES | NO |

11. [Oxford studyathon] Total knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 2105103 | Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty) | Procedure | CPT4 | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 44514804 | Conversion to total prosthetic replacement of knee joint not using cement | Procedure | OPCS4 | YES | YES | NO |
| 44514797 | Conversion to total prosthetic replacement of knee joint using cement | Procedure | OPCS4 | YES | YES | NO |
| 4079268 | Conversion to uncemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 2005904 | Total knee replacement | Procedure | ICD9Proc | NO | YES | NO |
| 43531648 | Total knee replacement | Procedure | SNOMED | NO | YES | NO |

12. [Oxford studyathon] Unicompartmental knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4274954 | Arthroplasty of patella | Procedure | SNOMED | NO | YES | NO |
| 2105102 | Arthroplasty, knee, condyle and plateau; medial OR lateral compartment | Procedure | CPT4 | NO | YES | NO |
| 45889826 | Arthroplasty, patella | Procedure | CPT4 | NO | YES | NO |
| 4079652 | Conversion to cemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079395 | Conversion to hybrid unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079654 | Conversion to uncemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4034299 | Prosthetic unicompartmental arthroplasty of the knee | Procedure | SNOMED | NO | YES | NO |
| 43019637 | Medical and Surgical @ Lower Joints @ Replacement @ Knee Joint, Left @ Open @ Synthetic Substitute, Unicondylar | Procedure | ICD10PCS | NO | NO | NO |
| 43018700 | Medical and Surgical @ Lower Joints @ Replacement @ Knee Joint, Right @ Open @ Synthetic Substitute, Unicondylar | Procedure | ICD10PCS | NO | NO | NO |
| 42897909 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Cemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897911 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897910 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Uncemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897906 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Cemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897908 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897907 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Uncemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |

### **Patients with total knee replacement**

[OD4] Patients with total knee replacement

Initial Event Cohort

People having any of the following: 

* a procedure of [Oxford studyathon] Total knee arthroplasty11
  + for the first time in the person's history

with continuous observation of at least 365 days prior and 0 days after event index date, and limit initial events to: **earliest event per person.**

Inclusion Rules

Inclusion Criteria #1: Age ge 40

Having all of the following criteria:

* with the following event criteria:
  + with age >= 40

Inclusion Criteria #2: has no prior knee replacement surgery or history of knee replacement any time prior

Having all of the following criteria:

* exactly 0 occurrences of a procedure of [Oxford studyathon] Total knee arthroplasty11

where event starts between all days Before and 1 days Before index start date

* and exactly 0 occurrences of a procedure of [Oxford studyathon] Unicompartmental knee arthroplasty12

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of a procedure of [Oxford studyathon] Revision of knee arthroplasty 5

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of a procedure of [Oxford studyathon] History of knee replacement codes3

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of an observation of [Oxford studyathon] History of knee replacement codes3

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #3: No prior other knee surgery any time prior

Having all of the following criteria:

* exactly 0 occurrences of a procedure of [Oxford studyathon] Any knee surgery2

where event starts between all days Before and 1 days Before index start date

Inclusion Criteria #4: no knee fracture on or any time prior

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Knee fracture4

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #5: has no rheumatoid arthritis or other inflammatory arthropathies on or any time prior

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Rheumatoid arthritis or other inflammatory arthropathies6

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #6: No septic arthritis on or any time prior

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Septic arthritis7

where event starts between all days Before and 0 days After index start date

Inclusion Criteria #7: Does not have symptomatic hip pathology

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Symptomatic hip pathology10

where event starts between 365 days Before and 0 days After index start date

Inclusion Criteria #8: Does not have symptomatic spinal pathology

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Symptomatic back pathology8

where event starts between 365 days Before and 0 days After index start date

Inclusion Criteria #9: Does not have symptomatic foot pathology

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford studyathon] Symptomatic foot pathology9

where event starts between 365 days Before and 0 days After index start date

Inclusion Criteria #10: Has no other exclusion related to prior knee or ligament injury

Having all of the following criteria:

* exactly 0 occurrences of a condition occurrence of [Oxford StudyAthon day4] Additional exclusions for prior knee and ligament related issues1

where event starts between all days Before and 0 days After index start date

* and exactly 0 occurrences of a procedure of [Oxford StudyAthon day4] Additional exclusions for prior knee and ligament related issues1

where event starts between all days Before and 0 days After index start date

Limit qualifying cohort to: **earliest event per person.**

End Date Strategy

No end date strategy selected. By default, the cohort end date will be the end of the observation period that contains the index event.

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 0 days.

Appendix 1: Concept Set Definitions

1. [Oxford StudyAthon day4] Additional exclusions for prior knee and ligament related issues

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 45476199 | [SO]Anterior horn of lateral meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45459301 | [SO]Anterior horn of medial meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45472852 | [SO]Lateral meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45429420 | [SO]Medial meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45476197 | [SO]Meniscus(wrist) | Spec Anatomic Site | Read | NO | NO | NO |
| 45482830 | [SO]Posterior horn of lateral meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45466118 | [SO]Posterior horn of medial meniscus | Spec Anatomic Site | Read | NO | NO | NO |
| 45463884 | [X]Other meniscus derangements | Condition | Read | NO | NO | NO |
| 4232079 | Acute injury of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 40484136 | Acute injury of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 45443951 | Acute meniscal tear, lateral | Condition | Read | NO | NO | NO |
| 4012747 | Acute meniscal tear, lateral | Condition | SNOMED | NO | NO | NO |
| 45928192 | acute meniscal tear, lateral | Condition | CIEL | NO | NO | NO |
| 4016403 | Acute meniscal tear, lateral, anterior horn | Condition | SNOMED | NO | NO | NO |
| 45437332 | Acute meniscal tear, lateral, anterior horn | Condition | Read | NO | NO | NO |
| 45510617 | Acute meniscal tear, lateral, bucket handle tear | Condition | Read | NO | NO | NO |
| 4017802 | Acute meniscal tear, lateral, bucket handle tear | Condition | SNOMED | NO | NO | NO |
| 4011661 | Acute meniscal tear, lateral, horizontal cleavage | Condition | SNOMED | NO | NO | NO |
| 45434025 | Acute meniscal tear, lateral, horizontal cleavage | Condition | Read | NO | NO | NO |
| 45517415 | Acute meniscal tear, lateral, peripheral detachment | Condition | Read | NO | NO | NO |
| 4017803 | Acute meniscal tear, lateral, peripheral detachment | Condition | SNOMED | NO | NO | NO |
| 45504001 | Acute meniscal tear, lateral, posterior horn | Condition | Read | NO | NO | NO |
| 45470899 | Acute meniscal tear, lateral, radial | Condition | Read | NO | NO | NO |
| 4011660 | Acute meniscal tear, lateral, radial | Condition | SNOMED | NO | NO | NO |
| 4151087 | Acute meniscal tear, medial | Condition | SNOMED | NO | NO | NO |
| 45523929 | Acute meniscal tear, medial | Condition | Read | NO | NO | NO |
| 45941368 | acute meniscal tear, medial | Condition | CIEL | NO | NO | NO |
| 45494089 | Acute meniscal tear, medial, anterior horn | Condition | Read | NO | NO | NO |
| 4015855 | Acute meniscal tear, medial, anterior horn | Condition | SNOMED | NO | NO | NO |
| 4015856 | Acute meniscal tear, medial, bucket handle tear | Condition | SNOMED | NO | NO | NO |
| 45464124 | Acute meniscal tear, medial, bucket handle tear | Condition | Read | NO | NO | NO |
| 45474159 | Acute meniscal tear, medial, horizontal cleavage | Condition | Read | NO | NO | NO |
| 4012746 | Acute meniscal tear, medial, horizontal cleavage | Condition | SNOMED | NO | NO | NO |
| 4012745 | Acute meniscal tear, medial, peripheral detachment | Condition | SNOMED | NO | NO | NO |
| 45447264 | Acute meniscal tear, medial, peripheral detachment | Condition | Read | NO | NO | NO |
| 45494090 | Acute meniscal tear, medial, posterior horn | Condition | Read | NO | NO | NO |
| 4012744 | Acute meniscal tear, medial, posterior horn | Condition | SNOMED | NO | NO | NO |
| 4011659 | Acute meniscal tear, medial, radial | Condition | SNOMED | NO | NO | NO |
| 45430737 | Acute meniscal tear, medial, radial | Condition | Read | NO | NO | NO |
| 2719660 | Addition to lower extremity fracture orthosis, adjustable motion knee joint, lerman type | Device | HCPCS | NO | NO | NO |
| 2719658 | Addition to lower extremity fracture orthosis, drop lock knee joint | Device | HCPCS | NO | NO | NO |
| 2719659 | Addition to lower extremity fracture orthosis, limited motion knee joint | Device | HCPCS | NO | NO | NO |
| 46272764 | Allotransplantation of meniscus | Procedure | SNOMED | NO | NO | NO |
| 4094168 | Anterior cruciate instability | Condition | SNOMED | NO | NO | NO |
| 4082561 | Anterior cruciate ligament brace | Device | SNOMED | NO | NO | NO |
| 4080658 | Anterior horn of lateral meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4130587 | Anterior horn of longitudinal segment of meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4080480 | Anterior horn of medial meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4131633 | Anterior third of longitudinal segment of meniscus | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4119997 | Arthroscopic meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4076596 | Arthroscopic partial lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45469423 | Arthroscopic partial lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 45452480 | Arthroscopic partial medial meniscectomy | Procedure | Read | NO | NO | NO |
| 4076595 | Arthroscopic partial medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4261074 | Arthroscopic reduction of bicondylar fracture of proximal tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 4205780 | Arthroscopic reduction of fracture of tibial plateau with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 45512575 | Arthroscopic repair lateral meniscus | Procedure | Read | NO | NO | NO |
| 45425949 | Arthroscopic repair medial meniscus | Procedure | Read | NO | NO | NO |
| 45512574 | Arthroscopic total lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 4076597 | Arthroscopic total lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4079532 | Arthroscopic total medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45515969 | Arthroscopic total medial meniscectomy | Procedure | Read | NO | NO | NO |
| 45422690 | Arthroscopic trimming of lateral meniscus | Procedure | Read | NO | NO | NO |
| 4085381 | Arthroscopic trimming of lateral meniscus | Procedure | SNOMED | NO | NO | NO |
| 4085380 | Arthroscopic trimming of medial meniscus | Procedure | SNOMED | NO | NO | NO |
| 45512576 | Arthroscopic trimming of medial meniscus | Procedure | Read | NO | NO | NO |
| 45435928 | Arthroscopic trimming of meniscus | Procedure | Read | NO | NO | NO |
| 4149603 | Arthroscopic trimming of meniscus | Procedure | SNOMED | NO | NO | NO |
| 4185047 | Arthroscopically aided anterior cruciate ligament augmentation | Procedure | SNOMED | NO | NO | NO |
| 4292075 | Arthroscopically aided anterior cruciate ligament reconstruction | Procedure | SNOMED | NO | NO | NO |
| 4208524 | Arthroscopically aided anterior cruciate ligament repair | Procedure | SNOMED | NO | NO | NO |
| 2106052 | Arthroscopically aided anterior cruciate ligament repair/augmentation or reconstruction | Procedure | CPT4 | NO | NO | NO |
| 4224970 | Arthroscopically aided posterior cruciate ligament augmentation | Procedure | SNOMED | NO | NO | NO |
| 4286791 | Arthroscopically aided posterior cruciate ligament reconstruction | Procedure | SNOMED | NO | NO | NO |
| 4077907 | Arthroscopically aided posterior cruciate ligament repair | Procedure | SNOMED | NO | NO | NO |
| 2106053 | Arthroscopically aided posterior cruciate ligament repair/augmentation or reconstruction | Procedure | CPT4 | NO | NO | NO |
| 2106055 | Arthroscopically aided repair of large osteochondritis dissecans lesion, talar dome fracture, or tibial plafond fracture, with or without internal fixation (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 45890091 | Arthroscopically aided treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, with or without manipulation | Procedure | CPT4 | NO | NO | NO |
| 2105996 | Arthroscopically aided treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, with or without manipulation; with internal or external fixation (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 2105995 | Arthroscopically aided treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, with or without manipulation; without internal or external fixation (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 2105998 | Arthroscopically aided treatment of tibial fracture, proximal (plateau); bicondylar, includes internal fixation, when performed (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 2105997 | Arthroscopically aided treatment of tibial fracture, proximal (plateau); unicondylar, includes internal fixation, when performed (includes arthroscopy) | Procedure | CPT4 | NO | NO | NO |
| 4305585 | Arthroscopy of knee with lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4026220 | Arthroscopy of knee with lateral meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 4229117 | Arthroscopy of knee with medial and lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4337357 | Arthroscopy of knee with medial and lateral meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 4313585 | Arthroscopy of knee with medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4170536 | Arthroscopy of knee with medial meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 4225263 | Arthroscopy of knee with meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 2106016 | Arthroscopy, knee, diagnostic, with or without synovial biopsy (separate procedure) | Procedure | CPT4 | NO | NO | NO |
| 2106033 | Arthroscopy, knee, surgical; abrasion arthroplasty (includes chondroplasty where necessary) or multiple drilling or microfracture | Procedure | CPT4 | NO | NO | NO |
| 2106015 | Arthroscopy, knee, surgical; meniscal transplantation (includes arthrotomy for meniscal insertion), medial or lateral | Procedure | CPT4 | NO | NO | NO |
| 2106034 | Arthroscopy, knee, surgical; with meniscectomy (medial AND lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed | Procedure | CPT4 | NO | NO | NO |
| 2106035 | Arthroscopy, knee, surgical; with meniscectomy (medial OR lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed | Procedure | CPT4 | NO | NO | NO |
| 2106037 | Arthroscopy, knee, surgical; with meniscus repair (medial AND lateral) | Procedure | CPT4 | NO | NO | NO |
| 2106036 | Arthroscopy, knee, surgical; with meniscus repair (medial OR lateral) | Procedure | CPT4 | NO | NO | NO |
| 2105048 | Arthrotomy with meniscus repair, knee | Procedure | CPT4 | NO | NO | NO |
| 4214724 | Arthrotomy with open meniscus repair | Procedure | SNOMED | NO | NO | NO |
| 45888318 | Arthrotomy, with excision of semilunar cartilage (meniscectomy) knee | Procedure | CPT4 | NO | NO | NO |
| 2104990 | Arthrotomy, with excision of semilunar cartilage (meniscectomy) knee; medial AND lateral | Procedure | CPT4 | NO | NO | NO |
| 2104989 | Arthrotomy, with excision of semilunar cartilage (meniscectomy) knee; medial OR lateral | Procedure | CPT4 | NO | NO | NO |
| 37116549 | Avulsion of cruciate ligament insertion | Condition | SNOMED | NO | NO | NO |
| 42535136 | Bilateral chronic derangement of meniscus of knees | Condition | SNOMED | NO | NO | NO |
| 44836183 | Bucket handle tear of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251295 | Bucket handle tear of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 77067 | Bucket handle tear of lateral meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45950834 | Bucket Handle Tear of Lateral Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 4138283 | Bucket handle tear of medial meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 36251296 | Bucket handle tear of medial meniscus of knee | Condition | MedDRA | NO | NO | NO |
| 1573885 | Bucket-handle tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15583 | Bucket-handle tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45540992 | Bucket-handle tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545845 | Bucket-handle tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45608517 | Bucket-handle tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15582 | Bucket-handle tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45598925 | Bucket-handle tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545844 | Bucket-handle tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589237 | Bucket-handle tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15584 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45545846 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45550628 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589238 | Bucket-handle tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573881 | Bucket-handle tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15571 | Bucket-handle tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45584390 | Bucket-handle tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45584391 | Bucket-handle tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45594078 | Bucket-handle tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15570 | Bucket-handle tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45565023 | Bucket-handle tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45565024 | Bucket-handle tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45555443 | Bucket-handle tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15572 | Bucket-handle tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584392 | Bucket-handle tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579531 | Bucket-handle tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584393 | Bucket-handle tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15562 | Bucket-handle tear of unspecified meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45598921 | Bucket-handle tear of unspecified meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45560135 | Bucket-handle tear of unspecified meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45555442 | Bucket-handle tear of unspecified meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15561 | Bucket-handle tear of unspecified meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45540988 | Bucket-handle tear of unspecified meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45569863 | Bucket-handle tear of unspecified meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45608514 | Bucket-handle tear of unspecified meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15563 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584387 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45594077 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584388 | Bucket-handle tear of unspecified meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 4200138 | Campbell operation on anterior cruciate ligament | Procedure | SNOMED | NO | NO | NO |
| 37108629 | Chronic rupture of anterior cruciate ligament of left knee | Condition | SNOMED | NO | NO | NO |
| 37117151 | Chronic rupture of anterior cruciate ligament of right knee | Condition | SNOMED | NO | NO | NO |
| 37108630 | Chronic rupture of posterior cruciate ligament of left knee | Condition | SNOMED | NO | NO | NO |
| 37108627 | Chronic rupture of posterior cruciate ligament of right knee | Condition | SNOMED | NO | NO | NO |
| 45766762 | Closed bicondylar fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4018353 | Closed fracture dislocation of knee joint | Condition | SNOMED | NO | NO | NO |
| 4176010 | Closed fracture of bone of knee joint | Condition | SNOMED | NO | NO | NO |
| 4172917 | Closed fracture of condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 45767614 | Closed fracture of epiphyseal plate of distal tibia | Condition | SNOMED | NO | NO | NO |
| 45767625 | Closed fracture of epiphyseal plate of proximal tibia | Condition | SNOMED | NO | NO | NO |
| 4211657 | Closed fracture of lower leg | Condition | SNOMED | NO | NO | NO |
| 4199590 | Closed fracture of lower limb | Condition | SNOMED | NO | NO | NO |
| 40491340 | Closed fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 4177534 | Closed fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4134330 | Closed fracture of tibial tuberosity | Condition | SNOMED | NO | NO | NO |
| 435666 | Closed fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 4016109 | Closed fracture proximal tibia, bicondylar | Condition | SNOMED | NO | NO | NO |
| 4015992 | Closed fracture proximal tibia, lateral condyle | Condition | SNOMED | NO | NO | NO |
| 4015991 | Closed fracture proximal tibia, medial condyle | Condition | SNOMED | NO | NO | NO |
| 4015631 | Closed fracture spine, tibia | Condition | SNOMED | NO | NO | NO |
| 4017670 | Closed fracture subluxation of knee joint | Condition | SNOMED | NO | NO | NO |
| 45427384 | Closed fracture-dislocation, knee joint | Condition | Read | NO | NO | NO |
| 45447278 | Closed fracture-subluxation, knee joint | Condition | Read | NO | NO | NO |
| 4181319 | Closed osteochondral fracture of proximal tibia | Condition | SNOMED | NO | NO | NO |
| 4077777 | Closed reduction of fracture of knee | Procedure | SNOMED | NO | NO | NO |
| 45492621 | Closed reduction of fracture of knee | Procedure | Read | NO | NO | NO |
| 4232558 | Closed reduction of fracture of plafond of tibia | Procedure | SNOMED | NO | NO | NO |
| 2105187 | Closed treatment of intercondylar spine(s) and/or tuberosity fracture(s) of knee, with or without manipulation | Procedure | CPT4 | NO | NO | NO |
| 2105184 | Closed treatment of tibial fracture, proximal (plateau); with or without manipulation, with skeletal traction | Procedure | CPT4 | NO | NO | NO |
| 2105183 | Closed treatment of tibial fracture, proximal (plateau); without manipulation | Procedure | CPT4 | NO | NO | NO |
| 40664491 | Collagen meniscus implant procedure for filling meniscal defects (e.g., cmi, collagen scaffold, menaflex) | Procedure | HCPCS | NO | NO | NO |
| 45420927 | Complete tear ulnar-carpal meniscus | Condition | Read | NO | NO | NO |
| 4018622 | Complete tear ulnar-carpal meniscus | Condition | SNOMED | NO | NO | NO |
| 4019069 | Complete tear, knee, anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4019068 | Complete tear, knee, posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 1573887 | Complex tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15589 | Complex tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45560141 | Complex tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45589239 | Complex tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560142 | Complex tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15588 | Complex tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45608520 | Complex tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608521 | Complex tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560140 | Complex tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15590 | Complex tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45608522 | Complex tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45589241 | Complex tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589240 | Complex tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573883 | Complex tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15577 | Complex tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45550627 | Complex tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45540991 | Complex tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45555444 | Complex tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15576 | Complex tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45584395 | Complex tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45598924 | Complex tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584396 | Complex tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15578 | Complex tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45608516 | Complex tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45555445 | Complex tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45569865 | Complex tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 73872 | Congenital deformity of knee joint | Condition | SNOMED | NO | NO | NO |
| 45510353 | Congenital discoid meniscus | Condition | Read | NO | NO | NO |
| 4321833 | Congenital discoid meniscus | Condition | SNOMED | NO | NO | NO |
| 45929767 | Congenital Discoid Meniscus | Condition | CIEL | NO | NO | NO |
| 45761722 | Cruciate-retaining total knee prosthesis | Device | SNOMED | NO | NO | NO |
| 4170311 | Current knee cartilage tear | Condition | SNOMED | NO | NO | NO |
| 75389 | Current tear of lateral cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45929506 | Current Tear of Lateral Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 45940580 | Current Tear of Medial Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 80242 | Current tear of medial cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 4117230 | Cyst of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45523675 | Cyst of lateral meniscus | Condition | Read | NO | NO | NO |
| 45470624 | Cyst of medial meniscus | Condition | Read | NO | NO | NO |
| 4115689 | Cyst of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 1570427 | Cystic meniscus | Condition | ICD10CM | NO | NO | NO |
| 45606171 | Cystic meniscus | Condition | ICD10 | NO | NO | NO |
| 1570432 | Cystic meniscus, anterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45606174 | Cystic meniscus, anterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45543527 | Cystic meniscus, anterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45572398 | Cystic meniscus, anterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570429 | Cystic meniscus, anterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45538714 | Cystic meniscus, anterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606173 | Cystic meniscus, anterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45553121 | Cystic meniscus, anterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570434 | Cystic meniscus, other lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45601389 | Cystic meniscus, other lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606175 | Cystic meniscus, other lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591778 | Cystic meniscus, other lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570431 | Cystic meniscus, other medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45582092 | Cystic meniscus, other medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45548361 | Cystic meniscus, other medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45557830 | Cystic meniscus, other medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570433 | Cystic meniscus, posterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45572399 | Cystic meniscus, posterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45577200 | Cystic meniscus, posterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45533786 | Cystic meniscus, posterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570430 | Cystic meniscus, posterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45572397 | Cystic meniscus, posterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45591777 | Cystic meniscus, posterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45601388 | Cystic meniscus, posterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45567499 | Cystic meniscus, unspecified lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606172 | Cystic meniscus, unspecified lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45543525 | Cystic meniscus, unspecified lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45572396 | Cystic meniscus, unspecified medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45596527 | Cystic meniscus, unspecified medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45543526 | Cystic meniscus, unspecified medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570428 | Cystic meniscus, unspecified meniscus | Condition | ICD10CM | NO | NO | NO |
| 45596528 | Cystic meniscus, unspecified meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45548359 | Cystic meniscus, unspecified meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548360 | Cystic meniscus, unspecified meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 4083551 | Deficiency of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4035606 | Deficiency of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4331318 | Degeneration of cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45932748 | Degeneration of Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 4209095 | Degeneration of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 37108999 | Degenerative rupture of lateral meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 37108998 | Degenerative rupture of lateral meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 42535061 | Degenerative rupture of medial meniscus of bilateral knees | Condition | SNOMED | NO | NO | NO |
| 37108883 | Degenerative rupture of medial meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 37108884 | Degenerative rupture of medial meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 36251297 | Derangement of anterior horn of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 44836184 | Derangement of anterior horn of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 433288 | Derangement of anterior horn of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45920959 | Derangement of Anterior Horn of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 46273519 | Derangement of anterior horn of lateral meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 1570440 | Derangement of anterior horn of lateral meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45538715 | Derangement of anterior horn of lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45591780 | Derangement of anterior horn of lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45572401 | Derangement of anterior horn of lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 42535139 | Derangement of anterior horn of lateral meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 42539201 | Derangement of anterior horn of lateral meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 44832639 | Derangement of anterior horn of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251298 | Derangement of anterior horn of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 435904 | Derangement of anterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45945212 | Derangement of Anterior Horn of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 46273520 | Derangement of anterior horn of medial meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 1570437 | Derangement of anterior horn of medial meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45601390 | Derangement of anterior horn of medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45596529 | Derangement of anterior horn of medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45567500 | Derangement of anterior horn of medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 76786 | Derangement of knee | Condition | SNOMED | NO | NO | NO |
| 437954 | Derangement of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 36251299 | Derangement of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 44821130 | Derangement of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 45938954 | Derangement of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 46273645 | Derangement of lateral meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 44832640 | Derangement of lateral meniscus, unspecified | Condition | ICD9CM | NO | NO | NO |
| 36251300 | Derangement of lateral meniscus, unspecified | Condition | MedDRA | NO | NO | NO |
| 77066 | Derangement of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45929281 | Derangement of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 46273646 | Derangement of medial meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 45954774 | Derangement of Meniscus | Condition | CIEL | NO | NO | NO |
| 75346 | Derangement of meniscus | Condition | SNOMED | NO | NO | NO |
| 46270434 | Derangement of meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 45591779 | Derangement of meniscus due to old tear or injury | Condition | ICD10 | NO | NO | NO |
| 1570435 | Derangement of meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 37109000 | Derangement of meniscus of bilateral knee joints | Condition | SNOMED | NO | NO | NO |
| 42535732 | Derangement of meniscus of knee joint due to and following old injury of knee | Condition | SNOMED | NO | NO | NO |
| 37108882 | Derangement of meniscus of left knee joint | Condition | SNOMED | NO | NO | NO |
| 37117647 | Derangement of meniscus of right knee joint | Condition | SNOMED | NO | NO | NO |
| 44823355 | Derangement of meniscus, not elsewhere classified | Condition | ICD9CM | NO | NO | NO |
| 1570442 | Derangement of other lateral meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45562679 | Derangement of other lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45553123 | Derangement of other lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45553124 | Derangement of other lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570439 | Derangement of other medial meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45582093 | Derangement of other medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45533788 | Derangement of other medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45562678 | Derangement of other medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 44826879 | Derangement of posterior horn of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251302 | Derangement of posterior horn of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 433556 | Derangement of posterior horn of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45941348 | Derangement of Posterior Horn of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 46270397 | Derangement of posterior horn of lateral meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 1570441 | Derangement of posterior horn of lateral meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45538716 | Derangement of posterior horn of lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45567501 | Derangement of posterior horn of lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591781 | Derangement of posterior horn of lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 42535137 | Derangement of posterior horn of lateral meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 42535138 | Derangement of posterior horn of lateral meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 44830330 | Derangement of posterior horn of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251303 | Derangement of posterior horn of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 75051 | Derangement of posterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45945211 | Derangement of Posterior Horn of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 46273647 | Derangement of posterior horn of medial meniscus due to injury of knee | Condition | SNOMED | NO | NO | NO |
| 45935106 | derangement of posterior horn of medial meniscus due to old tear or injury | Condition | CIEL | NO | NO | NO |
| 1570438 | Derangement of posterior horn of medial meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45596530 | Derangement of posterior horn of medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45577201 | Derangement of posterior horn of medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45586922 | Derangement of posterior horn of medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 37109001 | Derangement of posterior horn of medial meniscus of left knee | Condition | SNOMED | NO | NO | NO |
| 37117799 | Derangement of posterior horn of medial meniscus of right knee | Condition | SNOMED | NO | NO | NO |
| 45548362 | Derangement of unspecified lateral meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45553122 | Derangement of unspecified lateral meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45543528 | Derangement of unspecified lateral meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45562676 | Derangement of unspecified medial meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45533787 | Derangement of unspecified medial meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548363 | Derangement of unspecified medial meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570436 | Derangement of unspecified meniscus due to old tear or injury | Condition | ICD10CM | NO | NO | NO |
| 45562677 | Derangement of unspecified meniscus due to old tear or injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45586921 | Derangement of unspecified meniscus due to old tear or injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548364 | Derangement of unspecified meniscus due to old tear or injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45510352 | Discoid lateral meniscus | Condition | Read | NO | NO | NO |
| 4115691 | Discoid lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45606759 | Discoid meniscus | Condition | ICD10CM | NO | NO | NO |
| 45572400 | Discoid meniscus (congenital) | Condition | ICD10 | NO | NO | NO |
| 45935116 | discoid meniscus (congenital) unspecified site | Condition | CIEL | NO | NO | NO |
| 45507127 | Discoid meniscus - congenital | Condition | Read | NO | NO | NO |
| 4035416 | Discoid meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45930545 | discoid meniscus of knee | Condition | CIEL | NO | NO | NO |
| 4094470 | Dislocated knee with lateral meniscus tear | Condition | SNOMED | NO | NO | NO |
| 4094322 | Dislocated knee with medial meniscus tear | Condition | SNOMED | NO | NO | NO |
| 4152377 | Disorders of musculoskeletal implants and repairs | Condition | SNOMED | NO | NO | NO |
| 45429306 | Endoscopic meniscectomy of knee NEC | Procedure | Read | NO | NO | NO |
| 45462607 | Endoscopic meniscectomy operations | Procedure | Read | NO | NO | NO |
| 45449128 | Endoscopic partial meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 4124557 | Endoscopic partial meniscectomy of knee | Procedure | SNOMED | NO | NO | NO |
| 45465969 | Endoscopic total meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 2105005 | Excision of lesion of meniscus or capsule (eg, cyst, ganglion), knee | Procedure | CPT4 | NO | NO | NO |
| 4308109 | Excision of meniscus of acromioclavicular joint | Procedure | SNOMED | NO | NO | NO |
| 4237222 | Excision of meniscus of sternoclavicular joint | Procedure | SNOMED | NO | NO | NO |
| 46237424 | Excruciating pain | Meas Value | LOINC | NO | NO | NO |
| 40481169 | Extracapsular repair of tear of anterior cruciate ligament using suture stabilization and fiber tape implant | Procedure | SNOMED | NO | NO | NO |
| 4265432 | Finding of tear meniscus | Condition | SNOMED | NO | NO | NO |
| 45888842 | Fracture and/or Dislocation Procedures on the Femur (Thigh Region) and Knee Joint | Procedure | CPT4 | NO | NO | NO |
| 4136572 | Fracture dislocation of knee joint | Condition | SNOMED | NO | NO | NO |
| 4018352 | Fracture dislocation or subluxation knee | Condition | SNOMED | NO | NO | NO |
| 45527402 | FRACTURE KNEE CAP | Condition | OXMIS | NO | NO | NO |
| 4177207 | Fracture of condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 42536717 | Fracture of lateral condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 4185758 | Fracture of lower leg | Condition | SNOMED | NO | NO | NO |
| 42536718 | Fracture of medial condyle of tibia | Condition | SNOMED | NO | NO | NO |
| 440543 | Fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 4180747 | Fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4083802 | Fracture of tibial spine | Condition | SNOMED | NO | NO | NO |
| 4070301 | Fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 4136689 | Fracture subluxation of knee joint | Condition | SNOMED | NO | NO | NO |
| 45494104 | Fracture-dislocation or subluxation knee | Condition | Read | NO | NO | NO |
| 4306815 | High tear meniscus | Condition | SNOMED | NO | NO | NO |
| 46270087 | History of allotransplantation of meniscus | Observation | SNOMED | NO | NO | NO |
| 4179397 | History of reconstruction of anterior cruciate ligament tear | Observation | SNOMED | NO | NO | NO |
| 4115690 | Horizontal cleavage tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45500379 | Horizontal cleavage tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45493775 | Horizontal cleavage tear of medial meniscus | Condition | Read | NO | NO | NO |
| 4115688 | Horizontal cleavage tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 40479768 | Injury of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 40485073 | Injury of cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 4335808 | Injury of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 36251477 | Knee fracture | Condition | MedDRA | NO | NO | NO |
| 4079526 | Knee joint operation | Procedure | SNOMED | NO | NO | NO |
| 37585264 | Knee meniscectomy | Procedure | MedDRA | NO | NO | NO |
| 4162266 | Knee meniscus part | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4185116 | Knee meniscus structure | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 45423829 | Lateral meniscus derangement | Condition | Read | NO | NO | NO |
| 45423830 | Lateral meniscus derangement NOS | Condition | Read | NO | NO | NO |
| 45503730 | Lateral meniscus derangement unspecified | Condition | Read | NO | NO | NO |
| 4162267 | Lateral meniscus part | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4000804 | Lateral meniscus structure | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 45477225 | Lateral meniscus, anterior horn derangement | Condition | Read | NO | NO | NO |
| 45510351 | Lateral meniscus, posterior horn derangement | Condition | Read | NO | NO | NO |
| 4157180 | Lateral wire repair of ruptured anterior cruciate ligament | Procedure | SNOMED | NO | NO | NO |
| 4136694 | Ligament injury | Condition | SNOMED | NO | NO | NO |
| 4353286 | Ligament of meniscus of knee joint | Spec Anatomic Site | SNOMED | NO | NO | NO |
| 4310283 | Low tear meniscus | Condition | SNOMED | NO | NO | NO |
| 45440373 | Medial meniscus derangement | Condition | Read | NO | NO | NO |
| 45513759 | Medial meniscus derangement NOS | Condition | Read | NO | NO | NO |
| 45420663 | Medial meniscus derangement, unspecified | Condition | Read | NO | NO | NO |
| 45493774 | Medial meniscus, anterior horn derangement | Condition | Read | NO | NO | NO |
| 45487229 | Medial meniscus, posterior horn derangement | Condition | Read | NO | NO | NO |
| 42890621 | Meniscal degeneration | Condition | MedDRA | NO | NO | NO |
| 4124560 | Meniscal reattachment | Procedure | SNOMED | NO | NO | NO |
| 4118456 | Meniscal suture | Procedure | SNOMED | NO | NO | NO |
| 42739928 | Meniscal transplantation, medial or lateral, knee (any method) | Procedure | CPT4 | NO | NO | NO |
| 45525540 | MENISCECTOMY | Procedure | OXMIS | NO | NO | NO |
| 45482640 | Meniscectomy of temporomandibular joint | Procedure | Read | NO | NO | NO |
| 36570733 | Meniscitis | Condition | MedDRA | NO | NO | NO |
| 4332935 | Meniscus | Observation | SNOMED | NO | NO | NO |
| 46333168 | MENISCUS 6 - meniscus 6 liquid | Drug | NDC | NO | NO | NO |
| 46362072 | MENISCUS 6 SPECIAL ORDER - meniscus 6 special order pellet | Drug | NDC | NO | NO | NO |
| 42889621 | Meniscus cyst | Condition | MedDRA | NO | NO | NO |
| 45493776 | Meniscus derangement NEC | Condition | Read | NO | NO | NO |
| 45772374 | Meniscus forceps | Device | SNOMED | NO | NO | NO |
| 4200758 | Meniscus glaucopis | Observation | SNOMED | NO | NO | NO |
| 43053902 | Meniscus injury | Condition | MedDRA | NO | NO | NO |
| 45759013 | Meniscus knife | Device | SNOMED | NO | NO | NO |
| 36211093 | Meniscus lesion | Condition | MedDRA | NO | NO | NO |
| 37585262 | Meniscus of knee removal | Procedure | MedDRA | NO | NO | NO |
| 37520655 | Meniscus operation | Procedure | MedDRA | NO | NO | NO |
| 45758671 | Meniscus prosthesis | Device | SNOMED | NO | NO | NO |
| 37520656 | Meniscus removal | Procedure | MedDRA | NO | NO | NO |
| 45759006 | Meniscus retractor | Device | SNOMED | NO | NO | NO |
| 36251311 | Meniscus rupture | Condition | MedDRA | NO | NO | NO |
| 45771117 | Meniscus screw, bioabsorbable | Device | SNOMED | NO | NO | NO |
| 4100308 | Meniscus stable | Condition | SNOMED | NO | NO | NO |
| 42892026 | Meniscus tear | Condition | MedDRA | NO | NO | NO |
| 36251304 | Meniscus tear of knee | Condition | MedDRA | NO | NO | NO |
| 4102282 | Meniscus unstable | Condition | SNOMED | NO | NO | NO |
| 42536715 | Metaphyseal fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 45460357 | Multiple tears of lateral meniscus | Condition | Read | NO | NO | NO |
| 4117229 | Multiple tears of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 4115057 | Multiple tears of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45467199 | Multiple tears of medial meniscus | Condition | Read | NO | NO | NO |
| 75623 | Old anterior cruciate ligament disruption | Condition | SNOMED | NO | NO | NO |
| 4116762 | Old bucket handle tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45487230 | Old bucket handle tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45940018 | Old Bucket Handle Tear of Lateral Meniscus | Condition | CIEL | NO | NO | NO |
| 45927607 | Old Bucket Handle Tear of Medial Meniscus | Condition | CIEL | NO | NO | NO |
| 45443655 | Old bucket handle tear of medial meniscus | Condition | Read | NO | NO | NO |
| 44825690 | Old bucket handle tear of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251305 | Old bucket handle tear of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 75046 | Old bucket handle tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 4079723 | Old capsular, collateral ligament and cruciate damage to knee | Condition | SNOMED | NO | NO | NO |
| 4117235 | Old complete tear anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4117237 | Old complete tear posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 72406 | Old disruption of ligament of knee other than collateral AND/OR cruciate ligaments | Condition | SNOMED | NO | NO | NO |
| 4115061 | Old partial tear anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4117236 | Old partial tear posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 77069 | Old posterior cruciate ligament disruption | Condition | SNOMED | NO | NO | NO |
| 4183876 | Old rupture of cartilage AND/OR meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45940016 | Old Rupture of Cartilage and/or Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 45937480 | old tear of lateral meniscus | Condition | CIEL | NO | NO | NO |
| 4148489 | Old tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45513760 | Old tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45443656 | Old tear of medial meniscus | Condition | Read | NO | NO | NO |
| 4149920 | Old tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 4117231 | Old tear of meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 4148018 | Old tear of posterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45453642 | Old tear of posterior horn of medial meniscus | Condition | Read | NO | NO | NO |
| 45437071 | Old torn meniscus of knee | Condition | Read | NO | NO | NO |
| 4019163 | Open division anterior cruciate ligament knee | Condition | SNOMED | NO | NO | NO |
| 4016811 | Open division posterior cruciate ligament knee | Condition | SNOMED | NO | NO | NO |
| 4012286 | Open fracture dislocation of knee joint | Condition | SNOMED | NO | NO | NO |
| 4175990 | Open fracture of bone of knee joint | Condition | SNOMED | NO | NO | NO |
| 4134332 | Open fracture of tibial condyles | Condition | SNOMED | NO | NO | NO |
| 40490388 | Open fracture of tibial plateau | Condition | SNOMED | NO | NO | NO |
| 4134331 | Open fracture of tibial tuberosity | Condition | SNOMED | NO | NO | NO |
| 441979 | Open fracture of upper end of tibia | Condition | SNOMED | NO | NO | NO |
| 4015633 | Open fracture proximal tibia, bicondylar | Condition | SNOMED | NO | NO | NO |
| 4016110 | Open fracture proximal tibia, lateral condyle | Condition | SNOMED | NO | NO | NO |
| 4009617 | Open fracture proximal tibia, medial condyle | Condition | SNOMED | NO | NO | NO |
| 4012453 | Open fracture spine, tibia | Condition | SNOMED | NO | NO | NO |
| 4017671 | Open fracture subluxation of knee joint | Condition | SNOMED | NO | NO | NO |
| 45490755 | Open fracture-dislocation, knee joint | Condition | Read | NO | NO | NO |
| 45453956 | Open fracture-subluxation, knee joint | Condition | Read | NO | NO | NO |
| 4117107 | Open lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4114025 | Open medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4343671 | Open meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45502553 | Open meniscectomy of knee NEC | Procedure | Read | NO | NO | NO |
| 45472714 | Open meniscectomy operations | Procedure | Read | NO | NO | NO |
| 4154622 | Open operation on knee meniscus | Procedure | SNOMED | NO | NO | NO |
| 4079271 | Open partial lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45435927 | Open partial lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 45435926 | Open partial medial meniscectomy | Procedure | Read | NO | NO | NO |
| 4079530 | Open partial medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 40479729 | Open reduction of bicondylar fracture of tibia | Procedure | SNOMED | NO | NO | NO |
| 40478965 | Open reduction of bicondylar fracture of tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 4258122 | Open reduction of fracture of plafond of tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 40485420 | Open reduction of fracture of proximal tibia with internal fixation | Procedure | SNOMED | NO | NO | NO |
| 45476067 | Open repair lateral meniscus | Procedure | Read | NO | NO | NO |
| 4076186 | Open repair lateral meniscus | Procedure | SNOMED | NO | NO | NO |
| 4076592 | Open repair medial meniscus | Procedure | SNOMED | NO | NO | NO |
| 45482690 | Open repair medial meniscus | Procedure | Read | NO | NO | NO |
| 45499216 | Open total lateral meniscectomy | Procedure | Read | NO | NO | NO |
| 4076185 | Open total lateral meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 4076184 | Open total medial meniscectomy | Procedure | SNOMED | NO | NO | NO |
| 45479397 | Open total medial meniscectomy | Procedure | Read | NO | NO | NO |
| 45486015 | Open total meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 4190333 | Open total meniscectomy of knee | Procedure | SNOMED | NO | NO | NO |
| 2105188 | Open treatment of intercondylar spine(s) and/or tuberosity fracture(s) of the knee, includes internal fixation, when performed | Procedure | CPT4 | NO | NO | NO |
| 2105186 | Open treatment of tibial fracture, proximal (plateau); bicondylar, with or without internal fixation | Procedure | CPT4 | NO | NO | NO |
| 2105185 | Open treatment of tibial fracture, proximal (plateau); unicondylar, includes internal fixation, when performed | Procedure | CPT4 | NO | NO | NO |
| 4343454 | Operation on meniscus of the knee | Procedure | SNOMED | NO | NO | NO |
| 21498943 | Ortho-Knee: Cartilage repair/restoration (Autologous Chondrocyte Implantation (ACI); Microfracture; Osteochondral Allograft Transplantation; Osteochondral Autograft Transplantation (OATs)) | Meas Value | LOINC | NO | NO | NO |
| 21498746 | Ortho-Knee: Meniscal surgery (arthroscopic debridement, excision (menisectomy), or repair) | Meas Value | LOINC | NO | NO | NO |
| 21498602 | Ortho-Knee: Meniscal transplantation Allograft | Meas Value | LOINC | NO | NO | NO |
| 45437333 | Other acute meniscus tear | Condition | Read | NO | NO | NO |
| 44826878 | Other and unspecified derangement of medial meniscus | Condition | ICD9CM | NO | NO | NO |
| 36251306 | Other and unspecified derangement of medial meniscus | Condition | MedDRA | NO | NO | NO |
| 36251307 | Other derangement of lateral meniscus | Condition | MedDRA | NO | NO | NO |
| 44830331 | Other derangement of lateral meniscus | Condition | ICD9CM | NO | NO | NO |
| 1570443 | Other meniscus derangements | Condition | ICD10CM | NO | NO | NO |
| 45586923 | Other meniscus derangements | Condition | ICD10 | NO | NO | NO |
| 1570448 | Other meniscus derangements, anterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45567505 | Other meniscus derangements, anterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45577202 | Other meniscus derangements, anterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45582094 | Other meniscus derangements, anterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570445 | Other meniscus derangements, anterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45543529 | Other meniscus derangements, anterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45567504 | Other meniscus derangements, anterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45596531 | Other meniscus derangements, anterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570450 | Other meniscus derangements, other lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45548367 | Other meniscus derangements, other lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45538717 | Other meniscus derangements, other lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45567506 | Other meniscus derangements, other lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570447 | Other meniscus derangements, other medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45543530 | Other meniscus derangements, other medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45606176 | Other meniscus derangements, other medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45533789 | Other meniscus derangements, other medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570449 | Other meniscus derangements, posterior horn of lateral meniscus | Condition | ICD10CM | NO | NO | NO |
| 45557832 | Other meniscus derangements, posterior horn of lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45582095 | Other meniscus derangements, posterior horn of lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45596532 | Other meniscus derangements, posterior horn of lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570446 | Other meniscus derangements, posterior horn of medial meniscus | Condition | ICD10CM | NO | NO | NO |
| 45601394 | Other meniscus derangements, posterior horn of medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45601393 | Other meniscus derangements, posterior horn of medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45548366 | Other meniscus derangements, posterior horn of medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45601391 | Other meniscus derangements, unspecified lateral meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45557831 | Other meniscus derangements, unspecified lateral meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591782 | Other meniscus derangements, unspecified lateral meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45567502 | Other meniscus derangements, unspecified medial meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45586924 | Other meniscus derangements, unspecified medial meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45591783 | Other meniscus derangements, unspecified medial meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 1570444 | Other meniscus derangements, unspecified meniscus | Condition | ICD10CM | NO | NO | NO |
| 45548365 | Other meniscus derangements, unspecified meniscus, left knee | Condition | ICD10CM | NO | NO | NO |
| 45601392 | Other meniscus derangements, unspecified meniscus, right knee | Condition | ICD10CM | NO | NO | NO |
| 45567503 | Other meniscus derangements, unspecified meniscus, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 2005886 | Other repair of the cruciate ligaments | Procedure | ICD9Proc | NO | NO | NO |
| 44832788 | Other tear of cartilage or meniscus of knee, current | Condition | ICD9CM | NO | NO | NO |
| 1573888 | Other tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15592 | Other tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45589242 | Other tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45574744 | Other tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45598926 | Other tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15591 | Other tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45594080 | Other tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545847 | Other tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560143 | Other tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15593 | Other tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584398 | Other tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45594081 | Other tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45540995 | Other tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573884 | Other tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15580 | Other tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45555446 | Other tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579535 | Other tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45536193 | Other tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15579 | Other tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45603747 | Other tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579534 | Other tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45579533 | Other tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15581 | Other tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45560138 | Other tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45594079 | Other tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560139 | Other tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15565 | Other tear of unspecified meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45603743 | Other tear of unspecified meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45550624 | Other tear of unspecified meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45569864 | Other tear of unspecified meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15564 | Other tear of unspecified meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45579530 | Other tear of unspecified meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45603742 | Other tear of unspecified meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45589236 | Other tear of unspecified meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15566 | Other tear of unspecified meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45574742 | Other tear of unspecified meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45545843 | Other tear of unspecified meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45550625 | Other tear of unspecified meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 45450336 | Parrot beak tear of posterior horn of lateral meniscus | Condition | Read | NO | NO | NO |
| 4115058 | Parrot beak tear of posterior horn of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 4115056 | Parrot beak tear of posterior horn of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45460356 | Parrot beak tear of posterior horn of medial meniscus | Condition | Read | NO | NO | NO |
| 45465968 | Partial meniscectomy of knee | Procedure | Read | NO | NO | NO |
| 4118455 | Partial meniscectomy of knee | Procedure | SNOMED | NO | NO | NO |
| 4018502 | Partial tear, knee, anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4016560 | Partial tear, knee, posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 73571 | Pathological fracture | Condition | SNOMED | NO | NO | NO |
| 40483848 | Pathological fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 45766967 | Pathological fracture of tibia due to neoplastic disease | Condition | SNOMED | NO | NO | NO |
| 45767002 | Pathological fracture of tibia due to secondary osteoporosis | Condition | SNOMED | NO | NO | NO |
| 45463820 | Peripheral detachment of lateral meniscus | Condition | Read | NO | NO | NO |
| 4117228 | Peripheral detachment of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 4116759 | Peripheral detachment of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 45453641 | Peripheral detachment of medial meniscus | Condition | Read | NO | NO | NO |
| 1573886 | Peripheral tear of lateral meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15586 | Peripheral tear of lateral meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45540993 | Peripheral tear of lateral meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45603748 | Peripheral tear of lateral meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45550629 | Peripheral tear of lateral meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15585 | Peripheral tear of lateral meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45536194 | Peripheral tear of lateral meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608518 | Peripheral tear of lateral meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45536195 | Peripheral tear of lateral meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15587 | Peripheral tear of lateral meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45584397 | Peripheral tear of lateral meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608519 | Peripheral tear of lateral meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45540994 | Peripheral tear of lateral meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 1573882 | Peripheral tear of medial meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 15574 | Peripheral tear of medial meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45560137 | Peripheral tear of medial meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45579532 | Peripheral tear of medial meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45584394 | Peripheral tear of medial meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15573 | Peripheral tear of medial meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45540990 | Peripheral tear of medial meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45550626 | Peripheral tear of medial meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45598923 | Peripheral tear of medial meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15575 | Peripheral tear of medial meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45603745 | Peripheral tear of medial meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45608515 | Peripheral tear of medial meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45603746 | Peripheral tear of medial meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 37200832 | Periprosthetic fracture around internal prosthetic knee joint | Condition | ICD10CM | NO | NO | NO |
| 37200837 | Periprosthetic fracture around internal prosthetic left knee joint | Condition | ICD10CM | NO | NO | NO |
| 37200838 | Periprosthetic fracture around internal prosthetic left knee joint, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 37200840 | Periprosthetic fracture around internal prosthetic left knee joint, sequela | Condition | ICD10CM | NO | NO | NO |
| 37200839 | Periprosthetic fracture around internal prosthetic left knee joint, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 37200833 | Periprosthetic fracture around internal prosthetic right knee joint | Condition | ICD10CM | NO | NO | NO |
| 37200834 | Periprosthetic fracture around internal prosthetic right knee joint, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 37200836 | Periprosthetic fracture around internal prosthetic right knee joint, sequela | Condition | ICD10CM | NO | NO | NO |
| 37200835 | Periprosthetic fracture around internal prosthetic right knee joint, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 4097460 | Posterior cruciate instability | Condition | SNOMED | NO | NO | NO |
| 4079783 | Posterior cruciate ligament brace | Device | SNOMED | NO | NO | NO |
| 4194654 | Primary repair of torn ligament and capsule of knee, cruciate | Procedure | SNOMED | NO | NO | NO |
| 4300069 | Primary repair of torn ligament of knee, cruciate | Procedure | SNOMED | NO | NO | NO |
| 4116764 | Radial tear of lateral meniscus | Condition | SNOMED | NO | NO | NO |
| 45450337 | Radial tear of lateral meniscus | Condition | Read | NO | NO | NO |
| 45420664 | Radial tear of medial meniscus | Condition | Read | NO | NO | NO |
| 4116760 | Radial tear of medial meniscus | Condition | SNOMED | NO | NO | NO |
| 4198771 | Recent injury of posterior cruciate ligament | Observation | SNOMED | NO | NO | NO |
| 44782814 | Recent rupture of posterior cruciate ligament | Observation | SNOMED | NO | NO | NO |
| 4343907 | Reconstruction of anterior cruciate ligament of knee | Procedure | SNOMED | NO | NO | NO |
| 4343674 | Reconstruction of anterior cruciate ligament of knee joint | Procedure | SNOMED | NO | NO | NO |
| 4310053 | Reconstruction of anterior cruciate ligament using hamstring graft | Procedure | SNOMED | NO | NO | NO |
| 4346964 | Reconstruction of posterior cruciate ligament of knee joint | Procedure | SNOMED | NO | NO | NO |
| 45530527 | REDUCTION CLOSED FRACTURE KNEE | Procedure | OXMIS | NO | NO | NO |
| 4207985 | Reduction of closed intercondylar spine fractures of knee | Procedure | SNOMED | NO | NO | NO |
| 37585263 | Removal of meniscus of knee | Procedure | MedDRA | NO | NO | NO |
| 4147773 | Repair of knee cruciate ligaments | Procedure | SNOMED | NO | NO | NO |
| 4343904 | Repair of meniscus | Procedure | SNOMED | NO | NO | NO |
| 4346963 | Repair of posterior cruciate ligament of knee joint | Procedure | SNOMED | NO | NO | NO |
| 2105051 | Repair, primary, torn ligament and/or capsule, knee; collateral and cruciate ligaments | Procedure | CPT4 | NO | NO | NO |
| 2105050 | Repair, primary, torn ligament and/or capsule, knee; cruciate | Procedure | CPT4 | NO | NO | NO |
| 4035417 | Rupture of anterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4188487 | Rupture of cruciate ligaments | Condition | SNOMED | NO | NO | NO |
| 4035418 | Rupture of posterior cruciate ligament | Condition | SNOMED | NO | NO | NO |
| 4133015 | Sprain of anterior cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 74189 | Sprain of cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 4160875 | Sprain of ligament | Condition | SNOMED | NO | NO | NO |
| 4133016 | Sprain of posterior cruciate ligament of knee | Condition | SNOMED | NO | NO | NO |
| 45507308 | Sprain ulnar-carpal meniscus | Condition | Read | NO | NO | NO |
| 4273446 | Stability of meniscus - finding | Condition | SNOMED | NO | NO | NO |
| 40482293 | Stress fracture of tibia | Condition | SNOMED | NO | NO | NO |
| 4313458 | Tear meniscus height | Observation | SNOMED | NO | NO | NO |
| 45931752 | Tear Meniscus Knee | Condition | CIEL | NO | NO | NO |
| 36251309 | Tear of lateral cartilage or meniscus of knee, current | Condition | MedDRA | NO | NO | NO |
| 44834002 | Tear of lateral cartilage or meniscus of knee, current | Condition | ICD9CM | NO | NO | NO |
| 4119146 | Tear of lateral meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45931581 | Tear of Lateral Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 44832787 | Tear of medial cartilage or meniscus of knee, current | Condition | ICD9CM | NO | NO | NO |
| 36251310 | Tear of medial cartilage or meniscus of knee, current | Condition | MedDRA | NO | NO | NO |
| 4116323 | Tear of medial meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45943625 | Tear of Medial Meniscus of Knee | Condition | CIEL | NO | NO | NO |
| 4035415 | Tear of meniscus of knee | Condition | SNOMED | NO | NO | NO |
| 45951693 | tear of meniscus of knee, unspecified | Condition | CIEL | NO | NO | NO |
| 45555441 | Tear of meniscus, current | Condition | ICD10 | NO | NO | NO |
| 1573879 | Tear of meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 1573880 | Tear of unspecified meniscus, current injury | Condition | ICD10CM | NO | NO | NO |
| 45884943 | Times when pain is horrible or excruciating | Meas Value | LOINC | NO | NO | NO |
| 45913999 | Torn meniscus | Condition | CIEL | NO | NO | NO |
| 74124 | Traumatic arthropathy | Condition | SNOMED | NO | NO | NO |
| 4189458 | Traumatic arthropathy of lower extremity | Condition | SNOMED | NO | NO | NO |
| 4114604 | Traumatic arthropathy-knee | Condition | SNOMED | NO | NO | NO |
| 15568 | Unspecified tear of unspecified meniscus, current injury, left knee | Condition | ICD10CM | NO | NO | NO |
| 45584389 | Unspecified tear of unspecified meniscus, current injury, left knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45540989 | Unspecified tear of unspecified meniscus, current injury, left knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45560136 | Unspecified tear of unspecified meniscus, current injury, left knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15567 | Unspecified tear of unspecified meniscus, current injury, right knee | Condition | ICD10CM | NO | NO | NO |
| 45603744 | Unspecified tear of unspecified meniscus, current injury, right knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45536191 | Unspecified tear of unspecified meniscus, current injury, right knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45536190 | Unspecified tear of unspecified meniscus, current injury, right knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |
| 15569 | Unspecified tear of unspecified meniscus, current injury, unspecified knee | Condition | ICD10CM | NO | NO | NO |
| 45536192 | Unspecified tear of unspecified meniscus, current injury, unspecified knee, initial encounter | Condition | ICD10CM | NO | NO | NO |
| 45598922 | Unspecified tear of unspecified meniscus, current injury, unspecified knee, sequela | Condition | ICD10CM | NO | NO | NO |
| 45574743 | Unspecified tear of unspecified meniscus, current injury, unspecified knee, subsequent encounter | Condition | ICD10CM | NO | NO | NO |

2. [Oxford studyathon] Any knee surgery

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4119997 | Arthroscopic meniscectomy | Procedure | SNOMED | NO | YES | NO |
| 45887571 | Arthroscopy, knee, surgical | Procedure | CPT4 | NO | YES | NO |
| 45889153 | Surgical Procedures on the Femur (Thigh Region) and Knee Joint | Procedure | CPT4 | NO | YES | NO |

3. [Oxford studyathon] History of knee replacement codes

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 759927 | History of arthroplasty of left knee | Observation | SNOMED | NO | YES | NO |
| 759925 | History of arthroplasty of right knee | Observation | SNOMED | NO | YES | NO |
| 44805615 | History of knee replacement | Observation | SNOMED | NO | YES | NO |
| 42534919 | History of prosthetic unicompartmental arthroplasty of left knee | Observation | SNOMED | NO | YES | NO |
| 42535692 | History of revision of left total knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 42538988 | History of revision of right total knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 37119225 | History of right unicondylar knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 43530649 | History of total knee arthroplasty | Observation | SNOMED | NO | YES | NO |
| 2105130 | Removal of prosthesis, including total knee prosthesis, methylmethacrylate with or without insertion of spacer, knee | Procedure | CPT4 | NO | YES | NO |

4. [Oxford studyathon] Knee fracture

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4176010 | Closed fracture of bone of knee joint | Condition | SNOMED | NO | YES | NO |
| 4136572 | Fracture dislocation of knee joint | Condition | SNOMED | NO | YES | NO |
| 4177025 | Fracture of patella | Condition | SNOMED | NO | YES | NO |
| 4175990 | Open fracture of bone of knee joint | Condition | SNOMED | NO | YES | NO |

5. [Oxford studyathon] Revision of knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 45495901 | Conversion to hybrid total knee replacement NEC | Procedure | Read | NO | YES | NO |
| 43018821 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Femoral Surface, Left | Procedure | ICD10PCS | NO | YES | NO |
| 43019580 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Femoral Surface, Right | Procedure | ICD10PCS | NO | YES | NO |
| 2884349 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Left | Procedure | ICD10PCS | NO | YES | NO |
| 2886872 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Right | Procedure | ICD10PCS | NO | YES | NO |
| 43019648 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Tibial Surface, Left | Procedure | ICD10PCS | NO | YES | NO |
| 43020030 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Tibial Surface, Right | Procedure | ICD10PCS | NO | YES | NO |
| 4079528 | Revision cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076190 | Revision cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076874 | Revision hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 40484058 | Revision of hybrid prosthetic replacement of knee joint using cement | Procedure | SNOMED | NO | YES | NO |
| 44512521 | Revision of hybrid prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 4090451 | Revision of knee arthroplasty | Procedure | SNOMED | NO | YES | NO |
| 4106397 | Revision of knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44514814 | Revision of one component of total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 4076750 | Revision of resurfacing arthroplasty | Procedure | SNOMED | NO | YES | NO |
| 4058591 | Revision of total knee arthroplasty, all components | Procedure | SNOMED | NO | YES | NO |
| 45890559 | Revision of total knee arthroplasty, with or without allograft | Procedure | CPT4 | NO | YES | NO |
| 44514812 | Revision of total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 4076590 | Revision uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076872 | Revision uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 42872576 | Conversion to hybrid total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4138871 | Conversion from cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076600 | Conversion from cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 42872539 | Conversion from hybrid total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076602 | Conversion from hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44514795 | Conversion from previous cemented total prosthetic replacement of knee joint | Procedure | OPCS4 | NO | YES | NO |
| 40484529 | Conversion from previous hybrid prosthetic replacement of knee joint using cement | Procedure | SNOMED | NO | YES | NO |
| 44512518 | Conversion from previous hybrid prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 44514809 | Conversion from previous total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 44514802 | Conversion from previous uncemented total prosthetic replacement of knee joint | Procedure | OPCS4 | NO | YES | NO |
| 4138873 | Conversion from uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076601 | Conversion from uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079652 | Conversion to cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44512520 | Conversion to hybrid prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 40484500 | Conversion to hybrid prosthetic replacement of knee joint using cement | Procedure | SNOMED | NO | YES | NO |
| 4079395 | Conversion to hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 44514804 | Conversion to total prosthetic replacement of knee joint not using cement | Procedure | OPCS4 | NO | YES | NO |
| 44514797 | Conversion to total prosthetic replacement of knee joint using cement | Procedure | OPCS4 | NO | YES | NO |
| 44514811 | Conversion to total prosthetic replacement of knee joint NEC | Procedure | OPCS4 | NO | YES | NO |
| 4079268 | Conversion to uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079654 | Conversion to uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |

6. [Oxford studyathon] Rheumatoid arthritis or other inflammatory arthropathies

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 74125 | Inflammatory polyarthropathy | Condition | SNOMED | NO | YES | NO |
| 255891 | Lupus erythematosus | Condition | SNOMED | NO | YES | NO |
| 80809 | Rheumatoid arthritis | Condition | SNOMED | NO | YES | NO |
| 254443 | Sjögren's syndrome | Condition | SNOMED | NO | YES | NO |
| 134442 | Systemic sclerosis | Condition | SNOMED | NO | YES | NO |

7. [Oxford studyathon] Septic arthritis

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4167984 | Bacterial arthritis | Condition | SNOMED | NO | YES | NO |

8. [Oxford studyathon] Symptomatic back pathology

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 194133 | Low back pain | Condition | SNOMED | NO | YES | NO |
| 4134121 | Lumbar radiculopathy | Condition | SNOMED | NO | YES | NO |
| 4346975 | Lumbar spondylosis | Condition | SNOMED | NO | YES | NO |
| 4048684 | Lumbosacral spondylosis | Condition | SNOMED | NO | YES | NO |
| 4066600 | Multiple-level thoracic spondylosis without myelopathy | Condition | SNOMED | NO | YES | NO |
| 4169580 | Pain in spine | Condition | SNOMED | NO | YES | NO |
| 37016165 | Prolapse of lumbar intervertebral disc without radiculopathy | Condition | SNOMED | NO | YES | NO |
| 37016164 | Prolapse of thoracic intervertebral disc without radiculopathy | Condition | SNOMED | NO | YES | NO |
| 444263 | Radiculitis | Condition | SNOMED | NO | YES | NO |
| 4133643 | Thoracic back pain | Condition | SNOMED | NO | YES | NO |

9. [Oxford studyathon] Symptomatic foot pathology

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 37108991 | Arthropathy of bilateral feet | Condition | SNOMED | NO | YES | NO |
| 37117073 | Fibromatosis of plantar fascia of bilateral feet | Condition | SNOMED | NO | YES | NO |
| 4169905 | Foot pain | Condition | SNOMED | NO | YES | NO |
| 36570145 | Foot pain | Condition | MedDRA | NO | YES | NO |
| 36516950 | Plantar fasciitis | Condition | MedDRA | NO | YES | NO |

10. [Oxford studyathon] Symptomatic hip pathology

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4170554 | Hip pain | Condition | SNOMED | NO | YES | NO |
| 36570677 | Trochanteric bursitis | Condition | MedDRA | NO | YES | NO |
| 4297894 | Trochanteric bursitis | Condition | SNOMED | NO | YES | NO |

11. [Oxford studyathon] Total knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 2105103 | Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty) | Procedure | CPT4 | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 44514804 | Conversion to total prosthetic replacement of knee joint not using cement | Procedure | OPCS4 | YES | YES | NO |
| 44514797 | Conversion to total prosthetic replacement of knee joint using cement | Procedure | OPCS4 | YES | YES | NO |
| 4079268 | Conversion to uncemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 2005904 | Total knee replacement | Procedure | ICD9Proc | NO | YES | NO |
| 43531648 | Total knee replacement | Procedure | SNOMED | NO | YES | NO |

12. [Oxford studyathon] Unicompartmental knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4274954 | Arthroplasty of patella | Procedure | SNOMED | NO | YES | NO |
| 2105102 | Arthroplasty, knee, condyle and plateau; medial OR lateral compartment | Procedure | CPT4 | NO | YES | NO |
| 45889826 | Arthroplasty, patella | Procedure | CPT4 | NO | YES | NO |
| 4079652 | Conversion to cemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079395 | Conversion to hybrid unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079654 | Conversion to uncemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4034299 | Prosthetic unicompartmental arthroplasty of the knee | Procedure | SNOMED | NO | YES | NO |
| 43019637 | Medical and Surgical @ Lower Joints @ Replacement @ Knee Joint, Left @ Open @ Synthetic Substitute, Unicondylar | Procedure | ICD10PCS | NO | NO | NO |
| 43018700 | Medical and Surgical @ Lower Joints @ Replacement @ Knee Joint, Right @ Open @ Synthetic Substitute, Unicondylar | Procedure | ICD10PCS | NO | NO | NO |
| 42897909 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Cemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897911 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897910 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Uncemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897906 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Cemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897908 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897907 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Uncemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |

## Outcomes

### Venous thromboembolic events

[OD4] Venous thromboembolism events

allow new VTE events after 6mo gap

Initial Event Cohort

People having any of the following: 

* a condition occurrence of [Oxford Studyathon] Venous thromboembolism new1

with continuous observation of at least 0 days prior and 0 days after event index date, and limit initial events to: **all events per person.**

Limit qualifying cohort to: **all events per person.**

End Date Strategy

Date Offset Exit Criteria

This cohort defintion end date will be the index event's start date plus 1 days

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 180 days.

Appendix 1: Concept Set Definitions

1. [Oxford Studyathon] Venous thromboembolism new

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 44782751 | Acute deep venous thrombosis of axillary vein | Condition | SNOMED | YES | NO | NO |
| 44782752 | Acute deep venous thrombosis of internal jugular vein | Condition | SNOMED | YES | NO | NO |
| 44782421 | Acute deep venous thrombosis of upper extremity | Condition | SNOMED | YES | NO | NO |
| 44782766 | Acute deep venous thrombosis of upper extremity as complication of procedure | Condition | SNOMED | YES | NO | NO |
| 45757410 | Acute thrombosis of mesenteric vein | Condition | SNOMED | YES | NO | NO |
| 44782762 | Acute thrombosis of subclavian vein | Condition | SNOMED | YES | NO | NO |
| 36712810 | Acute thrombosis of superficial vein of left upper limb | Condition | SNOMED | YES | NO | NO |
| 36712811 | Acute thrombosis of superficial vein of right upper limb | Condition | SNOMED | YES | NO | NO |
| 44782760 | Acute thrombosis of superficial vein of upper extremity | Condition | SNOMED | YES | NO | NO |
| 435616 | Amniotic fluid embolism | Condition | SNOMED | YES | YES | NO |
| 435887 | Antepartum deep vein thrombosis | Condition | SNOMED | YES | YES | NO |
| 4179911 | Axillary vein thrombosis | Condition | SNOMED | YES | NO | NO |
| 4084942 | Brachiocephalic vein thrombosis | Condition | SNOMED | YES | NO | NO |
| 196715 | Budd-Chiari syndrome | Condition | SNOMED | YES | YES | NO |
| 4146840 | Cavernous sinus syndrome | Condition | SNOMED | YES | NO | NO |
| 4102202 | Cerebral venous sinus thrombosis | Condition | SNOMED | YES | NO | NO |
| 4062269 | Cerebral venous thrombosis in pregnancy | Condition | SNOMED | YES | YES | NO |
| 4046443 | Cerebral venous thrombosis of cortical vein | Condition | SNOMED | YES | NO | NO |
| 4048787 | Cerebral venous thrombosis of great cerebral vein | Condition | SNOMED | YES | NO | NO |
| 4223544 | Cerebral venous thrombosis of pregnancy AND/OR puerperium | Condition | SNOMED | YES | NO | NO |
| 4048786 | Cerebral venous thrombosis of sigmoid sinus | Condition | SNOMED | YES | NO | NO |
| 4043735 | Cerebral venous thrombosis of straight sinus | Condition | SNOMED | YES | NO | NO |
| 44782755 | Chronic deep venous thrombosis of internal jugular vein | Condition | SNOMED | YES | NO | NO |
| 44782741 | Chronic deep venous thrombosis of upper extremity | Condition | SNOMED | YES | NO | NO |
| 44782765 | Chronic deep venous thrombosis of upper extremity as complication of procedure | Condition | SNOMED | YES | NO | NO |
| 44782759 | Chronic thrombosis of subclavian vein | Condition | SNOMED | YES | NO | NO |
| 44782754 | Chronic thrombosis of superficial vein of upper extremity | Condition | SNOMED | YES | NO | NO |
| 4028057 | Deep venous thrombosis of upper extremity | Condition | SNOMED | YES | NO | NO |
| 193512 | Embolism and thrombosis of the renal vein | Condition | SNOMED | YES | NO | NO |
| 4240832 | Failed attempted termination of pregnancy with pulmonary embolism | Condition | SNOMED | YES | NO | NO |
| 4194609 | Intracranial thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 4179912 | Intracranial venous thrombosis | Condition | SNOMED | YES | NO | NO |
| 45765438 | Neonatal noninfectious cerebral venous sinus thrombosis | Condition | SNOMED | YES | NO | NO |
| 36717594 | Neonatal thrombosis of cerebral venous sinus | Condition | SNOMED | YES | NO | NO |
| 4111713 | Non-pyogenic venous sinus thrombosis | Condition | SNOMED | YES | NO | NO |
| 314667 | Nonpyogenic thrombosis of intracranial venous sinus | Condition | SNOMED | YES | NO | NO |
| 442055 | Obstetric air pulmonary embolism | Condition | SNOMED | YES | YES | NO |
| 433832 | Obstetric blood-clot pulmonary embolism | Condition | SNOMED | YES | YES | NO |
| 4061473 | Obstetric cerebral venous thrombosis | Condition | SNOMED | YES | YES | NO |
| 435026 | Obstetric pulmonary embolism | Condition | SNOMED | YES | YES | NO |
| 440477 | Obstetric pyemic and septic pulmonary embolism | Condition | SNOMED | YES | YES | NO |
| 4338761 | Orbital thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 318137 | Phlebitis and thrombophlebitis of intracranial sinuses | Condition | SNOMED | YES | YES | NO |
| 4089917 | Phlegmasia alba dolens - obstetric | Condition | SNOMED | YES | YES | NO |
| 4092406 | Portal thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 199837 | Portal vein thrombosis | Condition | SNOMED | YES | YES | NO |
| 438820 | Postpartum deep phlebothrombosis | Condition | SNOMED | YES | YES | NO |
| 4285751 | Postpartum pelvic thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 4222152 | Postpartum thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 4009180 | Postpartum venous thrombosis | Condition | SNOMED | YES | NO | NO |
| 4091708 | Pulmonary air embolism | Condition | SNOMED | YES | NO | NO |
| 440417 | Pulmonary embolism | Condition | SNOMED | NO | YES | NO |
| 4119608 | Pulmonary fat embolism | Condition | SNOMED | YES | NO | NO |
| 254662 | Pulmonary infarction | Condition | SNOMED | NO | YES | NO |
| 45766471 | Pulmonary oil microembolism | Condition | SNOMED | YES | NO | NO |
| 4119610 | Pulmonary tumor embolism | Condition | SNOMED | YES | NO | NO |
| 4235812 | Septic thrombophlebitis | Condition | SNOMED | YES | YES | NO |
| 4119609 | Subacute pulmonary fat embolism | Condition | SNOMED | YES | NO | NO |
| 4218759 | Superficial migratory thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 4085025 | Superficial thrombophlebitis | Condition | SNOMED | YES | NO | NO |
| 192981 | Superficial thrombophlebitis complicating pregnancy AND/OR puerperium | Condition | SNOMED | YES | NO | NO |
| 4119758 | Superficial thrombophlebitis of basilic vein | Condition | SNOMED | YES | NO | NO |
| 4124855 | Superficial thrombophlebitis of cephalic vein | Condition | SNOMED | YES | NO | NO |
| 4077218 | Superficial vein thrombosis | Condition | SNOMED | YES | NO | NO |
| 4100225 | Thrombophlebitis lateral venous sinus | Condition | SNOMED | YES | NO | NO |
| 4230403 | Thrombophlebitis of axillary vein | Condition | SNOMED | YES | NO | NO |
| 4217471 | Thrombophlebitis of basilar sinus | Condition | SNOMED | YES | NO | NO |
| 4289731 | Thrombophlebitis of breast | Condition | SNOMED | YES | NO | NO |
| 4319332 | Thrombophlebitis of cerebral vein | Condition | SNOMED | YES | NO | NO |
| 4167985 | Thrombophlebitis of inferior sagittal sinus | Condition | SNOMED | YES | NO | NO |
| 4135330 | Thrombophlebitis of intracranial venous sinus | Condition | SNOMED | YES | NO | NO |
| 4205652 | Thrombophlebitis of subclavian vein | Condition | SNOMED | YES | NO | NO |
| 36713011 | Thrombophlebitis of superficial vein of left lower limb | Condition | SNOMED | YES | NO | NO |
| 36713003 | Thrombophlebitis of superficial vein of left upper limb | Condition | SNOMED | YES | NO | NO |
| 37108993 | Thrombophlebitis of superficial vein of right lower limb | Condition | SNOMED | YES | NO | NO |
| 36713002 | Thrombophlebitis of superficial vein of right upper limb | Condition | SNOMED | YES | NO | NO |
| 444055 | Thrombophlebitis of superficial veins of lower extremity | Condition | SNOMED | YES | NO | NO |
| 42710054 | Thrombophlebitis of superficial veins of lower leg | Condition | SNOMED | YES | NO | NO |
| 433218 | Thrombophlebitis of superficial veins of upper extremities | Condition | SNOMED | YES | NO | NO |
| 4100224 | Thrombophlebitis of superior longitudinal venous sinus | Condition | SNOMED | YES | NO | NO |
| 4098706 | Thrombophlebitis of superior sagittal sinus | Condition | SNOMED | YES | NO | NO |
| 4319459 | Thrombophlebitis of the newborn | Condition | SNOMED | YES | NO | NO |
| 4277833 | Thrombophlebitis of torcular Herophili | Condition | SNOMED | YES | NO | NO |
| 319054 | Thrombophlebitis of upper extremities | Condition | SNOMED | YES | NO | NO |
| 36713001 | Thrombophlebitis of vein of left upper limb | Condition | SNOMED | YES | NO | NO |
| 37108983 | Thrombophlebitis of vein of right upper limb | Condition | SNOMED | YES | NO | NO |
| 195294 | Thrombosed hemorrhoids | Condition | SNOMED | YES | YES | NO |
| 4238705 | Thrombosis complicating pregnancy AND/OR puerperium | Condition | SNOMED | YES | NO | NO |
| 4228209 | Thrombosis of basilar sinus | Condition | SNOMED | YES | NO | NO |
| 4234264 | Thrombosis of cavernous venous sinus | Condition | SNOMED | YES | NO | NO |
| 4319329 | Thrombosis of cerebral veins | Condition | SNOMED | YES | NO | NO |
| 44811348 | Thrombosis of external jugular vein | Condition | SNOMED | YES | NO | NO |
| 4048890 | Thrombosis of inferior sagittal sinus | Condition | SNOMED | YES | NO | NO |
| 44811347 | Thrombosis of internal jugular vein | Condition | SNOMED | YES | NO | NO |
| 4273550 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Condition | SNOMED | YES | NO | NO |
| 4057329 | Thrombosis of lateral venous sinus | Condition | SNOMED | YES | NO | NO |
| 4049318 | Thrombosis of renal vein | Condition | SNOMED | YES | NO | NO |
| 4187790 | Thrombosis of retinal vein | Condition | SNOMED | YES | YES | NO |
| 4203836 | Thrombosis of subclavian vein | Condition | SNOMED | YES | NO | NO |
| 4323778 | Thrombosis of superficial vein of lower limb | Condition | SNOMED | YES | NO | NO |
| 4102203 | Thrombosis of superior longitudinal sinus | Condition | SNOMED | YES | NO | NO |
| 4084941 | Thrombosis of superior vena cava | Condition | SNOMED | YES | NO | NO |
| 4079905 | Thrombosis of torcular Herophili | Condition | SNOMED | YES | NO | NO |
| 4120114 | Thrombosis of transplanted vein | Condition | SNOMED | YES | NO | NO |
| 4105338 | Thrombosis transverse sinus | Condition | SNOMED | YES | NO | NO |
| 4317989 | Tolosa-Hunt syndrome | Condition | SNOMED | YES | NO | NO |
| 4124858 | Transplant renal vein thrombosis | Condition | SNOMED | YES | NO | NO |
| 4153353 | Traumatic thrombosis of axillary vein | Condition | SNOMED | YES | NO | NO |
| 444247 | Venous thrombosis | Condition | SNOMED | NO | YES | NO |
| 44782425 | Venous thrombosis due to central venous access device | Condition | SNOMED | YES | NO | NO |

### Post-operative infection events

[OD4] Post operative infection events

Initial Event Cohort

People having any of the following: 

* a condition occurrence of [Oxford studyathon] Post operative infection new (Danielle)1

with continuous observation of at least 0 days prior and 0 days after event index date, and limit initial events to: **all events per person.**

Limit qualifying cohort to: **all events per person.**

End Date Strategy

Date Offset Exit Criteria

This cohort defintion end date will be the index event's start date plus 1 days

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 60 days.

Appendix 1: Concept Set Definitions

1. [Oxford studyathon] Post operative infection new (Danielle)

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4102125 | Episiotomy infection | Condition | SNOMED | YES | NO | NO |
| 4173778 | Infected percutaneous endoscopic gastrostomy site | Condition | SNOMED | YES | NO | NO |
| 4084292 | Infected wire | Condition | SNOMED | YES | NO | NO |
| 440276 | Infection AND/OR inflammatory reaction due to internal prosthetic device, implant AND/OR graft | Condition | SNOMED | NO | NO | NO |
| 4224925 | Infection and fibrosis of spermatic cord remnant | Condition | SNOMED | YES | NO | NO |
| 4020602 | Infection and inflammatory reaction due to cardiac valve prosthesis | Condition | SNOMED | YES | NO | NO |
| 46270495 | Infection due to bariatric procedure | Condition | SNOMED | YES | NO | NO |
| 46270494 | Infection due to gastric band procedure | Condition | SNOMED | YES | NO | NO |
| 43020453 | Infection of cardiac graft | Condition | SNOMED | YES | NO | NO |
| 4084287 | Infection of cartilage graft | Condition | SNOMED | YES | NO | NO |
| 4085585 | Infection of cesarean section AND/OR perineal wound | Condition | SNOMED | YES | NO | NO |
| 4340124 | Infection of esophageal antireflux device | Condition | SNOMED | YES | NO | NO |
| 4150539 | Infection of internal Kirschner wire fixator | Condition | SNOMED | YES | NO | NO |
| 4084286 | Infection of muscle graft | Condition | SNOMED | YES | NO | NO |
| 4062133 | Infection of obstetric surgical wound | Condition | SNOMED | YES | NO | NO |
| 40480129 | Infection of pierced pinna | Condition | SNOMED | YES | NO | NO |
| 4343460 | Infection of skin donor site | Condition | SNOMED | YES | NO | NO |
| 4105101 | Infection of tendon graft | Condition | SNOMED | YES | NO | NO |
| 4083355 | Infection of tendon repair | Condition | SNOMED | YES | NO | NO |
| 4334028 | Infection of total ankle joint prosthesis | Condition | SNOMED | YES | NO | NO |
| 40483734 | Infection of total hip joint prosthesis | Condition | SNOMED | YES | NO | NO |
| 40479196 | Infection of total shoulder joint prosthesis | Condition | SNOMED | YES | NO | NO |
| 4334027 | Infection of ventriculoperitoneal shunt | Condition | SNOMED | YES | NO | NO |
| 4223206 | Penile prosthesis infection | Condition | SNOMED | YES | NO | NO |
| 44783580 | Peri-implant mucositis | Condition | SNOMED | YES | NO | NO |
| 4259505 | Postoperative endophthalmitis due to Propionibacterium acnes | Condition | SNOMED | YES | NO | NO |
| 437474 | Postoperative infection | Condition | SNOMED | NO | YES | NO |
| 44784295 | Postoperative infection of thyroidectomy wound | Condition | SNOMED | YES | NO | NO |
| 4253622 | Postoperative infectious endophthalmitis | Condition | SNOMED | YES | NO | NO |
| 4059737 | Postoperative urinary tract infection | Condition | SNOMED | YES | NO | NO |
| 4173660 | Prosthetic infection | Condition | SNOMED | NO | YES | NO |
| 4121469 | Prosthetic valve endocarditis | Condition | SNOMED | YES | NO | NO |
| 4127721 | Testicular prosthesis infection | Condition | SNOMED | YES | NO | NO |
| 4094909 | Tracheostomy sepsis | Condition | SNOMED | YES | NO | NO |

### Mortality

[OD4] Mortality

Initial Event Cohort

People having any of the following: 

* a death occurrence from Any Death

with continuous observation of at least 0 days prior and 0 days after event index date, and limit initial events to: **earliest event per person.**

Limit qualifying cohort to: **earliest event per person.**

End Date Strategy

No end date strategy selected. By default, the cohort end date will be the end of the observation period that contains the index event.

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 0 days.

Appendix 1: Concept Set Definitions

### Readmission after knee arthroplasty

[OD4] Readmission after knee arthroplasty

Initial Event Cohort

People having any of the following: 

* a visit occurrence of Inpatient or ER visit1

with continuous observation of at least 0 days prior and 0 days after event index date, and limit initial events to: **all events per person.**

For people matching the Primary Events, include:

Having any of the following criteria:

* at least 1 occurrences of a procedure of [Oxford studyathon] Total knee arthroplasty2

where event starts between all days Before and 1 days Before index start date

* or at least 1 occurrences of a procedure of [Oxford studyathon] Unicompartmental knee arthroplasty3

where event starts between all days Before and 1 days Before index start date

Limit cohort of initial events to: **earliest event per person.**

Limit qualifying cohort to: **earliest event per person.**

End Date Strategy

Date Offset Exit Criteria

This cohort defintion end date will be the index event's end date plus 0 days

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 0 days.

Appendix 1: Concept Set Definitions

1. Inpatient or ER visit

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 262 | Emergency Room and Inpatient Visit | Visit | Visit | NO | YES | NO |
| 9201 | Inpatient Visit | Visit | Visit | NO | YES | NO |

2. [Oxford studyathon] Total knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 2105103 | Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty) | Procedure | CPT4 | NO | YES | NO |
| 2105102 | Arthroplasty, knee, condyle and plateau; medial OR lateral compartment | Procedure | CPT4 | NO | YES | NO |
| 2105086 | Arthroplasty, patella; with prosthesis | Procedure | CPT4 | NO | YES | NO |
| 4079651 | Cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 44514804 | Conversion to total prosthetic replacement of knee joint not using cement | Procedure | OPCS4 | YES | YES | NO |
| 44514797 | Conversion to total prosthetic replacement of knee joint using cement | Procedure | OPCS4 | YES | YES | NO |
| 4079268 | Conversion to uncemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4076873 | Hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079394 | Primary cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079655 | Primary hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076191 | Primary uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4034299 | Prosthetic unicompartmental arthroplasty of the knee | Procedure | SNOMED | NO | YES | NO |
| 2005904 | Total knee replacement | Procedure | ICD9Proc | NO | YES | NO |
| 43531648 | Total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079653 | Uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |

3. [Oxford studyathon] Unicompartmental knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4274954 | Arthroplasty of patella | Procedure | SNOMED | NO | YES | NO |
| 2105102 | Arthroplasty, knee, condyle and plateau; medial OR lateral compartment | Procedure | CPT4 | NO | YES | NO |
| 45889826 | Arthroplasty, patella | Procedure | CPT4 | NO | YES | NO |
| 4079652 | Conversion to cemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079395 | Conversion to hybrid unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079654 | Conversion to uncemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4034299 | Prosthetic unicompartmental arthroplasty of the knee | Procedure | SNOMED | NO | YES | NO |

### Persons with knee arthroplasty revision

[OD4] Persons with knee arthroplasty revision

Initial Event Cohort

People having any of the following: 

* a procedure of [outcome team] knee revision 1

with continuous observation of at least 0 days prior and 0 days after event index date, and limit initial events to: **all events per person.**

Limit qualifying cohort to: **all events per person.**

End Date Strategy

No end date strategy selected. By default, the cohort end date will be the end of the observation period that contains the index event.

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 1 days.

Appendix 1: Concept Set Definitions

1. [outcome team] knee revision

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 42538472 | Attention to hybrid total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 42538473 | Attention to total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4138871 | Conversion from cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076600 | Conversion from cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4138873 | Conversion from uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 45495901 | Conversion to hybrid total knee replacement NEC | Procedure | Read | NO | YES | NO |
| 4079528 | Revision cemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076190 | Revision cemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076874 | Revision hybrid unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 42872821 | Revision of hybrid total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4090451 | Revision of knee arthroplasty | Procedure | SNOMED | NO | YES | NO |
| 4076750 | Revision of resurfacing arthroplasty | Procedure | SNOMED | NO | YES | NO |
| 45890559 | Revision of total knee arthroplasty, with or without allograft | Procedure | CPT4 | NO | YES | NO |
| 4076590 | Revision uncemented total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 4076872 | Revision uncemented unicompartmental knee replacement | Procedure | SNOMED | NO | YES | NO |
| 2005905 | Revision of knee replacement, not otherwise specified | Procedure | ICD9Proc | NO | YES | NO |
| 43018821 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Femoral Surface, Left | Procedure | ICD10PCS | NO | YES | NO |
| 43019580 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Femoral Surface, Right | Procedure | ICD10PCS | NO | YES | NO |
| 2884349 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Left | Procedure | ICD10PCS | NO | YES | NO |
| 2886872 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Right | Procedure | ICD10PCS | NO | YES | NO |
| 43019648 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Tibial Surface, Left | Procedure | ICD10PCS | NO | YES | NO |
| 43020030 | Medical and Surgical @ Lower Joints @ Revision @ Knee Joint, Tibial Surface, Right | Procedure | ICD10PCS | NO | YES | NO |

### Opioid use after arthroplasty

[OD4] Opioid use after arthroplasty

Initial Event Cohort

People having any of the following: 

* a drug exposure of [Oxford Day 2] opioids2

with continuous observation of at least 0 days prior and 0 days after event index date, and limit initial events to: **all events per person.**

For people matching the Primary Events, include:

Having all of the following criteria:

* at least 1 occurrences of a procedure of [Oxford day 2] all knee arthroplasty1

where event starts between all days Before and 90 days Before index start date

Limit cohort of initial events to: **all events per person.**

Limit qualifying cohort to: **all events per person.**

End Date Strategy

Date Offset Exit Criteria

This cohort defintion end date will be the index event's start date plus 1 days

Cohort Collapse Strategy:

Collapse cohort by era with a gap size of 0 days.

Appendix 1: Concept Set Definitions

1. [Oxford day 2] all knee arthroplasty

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 4274954 | Arthroplasty of patella | Procedure | SNOMED | NO | YES | NO |
| 2105103 | Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty) | Procedure | CPT4 | NO | YES | NO |
| 2105102 | Arthroplasty, knee, condyle and plateau; medial OR lateral compartment | Procedure | CPT4 | NO | YES | NO |
| 45889826 | Arthroplasty, patella | Procedure | CPT4 | NO | YES | NO |
| 4079527 | Conversion to cemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079652 | Conversion to cemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079395 | Conversion to hybrid unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 44514804 | Conversion to total prosthetic replacement of knee joint not using cement | Procedure | OPCS4 | YES | YES | NO |
| 44514797 | Conversion to total prosthetic replacement of knee joint using cement | Procedure | OPCS4 | YES | YES | NO |
| 4079268 | Conversion to uncemented total knee replacement | Procedure | SNOMED | YES | YES | NO |
| 4079654 | Conversion to uncemented unicompartmental knee replacement | Procedure | SNOMED | YES | YES | NO |
| 43019637 | Medical and Surgical @ Lower Joints @ Replacement @ Knee Joint, Left @ Open @ Synthetic Substitute, Unicondylar | Procedure | ICD10PCS | NO | NO | NO |
| 43018700 | Medical and Surgical @ Lower Joints @ Replacement @ Knee Joint, Right @ Open @ Synthetic Substitute, Unicondylar | Procedure | ICD10PCS | NO | NO | NO |
| 4034299 | Prosthetic unicompartmental arthroplasty of the knee | Procedure | SNOMED | NO | YES | NO |
| 42897909 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Cemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897911 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897910 | Replacement of Left Knee Joint with Unicondylar Synthetic Substitute, Uncemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897906 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Cemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897908 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 42897907 | Replacement of Right Knee Joint with Unicondylar Synthetic Substitute, Uncemented, Open Approach | Procedure | ICD10PCS | NO | NO | NO |
| 43531648 | Total knee replacement | Procedure | SNOMED | NO | YES | NO |
| 2005904 | Total knee replacement | Procedure | ICD9Proc | NO | YES | NO |

2. [Oxford Day 2] opioids

| **Concept Id** | **Concept Name** | **Domain** | **Vocabulary** | **Excluded** | **Descendants** | **Mapped** |
| --- | --- | --- | --- | --- | --- | --- |
| 19022417 | Heroin | Drug | RxNorm | YES | YES | NO |
| 1174888 | Hydrocodone | Drug | RxNorm | NO | YES | NO |
| 21604254 | OPIOIDS | Drug | ATC | NO | YES | NO |

### Negative control outcomes

Negative controls are concepts known to not be associated with the target or comparator cohorts, such that we can assume the true relative risk between the two cohorts is 1. Once potential negative control candidates were selected, manual clinical review to exclude any pairs that may still be in a causal relationship or similar to the study outcome was be performed to select the top concepts by patient exposure. The final list can be found in Table 3.

|  |  |
| --- | --- |
| Acquired hallux malleus | Hyperlipidemia |
| Acquired hallux valgus | Hypermetropia |
| Acquired trigger finger | Hypothyroidism |
| Allergic rhinitis | Impacted cerumen |
| Astigmatism | Kidney stone |
| Benign neoplasm of colon | Menopausal syndrome |
| Breast lump | Nicotine dependence |
| Carpal tunnel syndrome | Otitis media |
| Cataract | Presbyopia |
| Chronic obstructive lung disease | Rosacea |
| Diaphragmatic hernia | Sleep apnea |
| Disorder of brain | Tear film insufficiency |
| Disorder of breast | Tinnitus |
| Disorder of lung | Type 2 diabetes mellitus |
| Diverticular disease of colon | Uncomplicated asthma |
| Essential hypertension | Urinary incontinence |
| Gastro-esophageal reflux disease with esophagitis | Vitamin B deficiency |
| Gastroesophageal reflux disease | Vitamin D deficiency |
| Glaucoma | Wrist joint pain |
| Hand pain |  |

**Table 3**. Negative control outcomes

For each negative control outcome, a patient enters the negative control outcome cohort at the occurrence of a diagnosis code identified by the concepts listed above, or any one of its descendant codes.

### Positive control outcomes

In addition to negative control outcomes, we will also include synthetic positive control outcomes. These are outcomes based on the real negative controls, but where the true effect size is artificially increased to a desired effect size by injection of additional, simulated outcomes [[7](#_ENREF_7)]. To preserve confounding, these additional outcomes are sampled from predicted probabilities generated using a fitted predictive model. For each negative control outcome, three positive control outcomes will be generated with true relative risk is 1.5, 2, and 4. Using both negative and positive controls, we will fit a systematic error model and perform confidence interval calibration [[7](#_ENREF_7)].

## Covariates

### Propensity score covariates

Propensity scores (PS) will be used as an analytic strategy to reduce potential confounding due to imbalance between the target and comparator cohorts in baseline covariates. The propensity score is the probability of a patient being classified in the target cohort vs. the comparator cohort, given a set of observed covariates.

Tens of thousands of baseline covariates will be included in the propensity score model representing demographics (sex, age, index month and year), all conditions and drug dispensings observed in the 30, 365, 1095 days, and any time prior to index, all procedures in the 365 days and any time prior to index, visit counts in the 365 and 1095 days prior to index, and the CHADS2, CHA2DS2VASc, DCSI, and Charlson indices. A large-scale regularized logistic regression will be fit with a LaPlace prior (LASSO) with the optimal hyperparameter determined through 10-fold cross validation[9], a method with demonstrated superior covariate balancing properties than other popular methods for high-dimensional data[10].

# Data Analysis Plan

## Calculation of time-at risk

Time-at-risk periods will be specified dependent on the outcome. The primary time-at-risk for VTE, POI, readmission, and mortality is defined as the duration of time from the index date (day 0, inclusive) to 60 days after the index date. Two sensitivity time-at-risk variants are defined as index date to 1 year after index date and index date to 5 years after index date. For knee arthroplasty revision, the primary time-at-risk is defined as index date to 5 years after index date and the sensitivity time-at-risk was defined as index date to 1 year after index date. The opioid exposure outcome is assessed during a primary time-at-risk period from 91 days after index to 1 year after index. The 90-day washout period is intended to exclude prescriptions which may be a routine consequence of surgery. The sensitivity time-at-risk period is from 91 days after index to 5 years after index.

## Model Specification

In this study, we compare the target cohort with the comparator cohort for the hazards of outcome during the time-at-risk by applying a Cox proportional hazards model.

The time-to-event of outcome among patients in the target and comparator cohorts is determined by calculating the number of days from the start of the time-at-risk window (the cohort start date), until the earliest event among 1) the first occurrence of the outcome, 2) the end of the time-at-risk window as defined in section 9.1, and 3) the end of the observation period that spans the time-at-risk start.

Patients with the outcome observed prior to target or comparator cohort entry are not excluded from consideration.

Propensity scores will be used as an analytic strategy to reduce potential confounding due to imbalance between the target and comparator cohorts in baseline covariates. The propensity score is the probability of a patient being classified in the target cohort vs. the comparator cohort, given a set of observed covariates. In this study, the propensity score is estimated for each patient, using the predicted probability from a regularized logistic regression model, fit with a Laplace prior (LASSO) and the regularization hyperparameter selected by optimizing the likelihood in a 10-fold cross, a starting variance of 0.01 and a tolerance of 2e-7. Covariates to be used in the propensity score model are listed in section 8.6.

Patients are matched on the propensity score by two methods. The primary approach is variable-ratio matching which assigned UKA to TKA patients in a maximum ratio of 10:1 using 0.2 caliper on the standardized logit scale of the propensity score. The sensitivity approach is 1:1 ratio matching using the same caliper and scale. A final propensity score adjustment sensitivity analysis is to trim the upper and lower extremes of the propensity score distribution overlap by 5%.

### Pooling effect estimates across databases

Effects will be pooled across databases using a random-effects meta-analysis if there is sufficient homogeneity across populations (I2 < 40%). Estimates for negative and positive controls will be pooled before performing empirical calibration on the pooled estimates.

## Analyses to perform

### Comparative analyses

The two pairwise comparisons for estimating effects on 6 outcomes using primary and multiple sensitivity analyses defined by multiple time-at-risk definitions and propensity score matching and trimming approaches are summarized in Table 1. This study reported 56 effect estimates in total.

**Table 1. Tabulation of all study analytic variants**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Target cohort** | **Comparator cohort** | **Outcome(s)** | **Analysis** | **Time-at-risk** | **PS matching** | **Trimming** | **Estimates** |
| UKA | TKA | VTE, post-operative infection, readmission, mortality | Primary | 60 days | 10:1 variable | None | 4 |
| Sensitivity | 1 year | 10:1 variable | None | 4 |
| 5 years | 10:1 variable | None | 4 |
| 60 days | 10:1 variable | 5% | 4 |
| 60 days | 1:1 | None | 4 |
| Knee arthroplasty revision | Primary | 5 years | 10:1 variable | None | 1 |
| Sensitivity | 1 year | 10:1 variable | None | 1 |
| 5 years | 10:1 variable | 5% | 1 |
| 5 years | 1:1 | None | 1 |
| Opioid prescriptions | Primary | 91 days to 1 year | 10:1 variable | None | 1 |
| Sensitivity | 91 days to 5 years | 10:1 variable | None | 1 |
| 91 days to 1 year | 10:1 variable | 5% | 1 |
| 91 days to 1 year | 1:1 | None | 1 |
| UKA without prior spine-hip-foot pathology restriction | TKA without prior spine-hip-foot pathology restriction | VTE, post-operative infection, readmission, mortality | Primary | 60 days | 10:1 variable | None | 4 |
| Sensitivity | 1 year | 10:1 variable | None | 4 |
| 5 years | 10:1 variable | None | 4 |
| 60 days | 10:1 variable | 5% | 4 |
| 60 days | 1:1 | None | 4 |
| Knee arthroplasty revision | Primary | 5 years | 10:1 variable | None | 1 |
| Sensitivity | 1 year | 10:1 variable | None | 1 |
| 5 years | 10:1 variable | 5% | 1 |
| 5 years | 1:1 | None | 1 |
| Opioid prescriptions | Primary | 91 days to 1 year | 10:1 variable | None | 1 |
| Sensitivity | 91 days to 5 years | 10:1 variable | None | 1 |
| 91 days to 1 year | 10:1 variable | 5% | 1 |
| 91 days to 1 year | 1:1 | None | 1 |

UKA: unicompartmental knee arthroplasty; TKA: total knee arthroplasty; VTE: venous thromboembolism

## Output

For each analysis, we will produce 1) covariate summary before and after propensity score adjustment, 2) propensity score distribution, 3) covariate balance summary, 4) estimation for negative and positive controls, to assess residual error, 5) summary of outcome incidence, 6) hazard ratio estimates – pre- and post-calibration, and 7) Kaplan-Meier plot.

## Evidence Evaluation

We have executed diagnostics to determine if the analysis can be appropriately conducted. The diagnostics include:

* Propensity score distribution
* Covariate balance before and after propensity score matching
* Estimation for negative and positive controls, to assess residual error
* Negative and positive control exposures and outcomes will be used to evaluate the potential impact of residual systematic error in the study design, and to facilitate empirical calibration of the p-value and confidence interval for the exposures and outcome of interest.

Negative control outcomes in the context of this study are outcomes that are not believed to be caused by neither exposure in any comparison and where therefore the true hazard ratio is equal to 1. We will execute the same analysis used for the primary hypotheses to produce hazard ratio estimates for the negative controls. The distribution of effect estimates across all negative controls will be used to fit an empirical null distribution which models the observed residual systematic error. The empirical null distribution will then be applied to the target exposures and outcome of interest to calibrate the p-value [[11](#_ENREF_8)].

Positive control exposures and outcomes are pairs of exposures and outcomes where the hazard ratio is known to be of some magnitude greater than 1. We will synthesize positive controls by starting with the negative controls defined earlier, and adding additional, simulated outcomes during the time-at-risk until the desired true hazard ratio is achieved. The target hazard ratios are 1.5, 2 and 4. The negative and positive controls together will be used to estimate an empirical systematic error model, which will inform whether systematic error changes as a function of true effect size. The empirical systematic error model will then be applied to the target the target exposures and outcome of interest to calibrate the confidence interval [[12](#_ENREF_7)].

Empirical calibration serves as an important diagnostic tool to evaluate if the residual systematic error is sufficient to cast doubt on the accuracy of the unknown effect estimate. The calibration effect plot and calibration probability plots will be generated for review. We will report the traditional and empirically calibrated p-value and confidence interval for each negative control, as well as the hypothesis of interest.

# Study Diagnostics

## Sample Size and Study Power

Mortality can only be studied in Optum DoD. CCAE and MDCR have insufficient death capture to be used. Sample size and power are reported in the OHDSI Shiny application (<http://data.ohdsi.org>).

## Cohort Comparability

Optum, CCAE, and MDCR all achieved sufficient comparability, as seen in the propensity score distributions on the OHDSI Shiny application (<http://data.ohdsi.org>).

## Systematic Error Assessment

MDCD failed study diagnostics and will not be used for final analyses. Baseline covariates could not be made sufficient balanced, and unbalanced covariates were determined to be likely confounders important to the analysis.

# Strengths and Limitations of the Research Methods

Strength

* Cohort studies allow direct estimation of incidence rates following exposure of interest, and the new-user design can capture early events following treatment exposures while avoiding confounding from previous treatment effects. New use allows for a clear exposure index date.
* PS matching allow balancing on a large number of baseline potential confounders.
* Use of negative and positive control outcomes allow for evaluating the study design as a whole in terms of residual bias.

Limitations

* Even though many potential confounders will be included in this study, there may be residual bias due to unmeasured or misspecified confounders.

# Protection of Human Subjects

The study is using only de-identified data. Confidentiality of patient records will be maintained at all times. All study reports will contain aggregate data only and will not identify individual patients or physicians.

# Management and Reporting of Adverse Events and Adverse Reactions

This study uses coded data that already exist in an electronic database. In this type of database, it is not possible to link (i.e., identify a potential causal association between) a particular product and medical event for any individual. Thus, the minimum criteria for reporting an adverse event (i.e., identifiable patient, identifiable reporter, a suspect product, and event) are not available and adverse events are not reportable as individual adverse events reports. The study results will be assessed for medically important results.

# Plans for Disseminating and Communicating Study Results

The study results will be posted on the OHDSI website after completion of the study. At least one paper describing the study and its results will be written and submitted for publication to a peer-reviewed scientific journal.

# References

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