

TABLE E-1 ICD-9-CM Codes for Procedures, Preoperative Diagnoses, and Complications

Procedure	
Total hip replacement	
81.51	Total hip replacement
0.74-6	Hip replacement (bearing surface specific)
Total knee replacement	
81.54	Total knee replacement
Hip resurfacing	
0.85-7	Resurfacing hip (femoral head, acetabulum, or both)
Hip hemiarthroplasty	
81.52	Partial hip replacement
Revision hip replacement	
0.70-3	Revision of hip replacement (femoral component, acetabular component, both)
80.05	Arthrotomy for removal of prosthesis without replacement, hip
81.53	Revision of hip replacement, not otherwise specified
Revision knee replacement	
0.80-4	Revision of knee replacement (all components, tibial component, femoral component, patellar component)
80.06	Arthrotomy for removal of prosthesis without replacement, knee
81.55	Revision of knee replacement, not otherwise specified
81.59	Revision of joint replacement of lower extremity, not elsewhere classified
Exclusion from primary total joint cohort	
Revision hip replacement	
0.70-3	Revision of hip replacement (femoral component, acetabular component, both)
80.05	Arthrotomy for removal of prosthesis without replacement, hip
81.53	Revision of hip replacement, not otherwise specified
Revision knee replacement	
0.80-4	Revision of knee replacement (all components, tibial component, femoral component, patellar component)
80.06	Arthrotomy for removal of prosthesis without replacement, knee
81.55	Revision of knee replacement, not otherwise specified
81.59	Revision of joint replacement of lower extremity, not elsewhere classified
Long-term mechanical loosening/wear associated with revision	
996.40-1	Unspecified mechanical complication of internal orthopaedic device, implant, and graft, mechanical loosening of prosthetic joint
996.43-49	Broken prosthetic joint implant, peri-prosthetic fracture, peri-prosthetic osteolysis, bearing surface wear, other mechanical complication
996.77	Other complications due to internal joint prosthesis
Hip or knee fracture	
733.1*	Pathologic fracture
733.8*	Malunion and nonunion of fracture
820*	Fracture of neck of femur
Additional preoperative diagnoses	
HIV/AIDS	

TABLE E-1 (continued)

Procedure	
42	Human immunodeficiency virus
V08	Asymptomatic human immunodeficiency virus
795.71	Nonspecific serologic evidence of human immunodeficiency virus
Prior arthroplasty	
V43.6-69	Prior joint replacement of lower extremity
Prior history of thromboembolism	
V12.51	History of venous thrombosis and embolism
Osteonecrosis	
733.4*	Aseptic necrosis of bone
Osteoporosis	
733.0*	Osteoporosis
Posttraumatic joint disease	
716.15-6	Traumatic arthropathy of pelvic region, thigh, lower leg
Degenerative joint disease	
715.1	Primary osteoarthritis
715.15-6	Primary osteoarthritis of pelvic region, thigh, lower leg
715.2	Secondary osteoarthritis
715.25-6	Secondary osteoarthritis of pelvic region, thigh, lower leg
715.3	Osteoarthritis not specified
715.35-6	Osteoarthritis not specified of pelvic region thigh, lower leg
715.8	Osteoarthritis involving more than one site
715.89	Osteoarthritis involving more than one site, not specified as generalized
715.9	Osteoarthritis unspecified generalized or localized
715.95-6	Osteoarthritis unspecified generalized or localized, pelvic region, thigh, lower leg
717	Internal derangement of knee
717.8*	Other internal derangement of knee
717.9	Unspecified internal derangement of knee
718	Other derangement of joint
718.05	Articular cartilage disorder of pelvic region and thigh
718.09	Articular cartilage disorder of multiple sites
718.95	Unspecified derangement of joint in pelvic region and thigh
719.4	Pain in joint
719.45-6	Pain in joint in pelvic region, thigh, lower leg
719.5	Stiffness of joint
719.55-6	Stiffness of joint of pelvic region, thigh, lower leg
719.58	Stiffness of joint, other specified sites
719.8	Other specified disorders of joint
719.85-6	Other specified disorders of joint of pelvic region, thigh, lower leg
719.9	Unspecified disorder of joint
719.95-6	Unspecified disorder of joint, pelvic region, thigh, lower leg
Previous bone or joint infection	
711	Arthropathy associated with infections
711.05-6	Pyogenic arthritis of pelvic region, thigh, lower leg
711.90	Unspecified infective arthritis
711.95-6	Unspecified infective arthritis of pelvic region, thigh, lower leg
730	Osteomyelitis, periostitis and other infections involving bone

TABLE E-1 (continued)

Procedure	
730.95-6	Unspecified infection of bone of pelvic region, thigh, lower leg
Postoperative complications	
Acute renal failure	
584.5-9	Acute kidney failure
Arrhythmia	
427	Paroxysmal supraventricular tachycardia
Bleeding	
719.15	Hemarthrosis, pelvic region and thigh
998.11-3	Hemorrhage, hematoma, or seroma complicating a procedure
Wound complication	
998.3	Postoperative wound disruption
998.31-2	Disruption of internal or external operation (surgical) wound
Deep venous thrombosis	
453.4	Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity
453.41-2	Acute venous embolism and thrombosis of deep vessels of proximal and distal lower extremity
453.9	Other venous embolism and thrombosis of unspecified site
Wound infection	
682.6	Cellulitis and abscess of the leg
686.9	Unspecified local infection of skin and tissue
891	Open wound of the knee leg (except thigh) and ankle
891.1-2	Open wound of the knee leg (except thigh) and ankle, complicated or with tendon involvement
894	Multiple and unspecified open wound of the lower limb
894.1-2	Multiple and unspecified open wound of the lower limb complicated or with tendon involvement
998.5	Postoperative infection not elsewhere classified
998.51	Infected postoperative seroma
998.6	Persistent postoperative fistula not otherwise classified
998.83	Nonhealing surgical wound
998.59	Other postoperative infection
Myocardial infarction	
410	Acute myocardial infarction of anterolateral wall, episode of care unspecified
410.01	Acute myocardial infarction of anterolateral wall, initial episode of care
410.11	Acute myocardial infarction of other anterior wall, initial episode of care
410.2	Acute myocardial infarction of inferolateral wall, episode of care unspecified
410.21	Acute myocardial infarction of inferolateral wall, initial episode of care
410.3	Acute myocardial infarction of inferoposterior wall, episode of care unspecified
410.31	Acute myocardial infarction of inferoposterior wall, initial episode of care

TABLE E-1 (continued)

Procedure	
410.4	Acute myocardial infarction of other inferior wall, episode of care unspecified
410.41	Acute myocardial infarction of other inferior wall, initial episode of care
410.5	Acute myocardial infarction of other lateral wall, episode of care unspecified
410.51	Acute myocardial infarction of other lateral wall, initial episode of care
410.6	True posterior wall infarction, episode of care unspecified
410.9	Acute myocardial infarction of unspecified site, episode of care unspecified
410.91	Acute myocardial infarction of unspecified site, initial episode of care
997.1	Cardiac complications, not elsewhere classified
Pneumonia	
480-480.9	Viral pneumonia
481	Pneumococcal pneumonia [<i>Streptococcus pneumoniae pneumonia</i>]
482-482.9	Bacterial pneumonia
483	Pneumonia due to other specified organism
483	Pneumonia due to <i>Mycoplasma pneumoniae</i>
483.1	Pneumonia due to Chlamydia
483.8	Pneumonia due to other specified organism
484	Pneumonia in infectious disease classified elsewhere
484.1	Pneumonia in cytomegalic inclusion disease
484.3	Pneumonia in whooping cough
484.5-8	Pneumonia in anthrax, aspergillosis, other systemic mycoses, or infectious disease not classified elsewhere
485	Bronchopneumonia, organism unspecified
486	Pneumonia, organism unspecified
487	Influenza with pneumonia
507	Pneumonitis due to inhalation of food or vomitus
Pulmonary embolism	
415.11	Iatrogenic pulmonary embolism and infarction
415.19	Other pulmonary embolism and infarction
Sepsis	
995.91-2	Sepsis, severe sepsis
Stroke	
997.02	Iatrogenic cerebrovascular infarction or hemorrhage
Urinary tract infection	
599	Urinary tract infection, site not specified
997.5	Urinary complications, not elsewhere classified
Death	
798.1-2	Instantaneous death or death within 24 hours
798.9	Unattended death
Dislocation	
996.42	Dislocation of prosthetic joint

TABLE E-1 (continued)

Procedure	
Implant infection	
996.66-7	Infection and inflammatory reaction due to internal joint prosthesis or other orthopaedic device implant
996.69	Infection and inflammatory reaction due to other internal prosthetic device implant and graft
Incision and debridement (I&D)	
86.04	Other incision with drainage of skin and subcutaneous tissue
86.09	Other incision of skin and subcutaneous tissue
86.22	Excisional debridement of wound, infection, or burn
86.28	Nonexcisional debridement of wound, infection or burn
86.3	Other local excision or destruction of lesion or tissue of skin and subcutaneous tissue
*Indicates all subsequent codes starting with this number.	

TABLE E-2 Abbreviated List of Elixhauser Comorbidity Categories

Category	Diagnoses
Chronic pulmonary disease	Bronchitis (chronic or acute on chronic), emphysema, asthma, bronchiectasis, hypersensitivity pneumonitis, asbestosis, pneumoconiosis, respiratory conditions related to fumes and vapors
Chronic kidney disease	Hypertensive kidney disease with and without end stage disease, hypertensive heart and kidney disease with end stage renal disease, chronic kidney disease (moderate, severe, and end stage), post-kidney transplant, current dialysis
Coagulopathy	Congenital and acquired factor deficiencies, von Willebrand's disease, bleeding disorder from anticoagulant usage, qualitative platelet defects, thrombocytopenia, heparin-induced thrombocytopenia, pregnancy-related coagulopathy
Fluid/electrolyte imbalance	Hyperosmolality, hyposmolality, acidosis, alkalosis, mixed acid-base disorder, hypovolemia, volume depletion, hyperpotassemia, hypopotassemia, fluid overload
Heart failure	Hypertensive heart failure, hypertensive and renal disease related heart failure, systolic heart failure, diastolic heart failure, systolic and diastolic heart failure, acute on chronic heart failure
Liver disease	Chronic HBV (hepatitis B) with hepatitis delta with and without hepatic coma, chronic HCV with and without hepatic coma, cirrhosis, alcoholic cirrhosis, chronic unspecified hepatitis, post-liver transplant
Other arthritis	Chondrocalcinosis, crystalline arthropathy
Peripheral vascular disease	Atherosclerosis of the aorta, atherosclerosis of the peripheral arteries with and without claudication, atherosclerosis of the peripheral arteries with and without gangrene, dissection or rupture of the thoracic or abdominal aorta, arterial aneurysms, arterial embolism and thrombosis, arterial stricture, post-arterial bypass or grafting
Pulmonary circulatory disorder	Iatrogenic pulmonary embolism and infarction, septic pulmonary embolism, pulmonary embolism, primary pulmonary hypertension, kyphoscoliotic heart disease, pulmonary circulatory disease
Rheumatoid arthritis	Scleroderma, systemic lupus erythematosus, systemic sclerosis, dermatomyositis, polymyositis, eosinophilia myalgia, juvenile rheumatoid arthritis, postrheumatic arthropathy, unspecified inflammatory arthropathy
Valvular disease	Syphilitic valvular disease, mitral and/or aortic valve stenosis, mitral and/or aortic valve insufficiency, tricuspid valve disease, pulmonary valve disease, rheumatic valvular disease, endocarditis, post-cardiac transplant
Weight loss (abnormal weight loss/malnutrition)	Kwashiorkor, nutritional marasmus, protein-calorie malnutrition, abnormal loss of weight, underweight