

## **Appendix E-1**

Coding algorithm used to identify inclusion criteria, exclusion criteria, diagnosis, and complications.

### **Ankle Arthritis Inclusion Criteria**

81.56 (81.48 prior to 1989) Total ankle replacement

81.11 Ankle fusion

### **Study Exclusion Criteria**

Patients with the following ICD-9 procedure or diagnosis codes are excluded from case classification.

I. Conversion of previous ankle arthroplasty to total ankle arthroplasty or fusion—all patients with codes indicating previous arthroplasty or complications of previous total ankle arthroplasty are excluded. These codes include:

ICD-9 diagnosis codes: (code must be dx1)

996.4 Mechanical complication of internal orthopaedic device

996.67 Complication due to infection or inflammation of internal orthopaedic device, implant, or graft

996.66 (also 996.6 prior to 1989) Complication due to infection or inflammation of internal joint prosthesis

996.7 Complication of internal prosthetic device, implant, and graft

996.70 Complication due to unspecified device, implant, or graft

996.77 Complication due to joint prosthesis

996.78 Complication of unspecified orthopaedic internal device, implant, or graft

ICD-9 procedure codes

81.59 (81.39 prior to 1989) Revision of joint replacement of lower extremity, not classified

80.07 Arthrotomy for removal of prosthesis, ankle

II. Infection of ankle—Patients with codes for osteomyelitis, periostitis, and other infection of the bones previous to or during the index admission are excluded. The excluding codes include:

730.0, 730.06, 730.07 Acute or subacute osteomyelitis

730.1, 730.16, 730.17 Chronic osteomyelitis

711.0, 711.06, 711.07 Arthropathy associated with infections

996.60 Infection or inflammation due to unspecified device, implant, or graft

996.66 Infection or inflammation due to internal joint device or prosthesis

996.67 Infection or inflammation due to presence of unspecified orthopaedic device or implant

### **Diagnoses to be Flagged**

Degenerative disease

ICD-9 diagnoses 715, 715.0, 715.00, 715.07, 715.09, 715.1, 715.10, 715.17, 715.2, 715.20, 715.27, 715.3, 715.30, 715.37, 715.8, 715.80, 715.87, 715.89, 715.9, 715.90, 715.97.

Rheumatoid arthritis

ICD-9 diagnoses 714, 714.0.

Aseptic necrosis

ICD-9 diagnoses 733.4, 733.40, 733.44

**Outcomes: Reoperations**

81.59 Revision of joint replacement of lower extremity, not elsewhere classified  
80.07 Arthrotomy for removal of prosthesis, ankle  
81.54 (81.41 prior to 1989) Total knee replacement  
81.56 (81.48 prior to 1989) Total ankle replacement

81.11 Ankle fusion  
81.12 Triple arthrodesis  
81.13 Subtalar fusion  
81.14 Midtarsal fusion  
81.15 Tarsometatarsal fusion  
81.16 Metatarsophalangeal fusion  
81.17 Other fusion of foot

84.10 Amputation (not otherwise specified)  
84.11 Amputation of toe  
84.12 Amputation through foot  
84.13 Disarticulation of ankle  
84.14 Amputation of ankle through malleoli of tibia and fibula  
84.15 Other amputation below knee  
84.16 Disarticulation of knee  
84.17 Amputation above knee

**Outcomes: Complications****INFECTION**

730.0, 730.06, 730.07 Acute or subacute osteomyelitis  
730.1, 730.16, 730.17 Chronic osteomyelitis  
711.0, 711.06, 711.07 Arthropathy associated with infections  
996.60 (also 996.6 prior to 1989) Infection or inflammation due to unspecified device, implant, or graft  
996.66 Infection or inflammation due to internal joint device or prosthesis  
996.67 Infection or inflammation due to presence of unspecified orthopaedic device or implant  
998.59 (also 998.5 prior to 1996) Postoperative wound infection  
686.9 Postoperative wound infection

**PULMONARY EMBOLUS**

415.19 Pulmonary embolism pulmonary (artery) (vein)  
415.1, 415.11 Pulmonary embolism postoperative  
Pulmonary embolism PRIOR TO 1995 was coded as 997.3 as well as 415.1

TABLE E-2 Short-Term Complications (at 90 Days) Following Ankle Replacement and Ankle Fusion (No. of Cases)

Complication at 90 Days	Ankle Fusion (N = 4559)	Ankle Replacement (N = 470)
Pulmonary embolism	13	1
Total infection cases	116	13
Postoperative infection	81	8
Device-related infection	43	7
Infectious arthropathy	5	1
Chronic osteomyelitis	5	0
Acute osteomyelitis	16	0
Below-the-knee amputation	12	0
Major revision procedure	16	6
Ankle fusion	16	2
Removal of implant	0	2
Revision arthroplasty	0	3

TABLE E-3 Long-Term Complications Following Ankle Replacement and Ankle Fusion (No. of Cases)

Complication	Ankle Fusion	Ankle Replacement
At 1 yr		
Total no. of procedures	4191	423
Subtalar fusion	40	1
Major revision procedure	222	36
Ankle fusion	219	11
Revision arthroplasty	1	15
Removal of implant	4	10
Ankle arthroplasty	1	8
At 5 yr		
Total no. of procedures	2373	134
Subtalar fusion	67	1
Major revision procedure	269	31
Ankle fusion	265	9
Revision arthroplasty	1	16
Removal of implant	6	10
Ankle arthroplasty	1	7