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STROBE Statement—Checklist of items that should be included in reports of *cohort studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-4
Objectives	3	State specific objectives, including any prespecified hypotheses	3-4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up (b) For matched studies, give matching criteria and number of exposed and unexposed	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4-7
Bias	9	Describe any efforts to address potential sources of bias	12-13
Study size	10	Explain how the study size was arrived at	4-8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) If applicable, explain how loss to follow-up was addressed (e) Describe any sensitivity analyses	7-8
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram	8-9
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) Summarise follow-up time (eg, average and total amount)	8-9
Outcome data	15*	Report numbers of outcome events or summary measures over time	8-9
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	8-11
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12-13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	In submission files

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at <http://www.strobe-statement.org>.

Table A2: List of CPT codes analyzed

Name	Description (Detailed)	CPT	N	%
Total Knee Arthroplasty	Arthroplasty, Knee, Condyle And Plateau; Medial And Lateral Compartments With Or Without Patella Resurfacing (Total Knee Arthroplasty)	27447	39973	39.38
Total Hip Arthroplasty	Arthroplasty, Acetabular And Proximal Femoral Prosthetic Replacement (Total Hip Arthroplasty), With Or Without Autograft Or Allograft	27130	19912	19.62
Treat Thigh Fracture	Treatment Of Intertrochanteric, Peritrochanteric, Or Subtrochanteric Femoral Fracture; With Intramedullary Implant, With Or Without Interlocking Screws And/Or Cerclage	27245	2591	2.55
Treat Thigh Fracture	Open Treatment Of Femoral Fracture, Proximal End, Neck, Internal Fixation Or Prosthetic Replacement	27236	2578	2.54
Revise/Replace Knee Joint	Revision Of Total Knee Arthroplasty, With Or Without Allograft; Femoral And Entire Tibial Component	27487	2532	2.49
Reconstruct Shoulder Joint	Arthroplasty, Glenohumeral Joint; Total Shoulder (Glenoid And Proximal Humeral Replacement (Eg, Total Shoulder))	23472	2460	2.42
Partial Hip Replacement	Hemiarthroplasty, Hip, Partial (Eg, Femoral Stem Prosthesis, Bipolar Arthroplasty)	27125	1783	1.76
Revise/Replace Knee Joint	Revision Of Total Knee Arthroplasty, With Or Without Allograft; 1 Component	27486	1702	1.68
Treat Thigh Fracture	Treatment Of Intertrochanteric, Peritrochanteric, Or Subtrochanteric Femoral Fracture; With Plate/Screw Type Implant, With Or Without Cerclage	27244	1678	1.65
Revise Hip Joint Replacement	Revision Of Total Hip Arthroplasty; Both Components, With Or Without Autograft Or Allograft	27134	1328	1.31
Revision Of Knee Joint	Arthroplasty, Knee, Condyle And Plateau; Medial Or Lateral Compartment	27446	1096	1.08
Reconstruct Shoulder Joint	Arthroplasty, Glenohumeral Joint; Hemiarthroplasty	23470	992	0.98

Treat Thigh Fracture	Percutaneous Skeletal Fixation Of Femoral Fracture, Proximal End, Neck	27235	911	0.9
Treatment Of Ankle Fracture	Open Treatment Of Bimalleolar Ankle Fracture (Eg, Lateral And Medial Malleoli, Or Lateral And Posterior Malleoli, Or Medial And Posterior Malleoli), Includes Internal Fixation, When Performed	27814	608	0.6
Lumbar Spine Fusion	Arthrodesis, Posterior Or Posterolateral Technique, Single Level; Lumbar (With Lateral Transverse Technique, When Performed)	22612	593	0.58
Treatment Of Ankle Fracture	Open Treatment Of Distal Fibular Fracture (Lateral Malleolus), Includes Internal Fixation, When Performed	27792	546	0.54
Treat Knee Fracture	Open Treatment Of Tibial Fracture, Proximal (Plateau); Unicondylar, Includes Internal Fixation, When Performed	27535	439	0.43
Remove Spine Lamina 1 Lmbr	Laminectomy, Facetectomy And Foraminotomy (Unilateral Or Bilateral With Decompression Of Spinal Cord, Cauda Equina And/Or Nerve Root[S], [Eg, Spinal Or Lateral Recess Stenosis]), Single Vertebral Segment; Lumbar	63047	436	0.43
Total Hip Arthroplasty	Conversion Of Previous Hip Surgery To Total Hip Arthroplasty, With Or Without Autograft Or Allograft	27132	424	0.42
Revise Hip Joint Replacement	Revision Of Total Hip Arthroplasty; Femoral Component Only, With Or Without Allograft	27138	407	0.4
Treatment Of Tibia Fracture	Treatment Of Tibial Shaft Fracture (With Or Without Fibular Fracture) By Intramedullary Implant, With Or Without Interlocking Screws And/Or Cerclage	27759	393	0.39
Revise Hip Joint Replacement	Revision Of Total Hip Arthroplasty; Acetabular Component Only, With Or Without Autograft Or Allograft	27137	371	0.37
Treat Humerus Fracture	Open Treatment Of Proximal Humeral (Surgical Or Anatomical Neck) Fracture, Includes Internal Fixation, When Performed, Includes Repair Of Tuberosity(S), When Performed;	23615	364	0.36
Treatment Of Ankle Fracture	Open Treatment Of Trimalleolar Ankle Fracture, Includes Internal Fixation, When Performed, Medial And/Or Lateral Malleolus; Without Fixation Of Posterior Lip	27822	308	0.3

Lumbar Spine Fusion	Arthrodesis, Posterior Interbody Technique, Including Laminectomy And/Or Discectomy To Prepare Interspace (Other Than For Decompression), Single Interspace; Lumbar	22630	292	0.29
Repair Of Thigh Muscle	Suture Of Quadriceps Or Hamstring Muscle Rupture; Primary	27385	282	0.28
Low Back Disk Surgery	Laminotomy (Hemilaminectomy), With Decompression Of Nerve Root(S), Including Partial Facetectomy, Foraminotomy And/Or Excision Of Herniated Intervertebral Disc; 1 Interspace, Lumbar	63030	263	0.26
Treat Kneecap Fracture	Open Treatment Of Patellar Fracture, With Internal Fixation And/Or Partial Or Complete Patellectomy And Soft Tissue Repair	27524	239	0.24
Remove Spine Lamina 1/2 Lmbr	Laminectomy With Exploration And/Or Decompression Of Spinal Cord And/Or Cauda Equina, Without Facetectomy, Foraminotomy Or Discectomy (Eg, Spinal Stenosis), 1 Or 2 Vertebral Segments; Lumbar, Except For Spondylolisthesis	63005	196	0.19
Repair Of Kneecap Tendon	Suture Of Infrapatellar Tendon; Primary	27380	189	0.19
Treatment Of Thigh Fracture	Open Treatment Of Femoral Fracture, Distal End, Medial Or Lateral Condyle, Includes Internal Fixation, When Performed	27514	187	0.18
C-Laminoplasty W/Graft/Plate	Laminoplasty, Cervical, With Decompression Of The Spinal Cord, 2 Or More Vertebral Segments; With Reconstruction Of The Posterior Bony Elements (Including The Application Of Bridging Bone Graft And Non-Segmental Fixation Devices [Eg, Wire, Suture, Mini-Plates], When Performed)	63051	179	0.18
Repair Rotator Cuff Chronic	Repair Of Ruptured Musculotendinous Cuff (Eg, Rotator Cuff) Open; Chronic	23412	175	0.17
Treat Ulnar Fracture	Open Treatment Of Ulnar Fracture, Proximal End (Eg, Olecranon Or Coronoid Process[Es]), Includes Internal Fixation, When Performed	24685	171	0.17

Treatment Of Thigh Fracture	Open Treatment Of Femoral Shaft Fracture, With Or Without External Fixation, With Insertion Of Intramedullary Implant, With Or Without Cerclage And/Or Locking Screws	27506	171	0.17
Neck Spine Fuse&Removal C2	Arthrodesis, Anterior Interbody, Including Disc Space Preparation, Discectomy, Osteophytectomy And Decompression Of Spinal Cord And/Or Nerve Roots; Cervical Below C2	22551	166	0.16
Revise Kneecap With Implant	Arthroplasty, Patella; With Prosthesis	27438	162	0.16
Arthroscopic Rotator Cuff Repair	Arthroscopy, Shoulder, Surgical; With Rotator Cuff Repair	29827	154	0.15
Neck Spine Disk Surgery	Discectomy, Anterior, With Decompression Of Spinal Cord And/Or Nerve Root(S), Including Osteophytectomy; Cervical, Single Interspace	63075	151	0.15
Treat Thigh Fracture	Open Treatment Of Greater Trochanteric Fracture, Includes Internal Fixation, When Performed	27248	149	0.15
Removal Of Support Implant	Removal Of Implant; Deep (Eg, Buried Wire, Pin, Screw, Metal Band, Nail, Rod Or Plate)	20680	137	0.13
Treat Humerus Fracture	Open Treatment Of Humeral Shaft Fracture With Plate/Screws, With Or Without Cerclage	24515	128	0.13
Knee Arthroscopy/Surgery	Arthroscopy, Knee, Surgical; Debridement/Shaving Of Articular Cartilage (Chondroplasty)	29877	128	0.13
Reinforce Hip Bones	Prophylactic Treatment (Nailing, Pinning, Plating Or Wiring) With Or Without Methylmethacrylate, Femoral Neck And Proximal Femur	27187	119	0.12
Laminotomy Single Lumbar	Laminotomy (Hemilaminectomy), With Decompression Of Nerve Root(S), Including Partial Facetectomy, Foraminotomy And/Or Excision Of Herniated Intervertebral Disc, Reexploration, Single Interspace; Lumbar	63042	119	0.12
Optx Medial Ankle Fx	Open Treatment Of Medial Malleolus Fracture, Includes Internal Fixation, When Performed	27766	118	0.12

Neck Spine Fusion	Arthrodesis, Posterior Or Posterolateral Technique, Single Level; Cervical Below C2 Segment	22600	117	0.12
Treat Knee Fracture	Open Treatment Of Tibial Fracture, Proximal (Plateau); Bicondylar, With Or Without Internal Fixation	27536	117	0.12
Neck Spine Fusion	Arthrodesis, Anterior Interbody Technique, Including Minimal Discectomy To Prepare Interspace (Other Than For Decompression); Cervical Below C2	22554	116	0.11
Leg Surgery Procedure	Unlisted Procedure, Femur Or Knee	27599	109	0.11
Remove Knee Joint Lining	Arthrotomy, With Synovectomy, Knee; Anterior Or Posterior	27334	105	0.1
Knee Arthroscopy/Surgery	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	29881	105	0.1
Treatment Of Thigh Fracture	Open Treatment Of Femoral Shaft Fracture With Plate/Screws, With Or Without Cerclage	27507	104	0.1
Removal Of Elbow Bursa	Excision, Olecranon Bursa	24105	101	0.1
Treat Fx Rad Extra-Articul	Open Treatment Of Distal Radial Extra-Articular Fracture Or Epiphyseal Separation, With Internal Fixation	25607	99	0.1
Treat Lower Leg Fracture	Open Treatment Of Fracture Of Weight Bearing Articular Surface/Portion Of Distal Tibia (Eg, Pilon Or Tibial Plafond), With Internal Fixation, When Performed; Of Both Tibia And Fibula	27828	96	0.09
Revision Of Knee Joint	Arthroplasty, Femoral Condyles Or Tibial Plateau(S), Knee;	27442	92	0.09
Treat Fx Rad Intra-Articul	Open Treatment Of Distal Radial Intra-Articular Fracture Or Epiphyseal Separation; With Internal Fixation Of 2 Fragments	25608	88	0.09
Remove Spine Lamina >2 Crvcl	Laminectomy With Exploration And/Or Decompression Of Spinal Cord And/Or Cauda Equina, Without Facetectomy, Foraminotomy Or Discectomy (Eg, Spinal Stenosis), More Than 2 Vertebral Segments; Cervical	63015	88	0.09
Treat Humerus Fracture	Treatment Of Humeral Shaft Fracture, With Insertion Of Intramedullary Implant, With Or Without Cerclage And/Or Locking Screws	24516	83	0.08

Repair/Graft Of Tibia	Repair Of Nonunion Or Malunion, Tibia; With Iliac Or Other Autograft (Includes Obtaining Graft)	27724	80	0.08
Treatment Of Thigh Fracture	Open Treatment Of Femoral Supracondylar Or Transcondylar Fracture Without Intercondylar Extension, Includes Internal Fixation, When Performed	27511	79	0.08
Remove Vert Body Dcmprn Crvl	Vertebral Corpectomy (Vertebral Body Resection), Partial Or Complete, Anterior Approach With Decompression Of Spinal Cord And/Or Nerve Root(S); Cervical, Single Segment	63081	79	0.08
Optx Thigh Fx	Open Treatment Of Femoral Fracture, Proximal End, Head, Includes Internal Fixation, When Performed	27269	77	0.08
Treat Lower Leg Joint	Open Treatment Of Distal Tibiofibular Joint (Syndesmosis) Disruption, Includes Internal Fixation, When Performed	27829	76	0.07
Fusion Of Ankle Joint Open	Arthrodesis, Ankle, Open	27870	70	0.07
Reconstruct Ankle Joint	Arthroplasty, Ankle; With Implant (Total Ankle)	27702	68	0.07
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Debridement, Limited	29822	68	0.07
Knee Arthroscopy/Surgery	Arthroscopy, Knee, Surgical; Synovectomy, Major, 2 Or More Compartments (Eg, Medial Or Lateral)	29876	67	0.07
Explore/Treat Knee Joint	Arthrotomy, Knee; Including Joint Exploration, Biopsy, Or Removal Of Loose Or Foreign Bodies	27331	65	0.06
Treat Clavicle Fracture	Open Treatment Of Clavicular Fracture, Includes Internal Fixation, When Performed	23515	61	0.06
Knee Arthroscopy/Surgery	Arthroscopically Aided Anterior Cruciate Ligament Repair/Augmentation Or Reconstruction	29888	59	0.06
Repair Rotator Cuff Acute	Repair Of Ruptured Musculotendinous Cuff (Eg, Rotator Cuff) Open; Acute	23410	57	0.06
Lumbar Spine Fusion Combined	Arthrodesis, Combined Posterior Or Posterolateral Technique With Posterior Interbody Technique Including Laminectomy And/Or Discectomy Sufficient To	22633	56	0.06

	Prepare Interspace (Other Than For Decompression), Single Interspace And Segment; Lumbar			
Fusion Of Knee	Arthrodesis, Knee, Any Technique	27580	52	0.05
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Debridement, Extensive	29823	52	0.05
Repair Humerus With Graft	Repair Of Nonunion Or Malunion, Humerus; With Iliac Or Other Autograft (Includes Obtaining Graft)	24435	51	0.05
Removal Of Kneecap Bursa	Excision, Prepatellar Bursa	27340	51	0.05
Remove Spine Lamina 1 Crvl	Laminectomy, Facetectomy And Foraminotomy (Unilateral Or Bilateral With Decompression Of Spinal Cord, Cauda Equina And/Or Nerve Root[S], [Eg, Spinal Or Lateral Recess Stenosis]), Single Vertebral Segment; Cervical	63045	51	0.05
Reinforce Thigh	Prophylactic Treatment (Nailing, Pinning, Plating, Or Wiring) With Or Without Methylmethacrylate, Femur	27495	50	0.05
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Decompression Of Subacromial Space With Partial Acromioplasty, With Coracoacromial Ligament (Ie, Arch) Release, When Performed (List Separately In Addition To Code For Primary Procedure)	29826	50	0.05
Treat Fx Radial 3+ Frag	Open Treatment Of Distal Radial Intra-Articular Fracture Or Epiphyseal Separation; With Internal Fixation Of 3 Or More Fragments	25609	49	0.05
Revise Kneecap	Arthroplasty, Patella; Without Prosthesis	27437	48	0.05
Repair/Graft Of Thigh	Repair, Nonunion Or Malunion, Femur, Distal To Head And Neck; With Iliac Or Other Autogenous Bone Graft (Includes Obtaining Graft)	27472	48	0.05
Remove Shoulder Bone Part	Acromioplasty Or Acromionectomy, Partial, With Or Without Coracoacromial Ligament Release	23130	45	0.04
Replace Elbow Joint	Arthroplasty, Elbow; With Distal Humerus And Proximal Ulnar Prosthetic Replacement (Eg, Total Elbow)	24363	44	0.04

Treat Humerus Fracture	Open Treatment Of Humeral Supracondylar Or Transcondylar Fracture, Includes Internal Fixation, When Performed; Without Intercondylar Extension	24545	44	0.04
Knee Arthroscopy/Surgery	Arthroscopy, Knee, Surgical; With Lysis Of Adhesions, With Or Without Manipulation (Separate Procedure)	29884	43	0.04
Revis Reconst Shoulder Joint	Revision Of Total Shoulder Arthroplasty, Including Allograft When Performed; Humeral Or Glenoid Component	23473	42	0.04
Treat Fracture Radius/Ulna	Open Treatment Of Radial And Ulnar Shaft Fractures, With Internal Fixation, When Performed; Of Radius And Ulna	25575	42	0.04
Repair Achilles Tendon	Repair, Primary, Open Or Percutaneous, Ruptured Achilles Tendon;	27650	41	0.04
Repair/Graft Of Thigh Muscle	Suture Of Quadriceps Or Hamstring Muscle Rupture; Secondary Reconstruction, Including Fascial Or Tendon Graft	27386	40	0.04
Treat Humerus Fracture	Open Treatment Of Greater Humeral Tuberosity Fracture, Includes Internal Fixation, When Performed	23630	39	0.04
Revision Of Knee Joint	Arthroplasty, Knee, Tibial Plateau;	27440	39	0.04
Knee Arthroscopy/Surgery	Arthroscopy, Knee, Surgical; Synovectomy, Limited (Eg, Plica Or Shelf Resection) (Separate Procedure)	29875	38	0.04
Removal Of Kneecap	Patellectomy Or Hemipatellectomy	27350	36	0.04
Knee Arthroscopy/Surgery	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	29880	36	0.04
Exploratory Shoulder Surgery	Arthrotomy, Acromioclavicular, Sternoclavicular Joint, Including Exploration, Drainage, Or Removal Of Foreign Body	23044	34	0.03
Revision Of Unstable Kneecap	Reconstruction Of Dislocating Patella; With Extensor Realignment And/Or Muscle Advancement Or Release (Eg, Campbell, Goldwaite Type Procedure)	27422	34	0.03
Realignment Of Knee	Osteotomy, Proximal Tibia, Including Fibular Excision Or Osteotomy (Includes Correction Of Genu Varus [Bowleg] Or Genu Valgus [Knock-Knee]); Before Epiphyseal Closure	27455	34	0.03

Partial Removal Collar Bone	Claviclectomy; Partial	23120	33	0.03
Treat Fx Distal Radial	Percutaneous Skeletal Fixation Of Distal Radial Fracture Or Epiphyseal Separation	25606	33	0.03
Remove Knee Joint Lining	Arthrotomy, With Synovectomy, Knee; Anterior And Posterior Including Popliteal Area	27335	33	0.03
Incision Of Tibia	Osteotomy; Tibia	27705	33	0.03
Treatment Of Tibia Fracture	Percutaneous Skeletal Fixation Of Tibial Shaft Fracture (With Or Without Fibular Fracture) (Eg, Pins Or Screws)	27756	33	0.03
Repair Of Humerus	Repair Of Nonunion Or Malunion, Humerus; Without Graft (Eg, Compression Technique)	24430	31	0.03
Treat Elbow Fracture	Open Treatment Of Periarticular Fracture And/Or Dislocation Of The Elbow (Fracture Distal Humerus And Proximal Ulna And/Or Proximal Radius);	24586	31	0.03
Treat Finger Fracture Each	Open Treatment Of Phalangeal Shaft Fracture, Proximal Or Middle Phalanx, Finger Or Thumb, Includes Internal Fixation, When Performed, Each	26735	31	0.03
Repair/Graft Kneecap Tendon	Suture Of Infrapatellar Tendon; Secondary Reconstruction, Including Fascial Or Tendon Graft	27381	30	0.03
Repair Of Tibia	Repair Of Nonunion Or Malunion, Tibia; Without Graft, (Eg, Compression Technique)	27720	29	0.03
Explore Wound Extremity	Exploration Of Penetrating Wound (Separate Procedure); Extremity	20103	28	0.03
Exploration Of Hip Joint	Arthrotomy, Hip, Including Exploration Or Removal Of Loose Or Foreign Body	27033	27	0.03
Revision Of Knee Joint	Arthroplasty, Knee, Hinge Prosthesis (Eg, Walldius Type)	27445	27	0.03
Repair Of Thigh	Repair, Nonunion Or Malunion, Femur, Distal To Head And Neck; Without Graft (Eg, Compression Technique)	27470	27	0.03
Lat Retinacular Release Open	Lateral Retinacular Release, Open	27425	26	0.03

Revision Of Knee Joint	Arthroplasty, Femoral Condyles Or Tibial Plateau(S), Knee; With Debridement And Partial Synovectomy	27443	26	0.03
Thorax Spine Fusion	Arthrodesis, Posterior Or Posterolateral Technique, Single Level; Thoracic (With Lateral Transverse Technique, When Performed)	22610	25	0.02
Treat Metacarpal Fracture	Open Treatment Of Metacarpal Fracture, Single, Includes Internal Fixation, When Performed, Each Bone	26615	25	0.02
Treatment Of Fibula Fracture	Open Treatment Of Proximal Fibula Or Shaft Fracture, Includes Internal Fixation, When Performed	27784	25	0.02
Repair/Graft Radius Or Ulna	Repair Of Nonunion Or Malunion, Radius Or Ulna; With Autograft (Includes Obtaining Graft)	25405	24	0.02
Treatment Of Thigh Fracture	Open Treatment Of Femoral Supracondylar Or Transcondylar Fracture With Intercondylar Extension, Includes Internal Fixation, When Performed	27513	24	0.02
Treat Elbow Fracture	Open Treatment Of Monteggia Type Of Fracture Dislocation At Elbow (Fracture Proximal End Of Ulna With Dislocation Of Radial Head), Includes Internal Fixation, When Performed	24635	23	0.02
Repair Of Leg Tendon Each	Repair, Extensor Tendon, Leg; Primary, Without Graft, Each Tendon	27664	23	0.02
Repair Fibula Nonunion	Repair Of Fibula Nonunion And/Or Malunion With Internal Fixation	27726	23	0.02
Shoulder Surgery Procedure	Unlisted Procedure, Shoulder	23929	22	0.02
Fusion Of Foot Bones	Arthrodesis; Subtalar	28725	22	0.02
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Distal Claviclectomy Including Distal Articular Surface (Mumford Procedure)	29824	22	0.02
Arthroscopy Biceps Tenodesis	Arthroscopy, Shoulder, Surgical; Biceps Tenodesis	29828	22	0.02
Remove Lamina/Facets Lumbar	Laminectomy With Removal Of Abnormal Facets And/Or Pars Inter-Articularis With Decompression Of Cauda Equina And Nerve Roots For Spondylolisthesis, Lumbar (Gill Type Procedure)	63012	22	0.02

Reinsert Spinal Fixation	Reinsertion Of Spinal Fixation Device	22849	21	0.02
Excision Of Hip Joint/Muscle	Capsulectomy Or Capsulotomy, Hip, With Or Without Excision Of Heterotopic Bone, With Release Of Hip Flexor Muscles (Ie, Gluteus Medius, Gluteus Minimus, Tensor Fascia Latae, Rectus Femoris, Sartorius, Iliopsoas)	27036	21	0.02
Tibial Arthroscopy/Surgery	Arthroscopically Aided Treatment Of Tibial Fracture, Proximal (Plateau); Unicondylar, Includes Internal Fixation, When Performed (Includes Arthroscopy)	29855	21	0.02
Remove Spine Lamina 1/2 Crvl	Laminectomy With Exploration And/Or Decompression Of Spinal Cord And/Or Cauda Equina, Without Facetectomy, Foraminotomy Or Discectomy (Eg, Spinal Stenosis), 1 Or 2 Vertebral Segments; Cervical	63001	21	0.02
Repair Shoulder Capsule	Capsulorrhaphy, Anterior; With Labral Repair (Eg, Bankart Procedure)	23455	20	0.02
Treat Lower Leg Fracture	Open Treatment Of Fracture Of Weight Bearing Articular Surface/Portion Of Distal Tibia (Eg, Pilon Or Tibial Plafond), With Internal Fixation, When Performed; Of Fibula Only	27826	20	0.02
Remove Spine Fixation Device	Removal Of Posterior Segmental Instrumentation	22852	19	0.02
Repair Biceps Tendon	Tenodesis Of Long Tendon Of Biceps	23430	19	0.02
Treat Fracture Of Ulna	Open Treatment Of Ulnar Shaft Fracture, Includes Internal Fixation, When Performed	25545	19	0.02
Treat Clavicle Dislocation	Open Treatment Of Acromioclavicular Dislocation, Acute Or Chronic;	23550	18	0.02
Treat Fracture Of Radius	Open Treatment Of Radial Shaft Fracture, Includes Internal Fixation, When Performed	25515	18	0.02
Repair/Graft Femur Head/Neck	Bone Graft, Femoral Head, Neck, Intertrochanteric Or Subtrochanteric Area (Includes Obtaining Bone Graft)	27170	18	0.02
Resect Femur/Knee Tumor	Radical Resection Of Tumor, Femur Or Knee	27365	18	0.02
Decompression Of Lower Leg	Decompression Fasciotomy, Leg; Anterior And/Or Lateral, And Posterior Compartment(S)	27602	18	0.02

Remove Foreign Body	Incision And Removal Of Foreign Body, Subcutaneous Tissues; Complicated	10121	17	0.02
Knee Arthroscopy/Surgery	Arthroscopy, Knee, Surgical; For Removal Of Loose Body Or Foreign Body (Eg, Osteochondritis Dissecans Fragmentation, Chondral Fragmentation)	29874	17	0.02
Remove Spine Lamina 1/2 Thrc	Laminectomy With Exploration And/OR Decompression Of Spinal Cord And/OR Cauda Equina, Without Facetectomy, Foraminotomy Or Discectomy (Eg, Spinal Stenosis), 1 Or 2 Vertebral Segments; Thoracic	63003	17	0.02
Neck Spine Disk Surgery	Laminotomy (Hemilaminectomy), With Decompression Of Nerve Root(S), Including Partial Facetectomy, Foraminotomy And/OR Excision Of Herniated Intervertebral Disc; 1 Interspace, Cervical	63020	17	0.02
Muscle-Skin Graft Leg	Muscle, Myocutaneous, Or Fasciocutaneous Flap; Lower Extremity	15738	16	0.02
Resect Thigh/Knee Tum < 5 Cm	Radical Resection Of Tumor (Eg, Sarcoma), Soft Tissue Of Thigh Or Knee Area; Less Than 5 Cm	27329	16	0.02
Optx Post Ankle Fx	Open Treatment Of Posterior Malleolus Fracture, Includes Internal Fixation, When Performed	27769	16	0.02
Treat Ankle Dislocation	Open Treatment Of Ankle Dislocation, With Or Without Percutaneous Skeletal Fixation; With Repair Or Internal Or External Fixation	27848	16	0.02
Cervical Laminoplasty 2/> Seg	Laminoplasty, Cervical, With Decompression Of The Spinal Cord, 2 Or More Vertebral Segments;	63050	16	0.02
Iliac Bone Graft Microvasc	Bone Graft With Microvascular Anastomosis; Iliac Crest	20956	15	0.01
Treat Dislocation/Fracture	Open Treatment Of Shoulder Dislocation, With Fracture Of Greater Humeral Tuberosity, Includes Internal Fixation, When Performed	23670	15	0.01
Fusion Of Shoulder Joint	Arthrodesis, Glenohumeral Joint;	23800	15	0.01
Repair Arm Tendon/Muscle	Repair, Tendon Or Muscle, Upper Arm Or Elbow, Each Tendon Or Muscle, Primary Or Secondary (Excludes Rotator Cuff)	24341	15	0.01
Exc Thigh/Knee Tum Deep <5Cm	Excision, Tumor, Soft Tissue Of Thigh Or Knee Area, Subfascial (Eg, Intramuscular); Less Than 5 Cm	27328	15	0.01

Repair Degenerated Kneecap	Anterior Tibial Tubercleplasty (Eg, Maquet Type Procedure)	27418	15	0.01
Realignment Of Knee	Osteotomy, Proximal Tibia, Including Fibular Excision Or Osteotomy (Includes Correction Of Genu Varus [Bowleg] Or Genu Valgus [Knock-Knee]); After Epiphyseal Closure	27457	15	0.01
Repair Of Lower Leg	Repair Of Nonunion Or Malunion, Tibia; By Synostosis, With Fibula, Any Method	27725	15	0.01
Remove Spine Lamina 1 Thrc	Laminectomy, Facetectomy And Foraminotomy (Unilateral Or Bilateral With Decompression Of Spinal Cord, Cauda Equina And/Or Nerve Root[S], [Eg, Spinal Or Lateral Recess Stenosis]), Single Vertebral Segment; Thoracic	63046	15	0.01
Treat Ankle Fracture	Open Treatment Of Talus Fracture, Includes Internal Fixation, When Performed	28445	14	0.01
Insert Spine Fixation Device	Posterior Segmental Instrumentation (Eg, Pedicle Fixation, Dual Rods With Multiple Hooks And Sublaminar Wires); 3 To 6 Vertebral Segments (List Separately In Addition To Code For Primary Procedure)	22842	13	0.01
Revision Of Collar Bone	Osteotomy, Clavicle, With Or Without Internal Fixation; With Bone Graft For Nonunion Or Malunion (Includes Obtaining Graft And/Or Necessary Fixation)	23485	13	0.01
Treat Scapula Fracture	Open Treatment Of Scapular Fracture (Body, Glenoid Or Acromion) Includes Internal Fixation, When Performed	23585	13	0.01
Repair Finger Tendon	Repair, Extensor Tendon, Finger, Primary Or Secondary; Without Free Graft, Each Tendon	26418	13	0.01
Treat Hip Dislocation	Open Treatment Of Hip Dislocation, Traumatic, With Acetabular Wall And Femoral Head Fracture, With Or Without Internal Or External Fixation	27254	13	0.01
Reconstruction Knee	Ligamentous Reconstruction (Augmentation), Knee; Extra-Articular	27427	13	0.01
Repair Of Leg Tendon Each	Repair, Flexor Tendon, Leg; Primary, Without Graft, Each Tendon	27658	13	0.01

Removal Of Head Of Humerus	Resection, Humeral Head	23195	12	0.01
Repair Shoulder Capsule	Capsulorrhaphy, Anterior, Any Type; With Coracoid Process Transfer	23462	12	0.01
Treat Humerus Fracture	Open Treatment Of Humeral Condylar Fracture, Medial Or Lateral, Includes Internal Fixation, When Performed	24579	12	0.01
Treat Finger Fracture Each	Percutaneous Skeletal Fixation Of Unstable Phalangeal Shaft Fracture, Proximal Or Middle Phalanx, Finger Or Thumb, With Manipulation, Each	26727	12	0.01
Incision Of Knee Joint	Capsulotomy, Posterior Capsular Release, Knee	27435	12	0.01
Treatment Of Thigh Fracture	Percutaneous Skeletal Fixation Of Femoral Fracture, Distal End, Medial Or Lateral Condyle, Or Supracondylar Or Transcondylar, With Or Without Intercondylar Extension, Or Distal Femoral Epiphyseal Separation	27509	12	0.01
Reinforce Tibia	Prophylactic Treatment (Nailing, Pinning, Plating Or Wiring) With Or Without Methylmethacrylate, Tibia	27745	12	0.01
Treat/Graft Heel Fracture	Open Treatment Of Calcaneal Fracture, Includes Internal Fixation, When Performed; With Primary Iliac Or Other Autogenous Bone Graft (Includes Obtaining Graft)	28420	12	0.01
Fusion Of Foot Bones	Arthrodesis; Triple	28715	12	0.01
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Synovectomy, Partial	29820	12	0.01
Treat Dislocation/Fracture	Open Treatment Of Shoulder Dislocation, With Surgical Or Anatomical Neck Fracture, Includes Internal Fixation, When Performed	23680	11	0.01
Radical Resection Of Elbow	Radical Resection Of Capsule, Soft Tissue, And Heterotopic Bone, Elbow, With Contracture Release (Separate Procedure)	24149	11	0.01
Repair Wrist Joints	Arthroplasty, Interposition, Intercarpal Or Carpometacarpal Joints	25447	11	0.01
Treat Fracture Radius & Ulna	Open Treatment Of Radial And Ulnar Shaft Fractures, With Internal Fixation, When Performed; Of Radius Or Ulna	25574	11	0.01
Reconstruction Knee	Ligamentous Reconstruction (Augmentation), Knee; Intra-Articular (Open)	27428	11	0.01

Incision Of Thigh	Osteotomy, Femur, Shaft Or Supracondylar; With Fixation	27450	11	0.01
Carpal Tunnel Surgery	Neuroplasty And/Or Transposition; Median Nerve At Carpal Tunnel	64721	11	0.01
Repair Of Ruptured Tendon	Reinsertion Of Ruptured Biceps Or Triceps Tendon, Distal, With Or Without Tendon Graft	24342	10	0.01
Treat Humerus Fracture	Open Treatment Of Humeral Supracondylar Or Transcondylar Fracture, Includes Internal Fixation, When Performed; With Intercondylar Extension	24546	10	0.01
Treat Radius Fracture	Open Treatment Of Radial Head Or Neck Fracture, Includes Internal Fixation Or Radial Head Excision, When Performed;	24665	10	0.01
Decompress Forearm 1 Space	Decompression Fasciotomy, Forearm And/Or Wrist, Flexor Or Extensor Compartment; Without Debridement Of Nonviable Muscle And/Or Nerve	25020	10	0.01
Repair Finger/Hand Tendon	Repair Or Advancement, Flexor Tendon, In Zone 2 Digital Flexor Tendon Sheath (Eg, No Man'S Land); Primary, Without Free Graft, Each Tendon	26356	10	0.01
Incision/Fixation Of Femur	Osteotomy, Intertrochanteric Or Subtrochanteric Including Internal Or External Fixation And/Or Cast	27165	10	0.01
Treat Hip Dislocation	Open Treatment Of Hip Dislocation, Traumatic, Without Internal Fixation	27253	10	0.01
Remove Femur Lesion	Excision Or Curettage Of Bone Cyst Or Benign Tumor Of Femur;	27355	10	0.01
Resect Thigh/Knee Tum 5 Cm/>	Radical Resection Of Tumor (Eg, Sarcoma), Soft Tissue Of Thigh Or Knee Area; 5 Cm Or Greater	27364	10	0.01
Osteochondral Knee Allograft	Osteochondral Allograft, Knee, Open	27415	10	0.01
Revision Of Unstable Kneecap	Reconstruction Of Dislocating Patella; (Eg, Hauser Type Procedure)	27420	10	0.01
Leg/Ankle Surgery Procedure	Unlisted Procedure, Leg Or Ankle	27899	10	0.01
Fusion Of Foot Bones	Arthrodesis, Midtarsal Or Tarsometatarsal, Single Joint	28740	10	0.01
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Capsulorrhaphy	29806	10	0.01

Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Repair Of Slap Lesion	29807	10	0.01
Elbow Arthroscopy/Surgery	Arthroscopy, Elbow, Surgical; Debridement, Extensive	29838	10	0.01
Knee Arthroscopy/Surgery	Arthroscopically Aided Posterior Cruciate Ligament Repair/Augmentation Or Reconstruction	29889	10	0.01
Ankle Arthroscopy/Surgery	Arthroscopy, Ankle (Tibiotalar And Fibulotalar Joints), Surgical; With Ankle Arthrodesis	29899	10	0.01
Remove Spine Lamina >2 Thrc	Laminectomy With Exploration And/Or Decompression Of Spinal Cord And/Or Cauda Equina, Without Facetectomy, Foraminotomy Or Discectomy (Eg, Spinal Stenosis), More Than 2 Vertebral Segments; Thoracic	63016	10	0.01
Repair Spinal Fluid Leakage	Repair Of Dural/Cerebrospinal Fluid Leak, Not Requiring Laminectomy	63707	10	0.01
Apply Bone Fixation Device	Application Of A Multiplane (Pins Or Wires In More Than 1 Plane), Unilateral, External Fixation System (Eg, Ilizarov, Monticelli Type)	20692	9	0.01
Muscle Transfer Shoulder/Arm	Muscle Transfer, Any Type, Shoulder Or Upper Arm; Single	23395	9	0.01
Reinforce Shoulder Bones	Prophylactic Treatment (Nailing, Pinning, Plating Or Wiring) With Or Without Methylmethacrylate; Proximal Humerus	23491	9	0.01
Repair Radius Or Ulna	Repair Of Nonunion Or Malunion, Radius Or Ulna; Without Graft (Eg, Compression Technique)	25400	9	0.01
Incision Of Hip/Thigh Fascia	Fasciotomy, Hip Or Thigh, Any Type	27025	9	0.01
Decompression Of Lower Leg	Decompression Fasciotomy, Leg; Anterior And/Or Lateral Compartments Only	27600	9	0.01
Revision Of Lower Leg Tendon	Lengthening Or Shortening Of Tendon, Leg Or Ankle; Single Tendon (Separate Procedure)	27685	9	0.01
Repair/Graft Of Tibia	Repair Of Nonunion Or Malunion, Tibia; With Sliding Graft	27722	9	0.01

Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; Synovectomy, Complete	29821	9	0.01
Treat Shoulder Dislocation	Open Treatment Of Acute Shoulder Dislocation	23660	8	0.01
Treat Radius Fracture	Open Treatment Of Radial Head Or Neck Fracture, Includes Internal Fixation Or Radial Head Excision, When Performed; With Radial Head Prosthetic Replacement	24666	8	0.01
Decompress Forearm 1 Space	Decompression Fasciotomy, Forearm And/Or Wrist, Flexor Or Extensor Compartment; With Debridement Of Nonviable Muscle And/Or Nerve	25023	8	0.01
Release Palm Contracture	Fasciectomy, Partial Palmar With Release Of Single Digit Including Proximal Interphalangeal Joint, With Or Without Z-Plasty, Other Local Tissue Rearrangement, Or Skin Grafting (Includes Obtaining Graft);	26123	8	0.01
Tendon Excision Palm/Finger	Synovectomy, Tendon Sheath, Radical (Tenosynovectomy), Flexor Tendon, Palm And/Or Finger, Each Tendon	26145	8	0.01
Revise Knuckle With Implant	Arthroplasty, Metacarpophalangeal Joint; With Prosthetic Implant, Each Joint	26531	8	0.01
Treat Finger Dislocation	Open Treatment Of Interphalangeal Joint Dislocation, Includes Internal Fixation, When Performed, Single	26785	8	0.01
Revision/Removal Of Kneecap	Reconstruction Of Dislocating Patella; With Patellectomy	27424	8	0.01
Remove Lower Leg Bone Lesion	Excision Or Curettage Of Bone Cyst Or Benign Tumor, Tibia Or Fibula;	27635	8	0.01
Remove/Graft Leg Bone Lesion	Excision Or Curettage Of Bone Cyst Or Benign Tumor, Tibia Or Fibula; With Allograft	27638	8	0.01
Repair/Graft Achilles Tendon	Repair, Primary, Open Or Percutaneous, Ruptured Achilles Tendon; With Graft (Includes Obtaining Graft)	27652	8	0.01
Fusion Of Foot Bones	Arthrodesis, Midtarsal Or Tarsometatarsal, Multiple Or Transverse;	28730	8	0.01

Hip Arthro W/Debridement	Arthroscopy, Hip, Surgical; With Debridement/Shaving Of Articular Cartilage (Chondroplasty), Abrasion Arthroplasty, And/Or Resection Of Labrum	29862	8	0.01
Arthroscopy Of Joint	Unlisted Procedure, Arthroscopy	29999	8	0.01
Exploration Of Spinal Fusion	Exploration Of Spinal Fusion	22830	7	0.01
Repair Shoulder Capsule	Capsulorrhaphy, Glenohumeral Joint, Posterior, With Or Without Bone Block	23465	7	0.01
Fusion Of Shoulder Joint	Arthrodesis, Glenohumeral Joint; With Autogenous Graft (Includes Obtaining Graft)	23802	7	0.01
Release Elbow Joint	Arthrotomy Of The Elbow, With Capsular Excision For Capsular Release (Separate Procedure)	24006	7	0.01
Treat Humerus Fracture	Open Treatment Of Humeral Epicondylar Fracture, Medial Or Lateral, Includes Internal Fixation, When Performed	24575	7	0.01
Removal Of Wrist Bones	Carpectomy; All Bones Of Proximal Row	25215	7	0.01
Release Palm/Finger Tendon	Tenolysis, Flexor Tendon; Palm Or Finger, Each Tendon	26440	7	0.01
Treat Hip Dislocation	Open Treatment Of Spontaneous Hip Dislocation (Developmental, Including Congenital Or Pathological), Replacement Of Femoral Head In Acetabulum (Including Tenotomy, Etc);	27258	7	0.01
Repair Of Knee Ligament	Repair, Primary, Torn Ligament And/Or Capsule, Knee; Collateral	27405	7	0.01
Repair Of Knee Ligaments	Repair, Primary, Torn Ligament And/Or Capsule, Knee; Collateral And Cruciate Ligaments	27409	7	0.01
Exploration Of Ankle Joint	Arthrotomy, Posterior Capsular Release, Ankle, With Or Without Achilles Tendon Lengthening	27612	7	0.01
Revise Lower Leg Tendon	Transfer Or Transplant Of Single Tendon (With Muscle Redirection Or Rerouting); Deep (Eg, Anterior Tibial Or Posterior Tibial Through	27691	7	0.01

	Interosseous Space, Flexor Digitorum Longus, Flexor Hallucis Longus, Or Peroneal Tendon To Midfoot Or Hindfoot)			
Incision Of Heel Bone	Osteotomy; Calcaneus (Eg, Dwyer Or Chambers Type Procedure), With Or Without Internal Fixation	28300	7	0.01
Treat Heel Fracture	Open Treatment Of Calcaneal Fracture, Includes Internal Fixation, When Performed;	28415	7	0.01
Ankle Arthroscopy/Surgery	Arthroscopy, Ankle (Tibiotalar And Fibulotalar Joints), Surgical; Debridement, Extensive	29898	7	0.01
Decompress Spinal Cord Lmbr	Transpedicular Approach With Decompression Of Spinal Cord, Equina And/Or Nerve Root(S) (Eg, Herniated Intervertebral Disc), Single Segment; Lumbar (Including Transfacet, Or Lateral Extraforaminal Approach) (Eg, Far Lateral Herniated Intervertebral Disc)	63056	7	0.01
Repair Shoulder Capsule	Capsulorrhaphy, Anterior, Any Type; With Bone Block	23460	6	0.01
Reinforce Humerus	Prophylactic Treatment (Nailing, Pinning, Plating Or Wiring), With Or Without Methylmethacrylate, Humeral Shaft	24498	6	0.01
Treat Elbow Fracture	Open Treatment Of Periarticular Fracture And/Or Dislocation Of The Elbow (Fracture Distal Humerus And Proximal Ulna And/Or Proximal Radius); With Implant Arthroplasty	24587	6	0.01
Transplant Forearm Tendon	Tendon Transplantation Or Transfer, Flexor Or Extensor, Forearm And/Or Wrist, Single; Each Tendon	25310	6	0.01
Repair Hand Tendon	Repair, Extensor Tendon, Hand, Primary Or Secondary; Without Free Graft, Each Tendon	26410	6	0.01
Remove Hip Bone Les Deep	Excision Of Bone Cyst Or Benign Tumor, Wing Of Ilium, Symphysis Pubis, Or Greater Trochanter Of Femur; Deep (Subfascial), Includes Autograft, When Performed	27066	6	0.01
Remove Hip Foreign Body	Removal Of Foreign Body, Pelvis Or Hip; Deep (Subfascial Or Intramuscular)	27087	6	0.01

Treat Hip Fracture(S)	Open Treatment Of Acetabular Fracture(S) Involving Anterior Or Posterior (One) Column, Or A Fracture Running Transversely Across The Acetabulum, With Internal Fixation	27227	6	0.01
Treat Hip Fracture(S)	Open Treatment Of Acetabular Fracture(S) Involving Anterior And Posterior (Two) Columns, Includes T-Fracture And Both Column Fracture With Complete Articular Detachment, Or Single Column Or Transverse Fracture With Associated Acetabular Wall Fracture, With Internal Fixation	27228	6	0.01
Remove Femur Lesion/Graft	Excision Or Curettage Of Bone Cyst Or Benign Tumor Of Femur; With Allograft	27356	6	0.01
Treat Knee Fracture	Open Treatment Of Intercondylar Spine(S) And/Or Tuberosity Fracture(S) Of The Knee, Includes Internal Fixation, When Performed	27540	6	0.01
Resect Leg/Ankle Tum 5 Cm/>	Radical Resection Of Tumor (Eg, Sarcoma), Soft Tissue Of Leg Or Ankle Area; 5 Cm Or Greater	27616	6	0.01
Incision Of Tibia & Fibula	Osteotomy; Tibia And Fibula	27709	6	0.01
Fusion Of Foot Bones	Arthrodesis; Pantalar	28705	6	0.01
Shoulder Arthroscopy/Surgery	Arthroscopy, Shoulder, Surgical; With Lysis And Resection Of Adhesions, With Or Without Manipulation	29825	6	0.01
Knee Arthroscopy/Surgery	Arthroscopy, Knee, Surgical; With Lateral Release	29873	6	0.01
Laminotomy Single Cervical	Laminotomy (Hemilaminectomy), With Decompression Of Nerve Root(S), Including Partial Facetectomy, Foraminotomy And/Or Excision Of Herniated Intervertebral Disc, Reexploration, Single Interspace; Cervical	63040	6	0.01
Remove Vert Body Dcmprn Thrc	Vertebral Corpectomy (Vertebral Body Resection), Partial Or Complete, Transthoracic Approach With Decompression Of Spinal Cord And/Or Nerve Root(S); Thoracic, Single Segment	63085	6	0.01

Repair Spinal Fluid Leakage	Repair Of Dural/Cerebrospinal Fluid Leak Or Pseudomeningocele, With Laminectomy	63709	6	0.01
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Table A3: List of subsequent surgery CPT codes

CPT Code	Description
27487	REVISION OF TOTAL KNEE ARTHROPLASTY, WITH OR WITHOUT ALLOGRAFT; FEMORAL AND ENTIRE TIBIAL COMPONENT
27570	MANIPULATION OF KNEE JOINT UNDER GENERAL ANESTHESIA (INCLUDES APPLICATION OF TRACTION OR OTHER FIXATION DEVICES)
27486	REVISION OF TOTAL KNEE ARTHROPLASTY, WITH OR WITHOUT ALLOGRAFT; 1 COMPONENT
20680	REMOVAL OF IMPLANT; DEEP (EG, BURIED WIRE, PIN, SCREW, METAL BAND, NAIL, ROD OR PLATE)
27488	REMOVAL OF PROSTHESIS, INCLUDING TOTAL KNEE PROSTHESIS, METHYLMETHACRYLATE WITH OR WITHOUT INSERTION OF SPACER, KNEE
27134	REVISION OF TOTAL HIP ARTHROPLASTY; BOTH COMPONENTS, WITH OR WITHOUT AUTOGRAFT OR ALLOGRAFT
27310	ARTHROTOMY, KNEE, WITH EXPLORATION, DRAINAGE, OR REMOVAL OF FOREIGN BODY (EG, INFECTION)
11042	DEBRIDEMENT, SUBCUTANEOUS TISSUE (INCLUDES EPIDERMIS AND DERMIS, IF PERFORMED); FIRST 20 SQ CM OR LESS
27301	INCISION AND DRAINAGE, DEEP ABSCESS, BURSA, OR HEMATOMA, THIGH OR KNEE REGION
11044	DEBRIDEMENT, BONE (INCLUDES EPIDERMIS, DERMIS, SUBCUTANEOUS TISSUE, MUSCLE AND/OR FASCIA, IF PERFORMED); FIRST 20 SQ CM OR LESS
27590	AMPUTATION, THIGH, THROUGH FEMUR, ANY LEVEL;
27138	REVISION OF TOTAL HIP ARTHROPLASTY; FEMORAL COMPONENT ONLY, WITH OR WITHOUT ALLOGRAFT
11043	DEBRIDEMENT, MUSCLE AND/OR FASCIA (INCLUDES EPIDERMIS, DERMIS, AND SUBCUTANEOUS TISSUE, IF PERFORMED); FIRST 20 SQ CM OR LESS
10180	INCISION AND DRAINAGE, COMPLEX, POSTOPERATIVE WOUND INFECTION
27880	AMPUTATION, LEG, THROUGH TIBIA AND FIBULA;

27266	CLOSED TREATMENT OF POST HIP ARTHROPLASTY DISLOCATION; REQUIRING REGIONAL OR GENERAL ANESTHESIA
27091	REMOVAL OF HIP PROSTHESIS; COMPLICATED, INCLUDING TOTAL HIP PROSTHESIS, METHYLMETHACRYLATE WITH OR WITHOUT INSERTION OF SPACER
27137	REVISION OF TOTAL HIP ARTHROPLASTY; ACETABULAR COMPONENT ONLY, WITH OR WITHOUT AUTOGRAFT OR ALLOGRAFT
13160	SECONDARY CLOSURE OF SURGICAL WOUND OR DEHISCENCE, EXTENSIVE OR COMPLICATED
26990	INCISION AND DRAINAGE, PELVIS OR HIP JOINT AREA; DEEP ABSCESS OR HEMATOMA
20610	ARTHROCENTESIS, ASPIRATION AND/OR INJECTION, MAJOR JOINT OR BURSA (EG, SHOULDER, HIP, KNEE, SUBACROMIAL BURSA); WITHOUT ULTRASOUND GUIDANCE
27132	CONVERSION OF PREVIOUS HIP SURGERY TO TOTAL HIP ARTHROPLASTY, WITH OR WITHOUT AUTOGRAFT OR ALLOGRAFT
29871	ARTHROSCOPY, KNEE, SURGICAL; FOR INFECTION, LAVAGE AND DRAINAGE
10140	INCISION AND DRAINAGE OF HEMATOMA, SEROMA OR FLUID COLLECTION
29884	ARTHROSCOPY, KNEE, SURGICAL; WITH LYSIS OF ADHESIONS, WITH OR WITHOUT MANIPULATION (SEPARATE PROCEDURE)
27886	AMPUTATION, LEG, THROUGH TIBIA AND FIBULA; RE-AMPUTATION
20670	REMOVAL OF IMPLANT; SUPERFICIAL (EG, BURIED WIRE, PIN OR ROD) (SEPARATE PROCEDURE)
26951	AMPUTATION, FINGER OR THUMB, PRIMARY OR SECONDARY, ANY JOINT OR PHALANX, SINGLE, INCLUDING NEURECTOMIES; WITH DIRECT CLOSURE
27580	ARTHRODESIS, KNEE, ANY TECHNIQUE
27030	ARTHROTOMY, HIP, WITH DRAINAGE (EG, INFECTION)
27334	ARTHROTOMY, WITH SYNOVECTOMY, KNEE; ANTERIOR OR POSTERIOR
27870	ARTHRODESIS, ANKLE, OPEN
27596	AMPUTATION, THIGH, THROUGH FEMUR, ANY LEVEL; RE-AMPUTATION
27090	REMOVAL OF HIP PROSTHESIS; (SEPARATE PROCEDURE)
10060	INCISION AND DRAINAGE OF ABSCESS (EG, CARBUNCLE, SUPPURATIVE HIDRADENITIS, CUTANEOUS OR SUBCUTANEOUS ABSCESS, CYST, FURUNCLE, OR PARONYCHIA); SIMPLE OR SINGLE

23474	REVISION OF TOTAL SHOULDER ARTHROPLASTY, INCLUDING ALLOGRAFT WHEN PERFORMED; HUMERAL AND GLENOID COMPONENT
24105	EXCISION, OLECRANON BURSA
23655	CLOSED TREATMENT OF SHOULDER DISLOCATION, WITH MANIPULATION; REQUIRING ANESTHESIA
27331	ARTHROTOMY, KNEE; INCLUDING JOINT EXPLORATION, BIOPSY, OR REMOVAL OF LOOSE OR FOREIGN BODIES
23040	ARTHROTOMY, GLENOHUMERAL JOINT, INCLUDING EXPLORATION, DRAINAGE, OR REMOVAL OF FOREIGN BODY
27122	ACETABULOPLASTY; RESECTION, FEMORAL HEAD (EG, GIRDLESTONE PROCEDURE)
27884	AMPUTATION, LEG, THROUGH TIBIA AND FIBULA; SECONDARY CLOSURE OR SCAR REVISION
23473	REVISION OF TOTAL SHOULDER ARTHROPLASTY, INCLUDING ALLOGRAFT WHEN PERFORMED; HUMERAL OR GLENOID COMPONENT
11000	DEBRIDEMENT OF EXTENSIVE ECZEMATOUS OR INFECTED SKIN; UP TO 10% OF BODY SURFACE
12020	TREATMENT OF SUPERFICIAL WOUND DEHISCENCE; SIMPLE CLOSURE
97597	DEBRIDEMENT (EG, HIGH PRESSURE WATERJET WITH/WITHOUT SUCTION, SHARP SELECTIVE DEBRIDEMENT WITH SCISSORS, SCALPEL AND FORCEPS), OPEN WOUND, (EG, FIBRIN, DEVITALIZED EPIDERMIS AND/OR DERMIS, EXUDATE, DEBRIS, BIOFILM), INCLUDING TOPICAL APPLICATION(S), WOUND ASSESSMENT, USE OF A WHIRLPOOL, WHEN PERFORMED AND INSTRUCTION(S) FOR ONGOING CARE, PER SESSION, TOTAL WOUND(S) SURFACE AREA; FIRST 20 SQ CM OR LESS
10061	INCISION AND DRAINAGE OF ABSCESS (EG, CARBUNCLE, SUPPURATIVE HIDRADENITIS, CUTANEOUS OR SUBCUTANEOUS ABSCESS, CYST, FURUNCLE, OR PARONYCHIA); COMPLICATED OR MULTIPLE
27603	INCISION AND DRAINAGE, LEG OR ANKLE; DEEP ABSCESS OR HEMATOMA
23030	INCISION AND DRAINAGE, SHOULDER AREA; DEEP ABSCESS OR HEMATOMA
23332	REMOVAL OF FOREIGN BODY, SHOULDER; COMPLICATED (EG, TOTAL SHOULDER)
26910	AMPUTATION, METACARPAL, WITH FINGER OR THUMB (RAY AMPUTATION), SINGLE, WITH OR WITHOUT INTEROSSEOUS TRANSFER

20245	BIOPSY, BONE, OPEN; DEEP (EG, HUMERAL SHAFT, ISCHIUM, FEMORAL SHAFT)
29874	ARTHROSCOPY, KNEE, SURGICAL; FOR REMOVAL OF LOOSE BODY OR FOREIGN BODY (EG, OSTEOCHONDRITIS DISSECANS FRAGMENTATION, CHONDRAL FRAGMENTATION)
27252	CLOSED TREATMENT OF HIP DISLOCATION, TRAUMATIC; REQUIRING ANESTHESIA
23700	MANIPULATION UNDER ANESTHESIA, SHOULDER JOINT, INCLUDING APPLICATION OF FIXATION APPARATUS (DISLOCATION EXCLUDED)
27335	ARTHROTOMY, WITH SYNOVECTOMY, KNEE; ANTERIOR AND POSTERIOR INCLUDING POPLITEAL AREA
27303	INCISION, DEEP, WITH OPENING OF BONE CORTEX, FEMUR OR KNEE (EG, OSTEOMYELITIS OR BONE ABSCESS)
27607	INCISION (EG, OSTEOMYELITIS OR BONE ABSCESS), LEG OR ANKLE
27724	REPAIR OF NONUNION OR MALUNION, TIBIA; WITH ILIAC OR OTHER AUTOGRAFT (INCLUDES OBTAINING GRAFT)
28810	AMPUTATION, METATARSAL, WITH TOE, SINGLE
27610	ARTHROTOMY, ANKLE, INCLUDING EXPLORATION, DRAINAGE, OR REMOVAL OF FOREIGN BODY
28825	AMPUTATION, TOE; INTERPHALANGEAL JOINT
27881	AMPUTATION, LEG, THROUGH TIBIA AND FIBULA; WITH IMMEDIATE FITTING TECHNIQUE INCLUDING APPLICATION OF FIRST CAST
28820	AMPUTATION, TOE; METATARSOPHALANGEAL JOINT
22015	INCISION AND DRAINAGE, OPEN, OF DEEP ABSCESS (SUBFASCIAL), POSTERIOR SPINE; LUMBAR, SACRAL, OR LUMBOSACRAL
27882	AMPUTATION, LEG, THROUGH TIBIA AND FIBULA; OPEN, CIRCULAR (GUILLOTINE)
11040	DEBRIDEMENT; SKIN, PARTIAL THICKNESS
27360	PARTIAL EXCISION (CRATERIZATION, SAUCERIZATION, OR DIAPHYSECTOMY) BONE, FEMUR, PROXIMAL TIBIA AND/OR FIBULA (EG, OSTEOMYELITIS OR BONE ABSCESS)
27295	DISARTICULATION OF HIP
28805	AMPUTATION, FOOT; TRANSMETATARSAL
97605	NEGATIVE PRESSURE WOUND THERAPY (EG, VACUUM ASSISTED DRAINAGE COLLECTION), UTILIZING DURABLE MEDICAL EQUIPMENT (DME), INCLUDING TOPICAL APPLICATION(S),

	WOUND ASSESSMENT, AND INSTRUCTION(S) FOR ONGOING CARE, PER SESSION; TOTAL WOUND(S) SURFACE AREA LESS THAN OR EQUAL TO 50 SQUARE CENTIMETERS
10120	INCISION AND REMOVAL OF FOREIGN BODY, SUBCUTANEOUS TISSUES; SIMPLE
23044	ARTHROTOMY, ACROMIOCLAVICULAR, STERNOCLAVICULAR JOINT, INCLUDING EXPLORATION, DRAINAGE, OR REMOVAL OF FOREIGN BODY
26020	DRAINAGE OF TENDON SHEATH, DIGIT AND/OR PALM, EACH
29825	ARTHROSCOPY, SHOULDER, SURGICAL; WITH LYSIS AND RESECTION OF ADHESIONS, WITH OR WITHOUT MANIPULATION
27033	ARTHROTOMY, HIP, INCLUDING EXPLORATION OR REMOVAL OF LOOSE OR FOREIGN BODY
27592	AMPUTATION, THIGH, THROUGH FEMUR, ANY LEVEL; OPEN, CIRCULAR (GUILLOTINE)
27594	AMPUTATION, THIGH, THROUGH FEMUR, ANY LEVEL; SECONDARY CLOSURE OR SCAR REVISION
27704	REMOVAL OF ANKLE IMPLANT
24000	ARTHROTOMY, ELBOW, INCLUDING EXPLORATION, DRAINAGE, OR REMOVAL OF FOREIGN BODY
27552	CLOSED TREATMENT OF KNEE DISLOCATION; REQUIRING ANESTHESIA
23930	INCISION AND DRAINAGE, UPPER ARM OR ELBOW AREA; DEEP ABSCESS OR HEMATOMA
27372	REMOVAL OF FOREIGN BODY, DEEP, THIGH REGION OR KNEE AREA
27640	PARTIAL EXCISION (CRATERIZATION, SAUCERIZATION, OR DIAPHYSECTOMY), BONE (EG, OSTEOMYELITIS); TIBIA
11041	DEBRIDEMENT; SKIN, FULL THICKNESS
27265	CLOSED TREATMENT OF POST HIP ARTHROPLASTY DISLOCATION; WITHOUT ANESTHESIA
27275	MANIPULATION, HIP JOINT, REQUIRING GENERAL ANESTHESIA
10121	INCISION AND REMOVAL OF FOREIGN BODY, SUBCUTANEOUS TISSUES; COMPLICATED
26991	INCISION AND DRAINAGE, PELVIS OR HIP JOINT AREA; INFECTED BURSA
24160	REMOVAL OF PROSTHESIS, INCLUDES DEBRIDEMENT AND SYNOVECTOMY WHEN PERFORMED; HUMERAL AND ULNAR COMPONENTS
27598	DISARTICULATION AT KNEE
23107	ARTHROTOMY, GLENOHUMERAL JOINT, WITH JOINT EXPLORATION, WITH OR WITHOUT REMOVAL OF LOOSE OR FOREIGN BODY

23335	REMOVAL OF PROSTHESIS, INCLUDES DEBRIDEMENT AND SYNOVECTOMY WHEN PERFORMED; HUMERAL AND GLENOID COMPONENTS (EG, TOTAL SHOULDER)
24101	ARTHROTOMY, ELBOW; WITH JOINT EXPLORATION, WITH OR WITHOUT BIOPSY, WITH OR WITHOUT REMOVAL OF LOOSE OR FOREIGN BODY
25028	INCISION AND DRAINAGE, FOREARM AND/OR WRIST; DEEP ABSCESS OR HEMATOMA
27087	REMOVAL OF FOREIGN BODY, PELVIS OR HIP; DEEP (SUBFASCIAL OR INTRAMUSCULAR)
27703	ARTHROPLASTY, ANKLE; REVISION, TOTAL ANKLE
25449	REVISION OF ARTHROPLASTY, INCLUDING REMOVAL OF IMPLANT, WRIST JOINT
22861	REVISION INCLUDING REPLACEMENT OF TOTAL DISC ARTHROPLASTY (ARTIFICIAL DISC), ANTERIOR APPROACH, SINGLE INTERSPACE; CERVICAL

Table A4: List of variables

Variable
Age
Sex
Race
BMI
Functional Health Status
Charleston Comorbidity Index
ASA Classification
Smoking Status
Diabetes
Alcohol use
Steroid Use
Procedure Type
Emergency Status
Operative Time
Work RVUs
Wound Classification
Housing Status
Risk Analysis Index

* ASA: American Society of Anesthesiologists