

TABLE E-1 ICD-9-CM Codes Utilized to Identify the Study Cohort, Operative Approaches, and Revision Surgical Procedures

Procedure	Codes
Primary subaxial cervical fusion*	81.02, 81.03
Anterior approach	81.02
Posterior approach	81.03
Circumferential approach†	81.02, 81.03
Atlantoaxial fusion or re-fusion	81.01, 81.31
Lumbar fusion or re-fusion	81.06-81.08, 81.36-81.38
Thoracic fusion or re-fusion	81.04, 81.05, 81.34, 81.35
Fusion of unspecified level	81.00, 81.30, 81.39
Revision subaxial cervical fusion‡	81.32, 81.33

\*Patients undergoing a surgical procedure with primary subaxial cervical fusion codes but a diagnosis of mechanical complication of an orthopaedic implant (996.40, 996.49) were considered to be having miscoded revisions and were excluded from the cohort. †Concurrent listing of codes 81.02 and 81.03 designated a circumferential approach. ‡After the index procedure, ICD-9-CM codes 81.01-81.08 and/or 81.31-81.38 were also considered revision surgical procedures as long as codes 81.02, 81.03, 81.32, and/or 81.33 were also present and the fusion was in a region contiguous with the subaxial cervical spine. ICD-9-CM codes 81.00, 81.30, and 81.39 do not specify fusion level and were therefore not used to identify revision surgical procedures.

TABLE E-2 ICD-9-CM Codes Utilized to Identify Surgical Indications

Surgical Indication	Codes
Degenerative disc	7220, 72210, 72211, 7222, 7224, 72252, 7226, 72270, 72271, 72291
Spondylosis	7209, 7210, 7211, 7217, 72190, 72191
Spinal stenosis	7230, 7237, 72400, 72401, 72409
Fracture	80500, 80501, 80502, 80503, 80504, 80505, 80506, 80507, 80508, 80511, 80515, 80516, 80517, 8058, 80600, 80601, 80602, 80603, 80604, 80605, 80606, 80607, 80608, 80609, 80610, 80611, 80614, 80615, 80616, 80618, 80619, 8068, 8069, 9051
Spondylolisthesis	7384, 75612
Dislocation	83900, 83901, 83902, 83903, 83904, 83905, 83906, 83907, 83908, 83911, 83913, 83915, 83916, 83918, 83921, 83940
Pathologic fracture	73310, 73313, 73319
Nonunion or malunion	73381, 73382
Infection	01500, 01501, 01502, 01503, 01505, 3240, 3241, 3249, 3570, 47824, 73008, 73009, 73018, 73019, 73028
Deformity	73710, 73711, 73712, 73719, 73730, 73732, 73739, 7382, 7385, 74101, 7542, 75616
Rheumatic disease	6960, 7140, 7200, 7216
Neoplasm	1700, 1702, 1922, 1923, 1984, 20000, 20280, 20300, 20380, 2132, 2150, 2158, 2251, 2253, 2254, 22809, 2375, 23770, 23771, 2380, 2386, 2392, 73322
Spinal cord abnormalities	3360, 3361, 74259, 74782, 75617