



**Supplement 1.** Patient cohort construction with defined clinical phenotyping and exclusion criteria. ICD-9/10, International Classification of Diseases 9th or 10th version; CPT, Current Procedural Terminology; ACDF, anterior cervical discectomy and fusion; OPLL, Ossification of the posterior longitudinal ligament.

**Supplement 2.** Top 10 principal diagnoses for non-myelopathic cohort

Diagnostic code	No. of patients	Definition
722.0	30,570	Displacement of cervical intervertebral disc without myelopathy
721.0	12,306	Cervical spondylosis without myelopathy
722.4	7,468	Degeneration of cervical intervertebral disc
723.0	5,272	Spinal stenosis in cervical region
722.52	4,102	Degeneration of lumbar or lumbosacral intervertebral disc
722.10	1,738	Displacement of lumbar intervertebral disc without myelopathy
M50.12	1,736	Cervical disc disorder with radiculopathy, mid-cervical region
M48.02	1,704	Spinal stenosis, cervical region.
738.4	1,103	Acquired spondylolisthesis
M47.22	954	Other spondylosis with radiculopathy, cervical region