**SUPPLEMENTARY MATERIALS**

Supplementary Table 1. CPT codes defined

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| CPT codes | Definition |
| 22551 | Arthrodesis, anterior interbody, including disk space preparation, discectomy, osteophytectomy and decompression of spinal cord and/or nerve roots; cervical below C2 |
| 22554 | Arthrodesis, anterior interbody technique, including minimal distectomy to prepare interspace; cervical below C2 |
| 22612 | Arthrodesis, posterior or posterolateral technique, single level; lumbar |
| 22630 | Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace, single interspace; lumbar |
| 61312 | Craniectomy or craniotomy for evacuation of hematoma, supratentorial; extradural or subdural |
| 61510 | Craniectomy, trephination, bone flap craniotomy; for excision of brain tumor, supratentorial, except meningioma |
| 61512 | Craniectomy, trephination, bone flap craniotomy; for excision of brain tumor, supratentorial, for excision of meningioma, supratentorial |
| 61548 | Hypophysectomy or excision of pituitary tumor, transnasal or transseptal approach, nonstereotactic |
| 63020 | Laminectomy, with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disk; 1 interspace, cervical |
| 63030 | Laminectomy, with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disk; 1 interspace, lumbar |
| 63042 | Laminectomy, with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disk; reexploration, single interspace; lumbar |
| 63047 | Laminectomy, facetectomy and foraminectomy, single vertebral segment; lumbar  |
| 63075 | Discectomy, anterior, with decompression and of the spinal cord and/or never root(s), including osteophytectomy; cervical, single interspace |

CPT, current procedure terminology.

Supplementary Table 2. ICD-9 codes defined

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| ICD-9 codes | Definition |
| 191.1 | Malignant neoplasm of the frontal lobe |
| 198.3 | Secondary malignant neoplasm of the brain and spinal cord |
| 225.2 | Benign neoplasm of the cerebral meninges |
| 437.3 | Cerebral aneurysm nonruptured |
| 721.0 | Cervical spondylosis without myelopathy |
| 721.1 | Cervical spondylosis with myelopathy |
| 721.3 | Lumbosacral spondylosis without myelopathy |
| 722.0 | Displacement of cervical intervertebral disc without myelopathy |
| 722.10 | Displacement of lumbar intervertebral disc without myelopathy |
| 722.52 | Degeneration of lumbar or lumbosacral intervertebral disc |
| 722.71 | Intervertebral disk disorder with myelopathy cervical region |
| 723.0 | Spinal stenosis in cervical region |
| 724.02 | Spinal stenosis, lumbar region, without neurogenic claudication |
| 738.4 | Acquired spondylolisthesis |

ICD-9, Ninth Revision of International Classification of Disease.

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Supplementary Fig. 1. Ten most frequent current procedure terminology (CPT) codes in resident-assisted surgeries in the general cohort (n=13,654).



Supplementary Fig. 2. Ten most frequent ICD-9 codes in resident-assisted surgeries in the general cohort (n=13,654). ICD-9, Ninth Revision of the International Classification of Diseases.



Supplementary Fig. 3. Ten most frequent current procedure terminology (CPT) codes in attending alone surgeries in the general cohort (n=20,323).



Supplementary Fig. 4. Ten most frequent ICD-9 codes in attending alone surgeries in the general cohort (n=20,323). ICD-9, Ninth Revision of the International Classification of Diseases.