SIGNIFICANCE: This current study aims to characterize the epidemiology of surgical treatment for lumbar spinal stenosis in the United States in all age groups from 2004 to 2009. By providing the most recently available epidemiological data to clinicians, researchers and administrators, this may allow for assessment of need and allocation of hospital resources while also serving to stimulate future research.

INTRODUCTION: Over the last several decades, the number of surgeries performed for patients with lumbar spinal stenosis (LSS) has increased significantly. Several studies have reviewed indications for surgical management of these patients and controversy still exists as to what type of surgery should be performed. Select group of patients are indicated for decompressive surgery alone and others are indicated for decompression with fusion with or without instrumentation. Since lumbar spinal stenosis is most prevalent in the older patient population who generally carry more comorbidities, benefits and risks must be carefully weighed in the choice of surgical procedure.

METHODS: Data were obtained from the Healthcare Cost and Utilization Project Nationwide Inpatient Sample for the years 2004-2008. Discharges were identified using International Classification of Diseases, Ninth Revision, Clinical Modification diagnostic and procedure codes for patients with lumbar spinal stenosis. Population-based utilization rates were calculated from United States census data.

RESULTS: Between 2004 and 2009, national estimates for the annual number of inpatient discharges with a primary diagnosis of lumbar spinal stenosis increased from 91,630 to 99,373, with a peak in 2008 of 101,936 discharges. The proportion of patients between the age of 45 and 65 years with lumbar spinal stenosis increased from 31.7% to 33.5% of all cases, while all other age groups decreased in proportion. In 2004, 59.2% of all patients with a primary inpatient diagnosis of LSS were treated with surgical decompression alone without spinal fusion, while in 2009, this decreased to 49.9% of cases. Between 2004 and 2009, the percentage of LSS discharges requiring a fusion increased from 27.9% of all cases in 2004 to 37.4% in 2009.

DISCUSSION: Among all inpatient discharges for lumbar spinal stenosis, the proportion of cases requiring fusion increased over the time period of 2004 to 2009. Mean hospital charges for fusion cases increased by 60% from 2004 to 2009 while charges increased by only 45% for decompression procedures. The usage of bone morphogenetic protein and interbody spinal fusion devices also increased over the time period of this study. In addition to these findings, other patient demographics and hospital characteristics changed significantly throughout the duration of this study.

Fig 1: National estimate for the number of inpatient discharges with a primary diagnosis of Lumbar Spinal Stenosis (ICD9:724.02) from 2004 to 2009.

Fig 2: Percentage of all discharges with a diagnosis of Lumbar Spinal Stenosis that received decompression alone (ICD9: 03.02, 03.09, 80.51) or Fusion (ICD9: 81.04-81.08, 81.34-81.38, 81.61-81.64) in 2004 and 2009.

Out of all LSS cases that required fusion in 2009, 33% involved the use of bone morphogenetic protein (14% in 2004), 45% used an interbody spinal fusion device (ICD9: 84.51) (28% in 2004), 97.5% involved fusion of more than 2 levels (87% in 2004), and 14% of cases involved fusion of more than 4 vertebral levels (15% in 2004). Between 2004 and 2009, length of hospital stay for patients receiving a fusion decreased from 4.60 days to 4.0 days, in hospital mortality decreased from 0.3% to 0.1% and mean total hospital charges increased from $53,939 to $86,179. In 2009, the mean hospital charge for fusion cases using BMP was $101,999.

Fig 3: Mean total hospital charges associated with lumbar spinal stenosis discharges for 2004 and 2009.