Breaking the Bank and Breaking Our Back; Are We Spending Too Much on Spinal Fusions?

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Disclosures

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Introduction

Cost-effectiveness is an increasingly pressing concern, but concrete estimates of spending in neurosurgery remain scant.

Our Aims:
1) describe trends in the use of different kinds of neurosurgeries and in associated healthcare charges,
2) investigate whether increased utilization of different neurosurgical procedures correlates with increasing reimbursement,
3) compare our findings with trends in other surgical specialties.
Methods

We accessed the National Inpatient Samples (NIS) data from 1998 to 2012, stratified into four neurosurgical categories: craniotomies, spinal fusions, non-fusion spinal surgeries, and other neurosurgical operations.

With appropriate weighting, our data represented 11.7 million neurosurgical cases over 15 years.

Dollar amounts were adjusted to 2012 values.

Total charges are available for each patient entry in the NIS. Charge-to-Cost Ratios (CCR) are available through HCUP and allow for determination of costs.

For comparison between surgical disciplines, we accessed data for cardiothoracic procedures, hip and knee replacements, and hernia repairs.
Results

The following statistically significant trends were seen in Total Discharges/100,000 persons over the study period:

- Spinal fusions increased
- Non-fusion spinal procedures decreased
Results

Total discharges for patients over 65 / 100,000 persons vs. Year

The increased utilization of spinal fusions was not explained by an increasing proportion of elderly in the population over the study period.
Results

Trends in Total Hospital Charges (Millions USD) by Neurosurgical Type

$11 Billion was spent on spinal fusions in 1998, rising to $41.7 Billion in 2012

There has been a decrease in the proportion of neurosurgical spending dedicated to spinal non-fusion procedures, from 24% in 1998 to 14% in 2012
There has been an analogous upward trend in the utilization of Hip and Knee procedures and Spinal Fusions.
Discussion

We find a trend of steadily increasing utilization of spinal fusions, with a remarkable 110% relative increase in annual procedures over the study period and concurrent 280% increase in annual charges. This increasing utilization trend persists after adjustments for general population growth and increasing proportion of elderly in the population, suggesting the presence of a true increase in utilization as opposed to an artifact of population effects. Our findings reinforce the need for robust cost-effectiveness investigations to demonstrate that increased spending on spinal fusions is concurrent with increased value as assessed through patient-based quality outcomes. Notably, we find that there has been an analogous increase in the utilization of major hip and knee procedures while the utilization of CABG procedures has decreased.
Summary Points

There has been a dramatic increase in the utilization of spinal fusions and associated healthcare charges over the study period.

The increased utilization of spinal fusions is not explained by increasing proportion of elderly in the population.

The increase in utilization of spinal fusions is analogous to the increased utilization of major hip and knee procedures, but utilization of non-orthopaedic procedures (in this case, CABG) has decreased.

Future studies should aim to demonstrate increased utilization of fusions with improved quality-of-life outcomes to better correlate utilization of resources with value (quality/cost).