THE ECONOMIC VALUE OF NEUROSURGICAL RESIDENTS

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Disclosures

None
Neurosurgery residents perform various clinical duties that are of significant clinical and economic value to their hospitals and practices.

Payment of residents has historically come from two streams: direct medical education and indirect medical education payments.

- Both of these payments are formula driven and do not account for the potential differences in financial impact of different specialty programs on teaching hospitals.

This study seeks to evaluate the economic value of neurosurgery residents by measuring contribution on the basis of facility charges and work relative value units (wRVUs).
Methods

• Current Procedural Technology (CPT) codes from January 1st to June 30th, 2017 were collected retrospectively for all operative procedures performed by 7 residents at Buffalo General Hospital and Erie County Medical Center.

• For each procedure specific economic variables were obtained using the US CMCS Physician Fee Schedule.
  • Relative value unit (RVU), work relative value unit (wRVU), and facility price
  • Potential resident compensation was estimated using historical neurosurgery compensation data from the AMGA.
    • Resident contribution was estimated by multiplying the facility price and wRVU of procedures requiring a first-assist by the advanced practice practitioners (APP) modifier of 15%.
    • Given their similar levels of training, it was assumed that residents contributed to the procedure in a manner equal to that of a physician assistant or nurse practitioner.
Results

• For each procedure that allowed a first-assist to be billed, the facility price and wRVU provided by the CMCS Physician Fee Schedule were multiplied by the APP modifier of 15%.
  - The resultant values were summed to determine the total number of APP wRVUs and APP charges.
• Data from a 2015 AMGA study on neurosurgery compensation was used to calculate APP charges based on median wRVU for neurosurgery. This was done to equate the value of the wRVUs to a fully trained neurosurgeon.
• During the study period a total of 1,427 CPT codes were included. Results for estimated productivity and potential compensation are shown to the right.

### 1/1/2017 - 6/30/17 BGH & ECMC OR Productivity

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>APP wRVU</td>
<td>4238.43</td>
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<tr>
<td>APP Facility Price</td>
<td>$258,333.51</td>
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<tr>
<td>APP Charges (UBNS)</td>
<td>$695,326.07</td>
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<tr>
<td><strong>Potential Resident Contribution Compensation</strong></td>
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<tr>
<td>AMGA 2015 Median Comp (neurosurgery)</td>
<td>$772,914</td>
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<tr>
<td>Median wRVU (neurosurgery)</td>
<td>9,700</td>
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<tr>
<td>Median Comp per wRVU (neurosurgery)</td>
<td>$79.68</td>
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<tr>
<td>Potential Comp (study period)</td>
<td>$337,717.75</td>
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<tr>
<td>Annualized Potential Comp (dept.)</td>
<td>$675,435.50</td>
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<tr>
<td>Annualized Potential Comp per resident</td>
<td>$96,490.79</td>
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Discussion

• During the six month study period, trainees logged 4,238.43 wRVUs, equating to $337,717.45 in revenue left unbilled. These figures include OR productivity from BGMC and ECMC, accounting for two of our four facilities staffed by University at Buffalo neurosurgery residents. Assuming similar volume and case type, the estimated annual total departmental resident productivity and compensation is estimated to be 8,476.86 wRVUs and $675,435.50.

• According to a recent study, the average cost to train a resident in New York State was $139,126 (5).
  • Based on our estimate of revenue generated per resident, the present model has the potential to generate a self-sustaining residency training program for neurosurgery.
Summary

• The work currently performed by neurosurgical residents is of significant economic value.

• Based on the present data, the economic value of neurosurgery resident productivity is may be sufficient to sustain both the cost of their education and salary, which opens the door for the possibility of creating a self-funded and sustained neurosurgical training program.

• Further studies are needed to examine the value of the sum of resident productivity outside of just operative assistance, as well as in the development of a feasible economic model for the development of self-funded training program.
  • Specifically to address, non-OR work (i.e. outpatient clinic, inpatient consults, and bedside procedures) as well as the variance in geographic cost-of-training
References