THE ECONOMIC VALUE OF A NEUROSURGEON TO A HOSPITAL

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Engaging in complex financial negotiations is an increasingly common activity for neurosurgeons in a variety of practice settings. These negotiations often take place with hospitals. Knowledge of our financial value to a hospital is critical to the strengthening our position in these negotiations, whether these are over salary/benefits, equipment purchases, establishment of medical directorships, joint venturing, pay for call, and/or other important matters.

The purpose of this project is to provide specific tools by which a neurosurgeon can estimate his/her direct financial impact or worth to a hospital as measured by hospital collections directly generated by a neurosurgeon’s activities. It must be kept in mind that a neurosurgeon brings considerable additional value to a hospital in ways that are difficult to quantify and are outside the purview of this project. The ability to offer neurosurgical services adds considerably to the reputation of a hospital as well as the ability of a hospital to accept transfers that may require neurosurgical evaluation even when admitted to other services. No hospital can market itself as a comprehensive medical center without adequate neurosurgical coverage. The management of neurosurgical patients often requires the utilization of other hospital lines of service, which can represent a significant source of hospital revenue. In addition, state reimbursement for trauma care in some states is tied to trauma level designation which is affected by neurosurgical coverage.

Neurosurgery is an important complimentary service for many other specialties as well. Neurootology and skull base otolaryngology require collaboration with neurosurgery. Oncologists and radiation oncologists often depend on neurosurgeons to assist with the management of metastatic disease to the brain and spine. Neurologists frequently call on neurosurgeons for a variety of services. Neurosurgery is also necessary for a stroke program or a truly comprehensive spine program. While the ability to offer these services carries great financial benefit to a hospital and should be kept in the forefront by the negotiating neurosurgeon, financial quantification of this value is outside the scope of this project.

Neurosurgeons directly generate revenue for a hospital in many ways. The most obvious and significant is hospital reimbursement for inpatient and outpatient surgical procedures. Admissions that do not result in surgery but require clinical management by neurosurgeons as well as admission of patients to a hospital-owned inpatient rehabilitation facility (IRF) also can represent a significant source of hospital revenue. In addition, outpatient radiology and laboratory studies, outpatient physical/occupational therapy, neurodiagnostics, and provision of durable medical equipment (DME) produce hospital revenue.
Previous work exploring this question has been based upon either survey data or, in the case of the senior author (JDD), unverifiable and anecdotal information provided by a hospital. A document entitled “2010 Inpatient/Outpatient Revenue Survey” produced by Merritt-Hawkins summarized the data from surveys of hospital CFOs re: hospital collections by specialty per full time physician. The greatest shortcoming of this survey is the poor response rate with only 114 of 5000 surveys completed. Nonetheless, the collected data showed the average revenue generated by a neurosurgeon to be $2,815,650, a figure higher than any other specialty. Highlighting the importance of being armed with such data was the further observation that the average salary/income guarantee offer for a neurosurgeon derived from the Merritt Hawkins 2010 Review of Physician Recruiting Incentives was $612,000, also higher than any other specialty.

The senior author (JDD) requested the same data in 2009 from the hospital where his practice group of six neurosurgeons have historically done the vast majority of their surgery. Data from our one orthopedic spine partner was excluded. The average revenue reported by the hospital per surgeon was $2.9 million. However, this figure excluded the bulk of revenue generated from radiology and physical/occupational therapy, as the group members are all shareholders in other facilities providing these services.

We have produced a series of spreadsheets containing most of the avenues by which a neurosurgeon’s clinical activities can produce revenue for a hospital. They are, however, not exhaustive. Each is intended for editing by the user to add additional items and to remove items that don’t apply to the user’s particular practice. We recommend a careful examination of the documents found at http://medpac.gov/payment_basics.cfm to gain a more detailed understanding of Medicare reimbursement to hospitals across a whole spectrum of services. Included in these documents are thorough explanations of how payments vary from hospital to hospital allowing a more precise calculation of actual Medicare reimbursements at a particular institution with which a neurosurgeon may currently have or be considering a relationship.

For acute surgical and non-surgical inpatient care, Medicare reimburses according to the inpatient prospective payment system (IPPS). We have included a spreadsheet with a list of clinically cohesive groups as recognized by the Centers for Medicare and Medicaid Services (CMS). These groups, called Medicare severity diagnosis-related groups (MS-DRGs), are each given a weighted value (weight) that may change from year to year and which is used by CMS to determine acute care hospital reimbursement for Medicare inpatients. There are 746 MS-DRGs recognized in 2011 comprised of 335 base MS-DRGs most split into 2 or 3 MS-DRGs based on presence of either comorbidities/complications (CC) or major CC (MCC). These 746 MS-DRGs are divided into 25 major diagnostic categories (MDCs) by organ system. There are both medical and surgical MS-DRGs. Medical DRG codes are determined by principle and secondary ICD-9 diagnosis codes. Surgical DRG codes are listed by hospital surgical procedure code (different from professional CPT codes.) We have chosen many of the most relevant MS-DRGs for neurosurgeons, but it is important for individual practitioners to add or remove MS-DRGs to this spreadsheet to more accurately represent their practice. We believe that using Medicare reimbursements is a reasonable foundation
for a study of hospital reimbursement for neurosurgical patients, as worker’s compensation, Medicaid, and private insurance reimbursement rates are increasingly based on Medicare reimbursement rates.

To calculate the actual reimbursement for an inpatient admission, one simply multiplies the weight of the appropriate DRG by a hospital’s “rate”. The national base rate for 2011 is $5584 which is the sum of an “operating payment” of $5164 (based on operating expenses: labor, supplies, etc.) and a “capital payment” of $420 (based on depreciation, interest, rent, property insurance, and property taxes.) This ($5584) is the national average prospective payment to a hospital for inpatient care for a patient whose primary discharge diagnosis carries an MS-DRG “weight” of 1. Actual payment rate to a particular facility will vary depending on a host of factors including, but not limited to: local labor costs, disproportionate share of low income patients (as measured by % who are on SSI or covered by Medicaid), full LOS vs. transfer, “new technology” payment, rural hospital adjustment, graduate medical education additional payment, organ acquisition payments, and outlier payments (for rare, particularly costly cases.) Calculating the actual payment rate (base rate with all the previously described adjustments) for a particular hospital is possible by querying the databases for the hospital in question at www.cms.gov and editing the spreadsheet to reflect these actual numbers. One should also be aware that, remarkably, Medicare pays hospitals 70% of the bad debt from unpaid deductibles and copays from Medicare inpatients.

The calculation of hospital revenues from acute inpatient admissions/surgery is complicated by the complexity of determining whether there is an associated CC or MCC. Included in the “Neurosurgeon worth supplemental…” folder are two files, one with a comprehensive list of CC’s and the other with a comprehensive list of MCC’s. Each have hundreds of diagnoses. If this weren’t complicated enough, there are some CC’s and MCC’s which are considered to be included with the primary (non-CC or MCC) code (eg myelopathy in a patient whose primary MS-DRG is 473, cervical fusion). While hospitals will invariably have employed expert coders who comb the surgeon’s history and physical and hospital notes for all stated diagnoses and enter them into a software system which produces the proper MS-DRG, most surgeons lack those resources.

We recommend a mutually beneficial dialogue with a hospital with two goals. The first is to ensure that the surgeon’s H&Ps are routinely and thoroughly documenting all comorbidities so that the hospital is properly reimbursed for the care provided. Hospital coders are not allowed to comb the chart for diagnoses that the admitting physician does not specifically identify in his/her admitting H&P, subsequent progress notes, and discharge summary. As an example, BMI>40 is considered a CC, but coders are not allowed to find the height and weight and calculate the BMI unless the surgeon specifically notes that the patient is morbidly obese. The second purpose for dialoguing with the hospital on this matter is to obtain from them the historic breakdown of the surgeon’s admissions by CC and MCC. This will allow a more precise use of the acute inpatient spreadsheet.
Payment rates for outpatient services including diagnostic radiology, outpatient surgery or radiosurgery performed in the hospital or in a hospital affiliated ASC (updated regularly by CMS to include any procedures not deemed to always require an overnight stay), discography, spinal injections, EMG/NCV, EEG, neuropsychological evaluations, emergency department visits, and hospital clinic visits are all set according to the outpatient prospective payment system (OPPS). All of the approximately 3400 services are grouped with "similar" services into a much smaller number of ambulatory payment classification groups (APCs). Each APC has a relative weight. Payment for each service is calculated as relative weight multiplied by a conversion factor (CF), to 60% of which is applied a hospital wage index adjustment (40% is not subject to the wage index adjustment.) The hospital wage index varies by location and is available by geographic area at www.cms.gov. Additional adjustments are made for small, rural hospitals, children’s hospitals, and cancer hospitals, and outlier payments are allowed but limited. The unadjusted national conversion factor for 2011 is 68.876, and we have used this number to calculate a national average payment for each service in our spreadsheet.

Clinical laboratory services are identified and paid by Medicare by Healthcare Common Procedure Coding System (HCPCS) code. The payments can vary from state to state as CMS allows some variation by the Medicare administrative contractors (MACs). However, most reimburse at the national limitation amount (NLA) which is what we have provided in our lab spreadsheet. Again, state specific data can be obtained at www.cms.gov.

Outpatient physical and occupational therapy services represent another potentially significant source of hospital revenue generated by a neurosurgeon. Outpatient therapy is paid by Medicare according to the fees in the physician fee schedule with each service identified by HCPC code, and each therapy HCPC code value is determined by weight as measured in relative value units (RVUs). Each of the three RVU components (work, practice, and professional liability insurance) is adjusted by separate geographic practice cost indexes (GPCIs) according to local conditions. This adjusted RVU value is then multiplied by the national conversion factor (33.9764 in 2011.) There are additional upward adjustments for services provided in an underserved area, and there is an annual cap for a Medicare beneficiary that is $1870 in 2011. We have provided a PT/OT revenue spreadsheet allowing calculation of hospital revenues generated from these sources.

Provision of durable medical equipment (DME) to patients of neurosurgeons can also produce significant revenue for hospitals. DME is defined as an item that can withstand repeated use, primarily serves a medical purpose, and is generally not useful to a well person. Certain medications are also covered under the DME benefit by Medicare (for example albuterol for a nebulizer.) All DME items are divided into five categories and a total of about 2000 product groups. Each item within a product group is reimbursed the same. Most items are paid by the average of the allowed charges from 1986 and 1987 adjusted by the urban consumer price index, and there is a separate fee schedule for each state. There is no published national average for DME. All rates are subject to a national floor and ceiling to reduce the variability that may have existed in 1986 and 1987. Requirements for DME providers to participate in Medicare have increased considerably.
in recent years, and, while an initial competitive bidding project has been abandoned, there are plans to reintroduce competitive bidding. The provided DME spreadsheet contains values for the state of Mississippi, and it is recommended that the data for the specific state in question be obtained for a truer estimate. It is also critical to determine what specifics codes are applicable for the particular items ordered as there is considerable variability in fee between products whose descriptions are very similar.

Medicare and other payors also provide reimbursement to inpatient rehabilitation facilities (IRFs), some of which are free standing facilities and some of which are specialized hospital units (rehab floors.) Medicare reimburses these facilities according to the inpatient rehabilitation facility prospective payment system (IRF PPS). This system functions similarly to the IPPS for acute inpatient care. Instead of MS-DRGs, each patient is assigned to one of 100 case mix groups (CMGs), each of which has four additional tiers based on associated comorbidities, producing 400 possible payment amounts. The national base rate for a CMG/tier with a value of one is $13,860 for 2011. Seventy five percent of the base rate is adjusted by the local hospital wage index to account for variations in labor costs, and the other 25% of the base rate is not. There are also upward adjustments for rural location, disproportionate share of low income patients, and for teaching facilities. We have not produced a spreadsheet for IRF revenues, but a revenue estimate can be obtained by downloading the appropriate spreadsheet at www.cms.gov, and performing the same calculations as for other service categories.

The single greatest limitation of this project/tool is the fact that hospital reimbursement from non-Medicare sources varies considerably by both region and payor. Additionally, these rates are often negotiated by payor with each individual hospital. These are typically contractually confidential and are thus not obtainable with complete accuracy. For purposes of this project/tool, we recommend calculating reimbursement for privately insured patients as 175% of Medicare. This is a figure derived from the 2008 California OSHPD Hospital Annual Financial Data Profile (the most recent year for which there is data) which is readily available online at www.oshpd.ca.gov/HID/Products/Hospitals/AnnFinanData/HAFD.pdf. Reimbursement by private third party payors was adjusted by the % difference in gross revenue (by hospital day for inpatient data and by visit for outpatient data) to provide a fair comparison that did not exaggerate the discrepancy between Medicare and private payors. Remarkably, private third party hospital reimbursement was an identical 175% of Medicare for both inpatient and outpatient services.

Medicaid hospital reimbursement varies by state. Medicaid is a state run program with publicly available hospital reimbursement data in each state. For purposes of this project, we have estimated Medicaid reimbursement in each spreadsheet as being 90% of Medicare. We recommend obtaining the specific data for each state. Worker's Compensation reimbursement rates also vary considerably by state. It is typically administered and regulated by a state agency or commission with a publicly available hospital fee schedule. In Mississippi, inpatient maximum reimbursement allowable (MRA) is exactly 200% of the Medicare national base rate. In some states, including
Mississippi, private contracting between individual carriers and hospitals may complicate calculations, but discounts off of the fee schedule maximums are usually small.

Another limitation of this study is that it can only estimate how much a hospital will be reimbursed for a given patient. It does not estimate how much a hospital must expend to care for the patient. An understanding of how much a hospital is reimbursed for a given patient may represent an important starting point for engaging in discussions of cost saving measures that will hopefully provide a neurosurgeon with important leverage for future negotiations.

We recommend that the practicing neurosurgeon who is interested in making an estimate of hospital collections or potential collections from his/her practice follow the reading of this document with reading the folder containing the well written MEDPAC documents detailing how Medicare (as well as most other payors) pays for various services. This should be followed by opening each spreadsheet and editing according to specific location and other circumstances. A diligent practitioner can produce a pretty accurate estimate of his/her actual or potential hospital revenues.

In summary, this work is an attempt to provide any practicing neurosurgeon with tools by which to estimate his/her direct economic impact on a hospital in the form of actual hospital collections from clinical activities. It does not attempt to quantify the collections from admissions to other services that would not have been possible without neurosurgery coverage not does it attempt to place an economic value on intangibles such as hospital image or prestige associated with offering more comprehensive care. The associated spreadsheets are intended for editing by the individual practitioner to include revenue producers that we may have excluded as well as to remove those that don’t apply in particular practices. It is hoped that this work will prove useful to neurosurgeons in a variety of practice settings for a broad range of negotiations with hospitals.