

Assessing the Value of Work Done by an Orthopedic Resident During Call

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Abstract

Background Medicare funding for graduate medical education may be cut in the next federal budget.

Objective We quantified the value of work that 1 orthopedic surgery resident performs on call and compare it to Medicare educational funding received by the hospital for each resident.

Methods A single orthopedic resident's on-call emergency department and inpatient consults were collected during a 2-year call period at a large, tertiary, level-1 trauma center. Patient charts were reviewed; ICD-9 codes, evaluation and management, and procedural treatment were recorded. Codes were converted into work relative value units. The number of work relative value units was multiplied by the 2012 Medicare rate of \$34.03 per relative value units to calculate the monetary value of resident work.

Results Of 120 resident call shifts, 115 call sheets (95.8%) were available for review, and 1160 patients were seen (average = 10.09 consults/call). A total of 4688 work relative value units were generated (average = 40.76 per night), and the total dollar value generated was \$159,561 (\$1,387 per call) during the 2 years of call (average = \$79,780 annually). Evaluation and management codes generated 2340 work relative value units, with a calculated dollar amount of \$79,648, and procedural codes generated 2348 work relative value units, with a calculated dollar amount of \$79,913.

Conclusions Our institution estimated Medicare direct medical education support per resident at \$40,000/y, and total funding was \$130,000/resident. At our tertiary care institution, the unbilled work of 1 orthopedic resident on call amounts to more than 60% of Medicare direct medical education and indirect medical education funding annually.

Introduction

Resident physicians are a critical part of the medical workforce. They are important to the care for medically underserved patients and improve access to care by working at academic medical centers with a high volume of these patients. Most resident education is funded by the Medicare system, with national funding totaling \$9.5 billion in 2010.¹ To reduce the federal deficit, Medicare funding of graduate medical education (GME) has been targeted for cuts.¹ Simultaneously, numerous reports project coming physician shortages and decreased resident duty hours despite increased demand with the Affordable Care Act.¹ In this context, it is important to demonstrate

the value residents provide to the health care system during training to justify preservation or even increases in funding for GME.

Studies that quantify the amount and type of work done by residents are difficult to perform and interpret. Some have attempted to calculate the amount of work lost under duty hour reductions, resulting in estimates of as much as \$1.6 billion/y.^{2,3} Two studies^{4,5} tracked the types of duties that residents perform on call, whereas 2 others^{6,7} examined theoretical relative value unit (RVU) generation by residents and fellows. To date, no study, to our knowledge, has measured the number of RVUs generated by a single orthopedic resident while on call.

The purpose of our study was to quantify the amount and type of work performed by a junior orthopedic surgery resident during a 2-year experience of in-hospital call at a level-1 trauma center, and its calculated Medicare value. In our hospital, on-call work outside the operating room is performed without the attending physician being physically present, and thus, no bills are submitted for the care provided by the on-call resident. We compare the value of that work to the funding received from Medicare to support GME to determine whether the government investment in our orthopedic residency program is cost-effective.

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TABLE 1 CAROLINAS MEDICAL CENTER ORTHOPEDIC SURGERY RESIDENCY CALL SCHEDULE DURING POSTGRADUATE YEAR (PGY)–2 AND PGY-3		
Call Type ^a	Hours	Frequency
Night float		2 wk × 4/y
Sunday–Thursday	5:00 PM–6:30 AM	
Weekend call		1 shift every 3 weekends
Saturday	7:30 AM–7:30 AM	
Friday/Sunday	5:00 PM–7:30 AM/7:30 AM–5:00 PM	

^a The hours and frequency of call shifts. The weekend call was either Friday and Sunday shifts or a Saturday shift every third weekend.

Methods

We collected a single orthopedic resident’s on-call emergency department and inpatient consults during a 2-year (postgraduate year [PGY]–2 and PGY-3) call period at a large, tertiary, level-1 trauma center hospital. Patient charts were reviewed for demographic data, admission data, orthopedic diagnoses, and procedures performed without the presence of the attending surgeon. Each patient’s radiographs were reviewed and converted into International Classification of Disease, 9th Revision, codes. Procedural treatments provided acutely were reviewed and coded according to the Current Procedural Terminology (CPT) guidelines.⁸ Additional care for injury, such as a sling for a clavicle or scapula fracture or a cast for a distal radius fracture, was coded with the corresponding CPT code. If the CPT code included 90 days worth of follow-up care, then the –54 modifier was used to decrease the monetary value of the code by 30% to exclude follow-up care that the resident would not provide. The history and physical examination for either outpatient or inpatient consultation was also converted into an evaluation and management code. The CPT and evaluation and management codes were then converted into work relative value units (wRVUs)

using the 2012 Medicare wRVU crosswalk and then multiplying by the \$34.03 rate per Medicare wRVU for a total monetary value of work performed.⁹ The study was approved by the institution’s Institutional Review Board.

Results

There were 6 first-call junior (PGY-2 and PGY-3) residents in the call pool, which resulted in 120 calls per resident during a 2-year period. A *call shift* was defined as initially evaluating all orthopedic consults at a level-1, tertiary care hospital. Requests for consultation were from the adult or pediatric emergency departments or from current inpatients in the adult or children’s hospital. Call periods and frequencies are detailed in TABLE 1. In addition to orthopedics, our service covers hand consults 30 of 30 d/mo and spine consults an average of 7 of 30 d/mo.

Of the 120 call shifts, data for 115 shifts (95.8%) were available for review. A total of 1160 patients were seen (average = 10.09 consults/night), with 306 consults (26.4%) on patients younger than 18 years old, and 854 consults (73.6%) on patients 18 years or older. Consult types by orthopedic subspecialty are outlined in FIGURE 1.

Evaluation and management codes generated 2340 wRVUs with a calculated dollar amount of \$79,648. Procedural codes generated 2348 wRVUs with a calculated dollar amount of \$79,913. There were a total of 4688 wRVUs generated during the 115 call nights (40.76 RVUs/night, 4.04 wRVUs/patient). The total wRVU and consult figures can be seen in TABLE 2. The most common procedures and CPT codes are seen in FIGURES 2 and 3.

Discussion

Medicare remains the largest supporter of GME,¹ providing direct payments of \$3 billion/y to cover medical education expenses (direct medical education [DME]) related to the care of patients on Medicare and approximately \$6.5 billion in indirect medical education (IME) funding to

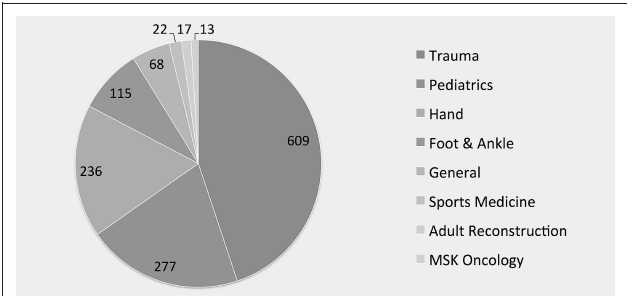


FIGURE 1 NUMBER OF CONSULTS BY SUBSPECIALTY TYPE Individual consults may have involved more than 1 subspecialty (ie, trauma and hand or trauma and sports).

TABLE 2 SUMMARY OF PRODUCTIVITY MEASURES

	Per Shift, Average	Total
Consults	10.09	1160
wRVUs	40.76	4688
Calculated dollar amount	\$1,387	\$159,561

Abbreviation: wRVUs, work relative value units.

teaching hospitals for the additional training-related costs associated with patient care.¹⁰ The DME payments are for direct costs of GME (stipends and benefits for residents and faculty), whereas IME payments cover expenses associated with treatment of severely ill patients and the additional costs related to teaching residents. Our institution estimated Medicare DME support per resident at \$40,000/y, and Medicare IME of \$90,000/resident/y for the years studied (written communication, D. Underwood, MBA, September 11, 2012).

This is the first study, to our knowledge, to quantify orthopedic resident on-call work and its monetary value. Studies⁷ in other specialties estimated pediatrics residents' outpatient clinic work to generate between \$67,230 and \$96,072 in Medicare revenue per year in 2001 and calculated the value of a pediatrics surgery fellow's on-call work at \$25,855 in billable services (annually).⁶ We found more than \$79,000 in billable resident services despite our calculation represented an underestimation of 4% because of the missing call sheets.

Medicare funding for physician training has been frozen since 1997, despite a 35% increase in the number of

matriculating medical students since 2002.¹¹ The Bowles-Simpson commission, tasked with reducing the federal deficit, proposed decreases in DME and IME payments that could total \$6 billion by 2015 and \$60 billion by 2020.^{12,13} Those changes would be implemented at a time when resident duty hours are being restricted further, physician shortages are predicted,¹¹ and after the anticipated increase in demand for health care because of the enactment of the Affordable Care Act.¹⁰ Reducing resident numbers or their duty hours will result in work currently done by residents being shifted to midlevel providers or attending surgeons, who will bill the government or private payers.

Our study has limitations, including that it details the experience of 1 resident at a single institution. The volume and nature of patient encounters on call differs among residents and institutions. Our study also does not account for the value added by on-call residents functioning as surgical assistants in the operating room (another unbilled service). We also did not identify the funding source for each patient, and some may have had private health insurance, whereas others were funded by Medicaid, Medicare, or self-pay. This highlights that commercial payers also benefit from residents providing clinical services that are not billed, yet they do not contribute to GME funding. We calculated the monetary value in Medicare dollars because that is the most uniform national payer with an assigned, annual dollar value per wRVU. The clinical work detailed in this study is provided in our hospital without the attending orthopedic surgeon being physically present, and thus, no bills are submitted for this resident work. Our institution does not support emergency medicine attending physicians billing for work done by orthopedic residents in the emergency department.

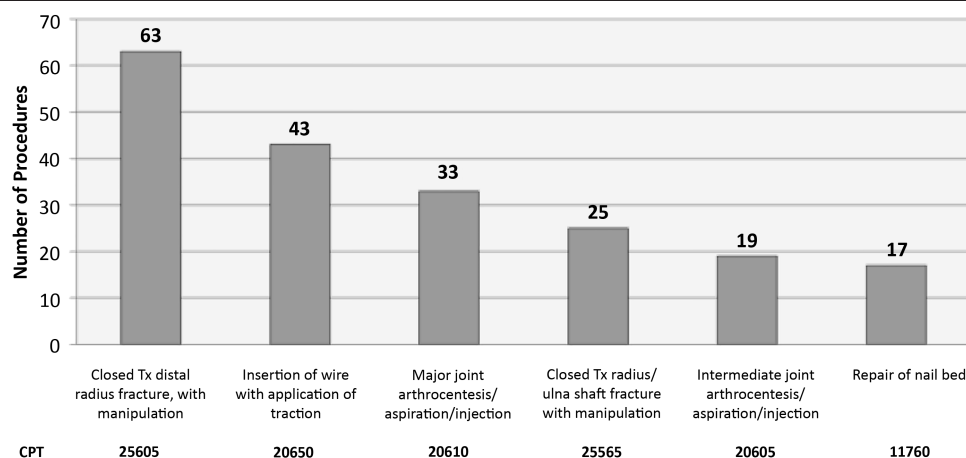


FIGURE 2 MOST COMMONLY PERFORMED PROCEDURES BY THE ON-CALL RESIDENT

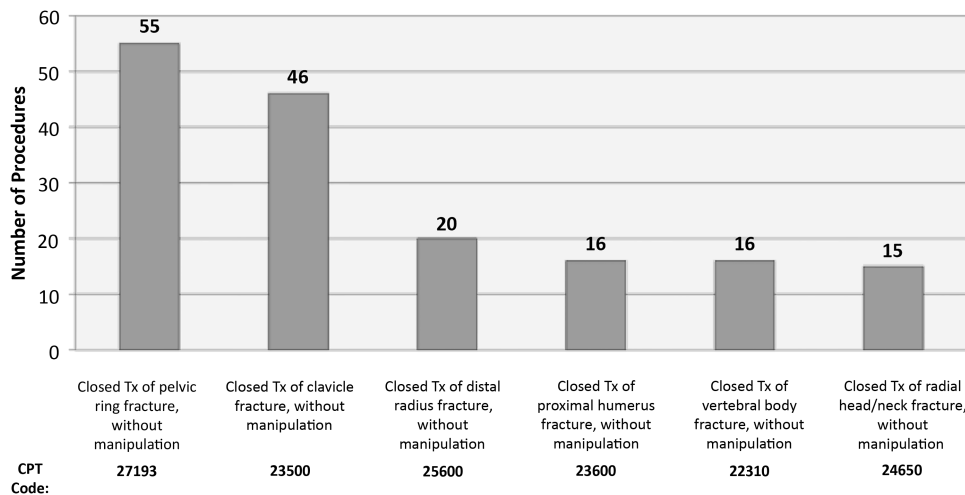


FIGURE 3

MOST COMMONLY MANAGED PROCEDURES BY THE ON-CALL RESIDENT WITHOUT INTERVENTION

Conclusion

Our findings support maintaining the level of Medicare funding received for residency programs, because the value of on-call work by orthopedic residents is twice the amount of DME funds paid to our hospital and more than 60% of the amount of combined DME and IME payments.

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