Practice patterns of academic general thoracic and adult cardiac surgeons

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Objective: We hypothesized that academic adult cardiac surgeons (CSs) and general thoracic surgeons (GTSs) would have distinct practice patterns of, not just case-mix, but also time devoted to outpatient care, involvement in critical care, and work relative value unit (wRVU) generation for the procedures they perform.

Methods: We queried the University Health System Consortium-Association of American Medical Colleges Faculty Practice Solution Center database for fiscal years 2007-2008, 2008-2009, and 2009-2010 for the frequency of inpatient and outpatient current procedural terminology coding and wRVU data of academic GTSs and CSs. The Faculty Practice Solution Center database is a compilation of productivity and payer data from 86 academic institutions.

Results: The greatest wRVU generating current procedural terminology codes for CSs were, in order, coronary artery bypass grafting, aortic valve replacement, and mitral valve replacement. In contrast, open lobectomy, video-assisted thoracic surgery wedge, and video-assisted thoracic surgery lobectomy were greatest for GTSs. The 10 greatest wRVU-generating procedures for CSs generated more wRVUs than those for GTSs ($P < .001$). Although CSs generated significantly more hospital inpatient evaluation and management (E & M) wRVUs than did GTSs ($P < .001$), only 2.5% of the total wRVUs generated by CSs were from E & M codes versus 18.8% for GTSs. Critical care codes were 1.5% of total evaluation and management billing for both CSs and GTSs.

Conclusions: Academic CSs and GTSs have distinct practice patterns. CSs receive greater reimbursement for services because of the greater wRVUs of the procedures performed compared with GTSs, and evaluation and management coding is a more important wRVU generator for GTSs. The results of our study could guide academic CS and GTS practice structure and time prioritization. (J Thorac Cardiovasc Surg 2014;148:1162-6)

In the community, mixed practice cardiothoracic surgeons are common. Nationally, surgeons defined as adult cardiac surgeons (CSs) perform 40% and 39% of pneumonectomies and lobectomies, respectively.[1] However, in a recent study, our group demonstrated that surgeons defined as general thoracic surgeons (GTSs) performed most of the complex noncardiac thoracic surgery performed in academic medical centers in the United States.[2]

The practice patterns of academic GTSs, which have tended to be elective and oncology based, might intuitively be expected to differ from the practice patterns of academic adult CSs, which have tended to be more inpatient based and critical care oriented, with more of an emergency or urgent patient population. We hypothesized that academic CSs and GTSs would have distinct practice patterns, including case mix, time devoted to outpatient care, involvement in critical care, and work relative value unit (wRVU) generation. To test this hypothesis, we queried the Faculty Practice Solution Center (FPSC) database, a national US database used for collating coding and billing data from participating academic practices. Objective coding and billing data were used to determine the practice patterns of academic CSs and GTSs.

We sought to determine the relative importance of the evaluation and management (E & M)-generated wRVUs compared with procedural coding-generated wRVUs to CS and GTS academic practices and the contributions of critical care. The results of the present study might bring value to the thoracic surgery specialty by guiding academic CS and GTS practice structure and prioritization and be instructional for professional development.

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Disclosures: Authors have nothing to disclose with regard to commercial support.

Received for publication June 7, 2013; revisions received April 12, 2014; accepted for publication April 17, 2014; available ahead of print May 15, 2014.

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0022-5223/$36.00

http://dx.doi.org/10.1016/j.jtcvs.2014.04.035

METHODS

Database

The present study was a retrospective cohort analysis using the University Health System Consortium and Association of American Medical Colleges FPSC database. The FPSC database is a compilation of billing, coding, productivity, and payer data from 86 academic institutions (all affiliated with a Liaison Committee on Medical Education–accredited US medical school) and includes >60,000 physicians in multiple specialties, as described in previous reports.[2,3] Only data from clinically active faculty who had spent >60% of clinical time in a specific clinical

Abbreviations and Acronyms

CABG = coronary artery bypass grafting
CPT = current procedural terminology
CS = cardiac surgeon
E & M = evaluation and management
FPSC = Faculty Practice Solution Center
GTS = general thoracic surgeons
wRVU = work relative value unit

pursuit (eg, CS and GTS) were included in the benchmarking process. We queried the FPSC database for the 3 fiscal years 2007-2008, 2008-2009, and 2009-2010. Of the 796 faculty participants included for fiscal year 2007-2008, 257 were identified as academic GTSs and 539 as CSs. Of the 874 faculty participants included for fiscal year 2008-2009, 279 were academic GTSs and 595 were CSs. Finally, of the 933 faculty participants included for fiscal year 2009-2010, 303 were academic GTSs and 630 were CSs. The data collected were de-identified, and the centers had contributed voluntarily. The University of California Davis Medical Center institutional review board approved the present project.

Search Criteria

Current procedural terminology (CPT) codes were categorized as either procedural or E & M.[4] The mean wRVUs and billing frequencies were abstracted for CSs and GTSs. The average wRVUs and billing frequencies for each CPT code were defined for the CSs and GTSs for the 3-year period. The most common procedures and procedures that generated the most wRVUs and the distribution of the procedural and E & M codes were determined for both CSs and GTSs. The frequency and wRVU generation for outpatient versus inpatient E & M coding and the frequency and wRVU generation of critical care E & M codes were also calculated for both groups.

Statistical Analysis

Student's *t* test was used when comparing the continuous variables between the 2 groups. The results from all *t* tests were considered statistically significant if $P \leq .05$. All statistical calculations and analyses were performed using Microsoft Excel for Windows 7 (Microsoft, Redmond, Wash).

RESULTS

Billing Frequency Characteristics

Of the 10 most frequently billed procedures from the CSs, all were cardiac-associated procedures (Table 1). For GTSs, only 1 of the top 10 most frequently billed procedures was cardiac in nature, coronary artery bypass grafting (CABG), single arterial graft. In order, the 3 most frequently billed procedures for CSs, expressed as 3-year averages, were CABG, single arterial graft; endoscopy, surgical, for CABG procedure (representing endoscopic vein harvest); and aortic valve replacement. Of the top 10 most frequent procedures for the CSs, 6 were CABG related, representing 30.1% of total CS procedures. For the GTSs, the top 3 in order were diagnostic bronchoscopy, regional thoracic lymphadenectomy, and mediastinoscopy. For the GTSs, CABG, single arterial graft, was the 10th most frequent procedural code (13.2 cases annually; 1.8% of total procedures).

The inpatient versus outpatient distribution of E & M CPT codes was compared for the 2 disciplines (Figure 1). For GTSs, the office outpatient services for new or established patients constituted 81.8% of total E & M billing and was greater than that for the CSs (62.0%; $P = .01$). The hospital inpatient services represented a larger percentage of total E & M billing for CS practice (37.9%) than for GTS practice (18.2%, $P < .001$). For both CS and GTS, critical care services represented a small fraction of the total E & M billing (1.5% for both).

rWVU Characteristics

The average top wRVU generating procedural CPT and E & M codes for the study period are listed in Table 2. CABG, single arterial graft, was the greatest wRVU-generating code for CSs (15.4% of total) and [open] lobectomy, single lobe, the greatest for GTSs (7.4% of total procedural and E & M wRVUs). Within the top 10 wRVU-generating codes for CSs, none were E & M codes. In contrast, 3 of the top 10 codes for the GTSs were E & M codes, all generated in the outpatient setting. Nine of the top wRVU-generating CPT codes for the CSs were strictly cardiac procedures, with the 10th being exploration of the chest. Exploration of the chest was defined as exploration for postoperative hemorrhage, thrombosis, or infection.[4] For the GTSs, CABG, single arterial graft, was the fourth greatest wRVU-generating code.

The 20 greatest wRVU-generating procedure codes for each specialty were analyzed as 3-year averages (Table 3). Of the top 20 procedures for the CS, 19 were purely cardiac in nature, with the 10th code, exploration of the chest, somewhat ambiguous regarding whether it applied to CS or GTS. For the GTSs, 3 of the top 20 greatest wRVU-generating procedures were cardiac surgical procedures. The 3 greatest wRVU-generating procedures for the CSs, in order, were CABG, single graft (2032.3 wRVUs), aortic valve replacement (1171.1 wRVUs), and mitral valve replacement (657.2 wRVUs). The 3 greatest wRVU-generating procedures for the GTSs, in order, were [open] lobectomy, single lobe (701.1 wRVUs); thoracoscopy, surgical, with wedge resection of the lung (454.3 wRVUs); and thoracoscopy, surgical, with lobectomy, total or segmental (384.1 wRVUs). CABG, single graft, was the fourth greatest wRVU-generating procedure for GTSs, with lobectomy and thoracoscopy not included in the top 20 for CSs.

Of the wRVUs generated by the top 50 procedural and E & M CPT codes for GTSs during the study period, 18.8% were generated by E & M codes compared with only 2.5% for CSs (Figure 2).