

## Clinical Revenue Directly Attributable to Anesthesiology Residents

During the graduate medical education reform of the 1990s, anesthesiology programs across the country downsized to accommodate a perceived oversupply of anesthesiologists in the marketplace and to make room for an additional number of training positions in the primary care residencies.<sup>1</sup> As academic programs struggled to work more efficiently either with replacement of clinical staff members or with different staffing models, many programs experienced an increase in their operational costs because of a reduction of their labor force and a discrepancy in anesthesiology billing practices.<sup>2,3</sup> Prior to 2011, the Centers for Medicare and Medicaid Services (CMS) and many private insurance companies reimbursed anesthesiology programs at a 50% discount. Today, academic anesthesiology programs have been able to bill for 100% of the services provided, regardless of staffing ratios.<sup>4</sup>

We examined the revenue stream directly generated by the clinical activities of anesthesiology residents at our program during the time period July 1, 2011, through June 30, 2012, and demonstrated that our entire residency program delivered 4664 billable anesthetics, billed for \$7,892,558, and collected \$2,802,969 in total payments. We determined that direct costs for an anesthesiology resident by clinical training year, including salary and fringe benefits for Clinical Anesthesia year 1 (CA-1), CA-2, and CA-3, were \$65,951, \$71,492, and \$75,636, respectively. With a total cost of nearly \$1,300,000 for our residency, we estimate that the direct revenue attributable to the anesthesiology residents is \$1,500,000.

There are several limitations to our analysis. First, the applicability of this methodology to other institutions may be limited for academic programs with different staffing models. Our methodology only accounts for the differences in billing when residents are staffed at 1:1 versus 1:2 ratios, and we show differences between the various classes in the subgroup analyses. Second, our academic program uses both a web-based scheduling program (OpenTempo, Richmond, VT) and an electronic billing service (PAR Management, Newton, MA). Academic programs without similar services may find it difficult to accurately track the revenue stream attributable to anesthesiology residents. Third, across the country, each training program faces a

different payer mix, which affects the reimbursement rates for clinical activities. Finally, we do not account for the indirect costs of training residents (eg, academic time to prepare lectures, teaching time in the operating room, assistant residents in research projects). For instance, using a survey method, Kelly et al<sup>5</sup> estimated that the “hidden” costs average \$4,439 per resident annually.

As anesthesiologists are challenged to redefine their roles in perioperative medicine, the clinical and administrative scope of practice continues to expand. Academic anesthesiology departments are unique in that a portion of work performed by their residents can be quantified with an electronic billing system. Although it is tempting to presume that anesthesiology residents are capable of creating a significant revenue stream for their clinical activities, it is important to recognize that the mission of an academic anesthesiology department is to balance the clinical, research, and educational components of a well-managed program.

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