



Improving the value of same-day pediatric orthopaedic surgery by using ambulatory surgery centers: direct cost savings are important, but there is more to the picture

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Comment on: Fabricant PD, Seeley MA, Rozell JC, *et al.* Cost Savings From Utilization of an Ambulatory Surgery Center for Orthopaedic Day Surgery. *J Am Acad Orthop Surg* 2016;24:865-71.

Received: 24 March 2017; Accepted: 30 April 2017; Published: 09 June 2017.

doi: 10.21037/aoj.2017.05.03

View this article at: <http://dx.doi.org/10.21037/aoj.2017.05.03>

Introduction

Attempts to improve the value of health care can pursue one of two primary aims: increase the quality of care while keeping costs level, or keep quality level while reducing costs (1). The Medicare Bundled Payment for Joint Replacement (2) is the highest-profile effort by the United States government to incentivize value-improvement efforts in orthopedic surgery. In a recent study, Peter Fabricant and co-authors (3) attempt to calculate the cost savings realized by performing surgery in an ambulatory surgery center (ASC) instead of in a university hospital (UH) setting. While they did not study the procedures that fall under the bundled payment program, they were attempting to answer the same fundamental question—how can surgical care be delivered most efficiently?

Summary of findings

The retrospective, observational study by Fabricant *et al.* compared the perioperative costs of surgical care for eight pediatric orthopedic procedures between an urban UH and an affiliated suburban ASC. The same attending surgeons and pool of residents provided the surgical care at both facilities. The UH and ASC purchased supplies from the same vendors at the same cost. The non-high-risk patients were given the choice of UH versus ASC, while those with significant comorbidities or expectations of complicated surgery (about 10% of the final sample) were assigned to the UH and subsequently excluded from the

analysis. The study utilizes two data sources: (I) electronic medical record (EMR) data, including operating room (OR) time, post-anesthesia care unit (PACU) time, and basic case variables (patient demographics, operation); and (II) hospital accounting data, including patient-level direct fixed and variable costs. Indirect costs, surgeon and professional fees, pre-operative time, and post-discharge costs were not included. No quality of care or outcomes data were reported.

The final sample of 1,021 patients had 1,365 procedures performed; 63% in the UH and 37% in the ASC. They estimated direct cost savings ranging from 17% for osteochondritis dissecans drilling to 43% for meniscus repair. On average, anesthesia time was reduced by 17 minutes per case, and operative time reduced by 47 minutes per case; these time improvements accounted for 80% of the estimated cost savings. The remaining 20% of savings were due to reduced use of supplies.

When moving to an ASC, count all the costs

In a single-institution observational analysis, the authors demonstrated reduced direct costs when performing low-risk orthopedic procedures on healthy adolescents in an ASC instead of a UH. Several issues must be considered when generalizing these results to other UHs, which may be looking for ways to reduce their operating costs or are considering opening an ASC themselves.

While Fabricant *et al.* must be commended for using hospital accounting data, we feel it is important to point

out the fundamental tradeoff that the authors made in conducting their analysis. They chose to collect patient-attributable cost data that was available and accurate, at the expense of being incomplete. They excluded multiple dimensions of care that contribute to the overall cost of surgical treatment and may differ between ASCs and UHs. We will highlight three.

First, costs were limited to those incurred in the OR and PACU. The stages of diagnosis, testing, referral, rehabilitation or “pre-hab”, prescriptions, follow-up outpatient or emergency care, and post-operative rehabilitation all contribute to the costs of an episode of care, around which bundled payments are conceptually based (4).

Second, the authors’ statement that their reported costs “represent the hospital’s actual cost of service delivery” cannot be entirely accurate. First, they only included direct costs and excluded indirect costs. These include facility staffing costs, operations, maintenance, utilities, and administrative overhead. Turnaround time between cases also falls in this category. It is uniformly assumed that these types of costs are lower in ASCs rather than UHs, so the current study may actually underestimate the potential cost savings opportunity of a UH-affiliated ASC. Second, while not explicitly stated, their accounting likely relied on top-down cost-center methodologies rather than more granular mechanisms such as “microcosting” or Time Driven Activity Based Costing (TDABC) (5-7). The cost-center approach is simpler, less expensive, and at the end of the day, balances the books. This methodology has been used in several surgical studies assessing cost-of-care (8-10). An over-simplified example of this methodology is calculating the “cost” of OR time: if it costs \$300,000 to run an OR for 300 hours then the cost per hour is \$1,000. TDABC, on the other hand, starts at the smallest unit—it calculates the cost per time unit of a given resource (e.g., Pre-op RN, OR Tech) and the amount of time that a patient consumes that resource. Pooling these small costs allows identification of the total cost of care for an individual patient moving through an entire episode of care. TDABC has been employed in a wide range of healthcare settings, including urology (11-13), neurosurgery (14), and radiology (15,16). An added benefit of TDABC is the ability to map the process of care and identify areas for improvement (7). The downside, of course, is TDABC is resource intensive and many institutions may not feel the benefits that are useful to note. Two other technical points are worth noting—the authors do not mention adjusting

cost data for time, which could bias results if the proportion of patients having surgery at the ASC changed over time. And their use of percent change is biased upward as they left out professional/surgeon fees which would increase the denominator without changing the numerator.

Lastly, if a UH does not already possess an ASC, the transition costs—both financial and cultural—can be substantial. Buying or building and licensing an ASC is a nontrivial and potentially risky investment that can take years to implement and backfire financially (17). Perhaps more importantly, however, actually transitioning surgical cases from a UH to an ASC can be challenging. A rule of thumb among close followers of the ASC industry is that generally only 50% of potential ASC cases actually get moved from a hospital-based setting (17). The reasons for this are multiple. Patient factors are one: Fabricant *et al.* left the choice of setting to the patients, and nearly 2/3 chose the UH. Surgeon factors are another: opening an ASC will require surgeons to change their practice habits and weekly or even daily schedule in order to commute to an ASC. If the ASC isn’t across the street from the UH, this disruption should not be underestimated. Additionally, some surgeons, particularly those that have practiced exclusively in an UH their entire career, will be reluctant to operate in settings where tertiary care backup—however unlikely it is they may need it—is unavailable. The capability of a UH’s leadership to navigate these transition issues will no doubt vary by institution, and these should be accounted for in seeking to generalize these results.

Conclusions

Increasing specialization and standardization of personnel, equipment and processes yield improvements in safety, efficiency and reliability in other industries, and are beginning to do so in health care as well (18,19). The ASC represents one way in which this vision can be realized for surgical care. Fabricant *et al.* successfully show that direct intraoperative costs for low-risk pediatric orthopedic procedures are significantly lower in an ASC rather than a hospital. However, it is important to note that this study does not provide the whole picture, as costs from other phases of the care episode, indirect costs, and institutional transition costs are omitted. Additionally, equivalent quality and outcomes between the ASC and UH were assumed, rather than reported. In the long run, we should expect to see a continued migration of surgical care to these lower-overhead, more efficient environments, but it is incumbent

upon the institutions involved to fully account for all of the cost and quality implications of such a decision.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned and reviewed by the Section Editor Hongfei Shi, MD, PhD (Department of Sports Medicine and Adult Reconstruction, Drum Tower Hospital, Medical School, Nanjing University, Nanjing, China).

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/aoj.2017.05.03>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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doi: 10.21037/aoj.2017.05.03

Cite this article as: O'Neill SM, Childers CP, Maggard-Gibbons M. Improving the value of same-day pediatric orthopaedic surgery by using ambulatory surgery centers: direct cost savings are important, but there is more to the picture. *Ann Joint* 2017;2:27.