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DUTY HOUR REFORM AND THE OUTCOMES OF PATIENTS TREATED BY NEW SURGEONS

Evaluating a New Paradigm in Surgical Training

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KEY**FINDINGS**

Despite concerns that duty hour reform might adversely affect the performance of new surgeons, this national study found no impact on patient outcomes, including 30-day mortality rates, failure-to-rescue, length of stay, and use of intensive care units. These findings should allay fears that reduced work hours during residency would produce surgeons less prepared for practice than their more experienced colleagues.

THE QUESTION

In 2003, the Accreditation Council for Graduate Medical Education transformed surgical training—and stirred controversy—by implementing reforms to resident duty hours. Among other changes, the restructured residency experience produced a net loss of 6-12 months of clinical training (as a result of reduced work hours). Some program directors, experienced surgeons, and trainees themselves questioned whether these changes would affect the development of surgical skills, judgment, and autonomy. To date, studies of duty hour reform have largely focused on its impact on residents during training and on patients in academic medical centers. This study assesses the impact of duty hour reform on the performance of new surgeons after their transition to independent practice.

The authors use a novel approach to account for potential changes over time in surgical performance that might be unrelated to duty hour reform. The study looks at whether the relative performance of new surgeons (compared to their more experienced colleagues) changed over two periods: 1999-2003 (pre-reform) and 2009-2013 (post-reform). Patients of new surgeons (defined as practicing less than three years) were matched by hospital and operation with patients of experienced surgeons (practicing greater than 10 years) in both periods; only the new surgeons in the later period had been trained after duty hour reform. More than 2,500 new/experienced surgeons were paired in the traditional era, and compared to nearly 1,900 new/experienced surgeons in the modern era.

The question under study was whether the known gap in outcomes between new and experienced surgeons changed after duty hour reform. To find out, the authors compared 30-day mortality, readmissions, failure-to-rescue (death after developing a complication), and other outcomes in Medicare patients of general and orthopedic surgeons practicing in more than 1,400 hospitals nationwide.

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THE FINDINGS

The 30-day mortality rates of new surgeons were slightly higher than experienced surgeons in both training eras, but significantly higher only in the traditional era (7.0% vs. 6.3%). Importantly, the paired differences over the two periods did not change significantly in terms of 30-day mortality, 30-day failure-to-rescue, 30-day readmissions and death, ICU use, or length of stay. However, the paired differences indicated that patients of new surgeons trained in the modern era required increased anesthesia time (+9 minutes), experienced higher odds of prolonged stay (+8%), and higher 30-day resource costs (+$255, in 2013 dollars). The authors note that an emphasis on reducing readmissions in the modern era may encourage physicians to prolong length of stay.

The results were similar for general and orthopedic surgeons, with a notable exception. Patients of new general surgeons trained in the modern era had relatively lower 30-day readmissions or death (-14%). However, this reflects a slight increase in 30-day readmissions among experienced surgeons across training eras, rather than a change in the rate of readmissions among new surgeons in the modern era.

No significant difference in relative performance of new and experienced surgeons from traditional to modern era

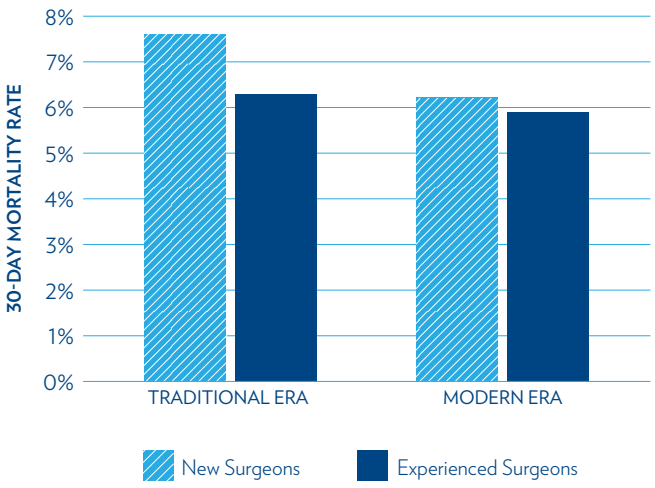

Figure 1. Matched 30-day mortality rates, new and experienced surgeons, traditional and modern era.

THE IMPLICATIONS

This is the first national study to address concerns about the impact of duty hour reform on the performance of new surgeons. By using contemporaneous experienced surgeons as controls, the authors address controversy surrounding the new educational model's impact on patient outcomes. The study's findings provide reassurance that patient outcomes did not suffer when surgical training was restructured. To our knowledge, this is the first study to use the patient outcomes of practicing surgeons to measure changes in surgical training. These methods can be a template for evaluating the impact of other educational reforms across medical specialties.

THE STUDY

The authors identified nearly 1.5 million fee-for-service Medicare beneficiaries aged 65.5 or older who underwent general or orthopedic surgery (requiring an incision) in two time frames: 1999-2003 and 2009-2013. They identified the operating physician for each patient using the Medicare Part B file. For patients with multiple qualifying surgeries, an operation was chosen randomly, so that each patient was included only once.

They divided surgeons into four groups based on training era (before or after reform) and experience level (new or experienced). Surgeons trained before reform completed their entire residency prior to reform and began independent practice between 1999 and 2003. Surgeons trained after reform entered independent practice between 2009 and 2013. "New" physicians had less than three years of independent practice, and "experienced" ones had ten or more years of independent practice.

In each training era, new and experienced surgeons operating in the same hospital were paired for this "difference in differences" analysis. This resulted in 2,578 pairs in the pre-reform era and 1,820 pairs in the post-reform era. Within each surgeon pair, the authors selected 10 patients of experienced surgeons and 10 patients of new surgeons for analysis. The patients were matched by procedure, demographics, and risk factors (such as comorbidities) that could contribute to differences in outcomes. The primary outcome was 30-day mortality; other outcomes included 30-day readmissions, anesthesia time, length-of-stay, ICU usage, and 30-day resource-based costs.

Kelz RR, Niknam BA, Sellers MM, Sharpe JE, Rosenbaum PR, et al. Duty Hour Reform and the Outcomes of Patients of New Surgeons. *Annals of Surgery*. 2020 Apr;271(4):599-605.

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