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Anesthesiologist Direction and Patient Outcomes

Abstract

The relationship between physicians and nurses in the delivery of anesthesia care is politically and financially charged, and hotly debated. Against this backdrop, federal regulators have proposed dropping a Medicare requirement that nurse anesthetists be supervised by a physician. Proponents note that the new regulations would resolve inconsistencies between Medicare supervisory requirements and state law, while opponents voice concerns for patient safety. This Issue Brief describes the current controversy, and summarizes a newly published study that suggests differences in patient outcomes depending on the nature and level of anesthesiologist involvement in surgical care.

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Anesthesiologist Direction and Patient Outcomes

Editor's note: The relationship between physicians and nurses in the delivery of anesthesia care is politically and financially charged, and hotly debated. Against this backdrop, federal regulators have proposed dropping a Medicare requirement that nurse anesthetists be supervised by a physician. Proponents note that the new regulations would resolve inconsistencies between Medicare supervisory requirements and state law, while opponents voice concerns for patient safety. This Issue Brief describes the current controversy, and summarizes a newly published study that suggests differences in patient outcomes depending on the nature and level of anesthesiologist involvement in surgical care.

Who delivers anesthesia care?

In the United States, anesthesia care is primarily delivered by anesthesiologists and certified registered nurse anesthetists (CRNAs). These providers have worked together or separately for many years in a variety of models, ranging from independent practice to a team approach. As the pressure to contain health care costs mounts, and as payers seek the most cost-effective mix of health care professionals, competition between anesthesia providers has intensified.

- CRNAs are advanced practice nurses who administer approximately 65% of all anesthetics delivered in the United States each year, most often in conjunction with an anesthesiologist. CRNAs practice in every setting where anesthesia is available and are the sole anesthesia providers in many rural hospitals.
- Administrative language in Medicare Part A requires physician supervision of CRNA as a condition of hospital participation in Medicare. However, CRNAs have been reimbursed directly by Medicare Part B, without any supervision requirement, since 1986.
- Nursing statutes and regulations in 29 states do not require physician supervision of CRNAs. In 1997, the Health Care Financing Administration (HCFA) proposed a rule that would remove the federal requirement and defer to state law on the issue of physician supervision of CRNAs. In March 2000, HCFA announced it would move forward on its proposal, although the final rule has yet to be published.
- While the proposed rule was pending, Congressional bills were introduced on both sides of the issue. Some bills require HCFA to finalize the proposed rule and remove physician supervision requirements (H.R. 804, S. 866); others mandate a large-scale anesthesia outcomes study before any change is finalized (H.R. 632, S. 818).

Pennsylvania study examines the effect of anesthesia providers on surgical outcomes in Medicare patients

A newly published study by Silber and colleagues examined surgical outcomes in Medicare patients who had different anesthesia providers. The investigators analyzed Medicare claims records for all elderly patients in Pennsylvania who had general surgical or orthopedic procedures between 1991-1994, and used billing records to determine the level of anesthesiologist involvement in each case.

- Cases were defined as “directed” if an anesthesiologist billed Medicare Part B for personally performing a case or medically directing a CRNA or physician resident. “Medical direction,” as defined by HCFA, involves performing a pre-anesthetic examination, prescribing the anesthesia plan, being physically present in the operating suite, and providing post-anesthesia care. No more than four cases can be medically directed by a physician concurrently. Physicians not meeting these strict criteria could bill for “supervision” if appropriate, but they received markedly reduced payments.
- The remainder of cases were considered “undirected” by an anesthesiologist. This group included cases that had no Part B bill for anesthesia care (61%) and those that had a Part B bill by someone other than an anesthesiologist (39%). The no-bill cases could represent supervision or performance by a hospital-employed physician or CRNA, or an undirected physician resident case. The billed cases were either directed by a non-anesthesiologist, supervised by an anesthesiologist or other physician, or performed by a CRNA without a physician billing for supervision.
- Across 245 hospitals, there were 194,430 “directed” cases and 23,010 “undirected” cases. Within these two groups, Silber and colleagues examined the following outcomes: death rate within 30 days of admission, in-hospital complication rate, and failure-to-rescue rate (defined as the rate of death after complications).

Directed and undirected cases had different patient and hospital characteristics

The two groups of the study were dissimilar in important patient and hospital characteristics.

- Undirected patients were more likely to be male, to have a history of arrhythmia, congestive heart failure, and non-insulin-dependent diabetes, and to have been admitted through the emergency room. Directed patients were more likely to have cancer.
 - Hospitals in which undirected cases occurred tended to be smaller (less than 200 beds), to have less specialized technology and facilities, and were less likely to be involved with teaching medical students and residents. Hospitals in which directed cases occurred tended to have higher percentages of anesthesiologists and surgeons who were board-certified.
 - These differences pointed to the need to adjust for patient and institutional characteristics as the study data were analyzed. Thus, the investigators adjusted for 11 hospital characteristics (such as size, nurse staffing, trauma center designation), 27 patient characteristics, and 42 procedure categories. They also adjusted for each individual hospital in a separate analysis.
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Undirected group had higher mortality, failure-to-rescue rates

After statistical adjustments to account for different characteristics in the two groups, significant differences in outcomes remained. The undirected group had higher 30-day mortality rates and failure-to-rescue rates, although the complication rate was the same in both groups.

- Compared to the directed group, the undirected group had a higher mortality rate, accounting for 2.5 excess deaths per 1,000 cases, and an even higher failure-to-rescue rate, accounting for 6.9 excess deaths per 1,000 cases with complications.
- The complication rate was similar in the groups, consistent with previous research indicating that complications are poorly recorded in Medicare claims, and are a poor indicator of quality of care.
- The results were unchanged when the investigators considered only billed cases, non-emergency cases, or when they adjusted for the individual hospital and the size of its metropolitan area. These and other analyses suggest that the results do not reflect differences in overall hospital quality, in severity of illness, or in how hospitals assigned cases to be directed or undirected (selection bias).
- Besides anesthesiologist direction, two other factors were related to lower mortality and failure-to-rescue rates: larger hospital size and a higher registered nurse-to-bed ratio. This is consistent with other studies that highlight the importance of nurse staffing in patient outcomes.

Strengths and limitations of the Pennsylvania study

The study's strengths lie in its use of well-established and well-recorded outcome measures, as well as its extensive statistical adjustments for severity of illness and other factors known to be associated with outcomes. As in all claims-based outcomes research, the study is limited by possible errors in billing information.

- The 30-day mortality rate is the most commonly used quality outcome measure in health services research. This measure is especially appropriate in this study, since modern perioperative intensive care often delays immediate postoperative deaths even when the precipitating event occurs in the operating room. This study suggests that anesthetic practice potentially influences operative mortality to a much greater extent than previously recognized.
- The failure-to-rescue rate is a relatively new measure that might provide better insight into quality of care than either mortality or complications. This rate is likely to be affected less by errors in the measurement of patient characteristics and severity of illness, and more by the provider's skill and training.
- Because the study was based on Medicare claims data, the accuracy of the definition for "directed" and "undirected" anesthesia care is only as reliable as the bills (or lack of bills) submitted by providers. In-depth review of medical charts would provide the clinical information needed to confirm the billing data.

POLICY IMPLICATIONS

The study provides insights into provider and hospital factors that affect surgical outcomes in Medicare beneficiaries. It suggests significant differences in outcomes based on the level of involvement of an anesthesiologist in delivering anesthesia care.

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POLICY IMPLICATIONS

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- These results should be addressed and confirmed by further studies, ideally ones that include chart reviews. Further research is needed to clarify whether these results are due to billing anomalies, differences in postoperative care, or the nature and quality of physician oversight of anesthesia care.
- The study does not directly address the question of physician supervision of CRNAs, since all cases in the study were ostensibly supervised by a physician (as per Medicare regulations), though not necessarily an anesthesiologist. However, the findings suggest that qualifications and training of the anesthesia provider have a large impact on mortality.
- Further research is needed to delineate optimal roles for the anesthesiologist and CRNA. New Medicare billing procedures, effective January 1998, might help researchers correctly identify the level of involvement of the CRNA and anesthesiologist in each case. Medicare claims now have specific codes for personally performed procedures, medical direction, medical supervision, direction of residents, as well as procedures performed by CRNAs.
- The legislative battles rage on, as both sides await publication of HCFA's final rule. Legislation must balance professional roles and patient welfare, while preserving access to anesthesia care and healthy competition among qualified providers. Late last month, two new bills (H.R. 5286 and H.R. 5251) were introduced in Congress, both delineating new Medicare rules for CRNAs.

This Issue Brief is based on the following article: J.H. Silber, S.K. Kennedy, O. Even-Shoshan, W. Chen, L.F. Koziol, A.M. Showan, D.E. Longnecker. Anesthesiologist direction and patient outcomes. *Anesthesiology*, July 2000, vol. 93, pp. 152-163. See also Dr. Silber's testimony before the Subcommittee on Antitrust, Business Rights, and Competition, Judiciary Committee, U.S. Senate, June 7, 2000.

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