

## Anesthesiology

## Patient safety

### Influence of anesthesiologists' supervision ratios on first-case starts

Anesthesiologists often supervise 2 certified registered nurse anesthetists concurrently. Administrators who want to reduce their anesthesia group's costs sometimes encourage anesthesiologists to change their supervision ratios from 1:2 to 1:3.

Hospitals offer many first-case start times and focus on starting these cases on time. The number of supervising anesthesiologists may affect the feasibility of first cases starting on time.

Using 1 year's data from an anesthesia information management system, researchers from the Jefferson Medical College, Philadelphia, and the University of Iowa, Iowa City, examined:

- anesthesiologist supervision lapses (an interval with too few anesthesiologists to supervise all critical portions of cases) with a ratio of 1:1, 1:2, and 1:3
- the peak time of day supervision lapses occurred
- the average delay when 2 patients supervised by the same anesthesiologist were ready for induction at the same time.

The researchers found that even at a supervision ratio of 1:2, lapses occurred on 35% of days, and the peak incidence of lapses occurred before 8 am. For first cases, the average time from patient entry into the OR until the patient was ready for prepping and draping was 22.2 minutes. Changing the ratio to 1:3 had an even larger effect, with lapses during first case starts on 99% of days.

The researchers concluded that either staggered case starts or additional anesthesiologists working at the start of the day are needed to reduce supervision lapses that delay first-case starts.

Epstein R H, Dexter F. *Influence of supervision ratios by anesthesiologists on first-case starts and critical portions of anesthetics*. *Anesthesiology*. March 2012;116:683-691.

[www.anesthesiology.org](http://www.anesthesiology.org)

### Preventing patient harm caused by defective surgical instruments

Defective surgical instruments may lead to serious patient harm during surgery, such as tissue damage, bleeding, and retained pieces of broken instruments. The risk of broken instruments associated with serious patient harm is not well known, however.

The purpose of this retrospective study from the University of Tokyo, Japan, was to examine the features of defective surgical instruments and establish a strategy to reduce the risk of patient harm.

Researchers studied 19,474 surgical procedures from 2007 to 2009 and found 1,775 nonfunctioning instruments. Of these, 112 were found during a surgical procedure and were associated with near-miss incidents in the OR—2 of which were potentially critical.

More than half of the defective instruments were tissue-grasping, bone-boring/gnawing, and endoscopic instruments. Wearing out and inappropriate use of instruments were 2 major causes of defects. The rest consisted of inadequate inspection and factory defects.

The manufacturer's inspection found 346 defective endoscopic instruments.

The researcher concluded that the appropriate use and adequate inspection of instruments are key for reducing the risk of patient harm caused by defective surgical instruments.

Yasubara H, Fukatsu K, Komatsu T, et al. *Prevention of medical accidents caused by defective surgical instruments*. *Surgery*. February 2012;151:153-161.

<http://journals.elsevierhealth.com/periodicals/ymsy>

## Role of third-party vendors in bronchoscope malfunction, incomplete disinfection

Infection outbreaks associated with bronchoscopes have been linked with failures in cleaning and disinfection, malfunctioning parts, and damage that occurs during use. Optimally, repairs of damaged bronchoscopes are performed by the manufacturer. However, because of the high cost of repairs, it is common for institutions to use less expensive third-party vendors.

In this report, researchers from Johns Hopkins University School of Medicine, Baltimore, describe the investigation of a cluster of 4 patients whose bronchoalveolar lavage cultures grew *Pseudomonas putida*. The investigation led to the discovery that bronchoscope repairs made by a third-party vendor may have contributed to bronchoscope damage and contamination.

The 4 patients had undergone bronchoscopy with 1 of 2 bronchoscopes. Inspection found that these 2 bronchoscopes had biopsy ports that were easily loosened by hand and had sludge accumulation at the port site. Samples taken from the bronchoscopes grew *P putida*, *Pseudomonas aeruginosa*, and *Stenotrophomonas maltophilia*. The *P putida* strains from the bronchoscopes matched those from the patients.

Investigators found that the bronchoscopes had been sent to a third-party vendor for repair and maintenance, rather than sending them to the manufacturer. Examination of the bronchoscopes by the manufacturer found irregularities in repairs and nonstandard part replacements. No further cases of *P putida* were identified after the bronchoscopes were removed from service.

The investigators concluded that third-party vendors without access to proprietary information may contribute to malfunction of devices, which can lead to contamination and incomplete disinfection.

An accompanying editorial by infection prevention experts David Weber, MD, and William Rutala PhD, MPH, from the University of North Carolina Medical School, Chapel Hill, notes that this report illustrates the importance of proper repair and maintenance of bronchoscopes and the possibility of damage by third-party vendors.

Cosgrove S E, Ristaino P, Caston-Gaa A, et al. *Caveat Emptor: The role of suboptimal bronchoscope repair practices by a third-party vendor in a pseudo-outbreak of Pseudomonas in bronchoalveolar lavage specimens*. *Infect Control Hosp Epidemiol*. March 2012;33:224-229. *Accompanying editorial*, 230-234.

<http://www.jstor.org/action/showPublication?journalCode=infecontbospepid>

## Quality improvement

### Correlation between inpatient surgical outcomes and costs

Because of the growing recognition that inpatient surgical outcomes vary widely, payers, policy makers, and professional organizations have launched a number of quality efforts aimed at improving patient outcomes. Despite the obvious value of these programs, however, their effects on health care costs are uncertain.

In this study, researchers from the University

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of Michigan, Ann Arbor, examined the relationships between patient outcomes and 30-day Medicare payments in patients undergoing 4 common inpatient surgical procedures—coronary bypass, total hip, abdominal aortic aneurysm (AAA) repair, and colectomy.

Hospital complication rates were strongly correlated with payments for all 4 procedures. For coronary bypass, hospitals in the highest complication quintile had average payments \$5,353 per patient higher than hospitals in the lowest quintile. Payments to hospitals with high complication rates were also higher for colectomy (\$2,719), AAA repair (\$5,279), and total hip (\$2,436). Hospital mortality was not associated with higher payments.

The researchers concluded that Medicare payments for inpatient surgery are substantially higher at hospitals with higher rates of complications. The findings suggest that efforts aimed at improving surgical quality may ultimately reduce costs and improve outcomes.

*Birkmeyer J D, Gust C, Dimick J B, et al. Hospital quality and the cost of inpatient surgery in the United States. Ann Surg. January 2012;1:1-7.*

[www.annalsofsurgery.com](http://www.annalsofsurgery.com)

## Regional surgical quality collaborative improves outcomes, reduces costs

The development of systems to collect surgical data on a national level, such as the American College of Surgeons National Surgical Quality Improvement

Program (ACS NSQIP), plus process improvement based on the data have been shown to reduce morbidity and mortality.

Though there is a clear benefit to the use of these data on a national level, regional surgical quality groups have also shown significant improvement in outcomes by sharing data and auditing practice patterns.

In 2008, a 10-hospital regional surgical quality collaborative—the Tennessee Surgical Quality Collaborative (TSQC)—was formed by the Tennessee chapter of ACS, Tennessee Hospital Association, and BlueCross BlueShield of Tennessee Health Foundation.

In this study, researchers from Vanderbilt University Medical Center, Nashville, and the University of Tennessee College of Medicine, Chattanooga, hypothesized that overall patient surgical outcomes would improve using TSQC and the ACS NSQIP systems to share surgical processes and outcomes data.

Data from the 10-hospital collaborative were collected from January to December 2009 (period 1) and January to December 2010 (period 2). Postoperative complications and 30-day mortality were compared between periods, and hospital costs associated with complications were calculated.

A total of 14,205 surgical procedures were performed in period 1 and 14,901 in period 2. There were significant reductions between periods (per 10,000 cases) in surgical site infections (357.6 vs 289.9, 18.9% reduction), on ventilator longer than 48 hours (293.6 vs 250.3, 14.7% reduction), graft/prosthesis/

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flap failure (45.8 vs 18.1, 60.5% reduction), acute renal failure (75.3 vs 56.4, 25.1% reduction), and wound disruption (90.8 vs 59.7, 34.3% reduction). Though mortality was higher in period 2, no statistical difference was found. Net savings from avoiding complications were \$2,197,543 per 10,000 cases.

The researchers concluded that participation in the regional surgical quality collaborative resulted in improved outcomes and reduced costs.

*Guillamondegui O D, Gunter O L, Hines L, et al. Using the National Surgical Quality Improvement Program and the Tennessee Surgical Quality Collaborative to improve surgical outcomes. J Am Coll Surg. Article published Jan 23, 2012, online ahead of print.*

<http://www.journalacs.org/>

## Surgical trends

### VTE in arthroplasty patients receiving recommended prophylaxis

Postoperative venous thromboembolism (VTE) is the second most frequent surgical adverse event after infections. Without prophylactic therapy, its incidence is particularly high after orthopedic procedures.

Though systematic prophylaxis of VTE has been implemented for more than 20 years, no estimate of VTE risk before hospital discharge is available from the literature. In addition, rates of in-hospital VTE are often studied and reported in the context of safety reviews without a benchmark based on expected rates of events.

Researchers from Switzerland performed a meta-analysis to establish an estimate of symptomatic VTE event rates before hospital discharge in patients undergoing knee and hip arthroplasty. The analysis included 44,844 patients in 47 studies.

They found that approximately 1 in 100 patients undergoing knee arthroplasty and 1 in 200 patients undergoing hip arthroplasty will develop VTE before discharge despite receiving recommended prophylaxis.

The results can be used as a benchmark to eval-

uate patient safety indicators from routinely collected data, the researchers concluded. The findings also are of value to patients and clinicians when considering the risks and benefits of arthroplasty.

An accompanying editorial notes that the rates of symptomatic VTE before discharge may be suboptimal safety indicators because the period of VTE risk extends beyond the length of hospitalization from 4 to 12 weeks depending on the arthroplasty procedure. Future studies should lengthen the period of observation to accurately collect outcome events that reflect the entire period of VTE risk.

*Januel J M, Chen G, Ruffieux C, et al. Symptomatic in-hospital deep vein thrombosis and pulmonary embolism following hip and knee arthroplasty among patients receiving recommended prophylaxis. JAMA. Jan 18, 2012;307:294-303. Accompanying editorial, 306-3-7.*

[www.jama.com](http://www.jama.com)

### Gastric bypass better than banding for weight loss

Gastric banding and Roux-en-Y gastric bypass are used to treat morbid obesity. Bariatric procedures have more than doubled in the US, and the increase is much greater for gastric banding. This is possibly because banding is perceived as a simpler, safer, and reversible procedure and because of a huge marketing campaign.

In this study, researchers from Switzerland compared gastric bypass and banding in 422 matched patients to determine which procedure provided superior results.

The researchers found that patients undergoing bypass lost more weight and kept it off significantly better after 6 years than those undergoing banding. Though bypass patients had a higher rate of complications immediately after surgery (17.2% vs

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5.4%), in the long term, there were more complications (41.6% vs 19%) and more follow-up operations (26.6% vs 12.7%) after banding.

The researchers concluded that Roux-en-Y gastric bypass is associated with better weight loss than gastric banding, resulting in better correction of comorbidities. Higher early complication rates in bypass patients are compensated by much higher long-term complication and reoperation rates in banding patients.

Romy S, Donadini A, Giusti V, et al. Roux-en-Y gastric banding for morbid obesity. Arch Surg. Article published Jan 16, 2012, online ahead of print.

<http://archsurg.ama-assn.org/>

## Increase in BMP use not linked to better outcomes

Surgeons have rapidly adopted bone morphogenetic protein (BMP) for fusion surgery in older patients, though evidence of its efficacy and safety was sparse. BMP is used in 30% of spinal fusions.

This study, led by researchers from the Oregon Health and Science University, Portland, assesses BMP use among Medicare patients and compares complications, reoperation rates, and charges for patients undergoing lumbar fusion with and without BMP.

Analyzing Medicare data of nearly 17,000 lumbar spinal fusion procedures, the researchers found BMP use increased from 5.5% in 2003 to 28.1% in 2008. Complications, 30-day re-hospitalizations, and

need for repeat surgery were similar with and without BMP use. BMP increased hospital charges an average of \$15,000, though reimbursement under Medicare DRGs averaged only \$850 more. Patients receiving BMP were significantly less likely to need nursing home care while recovering, however.

The researchers concluded that the increased use of BMP for spinal fusion over the past decade has added substantial costs without improving outcomes.

Deyo R A, Ching A, Matsen L, et al. Use of bone morphogenetic proteins in spinal fusion surgery for older adults with lumbar stenosis. Spine. February 2012;37:222-230.

<http://journals.lww.com/spinejournal/>

## Standards and regulations

### American Society of Anesthesiologists

ASA has updated 3 documents with new evidence from the literature. The updates do not change current recommendations. Updates include:

- Practice advisory for preanesthesia evaluation.  
[http://journals.lww.com/anesthesiology/Citation/publishahead/Practice\\_Advisory\\_for\\_Preanesthesia\\_Evaluation\\_An.98930.aspx](http://journals.lww.com/anesthesiology/Citation/publishahead/Practice_Advisory_for_Preanesthesia_Evaluation_An.98930.aspx)
- Practice advisory for perioperative visual loss associated with spine surgery.  
[http://journals.lww.com/anesthesiology/Fulltext/2012/02000/Practice\\_Advisory\\_for\\_Periooperative\\_Visual\\_Loss.11.aspx](http://journals.lww.com/anesthesiology/Fulltext/2012/02000/Practice_Advisory_for_Periooperative_Visual_Loss.11.aspx)

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- Practice guidelines for acute pain management in the perioperative setting.

[http://journals.lww.com/anesthesiology/Fulltext/2012/02000/Practice\\_Guidelines\\_for\\_Acute\\_Pain\\_Management\\_in.10.aspx](http://journals.lww.com/anesthesiology/Fulltext/2012/02000/Practice_Guidelines_for_Acute_Pain_Management_in.10.aspx)

## Association of periOperative Registered Nurses

AORN has released an implementation guide for its “Recommended practices for prevention of retained surgical items.” The guide is the third in a series designed to bridge the gap between standards and their implementation.

<http://www.aorn.org/>

## Joint Commission

*Revised elements of performance for ASCs.* The Joint Commission has revised 3 elements of performance for ambulatory surgery centers (ASCs) that use deemed status. The changes modify language that requires ASCs to provide patient-rights information to patients before the date of surgery. This information can now be provided on the day of surgery.

The changes align Joint Commission requirements with CMS revisions to several Medicare conditions for coverage for ASCs made last fall. The changes will be in the 2012 update to the ambulatory care accreditation manual.

<http://www.jointcommission.org/issues/article.aspx?Article=VH06bZRjlxdvZuIY6nsBx2bkoTGsECp6XFrfCZSY1RI%3d>

*Targeted Solutions Tool for wrong site surgery.* The Joint Commission Center for Transforming Healthcare launched its Targeted Solutions Tool for wrong site surgery on Feb 14. The tool, which was piloted in 8 facilities, identifies specific areas of weakness to focus on for improvement. The tool is available to accredited organizations.

<http://www.centerfortransforminghealthcare.org/>

## US Government Accountability Office

*Lack of Price Transparency May Hamper Hospitals' Ability to Be Prudent Purchasers of Implantable Medical Devices.* This Government Accountability Office

(GAO) study, requested by Senator Max Baucus, chair of the Senate Finance Committee, finds that prices hospitals pay for implantable devices like automated implantable cardioverter defibrillators (AICDs) vary widely. On specific models, the difference between the lowest and highest prices ranged from \$6,844 to \$8,723 (including rebates).

The GAO notes that hospitals have difficulty comparing prices that might enable them to get better deals because many manufacturers require them to sign confidentiality clauses that restrict them from revealing the prices they pay. Physician preferences can also affect implant prices because they limit hospitals' abilities to get volume discounts.

Policymakers are concerned that the lack of price transparency inhibits competition, leading to higher spending on implants and thus higher costs for Medicare.

[www.gao.gov/assets/590/587688.pdf](http://www.gao.gov/assets/590/587688.pdf)

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