Early exposure to anesthesia linked to learning disabilities

Every year, millions of children receive general anesthesia for procedures ranging from hernia repair to ear surgery. Studies of learning and cognition in children exposed to anesthesia and surgery have been few, and they have relied on single outcome measures and have not controlled for comorbidities.

To investigate the association between early exposure to anesthesia and learning disabilities, researchers from the Mayo Clinic in Rochester, Minnesota, examined data on 350 children exposed to anesthesia and surgery before the age of 2 and matched them with 700 children who did not undergo a procedure with anesthesia.

Of those exposed to anesthesia, 286 had only 1 surgery and 64 had more than 1. Among children who had multiple surgeries, 36.6% developed a learning disability later in life. Of those who had just 1 surgery, 23.6% developed a learning disability, which compared with 21.2% of children who developed learning disabilities but never had surgery or anesthesia. Researchers saw no increase in behavior disorders among children with multiple surgeries.

The researchers concluded that repeated exposure to anesthesia and surgery before the age of 2 was a significant independent risk factor for the later development of learning disabilities.


Effectiveness of home laundering uniforms

Microorganisms are often shed from sick patients or are present in the environment and may contaminate nurses’ uniforms. In the UK, many nurses are expected to launder their uniforms at home, using washing machines that frequently have low-temperature wash cycles.

In this study, researchers from the UK investigated whether the use of low-temperature wash cycles results in a microbiologically acceptable uniform to wear in the hospital. They tested nurses’ uniforms worn at work plus fabric swatches experimentally contaminated with methicillin-resistant Staphylococcus aureus (MRSA) and gram-negative Acinetobacter baumannii.

The researchers found that home washing uniforms with detergent and a water temperature of 140°F (60°C) did eliminate both types of microorganisms. At a lower temperature of 104°F (40°C), MRSA was eliminated, but large amounts of Acinetobacter remained. Using a hot iron on uniforms after a 104°F wash did eliminate the Acinetobacter. The effect of tumble drying the uniforms was not tested.

In the US, a typical warm setting is 90°F to 111°F, while hot is 111°F, and cold is 70°F to 90°F. A more stringent standard has been issued by the US Environmental Protection Agency for “Energy Star” washers, which use 37% less energy and 50% less water than noncertified machines.

The researchers concluded that laundry in a domestic washing machine at 140°F (60°C) for 10 minutes is sufficient to decontaminate hospital uniforms and reduces the bacterial load by more than 7-log reduction. The addition of a biological or nonbiological detergent is beneficial in removing MRSA. Gram-negative bacteria that remain after laundering are effectively removed by ironing.

Lakdawala N, Pham J, Shab M, et al. Effectiveness of

http://www.jstor.org

Cardiac device-related infections linked to higher mortality, costs

Cardiovascular implantable electronic devices (CIED), such as pacemakers and defibrillators, can reduce morbidity and mortality in selected patients, but these benefits may have to be weighed against life-threatening and costly infectious complications.

In a study led by the Mayo Clinic College of Medicine, Rochester, Minnesota, researchers analyzed the risk-adjusted total and incremental admission mortality, long-term mortality, length of stay, and costs associated with CIED infections.

Of 200,000 Medicare patients who received devices or had one replaced or revised in 2007, 5,800 were admitted with an infection.

Depending on the type of device implanted, infection was associated with significant increases in admission mortality from 4.6% to 11.3% and increases in long-term mortality from 26.5% to 35.1%. Increases in incremental costs ranged from $14,360 to $16,500, and total admission costs from $28,680 to $53,350, depending on the device.

The researchers concluded that Medicare beneficiary admissions for CIED patients with infection are associated with significant, device-dependent, incremental increases in admission mortality, long-term mortality, length of stay, and cost compared with CIED patients without infection. Intensive care and pharmacy services accounted for more than half of the incremental costs associated with infections.


http://archinte.ama-assn.org/cgi/content/abstract/archinternmed.2011.441

Effect of surgeon sleep deprivation on outcomes in cardiac surgery

Sleep deprivation has been shown to have negative effects on mood and cognitive and psychomotor function, but the clinical relevance of these findings in surgical practice remains controversial.

Canadian researchers designed this prospective, observational study to determine the effect of surgeon sleep hours on patient outcomes in cardiac surgery.

Over a 6-year period (January 2004 to December 2009), researchers collected sleep hours of 6 cardiac surgeons ranging in age from 32 to 55 years. They analyzed the complication and mortality rates in cardiac procedures performed by surgeons with 0 to 3, 3 to 6, or more than 6 hours of sleep the evening before surgery.

Of 4,047 surgical procedures, 83 were performed by severely sleep-deprived surgeons with 0 to 3 hours of sleep, 1,595 by moderately sleep-deprived surgeons with 3 to 6 hours, and 2,369 with more than 6 hours.
Mortality rates and major complications were similar in all 3 groups. No significant association was found between surgeon age, hours of sleep, mortality, or major complications.

The researchers concluded that the study showed no evidence that surgeon sleep hours had an adverse effect on postoperative outcomes, even in patients with a high predicted risk.

An accompanying editorial by David D. Yuh, MD, division of cardiac surgery at Johns Hopkins Hospital, Baltimore, notes that the results of this study, while reassuring, may not be reflected in future cardiac surgeons. Surgeons in the study did not train under work-hour restrictions imposed by the Accreditation Council for Graduate Medical Education (ACGME) in the US. The concern many academic surgeons have is in the ability of the new generation of cardiac surgeons to sufficiently adapt to long hours and fatigue in their own practices without the ACGME work-hour protections they had as postgraduate trainees.


Quality improvement

Predictive factors of readmission rates after abdominal surgery

The last decade has seen an increased emphasis on reducing hospital length of stay. However, there has been no consensus on whether programs that encourage early discharge raise the risk of adverse outcomes and increase readmissions.

With readmission rates for surgeons becoming a quality indicator of performance, implications of readmission extend beyond financial concerns and could potentially affect credentialing and referral patterns. Thus, predictive factors of hospital readmission are needed.

The aim of this study from researchers at the University of Louisville School of Medicine, Louisville, Kentucky, was to evaluate predictive factors of hospital readmission rates in patients undergoing abdominal surgical procedures.

Of 266 patients evaluated, 78 (30%) were readmitted for various diagnoses, of which the most common was dehydration (26%).

Significant predictive factors for readmission were age of 69 years or more, number of discharge meds (9 or more), low amount of oral intake (50% or less) at home, and lack of caregiver at home.

Comorbidities, diagnosis, number of preoperative medications, patient education, type of surgical procedures, blood loss, and complications were not found to be significant for readmission.
The researchers concluded that readmission is a frequent event associated with gaps in follow-up care. An earlier outpatient visit after discharge could potentially prevent a percentage of patients needing to be readmitted.


**Surgical site infections**

**DVT prophylaxis increases SSIs in colorectal surgical patients**

There has been a push by national regulatory bodies and physician organizations to standardize the use of deep vein thrombosis (DVT) prophylaxis. The Joint Commission has included DVT prophylaxis as a quality measure.

Use of chemical prophylaxis has been associated with complications; however, and low-dose unfractionated heparin has been linked to postoperative bleeding, thrombocytopenia, wound drainage, and hematoma formation. Recently orthopedic studies have suggested that heparin may predispose patients to development of postoperative surgical site infections (SSIs).

This study from Cedars Sinai Medical Center, Los Angeles, examines the association between perioperative heparin and development of postoperative SSIs as well as length of stay in colorectal surgery patients.

Of 181 patients who underwent abdominal procedures performed by colorectal surgeons between July 2008 and June 2009, 82 patients (45%) received heparin prophylaxis and 99 (55%) did not.

SSIs occurred in 19 patients (23%) receiving heparin, compared with 9 (9%) who did not receive heparin.

Univariate analysis found SSIs to be associated with heparin use and increased operative time. Multivariate analysis showed SSIs associated only with heparin use.

The researchers concluded that there appears to be a higher incidence of SSIs in colorectal surgery patients treated with heparin prophylaxis. Careful evaluation of patients on an individualized basis for chemical prophylaxis should be performed to minimize morbidity.


**SSI rates in laparoscopic vs open colorectal surgery**

Colorectal surgery has traditionally had a high rate of surgical site infections (SSIs). The use of the laparoscopic technique to treat colorectal disease has been associated with more rapid return of pulmonary function, reduced ileus, and shorter length of stay. The laparoscopic technique has also been associated with decreased SSIs in less complicated gastrointestinal surgery. But, the complexity of laparoscopic colorectal surgery has limited more widespread adoption.

Using the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) data base, researchers from Huntington Memorial Hospital and Huntington Medical Research Institutes, Pasadena, California, evaluated the effect of laparoscopic versus open surgery techniques on the incidence of postoperative SSIs in colorectal surgery patients. A total of 7,755 laparoscopic and 16,184 open cases were identified.

The laparoscopic group had an SSI rate of 9.4%, compared with 15.7% in the open group, a significant difference. No statistical difference was found in
the type of SSIs (superficial, deep, and/or organ space) between the groups.

Multivariate analysis identified several factors associated with SSIs, but the laparoscopic technique was the only factor found to decrease risk. The researchers concluded that despite a significantly lower incidence of postoperative SSIs with laparoscopic colorectal surgery, only 32% of procedures were performed with this technique. Many stakeholders, including patients, physicians, payers, administrators, and policymakers are likely to drive adoption toward increased use of laparoscopic colorectal surgery.


Improving risk-adjusted SSI measures for the NHSN

The National Healthcare Safety Network (NHSN) provides simple risk adjustment of surgical site infection (SSI) rates to participating hospitals to facilitate quality improvement activities. However, procedure-specific, multivariate risk models that incorporate additional weighted patient factors could calculate more credible, standardized, and reliable risk-adjusted SSI metrics than the stratified SSI rates limited to the traditional NHSN risk index.

The objective of this study from the Centers for Disease Control and Prevention (CDC), Atlanta, was to develop new procedure-specific risk models for each of the procedure categories reported to the NHSN, incorporating existing NHSN data elements, and to compare their predictive performance with procedure category-specific models composed of only the traditional NHSN risk index.

The CDC uses the NHSN for surveillance of health care-associated infections, other adverse event in health care, and adherence to prevention practices in hospitals and other facilities.

From Jan 1, 2006, through Dec 31, 2008, 847 hospitals in 43 states reported a total of 849,659 procedures and 16,147 primary incisional SSIs among 39 operative procedure categories to the NHSN.

Overall, the median c-index (a statistic based on the ranks of predicted probabilities and compares these ranks in individuals with and without disease) of the new CDC procedure-specific risk models was greater than the median c-index of the NHSN risk index models. For 33 of 39 procedures, the new procedure-specific models yielded a higher c-index than did the NHSN risk index models.

The authors concluded that risk models based on the NHSN risk index, though simple in design, showed poor predictive performance for many procedures. The new procedure-specific predictive models developed with currently collected NHSN data elements significantly improved the predictive performance for most procedures.


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Standards and regulations

American Academy of Orthopaedic Surgeons

Preventing Venous Thromboembolic Disease. The American Academy of Orthopaedic Surgeons has released a new guideline on preventing venous thromboembolism in patients undergoing elective hip and knee arthroplasty.

Postoperative recommendations include:
- encouraging patients to walk as soon as possible
- administering anticoagulants
- using mechanical compression devices.

The authors recommended against postoperative ultrasonography screenings for thromboembolic disease because they were found not to reduce the risks of deep venous thrombosis or pulmonary embolism.

Preoperative recommendations include discussing with patients any history of blood clots and stopping medications such as antiplatelet medications or aspirin.

The guideline is an update of the 2007 guideline for preventing symptomatic pulmonary embolism in patient undergoing hip or knee arthroplasty. Differences between the two center on new processes for preventing bias and a new statistical technique for analyzing the data.

Food and Drug Administration

Preventing Surgical Fires Initiative. On Oct 13, the Food and Drug Administration and 16 partner organizations launched an initiative to:
- increase awareness of factors contributing to surgical fires
- disseminate tools for preventing surgical fires
- promote surgical fire risk reduction practices throughout the healthcare community.

Tools include a free fire safety video developed by the Anesthesia Patient Safety foundation and AORN’s Fire Safety Toolkit, which can be downloaded for free through Nov 13.

Pilot Program for Voluntary Parallel Review of Medical Devices. The Food and Drug Administration (FDA) and Centers for Medicare and Medicaid Services (CMS) have launched a pilot program for voluntary concurrent parallel review of new medical devices.

The program has the potential to increase patient access to innovative devices by reducing the time between FDA approval and CMS national coverage determination.

The FDA and CMS began accepting submissions on Oct 7 and issued procedures for voluntary participation. The voluntary program will last up to 2 years and will not change the existing separate and distinct review standards for FDA device approval and CMS coverage determination.

http://www.fda.gov/Drugs/DrugSafety/SafeUseInitiative/PreventingSurgicalFires/default.htm

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