



Society for Pediatric Anesthesia

NEWSLETTER

Volume 6 Number 2

Summer-Fall, 1993

SPA SEVENTH ANNUAL MEETING

The Seventh Annual Meeting of the Society for Pediatric Anesthesia (SPA) will be held Friday, October 8, 1993 at the Washington, DC Renaissance Hotel in the nation's capital. As in past years, a continental breakfast will be provided for participants of the meeting. Registration and breakfast will be at 7:00 a.m., and the meeting will commence at 8:00 a.m.

Summary and Objectives

During the past two years, tremendous strides in treating children with pulmonary vascular and intrinsic lung disease have been accomplished. Surfactant replacement therapy, nitric oxide inhalation, nonspecific pulmonary vasodilators, high frequency jet ventilation and extracorporeal membrane oxygenation (ECMO) have dramatically improved patient survival when applied in the perioperative period. Anesthesiologists, particularly pediatric anesthesiologists, have led the way with some of these developments.

These accomplishments have had significant impact on anesthetic and general medical care of the pediatric patient. Knowledge of these therapies is essential for effective patient care for anesthesiologists caring for children in the perioperative period. This meeting will review these new therapeutic approaches.

The objective of this year's meeting will be to educate attendees on the pulmonary system and, specifically, the regulation of pulmonary vascular tone in health and disease. Basic mechanisms of pulmonary endothelial function will be addressed, and new strategies to regulating pulmonary vascular tone using novel medical gases (i.e., nitric oxide and pharmacologic agents) will be presented. In addition, newer approaches to mechanical ventilation, pulmonary support such as ECMO, as well as surfactant therapy



Jefferson Memorial - Built following a 1934 Act of Congress, this monument to Thomas Jefferson reflects his partiality toward Roman and Palladian architecture. (Photo courtesy of the Washington, DC Convention and Visitors Association.)

will be discussed.

The meeting program will also examine two controversial therapies: the use of atropine during the induction of anesthesia and anesthetic delivery systems (partial rebreathing versus circle). The program will feature a clinical update session on the use of the laryngeal mask, the light wand and propofol. An informative, practical session on the "nuts and bolts" of setting up and maintaining a pediatric pain service will round out the program.

Synopsis

The first part of the morning session will be devoted to the examination of pulmonary vascular tone in health and disease and its treatment.

C. Norman Gillis, Ph.D., Professor of Anesthesiology and Pharmacology at Yale University, an internationally recognized expert in pulmonary endothelial function, will discuss the regulation of pulmonary vascular tone.

Stephen Rimar, M.D., Assistant Professor of Anesthesiology and Pediatrics at Yale, will examine disturbances in endothelial regulation as a result of lung injury. Drs. Gillis and Rimar are co-investigators and collaborators in the area of pulmonary endothelial function.

Jeffrey Fineman, M.D., Assistant Professor of Pediatrics at the University of California School of Medicine at San Francisco, will discuss the role of nitric oxide in regulating the transitional circulation and in the treatment of pulmonary vascular disease.

William R. Clarke, M.D., Assistant Professor of Anesthesiology at Seattle Children's Hospital, will discuss the use of newer pharmacological agents in the control of pulmonary vascular tone. Dr. Clarke's experimental investigations in the area of pharmacologic control of pulmonary vascular tone have led to newer insights into mechanisms of regulation.

(Continued on page 2)

SPA SEVENTH ANNUAL MEETING

SPA Contents

SPA Seventh Annual Meeting	1
SPA Seventh Annual Meeting Program	3
SPA Annual Meeting Registration Form	4
Literature Reviews	5
SPA Supports \$25,000 FAER Grant	12

The Society for Pediatric Anesthesia (SPA) publishes the SPA Newsletter twice a year: the Winter-Spring issue and the Summer-Fall issue. The information presented in the SPA Newsletter has been obtained by the Editors. Validity of opinions presented, drug dosages, accuracy and completeness of content are not guaranteed by SPA.

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(Continued from page 1)

The morning session will be concluded with two talks addressing newer approaches to the treatment of pulmonary insufficiency.

Jon Meliones, M.D., Assistant Professor of Pediatrics and Anesthesiology at Duke University, will discuss new strategies of mechanical ventilation, including jet and high frequency ventilation as well as ECMO.

Francis X. McGowan, Jr., M.D., Assistant Professor of Anesthesiology and Pediatrics, Children's Hospital of Pittsburgh, will present the role of surfactant replacement therapy for the treatment of pulmonary insufficiency in children.

The first part of the afternoon session will address controversies in pediatric anesthesia. The first controversy will examine the best anesthetic delivery system for pediatric patients.

Jon Michael Badgwell, M.D., Associate Professor of Anesthesiology and Pediatrics at Texas Tech University, will champion the cause of the circle system.

Lynda Jo Means, M.D., Associate Professor of Anesthesiology at Riley Children's Hospital, will enumerate the benefits of partial rebreathing systems (Mapleson).

The second controversy will examine the use of atropine during the induction of anesthesia. **Susan C. Nicolson, M.D.**, Associate Professor of Anesthesiology at Children's Hospital of Philadelphia, will present arguments for the use of atropine during induction of anesthesia.

George A. Gregory, M.D., Professor of Anesthesiology and Pediatrics at the University of California School of Medicine at San Francisco, will discuss the reasons why atropine use is not necessary.

The next session will focus on clinical updates in pediatric anesthesia. **Mehernoor F. Watcha, M.D.**, Associate Professor of Anesthesiology at the University of Texas at Dallas, will discuss the use of the laryngeal mask airway in pediatric patients. Dr. Watcha has significant experience with this technique.

Mark S. Schreiner, M.D., Assistant Professor of Anesthesiology at Children's Hospital of Philadelphia, will discuss the use of light wand intubation, a technique

which he has helped to pioneer with children.

This session will conclude with a discussion of the use of propofol outside of the operating room, to be presented by **Scott R. Schulman, M.D.**, Assistant Professor of Anesthesiology and Pediatrics at Duke University.

The final afternoon session will focus on practical issues with regard to the setting up of a pediatric pain service. Recognized experts in the field will discuss the nuts-and-bolts issues of initiating and maintaining a pediatric pain service with specific reference to personnel, policies and protocols, billing, record keeping and implementation.

Charles B. Berde, M.D., Associate Professor of Anesthesiology at Boston Children's Hospital, **David E. Cohen, M.D.**, Associate Professor of Anesthesiology at Children's Hospital of Philadelphia, and **Donald C. Tyler, M.D.**, Professor of Anesthesiology at Seattle Children's Hospital, will be the panelists presenting their approaches.

This session will be moderated by **Myron Yaster, M.D.**, who also brings significant experience to this session as Director of the Pediatric Pain Service at Johns Hopkins University.

The 1993 SPA Annual Meeting is co-sponsored by the American Society of Anesthesiologists (ASA). ASA is approved by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

ASA designates this continuing medical education program for 6.0 credit hours in category 1 of the Physician's Recognition Award of the American Medical Association.

Registration fees are \$100 for SPA members and \$200 for non-SPA members (\$100 registration fee and \$100 immediate SPA membership for qualified physicians). A buffet reception is planned for Friday evening from 7:00 p.m. to 10:00 p.m. at the United States Senate Restaurant (Room G-50) in the Dirksen Building. The meeting registration includes admission to the reception. □

SPA SEVENTH ANNUAL MEETING PROGRAM

Friday, October 8, 1993 - Washington, DC Renaissance Hotel

7:00 a.m. - 8:00 a.m.
REGISTRATION AND
CONTINENTAL BREAKFAST
Grand Ballroom - South Salon

8:00 a.m. - 8:05 a.m.
Introductory Remarks
Charles H. Lockhart, M.D., President
*Grand Ballroom - North and
Central Salons*

8:05 a.m. - 10:15 a.m.
Regulation of the Pulmonary Circulation
Moderator: William J. Greeley, M.D.
*Grand Ballroom - North and
Central Salons*

8:05 a.m.
Endothelial Regulation of Pulmonary
Vascular Tone - Basic Mechanisms
C. Norman Gillis, Ph.D.

8:40 a.m.
Endothelial Regulation of Pulmonary
Vascular Tone - Effects of Lung Injury
Stephen Rimar, M.D.

9:15 a.m.
Inhaled Nitric Oxide in the Treatment of
Pulmonary Vascular Disease
Jeffrey Fineman, M.D.

10:00 a.m.
Questions and Answers

10:15 a.m. - 10:45 a.m.
COFFEE BREAK

10:45 a.m. - 12 noon
New Treatment Strategies for
Cardiorespiratory Disease
Moderator: Jeffrey P. Morray, M.D.
*Grand Ballroom - North and
Central Salons*

10:45 a.m.
Pharmacologic Control of the
Pulmonary Circulation
William R. Clarke, M.D.

11:05 a.m.
New Strategies in Mechanical
Ventilation
Jon Meliones, M.D.

11:25 a.m.
What is the Role of Surfactant
Replacement Therapy?
Francis X. McGowan, Jr., M.D.

11:45 a.m.
Questions and Answers

12 noon - 1:30 p.m.
LUNCHEON
Grand Ballroom - South Salon

1:30 p.m. - 2:20 p.m.
Controversies in Pediatric Anesthesia
Moderator: Charles H. Lockhart, M.D.
*Grand Ballroom - North and
Central Salons*

Anesthetic Delivery Systems: Which is
the Best for Our Pediatric Patients?

Circle System
Jon Michael Badgwell, M.D.

Partial Rebreathing Systems
(Mapleson)
Lynda Jo Means, M.D.

Audience Rebuttal

Atropine Use Before and During the
Induction of Anesthesia

Pro
Susan C. Nicolson, M.D.

Con
George A. Gregory, M.D.

Audience Rebuttal

2:20 p.m. - 3:15 p.m.
Clinical Update in Pediatric Anesthesia
Moderator: Mark A. Rockoff, M.D.
*Grand Ballroom - North and
Central Salons*

Laryngeal Mask
Mehernoor F. Watcha, M.D.

Light Wand Intubation
Mark S. Schreiner, M.D.

Anesthesia Outside the OR: What Is the
Role of Propofol?
Scott R. Schulman, M.D.

Questions and Answers

3:15 p.m. - 3:45 p.m.
COFFEE BREAK

3:45 p.m. - 4:45 p.m.
The Nuts and Bolts of Starting and
Maintaining a Pediatric Pain Service
Moderator: Myron Yaster, M.D.
*Grand Ballroom - North and
Central Salons*

Personnel, Coverage, Billing,
Monitoring, Policies and Procedures

Panelists: **Charles B. Berde, M.D.**
David E. Cohen, M.D.
Donald C. Tyler, M.D.

Questions and Answers

4:45 p.m.
BUSINESS MEETING
Election of Officers and Directors

7:00 p.m. - 10:00 p.m.
SPA BUFFET RECEPTION
United States Senate Office Restaurant
Dirksen Building

Society for Pediatric Anesthesia

1993 Annual Meeting Registration Form

Washington, DC Renaissance Hotel

October 8, 1993

SPA 1993 Annual Meeting registration fees are: SPA Members - \$100; Non-SPA Members - \$200 (includes \$100 meeting registration and \$100 immediate SPA membership for qualified physicians). Extra buffet reception tickets for spouses or guests may be purchased in advance at the cost of \$35 per person.

Please print or type information

Name _____

Address (Check Preference): Home Business: _____

City _____ State _____ ZIP Code _____

Hospital Affiliation _____

Business Telephone () _____

Home Telephone () _____

SPA Buffet Reception Registration

This portion of the registration form *must* be completed should you wish to attend the SPA Buffet Reception on Friday evening, October 8, 1993 at the United States Senate Restaurant (Room G-50) in the Dirksen Building. You and your guest(s) *must* provide their Social Security numbers (SSN) or passport numbers (PN). There will be no on-site registration for the SPA Buffet Reception as security restrictions require SPA to provide Capitol Police a final list of attendees, including each individual's Social Security number or passport number 24 hours prior to the reception on Friday evening. You must preregister for the SPA Annual Meeting to attend the Buffet Reception at the United States Senate Restaurant.

I plan to attend the 1993 SPA Buffet Reception: (Cost is included in registration fee.)

Name: _____ SSN/PN: _____

I plan to bring the following guest(s) with me to the Buffet Reception: (Cost for additional tickets is \$35 each.)

Name: _____ SSN/PN: _____

Name: _____ SSN/PN: _____

Registration Fees:	SPA Members (\$100)	_____
	Non-SPA Members (\$200)	_____
	(includes immediate SPA membership for qualified physicians)	
	Extra Buffet Reception Ticket (\$35 each)	_____
	TOTAL	_____

Cancellation of Registration:

Cancellation of registration must be submitted in writing and will be accepted until October 1, 1993. Please include your home address to expedite the processing of your check. Your refund, less a \$50 administrative fee, will be sent after the conclusion of the meeting.

Make check payable to the **Society for Pediatric Anesthesia** and mail to:
 Society for Pediatric Anesthesia
 520 N. Northwest Highway
 Park Ridge, Illinois 60068-2573

LITERATURE REVIEWS

The following literature reviews have been selected from recent issues of international journals concerning pediatric and surgical studies which may be of interest to the pediatric anesthesiologist.

American Heart Association: Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiac Care.

JAMA 1992; 268:2171-2295.

Reviewed by **Barbara W. Palmisano, M.D.**

The Fifth National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care met in 1992 to update and expand its guidelines for advanced cardiopulmonary resuscitation. Several notable changes were made from previous recommendations which were last published in 1986. The term "standards" has been eliminated and replaced with "guidelines" and "recommendations" so that legalistic implications are avoided. Topics other than CPR are addressed. These include measures to prevent the need for CPR such as prevention of childhood injuries and reduction of risk factors for cardiovascular diseases. Also included are intervention recommendations for conditions that may lead to cardiopulmonary arrest such as foreign-body airway obstruction, hypothermia, near-drowning, trauma, electric shock and lightning strike. Ethical considerations in resuscitation and suggestions for appropriate application and termination of CPR are also given. The 1992 Guidelines include a new system of classifying recommendations based on the strength of supporting scientific evidence. Recommendations are graded from Class I (definitely effective) to Class III (inappropriate, possibly harmful). Class II is divided into IIa (acceptable but of uncertain efficacy) and IIb (not well-established but possibly helpful). Pediatric advanced life support guidelines now include detailed decision algorithms for the most common pediatric cardiac arrhythmias — bradycardia and asystole or pulseless arrest. New recommendations are given for the use of noninvasive transcutaneous pacing for children with profound symptomatic bradycardia unresponsive to basic and advanced life support (Class IIb). Advanced life support recommendations for the pediatric trauma victim have also been added in response to the observation that improper resuscitation is a major cause of preventable

pediatric trauma death. Major changes in recommendations for drug usage in pediatric resuscitation have been made in the 1992 Guidelines. The repeat dose of epinephrine in pediatric resuscitation has been increased to 0.1-0.2 mg/kg (Class IIa) because there is evidence of improved outcome with high-dose epinephrine in children. (The initial dose of epinephrine is unchanged at 0.01 mg/kg.) Isoproterenol is no longer recommended for therapy of bradycardia. Its purely beta-adrenergic effects result in decreased coronary perfusion pressure and increased myocardial oxygen demand which are undesirable in the setting of potential myocardial ischemia. Epinephrine is recommended in place of isoproterenol in the treatment of nonvagal mediated bradycardia associated with low cardiac output. Adenosine is now recommended as the drug of choice for conversion of supraventricular tachycardia in stable children (Class I). The initial dose is 0.1 mg/kg which may be doubled if necessary up to a single maximum dose of 12 mg. Lastly, the need to use higher doses of drugs in larger volumes for endotracheal administration is emphasized.

Antibiotic prophylaxis for cardiothoracic operations: Meta-analysis of 30 years of clinical trials.

Kreter B, Woods M. *J Thorac Cardiovasc Surg* 1992; 104(3):590-599.

Reviewed by **Stephen Rimar, M.D.**

This is a surprisingly readable article which critically reviews the infectious outcomes of prospective, randomized and controlled studies of cardiothoracic surgery prophylaxis in the last 30 years by means of meta-analytic techniques. Placebo-controlled trials demonstrated that a consistent benefit to the administration of antibiotic prophylaxis beyond 48 hours was not associated with improved infectious outcomes. In addition, the studies show that second generation cephalosporins, cefamandole and cefuroxime performed better than cefazolin, with an approximate 1-1/2-fold reduction in wound infection rate.

Selective pulmonary and systemic vasodilator effects of amrinone in children: New therapeutic implications.

Robinson BW, Gelband H, Mas MS. *J Am Coll Cardiol* 1993; 21(6):1461-1465.

Reviewed by **Stephen Rimar, M.D.**

Despite the routine use of amrinone by many pediatric anesthesiologists, limited data are available on its use in children. This study was performed in 19 patients (aged 2 months to 8.3 years) in order to determine the systemic and pulmonary hemodynamic effects of amrinone given as a bolus (3 mg/kg) and then followed by infusion of 1 mg/sec into the pulmonary artery. The authors conclude that amrinone has potent vasodilator effects, and depending on the pulmonary artery pressure and pulmonary vascular resistance of the patient, these effects may even be selective for the pulmonary circulation.

Intermediate-term outcome after pulmonary balloon valvuloplasty: Comparison with matched surgical control group.

O'Connor BK, Beekman RH, Lindauer A, Rocchini A. *J Am Coll Cardiol* 1992; 20(1):169-173.

Reviewed by **Stephen Rimar, M.D.**

This is a follow-up study of 20 patients four to five years following balloon valvuloplasty in childhood compared to those who received surgical valvotomy. The authors conclude that, compared to surgical valvotomy, balloon valvuloplasty for isolated pulmonary stenosis provides nearly equivalent long-term gradient relief with less valvular insufficiency and less late ventricular ectopic activity. This is yet another report to suggest that, in the future, pediatric anesthesiologists may be sedating significant numbers of patients for repair of congenital heart disease not in the operating room, but in the cath lab.

Postoperative pulmonary flow dynamics after Fontan surgery: Assessment with nuclear magnetic resonance velocity mapping.

Rebergen SA, Ottenkamp J, Doornbos J, van der Wall EE, Chen JGJ, De Roos A. *J Am Coll Cardiol* 1993; 21(1):123-131.

Reviewed by *Stephen Rimar, M.D.*

This is state-of-the-art imaging of the pulmonary circulation. Although there are limitations of this technology, the prospects for the future are encouraging.

Report of the National Institute of Neurological Disorders and Stroke workshop on near infrared spectroscopy.

Hirtz DG. *Pediatrics* 1993; 91:414-417. Reviewed by *Mehernoor F. Watcha, M.D.*

This is a report about a new application of an existing technology. Near infrared spectroscopy (NIRS) can provide information regarding changes in cerebral oxygen saturation, cerebral blood flow and volume, and oxygenation in the brain. This report emphasizes that there are many problems to be addressed before NIRS can be used widely. It will be necessary to demonstrate the safety and benefits of NIRS in clinical care. It is most important to verify with appropriate clinical trials that NIRS has predictive value before widespread dissemination of this new and highly promising technology occurs.

Accuracy of central venous pressure measurements from the abdominal inferior vena cava.

Lloyd DR, Donnerstein RL, Berg RA. *Pediatrics* 1992;89:506-508. Reviewed by *Mehernoor F. Watcha, M.D.*

Central venous pressure measurements in the abdominal inferior vena cava were compared with measurements of the right atrium in infants and children undergoing cardiac catheterization. The abdominal inferior vena cava was noted to be a safe and convenient site for the measurement of central venous pressure at the end of expiration. The differences in pressure, between the inferior vena cava and the right atrium, were within 1 mm Hg in all 20 patients studied, and the mean difference was 0 ± 0.36 mm Hg. This study will support physicians who prefer the femoral venous route for access to the central circulation rather than the internal jugular route.

Lactic acidosis in critical illness.

Mizock BA, Falk JL. *Crit Care Med* 1992; 20(1):80-93. Reviewed by *Scott R. Schulman, M.D.*

Lactic acid levels are frequently obtained in critical illness as a gauge of organ perfusion. However, their prognostic significance is not known. This article

provides an excellent review of the mechanism and classification of the lactate ion and its relationship to organ perfusion. Treatment strategies are discussed, and directions for future research are suggested.

Adenotonsillectomy for upper airway obstruction carries increased risk in children with a history of prematurity.

McGowan FX, Kenna MA, Fleming JA, O'Connor T. *Pediatr Pulmonol* 1992; 13:222-226.

Reviewed by *Brian J. Gronert, M.D.*

To better define the clinical presentation and perioperative outcome of otherwise normal children 12 years and younger undergoing adenotonsillectomy (T&A) for relief to upper airway obstruction, these authors reviewed 60 consecutive hospital records. Seven patients with trisomy 21, neurologic impairments or preoperative cor pulmonale were excluded. The most serious complications were pulmonary edema and prolonged postoperative oxygen desaturation. Multivariate logistic regression analysis found a history of prematurity and/or very low birth weight to be the most significant risk factors related to the occurrence of complications. Other significant risk factors included adenoidal facies and evidence of respiratory distress at the time of surgery. Eighty-five percent of the perioperative complications occurred in the 28 percent of the population with a history of prematurity. This study indicates that children with a history of prematurity and low birth weight undergoing T&A for relief of upper airway obstruction are at a significant risk for complications such as hypoxemia, pulmonary edema and severe persistent upper airway obstruction following the procedure.

Accuracy of pulse oximetry in children with cyanotic congenital heart disease.

Schmitt HJ, Schuetz WH, Proechel PA, Jaklin C. *J Cardiothorac Vasc Anesth* 1993; 7:61-65.

Reviewed by *Brian J. Gronert, M.D.*

The pulse oximeter has become the standard of care in the operating room, but its accuracy below 90 percent in children is controversial. These authors compared the Nellcor N-100 pulse oximeter with a co-oximeter to measure arterial oxygen saturation in 56 children with cyanotic congenital heart disease. Two oxygen saturation measurements were done in each child after induction of "steady state" gen-

eral anesthesia before the surgical procedure. Below an oxygen saturation of 80 percent, the pulse oximeter was not as accurate as at higher saturations and overestimated the true value. High hematocrit was not associated with impaired accuracy of pulse oximetry at saturation values below 80 percent. In the presence of hemoglobin desaturation below 80 percent, it is advisable to check pulse oximeter readings with a co-oximeter or arterial blood gas.

The modified Fontan procedure: Physiology and anesthetic implications.

Hosking MP, Beynen FM. *J Cardiothorac Vasc Anesth* 1992; 6:465-475.

Reviewed by *Brian J. Gronert, M.D.*

This review article discusses the cardiac malformations for which the modified Fontan is a functional correction. The anesthetic management for the modified Fontan procedure and the anesthetic management for noncardiac surgery for patients who have undergone the modified Fontan procedure are discussed. These authors highlight the extended selection criteria such as younger age children to avoid other palliative procedures (e.g., central shunts) that are associated with pulmonary artery distortion or the development of pulmonary hypertensive disease. Mortality rates for the modified Fontan operation in children with uncomplicated tricuspid atresia are less than 5 percent. Morbidity is generally related to systemic venous hypertension (i.e., pleural effusion, peripheral edema, ascites, liver distention and dysfunction), but also includes cardiac dysrhythmias. After the Fontan operation, cardiac index at rest and in response to exercise is reduced compared to normal controls. However, the majority of patients are able to participate in at least moderate athletic activity. The anesthetic management goals of the patient for noncardiac surgery after the Fontan operation are: 1) skillful airway management to avoid increasing pulmonary vascular resistance; 2) prevention of hypovolemia due to NPO status; 3) placement of an intravenous cannula; and 4) careful hydration prior to anesthetic induction.

Otolaryngologic manifestations of the mucopolysaccharidoses.

Bredenkamp JK et al. *Ann Otol Rhinol Laryngol* 1992; 101:472-478.

Reviewed by *Howard B. Gutstein, M.D.*

This paper is a retrospective review of

45 children encompassing all seven types of mucopolysaccharidoses. Descriptions were provided of head and neck complications. While specifics of anesthetic management were not addressed, this paper still represents a valuable summary of these conditions and is a necessary addition to every pediatric anesthesiologist's library. It is important to note that every patient with one of these syndromes had at least one complication involving the head and neck region, over half of which required some sort of operative intervention. Upper airway obstruction occurred in nearly 40 percent of these patients, and nearly half of those children required a tracheostomy. Cervical spine instability was noted in nearly 20 percent of the patients, exclusively in children with Morquio, Maroteaux-Lamy and Sly syndromes. The most common form of instability was atlantoaxial subluxation. Airway obstruction occurred most commonly with Hurler, Morquio, Maroteaux-Lamy and Sly syndromes. Airway obstruction was uncommon in the Hunter and San Filippo syndromes. This contrasts sharply with previous studies that had reported a high incidence of airway obstruction in Hunter's patients. In addition, the pathophysiology of pulmonary disease in these patients was discussed in detail.

Urgent adenotonsillectomy for upper airway obstruction.

Shectman FG, Lin PT, Pincus RL. *Int J Pediatr Otorhinolaryngol* 1992; 24:83-89.

Reviewed by **Howard B. Gutstein, M.D.**

This paper reviewed 5,000 adenotonsillectomies performed over seven years. Six patients, or 0.1 percent of the total, were identified with acute upper airway obstruction severe enough to require emergency intubation either in the emergency department or the operating room. Subsequently, after cardiorespiratory stabilization and treatment of cor pulmonale, these patients underwent urgent adenotonsillectomy. Postoperatively, the patients did well. The authors point out that as routine referrals for adenotonsillectomy decrease, we may see more patients presenting with advanced cardiopulmonary symptoms related to chronic upper airway obstruction. The authors re-emphasized the point that cardiorespiratory stabilization should be completed prior to adenotonsillectomy, and that these patients should be watched closely for up to 36 hours after surgery due to the potential

for development of cardiorespiratory complications secondary to the loss of hypoxic drive.

Consumer product aspiration and ingestion in children: Analysis of emergency room reports to the national electronic injury surveillance system.

Reilly JS, Walter MA. *Ann Otol Rhinol and Laryngol* 1992; 101:739-741.

Reviewed by **Howard B. Gutstein, M.D.**

This paper listed the "hot" items that children aspirated between 1988 and 1990. Unfortunately, this paper did not analyze any food product aspirations, which are known to be the most common cause of choking and aspiration events. Children under 3 years of age were studied. It is interesting to note that boys had a higher incidence of aspiration and risk of death than girls. It was noted that the age for risk of death was significantly less (13.4 versus 22.7 months) than the average age of children aspirating objects. Coins remain the most common item to aspirate, accounting for more than 50 percent of all incidents. Nails, pins and spherical objects are the next most commonly aspirated objects, with overall mortality being highest for spherical objects followed by balloons and toy parts. All deaths occurred at home. However, it is heartening to note that over the last 50 years, the hospital mortality rate for foreign body aspiration has been reduced from a rate of more than 50 percent to close to 0 percent because of improved airway management techniques.

Subglottic ulceration and healing following endotracheal intubation in the neonate: A morphometric study.

Gould SJ, Young M. *Ann Otol Rhinol and Laryngol* 1992; 101:815-820.

Reviewed by **Howard B. Gutstein, M.D.**

This paper is a retrospective pathologic study of 78 larynges in patients ranging from 22 to 40 weeks gestation who had survived from a few hours to up to 300 days. The interesting point of this study was that acute subglottic injury after intubation is almost invariable, but the progression of injury is relatively short-lived. The acute injury usually consists of ulceration of the subglottic epithelium, but healing starts after a few days and progresses rapidly until almost complete healing occurs by 30 days after intubation. The authors suggested that subglottic stenosis is the exception rather than the rule after prolonged intubation. They were

not able to develop a clinical profile of the infant susceptible to subglottic stenosis, but showed that severe injury was not dependent on either gestational age or length of intubation. They hypothesized that if trauma was minimized during ulcer healing, proliferation of granulation tissue should be minimal and not lead to the development of subglottic stenosis. The endotracheal tube was also postulated to serve a beneficial function in preventing swelling and acting as a stent around which the damaged larynx might heal.

Prolonged intubation injuries of the larynx: Endoscopic diagnosis, classification and treatment.

Benjamin P. *Ann Otol Rhinol and Laryngol* 1992; 102(suppl.4):1-15.

Reviewed by **Howard B. Gutstein, M.D.**

While a bit detailed for general reading, this article provides a classification scheme for subglottic stenosis and suggests that maintenance of a leak around the endotracheal tube and meticulous tracheobronchial care should minimize the incidence of postintubation subglottic stenosis. The author also advised against routine tracheostomy for the long-term ventilatory care of the neonate.

Management of airway obstruction in patients with congenital heart defects.

Davis DA, Tucker JA, Russo P. *Ann Otol Rhinol and Laryngol* 1993; 102:163-166.

Reviewed by **Howard B. Gutstein, M.D.**

This paper outlines the significant association between complex congenital heart malformations and tracheobronchial obstruction. These malformations can compromise the infant's airway by direct compression or by increased pulmonary artery pressures causing pulmonary vessel distention and tracheobronchial compression. Surgical procedures involving conduits or prostheses may also result in direct airway compression. In addition, recurrent laryngeal nerve or phrenic nerve damage, while not causing airway obstruction, should be considered in the postoperative patient who is difficult to extubate. The authors suggest that a workup for potential airway problems should occur prior to any surgery for complex congenital heart disease. They also suggest that conservative approaches such as tracheostomy, bronchoscopy with stenting or prolonged mechanical ventilation may be preferable to surgical correction of an obstructed airway due to the high morbidity and mortality rates

associated with surgical repair of airway obstruction.

Developmental changes in pain expression in premature, full-term, 2- and 4-month-old infants.

Johnston CC, Stevens B, Craig KD, Grunau RVE. *Pain* 1993; 52:201.

Reviewed by *David E. Cohen, M.D.*

This paper examined how specific behavioral responses to pain changed in the first four months of life in preterm, term, 2-month and 4-month-old infants. Facial and vocal response to heel-stick and intramuscular injection were examined. Sharp pain produced distinct facial actions around the mouth and eyes as well as high-pitched cries. Premature infants (32-34 weeks) were different than older infants (high-pitched cry). Term infants had different responses from the 2- to 4-month-old infants. The differences in responses may reflect more organized behavior in the older infants.

TENS children's procedural pain.

Lander J, Fowler-Kerry S. *Pain* 1993; 52:209.

Reviewed by *David E. Cohen, M.D.*

Though statistically significant, TENS did not produce a clinically statistical reduction in pain associated with venipuncture in children between 5 and 17 years. The distress of venipuncture was most severe in the younger patients studied.

Inducing pain in children — a controversial issue.

McGrath PA. *Pain* 1993; 52:255.

Reviewed by *David E. Cohen, M.D.*

This editorial reviews the issues regarding the use of experimental pain in research studies in children. Some questions may require the use of experimental pain. Careful consideration must be given to the study question, to the research design and to the specific harm and benefits to participants and all children.

Toward validation of pain measurement tools for children: A pilot study.

Tyler DC, Douthit AT, Chapman CR. *Pain* 1993; 52:301.

Reviewed by *David E. Cohen, M.D.*

The CHEOPS, faces and an observational pain scale reflected expected trends in the pain of postoperative children. Each correlated with one another.

The placebo effect: An unpopular topic.

Wall PD. *Pain* 1992; 51:1.

Reviewed by *David E. Cohen, M.D.*

The concept of the "placebo effect" is reviewed. Three hypotheses are proposed to explain the effect. The mechanism may be related to the reduction of anxiety, a cognitive readjustment of appropriate behavior or a classical conditioned Pavlovian response.

Enhancement of morphine analgesia by fenfluramine in subjects receiving tailored opioid infusions.

Coda B, Hill H, Schaffer R, Luger T, Jacobson R, Chapman C. *Pain* 1993; 52(1):85.

Reviewed by *David E. Cohen, M.D.*

This article demonstrates the opioid-enhancing effects in normal volunteers of fenfluramine, a serotonin releaser. Borderline analgesic effects were seen from fenfluramine. Some decrease in alertness was also noted.

Patient-controlled analgesia for sickle-cell-related pain.

Shapiro B, Cohen D, Howe C. *J Pain Symptom Manage* 1993; 8(1):22.

Reviewed by *David E. Cohen, M.D.*

A retrospective review revealed a wide range of the amount of opioid delivered for analgesia of vasoocclusive crisis pain. PCA was an effective delivery device. Recommendations for use in this condition are provided.

Fentanyl: Clinical use as postoperative analgesic-epidural/intrathecal route.

Grass J. *J Pain Symptom Manage* 1992; 7(7):419.

Reviewed by *David E. Cohen, M.D.*

This is an excellent review of the use of peridural fentanyl.

The use of methylphenidate in patients with incident cancer pain receiving regular opiates: A preliminary report.

Bruera E, Fainsinger R, MacEachern T, Hanson J. *Pain* 1992; 50:75.

Reviewed by *David E. Cohen, M.D.*

This open trial supports the use of methylphenidate in severe pain. Its use allows an increase in the maximum-tolerated opioid dose, permitting better pain relief with less sedation.

Patient-controlled analgesia: The relation of psychological factors to pain and analgesic use in adolescents with postoperative pain.

Gil K, Ginsberg B, Muir M, Sullivan F, Williams D. *Clin J Pain* 1992; 8:215.

Reviewed by *David E. Cohen, M.D.*

High levels of anxiety and distress in adolescents were related to higher PCA use and greater postoperative pain. Patient anxiety was also highly related to adolescent pain and PCA use.

The spinal pharmacology of acutely and chronically administered opioids.

Yaksh T. *J Pain Symptom Manage* 1992; 7(6):356.

Reviewed by *David E. Cohen, M.D.*

A brief report examines spinal opioid receptor pharmacology and issues of tolerance after long-term exposure.

Postoperative apnea in infants.

Naylor B et al. *J Pediatr Surg* 1992; 27(8):955-957.

Reviewed by *Lawrence H. Feld, M.D.*

The authors did a retrospective review of 127 neonates and evaluated them for postoperative apnea and bradycardia after inguinal surgery. The patients were divided into three groups based on post-conceptual age. Of Group 1 patients, post-conceptual age 33-39 weeks, 10/29 (34.5 percent) developed episodes of apnea/bradycardia. Preoperative assessment (looking at birth weight, weight at surgery, operative procedure, operating room time, presence or absence of intubation, type of anesthetic agents and the particular anesthesiologist) was unable to identify this particular subgroup at risk. Only 7/10 patients who developed apnea/bradycardia in Group 1 were considered high risk by preoperative evaluation. The other three patients that developed apnea were not even considered at risk. Conversely, there were six patients in Group 1 whose preoperative evaluations rendered them high risk, yet they did not develop postoperative problems. In Group 2, which had 54 patients, postconceptual age 40-44 weeks, 8/54 (14.8 percent) developed apnea/bradycardia; and in Group 3 with 44 patients, postconceptual age 45-60 weeks, one patient (2.3 percent) developed apnea/bradycardia. In the latter two groups, preoperative assessment as noted above identified all patients at high risk. No patient in these groups developed postoperative apnea/bradycardia if preoperative indications were absent. The authors conclude that after postconceptual age of 40 weeks, patients at risk for apnea/bradycardia can be identified preoperatively. Patients operated on up to 39 weeks postconceptual age should be monitored postoperatively. Postoperative apnea was

noted in only 19 patients (15 percent), all of whom were expremature infants. Postoperative apnea in infants and those who are candidates for same-day surgical admission and discharge are always interesting and controversial subjects for anesthesiologists and surgeons to discuss. Clearly, no one definitive study has been published to date that allows one to come up with an absolute policy. Correlation was seen between postoperative apnea/bradycardia and gestational age, postconceptual age, associated medical conditions, need for postoperative medications and ASA physical status. There was no correlation between birth weight, weight at surgery, operative procedure, operative time, presence or absence of the endotracheal tube, type of anesthetic agents and the anesthesiologist. They conclude that there is an increased incidence of apnea/bradycardia in infants less than 39 weeks conceptual age, and these infants should be monitored postoperatively for 24 hours. They also concluded that expremature infants greater than 39 weeks postconceptual age are at high risk of postoperative apnea/bradycardia only if they have preoperative indications of apnea/bradycardia, Hb <10 gms, chronic respiratory disease, or are taking theophylline at the time of surgery. This study is reassuring in its attempt to identify red flags for postoperative apnea/bradycardia in that population of term and older expremature infants. Unfortunately, the study suffers from the failures of retrospective analysis. It would have been nice to know what anesthetic techniques were used. Did any babies receive narcotics, spinal anesthetics or caudal anesthetics? Were muscle relaxants used? Out of the 127 infants enrolled in the study, 107 were male and 20 were female. Can the two groups be compared if the demographic distribution is so different? Were all apnea/bradycardia events recorded or were only the major episodes noted? To make such a broad recommendation as above, can 127 neonates be a large enough series, or do we need a larger sample size or even a multicenter study that is prospective to answer the question fairly?

Improved outcome utilizing spinal anesthesia in high risk infants.

Sartorelli KH et al. *J Pediatr Surg* 1992; 27(8):1022-1025.

Reviewed by **Lawrence H. Feld, M.D.**

The authors looked at 140 high-risk infants (ASA greater or equal to PS-2) in

a prospective evaluation using spinal anesthesia for inguinal herniorrhaphy, circumcision, orchiopexy and cystoscopy. The mean gestational age of these infants was 30.8 weeks \pm 3.7 weeks (minimum 24 weeks) with a mean birth weight of 1466 gms \pm 638.8 gms. The mean post-conceptual age and weight at the time of surgery was 44.8 weeks \pm 7.8 weeks and 3376 gms \pm 1242 gms respectively. Difficulty in administering the block occurred in six cases (4.2 percent). Postoperative complications occurred in five children (3.8 percent). They included: postoperative fever (2), transient bradycardia (2) and apnea (1). The single case of apnea occurred in a premature infant who received supplemental intravenous midazolam. The length of surgery in these cases ranged from 15-95 minutes (mean 53 minutes) with two incidents of inadequate anesthesia. The mean duration of anesthesia was 146 minutes (50-240 minute range). The authors concluded that there were no episodes of apnea or significant bradycardia that developed in patients given only a spinal anesthetic. They state further that the use of the spinal technique in this patient population may obviate the need for mandatory postoperative admission. This study was a nicely done prospective study addressing a problem that is, as we know, being addressed on a national scale; i.e., what patients are candidates for same-day discharge; what anesthetic technique is best suited to achieve that end? This study demonstrates that spinal anesthesia is reliable, safe and effective in this patient population. Spinal anesthesia was successfully obtained in 95.8 percent and required no supplemental sedative or anesthetic in 93.2 percent of patients enrolled in this study. The study is interesting, but before foregoing admission to the hospital, a larger study confirming these results must be undertaken.

The value of pre-emptive analgesia in the treatment of postoperative pain.

Dahl JB, Kehlet H. *Br J Anaesth* 1993; 70:434-439.

Reviewed by **Alan S. Klein, M.D.**

This paper is a "must read" for all anesthesiologists. The concept of "pre-emptive analgesia" has gained widespread acceptance. This paper is a critical analysis of clinical studies on the effects of pre-emptive analgesia on acute postoperative pain. The authors state that available data from the few studies of identical neural block techniques, compared before and

after operations, do not document clinically relevant differences in postoperative analgesia or analgesic requirements. Several studies are available on preoperative neural block with local anesthetics compared with no treatment, and most studies have found a reduction in late postoperative pain, requests for additional analgesics or both, compared with no neural block. However, these studies do not demonstrate that such effects result from optimal timing of analgesia for a reduction in central hyperexcitability by preoperative analgesic treatment. Other studies during greater surgical trauma have not been able to show that intense preoperative extradural analgesia, followed by one to four days of continuous extradural treatment combinations of local anesthetics and opioids, has any long-lasting effect on postoperative pain during rest or mobilization, compared with no neural block. More well-designed clinical studies are needed to evaluate the implications of the findings of central hyperexcitability and long-lasting analgesic effects of the preinjury neural block.

Effect of the laryngeal mask airway on lower oesophageal sphincter pressure in patients during general anaesthesia.

Rabey PG, Murphy PJ, Langton JA, Barker P, Rowbotham DJ. *Br J Anaesth* 1992; 69:346-348.

Reviewed by **Alan S. Klein, M.D.**

The authors demonstrated that a decrease in lower oesophageal sphincter barrier pressure may occur when the laryngeal mask airway (LMA) is used for airway management during anesthesia with spontaneous ventilation. This may provide a possible explanation for the increased incidence of regurgitation of gastric contents that has been shown to occur when the LMA is used, compared with a face mask. In a study done by Barker (*Br J Anaesth* 1992; 69:314-315), there was a 25-percent incidence of regurgitation into the bowl of the LMA, but no dye was seen in the trachea. It is notable that those authors used a light induction dose of propofol (2 mg/kg). In a letter to the editor (*Br J Anaesth* 1992; 69:381), Brimacombe and Barry point out that the relevance of Barker's study (and this study) to clinical anesthesia is unknown. Despite the high incidence of regurgitation, aspiration with the LMA appears to be uncommon. To date, there have been no reported fatalities secondary to aspiration associated with the LMA worldwide.

Editorial for upper airway reflexes.

Drummond GB. *Br J Anaesth* 1993; 70:121-123.

Reviewed by *Alan S. Klein, M.D.*

The editorial should be read by anyone managing airways. It is an excellent review of the subject.

Use of ultrasound to evaluate internal jugular vein anatomy and to facilitate central venous cannulation in paediatric patients.

Alderson PJ, Burrow FA, Stemp LI, Holtby HM. *Br J Anaesth* 1993; 70:145-148.

Reviewed by *Alan S. Klein, M.D.*

The authors evaluated a two-dimensional ultrasound scanner to examine venous anatomy and ease of percutaneous central venous cannulation by experienced cardiac anaesthetists in neonates and infants up to age 6 years. They found that 18 percent of their children had anomalous venous anatomy that may account for some of the difficulties reported in central venous cannulation. The diameter of internal jugular (IJ) vein was predicted poorly by the patients' age or weight. By determining the course of the IJ with the scanner and marking it on the skin, the time to insertion and number of insertions were reduced, as were the number of complications. In this study, the patients ranged in age from 3 days to 5.5 years. None of the children was premature. Of note is that, in 10 percent of the patients, the jugular vein ran so medially that it entirely overlaid the carotid artery; in 2 percent, the vein ran widely lateral to the carotid artery; and in another 2 percent, the vein could not be seen. In 82 percent, the IJ ran inferolateral to the carotid artery; in 4 percent, the vein was of an unusually small diameter. At the level of the cricoid ring, the vein was seen 4-10 mm below the surface of the skin, correlating best with weight. The vein varied in diameter from 2.5-12 mm. The most common complication was inability to pass the Seldinger wire into the superior vena cava after venous blood has been aspirated. This occurred in 8/20 patients in procedures guided by anatomic landmarks alone and 3/20 guided by ultrasound. Carotid artery puncture occurred in 2/20 patients in anatomically guided procedures and 1/20 in the ultrasound-guided group. Overall, eight cannulations in the anatomically guided group and 16 in the ultrasound guided group were uncomplicated. The overall success rate for cannulation was 16/20 in the

landmarked-guided and 20/20 in the ultrasound-guided group.

Comparison of in vitro contracture testing with ryanodine, halothane and caffeine in malignant hyperthermia and other neuromuscular disorders.

Hopkins PM, Ellis FR, Halsall PJ. *Br J Anaesth* 1993; 70:397-401.

Reviewed by *Alan S. Klein, M.D.*

The authors present results from 155 patients attending for diagnosis of their malignant hyperthermia (MH) status, on whom muscle in vitro contracture test (IVCT) had been done using halothane, caffeine and ryanodine. They also studied muscle specimens from six patients with other neuromuscular disorders. The accuracy of new genetic linkage studies being performed to identify MH-susceptible patients is entirely dependent on the accurate phenotyping of as many individuals as possible from MH families using IVCT. It is, therefore, essential that the numbers of false positive, false negative and doubtful IVCT diagnosis are minimized. The separate exposure halothane and caffeine tests have imperfections. Results of IVCT performed in patients with a low risk of MH (controls) suggest a false positive rate of approximately 4 percent using the European procedure, and 9 percent using the North American procedure. In the authors' experience, 14 percent of patients with an abnormal response to halothane reacted normally to caffeine, indicating the caffeine test lacks total sensitivity. Both procedures are associated with a lack of specificity, in that muscle from patients with myopathies other than MHS develop abnormal contracture responses. The authors' experience using ryanodine (RCT) indicates that this warrants consideration for use as a third test. There is even a suggestion in their results that a further delineation of a group of MH-equivocal patients may be categorized as susceptible or nonsusceptible using RCT. The results from muscle of patients with other neuromuscular disorders showed that RCT is also not specific for MH. It seems that we may have another tool to use in our quest to solve this difficult problem.

The "K-type" caffeine-halothane responder susceptible to malignant hyperthermia?

Ellis FR, Halsall PJ, Hopkins PM. *Br J Anaesth* 1992; 69:468-470.

Reviewed by *Alan S. Klein, M.D.*

The authors studied the value of the combined caffeine-halothane contracture test (CHCT) for malignant hyperthermia (MH) screenings in which caffeine and halothane are administered concurrently. They conclude that the test lacks specificity, produces both false positive and false negative results (thus rendering the designation K-type meaningless as far as MH screening is concerned), and is potentially dangerous. They suggest that it should no longer be used in relation to MH phenotyping. This is in concordance with the European MH group findings. The authors point out that there is anecdotal recognition that K-types are found in 10-30 percent of the population. The comparative rarity of MH susceptibility axiomatically should be evidence against an association between K-type and MH susceptibility. Currently, the patient is regarded as MHS (susceptible) if the muscle produces a sustained increase in baseline tension to both halothane and caffeine on separate specimens. If the muscle produces an abnormal response to only one agent, the patient is classified as MHE (equivocal). If both tests are normal, the patient is regarded as MHN (normal). It is interesting that only 50 percent of the MHS patients were positive to the CHCT when a clear correlation between the two tests might have been expected. □

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