

# Society for Pediatric Anesthesia



education • research • patient care

Volume 19 Number 5

Winter 2006

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

## Inside this Issue

Editor's Corner .....	2
Annual Meeting Review.....	4
ASA Scientific Papers & Presentations .....	6
PBLD Review.....	7
Poster Discussion .....	7
Highlights of the SPA/AAP Breakfast Panel .....	8
Clinical Forum: Pediatric Anesthesia Challenges .....	9
Literature Reviews.....	9

## Find it on the Web

- Literature Reviews with full references
- PedsPassport by Helen V. Lauro, MD, FAAP
- 2006 SPA Supporters and Exhibitors



**Society for Pediatric Anesthesia**

education • research • patient care ®  
2209 Dickens Road  
Richmond, VA 23230-2005

Non-Profit Org.  
U.S. Postage  
PAID  
Permit No. 956  
Richmond, VA

## Society for Pediatric Anesthesia



The Society for Pediatric Anesthesia (SPA) publishes the SPA Newsletter four times a year. 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.

### Communications Committee

#### Co-Chairs:

**Shobha Malviya, MD**

University of Michigan Health System, Ann Arbor, MI

**Allison Kinder Ross, MD**

Duke University Medical Center, Durham, NC

#### Newsletter Editor:

**Rita Agarwal, MD, FAAP**

Children's Hospital, Denver, CO

#### Associate Editor:

**Thomas Mancuso, MD, FAAP**

Children's Hospital, Boston, MA

**Cheryl K. Gooden, MD, FAAP**

Mount Sinai Medical Center, New York, NY

**Helen V. Lauro, MD, FAAP**

SUNY Downstate Medical Center/  
Long Island College Hospital, Brooklyn, NY

#### Contributing Editor:

**Hoshang J. Khambatta, MD**

Columbia Presbyterian Medical Center  
New York, NY

#### Guest Contributors:

**Shahid Hussain, MD, FAAP**

University of Arkansas for Medical Sciences  
& Arkansas Children's Hospital, Little Rock, AR

**Constance S. Houck, MD**

Children's Hospital, Boston, MA

The complete communications committee roster and assistant newsletter editors can be found on the SPA website [www.pedsanesthesia.org](http://www.pedsanesthesia.org).

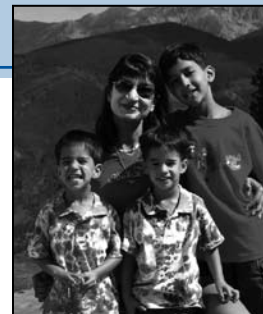
© 2006

## Editor's Corner

**Rita Agarwal, MD, FAAP**

Editor

The Children's Hospital/UCHSC, Denver, CO



Thank you everyone for all of your support over the past 6 years. There are so many people to thank, especially my wonderful assistant and associate editors. I can't list everyone's

names; however there are a few people that deserve special recognition. The first person that I owe a huge deal of gratitude to is Jay Deshpande MD, FAAP, for showing so much faith in me. Thomas Mancuso, MD, FAAP has worked tirelessly from the beginning, as Associate Newsletter Editor and consistently provided superb reviews and commentary. He always provided excellent and thought-provoking Point/CounterPoint Sections. I know that Drs. Lauro and Gooden, who are now the Associate Editors, will do a great job in the future. They have both been extremely productive in the past.

This is the traditional ASA review newsletter and it is chock full of summaries from the SPA Annual Meeting, and the ASA. The Clinical Forum, Panels, Posters and Breakfast Panels that are covered here are the ones that members of the Communications Committee attended and were able to write about. Drs. Ahmed, Malviya, Lauro, and Houck tried to capture the essence of each session they reviewed for those who were unable to attend. Hopefully you will find this useful. If not, please feel free to let Dr. Allison Kinder Ross, your next Editor in Chief know!

I am delighted that Dr. Kinder Ross has agreed to take on this position. Allison has been very active in the SPA, both as part of the Communication Committee and on the newsletter. She has been on the SPA Board of Directors and was the Co-Chair of the Communications Committee. I know that she will do a phenomenal job, so please join me in congratulating her.

Since this is final Editor's Corner I wanted to include one of my favorite photos of myself and my darling boys, whose antics I hope to share in a future "Kids Page".

Thank you all for your support over these past few years. I hope you enjoyed the newsletter as much as I enjoyed helping put it together.

## DON'T FORGET TO USE YOUR SPA MEMBER RESOURCES

SPA Link: [www.pedsanesthesia.org/research](http://www.pedsanesthesia.org/research)

### Research Funding: Foundation for Anesthesia Education and Research Update

Application deadlines: February 15 and August 15

- Research Starter Grant (RSG)
- Mentored Research Training Grant (MRTG)
- Research Fellowship Grant (RFG)
- Research in Education Grant (REG)

# UPCOMING MEETINGS

## 2007 PEDIATRIC ANESTHESIOLOGY

A meeting co-sponsored by  
the Society for Pediatric Anesthesia and the  
American Academy of Pediatrics Section  
on Anesthesiology and Pain Medicine

**March 8-11, 2007**

**Pointe Hilton Squaw Peak  
Phoenix, Arizona**

## SPA/APA

21<sup>st</sup> ANNUAL JOINT MEETING

October 12, 2007 • San Francisco  
Location TBA

Society for Pediatric Anesthesia  
United Kingdom Association of Paediatric Anaesthetists

IT'S NOT TOO SOON TO PLAN FOR 2008!

## Pediatric Anesthesiology 2008

April 3 – 6, 2008 • San Diego, California

A joint meeting with the  
American Academy  
of Pediatrics



## 22ND ANNUAL MEETING

October 7, 2008 • Orlando, Florida

# Annual Meeting Review: October 13, 2006 in Chicago

**Helen Lauro, MD, FAAP**

The 20<sup>th</sup> Annual Meeting for the Society of Pediatric Anesthesia was held October 13 at the Chicago Marriott Downtown in Chicago, Illinois. Program Chair, Santhanam Suresh, M.D. (Children's Memorial, Chicago, IL) and SPA President Francis X. McGowan, Jr., M.D. (Children's Hospital, Boston, MA) provided welcoming remarks.

During the first morning session, moderated by Elliot J. Krane, M.D. (Stanford University, Stanford CA), Charles H. Berde M.D., Ph.D. (Children's Hospital, Boston, MA) lectured on Chronic Nociceptive and Neuropathic Pain in Developing Animals and in Children. He contrasted chronic neuropathic pain epidemiology, clinical course and management for a variety of disorders between infants and children and adults.

Benefits of cognitive based therapy (CBT) was emphasized, including decreased pain, improved function, and short-term benefits (i.e. improved gait and stair climbing) and long-term benefits (i.e. improved school attendance, better patient follow up). Neuroplasticity—the concept that we can change responses to outside perturbations like opioid administration, explains why younger children and adolescents get tolerant faster than adults do, resulting in profound opioid tolerance in PICU and pediatric oncology patients. As a correlate of this, the RAVE hypothesis explains why different opioids differ in activation of tolerance (methadone versus morphine); lower RAVE index opioids should be selected for chronic administration. In particular, infant strategies may include NMDA antagonists with clonidine to decrease tolerance. The “spared nerve injury model,”—illustrating lack of allodynia and neuropathic pain in rats less than 4 weeks of age may offer explanations neuropathic pain is uncommon before school age.

Shobha Malviya, M.D. (University of Michigan, Ann Arbor, MI) presented Assessment of Pain in Children, via “redefining 10”—i.e. a 10 pain score is different for a 12-year-old in sickle cell crisis and a 5-year-old falling off a bike; necessitating comprehensive pain assessment. Self-report pain methods (psychological) were elucidated including faces scale, Oucher (ethnic and gender bias), numerical scales (pain thermometers and pain ladders), poker chip tools, color scales (red/black = pain), pain words—small medium and big; it “feels like lightning” and pain interviews and pain questionnaires. Behavioral assessments including CHEOPS (Children's Hospital of Eastern Ontario Pain Scale), OPS (Objective Pain Score) and FLACC (Face, Legs, Activity, Cry and Consolability) scale were reviewed.

Unique pain behaviors should be sought particularly in cognitively impaired children such as those with cerebral palsy, as retarded children can show the same extent of pain as normal children. The interpretation of complex patient data and scientific principles of pain assessment was enforced as the best pain assessment practice for “pain as fifth vital sign.” We need not rely on physiological (biological) pain methods in infants—“state-of-the-art” pain tools in those less than one year old include the neonatal/infant pain scale (NIPS), the FLACC for the preverbal child, self-reporting in older children, but it is best to use all the tools in conjunction with each other.

K.J.S. Anand, M.D., MBBS, DPhil (Arkansas Children's Hospital, Little Rock, AR) discussed Neurobiology of Acute Pain in Children. Pathways of supraspinal processing of acute pain reveal that the lateral thalamic system provides content while the medial thalamic system provides context—when the two systems are “out of sync” acute pain may evolve to chronic pain. He touched on the controversial area of fetal pain with the current thinking that fetal pain occurs before late gestation—probably in second trimester. In the social context of pro-choice and pro-life issues, he voiced that if we accept that pain does occur during dismemberment of fetus, the pertinent question becomes should we administer lethal intra-amniotic injections to a fetus before termination.

Allison Kinder Ross, M.D. (Duke University, Durham, NC) moderated the second morning session “Non-pharmacologic approaches to



Who's Who at the Annual Meeting – Top row: Zulfiqar Ahmed, Jayant Deshpande, Frank McGowan. Bottom row: Joe Tobin, Peter Davis, Randy Flick and Shobha Malviya

pain management”, introduced J. Christian Abajian, M.D. (University of Vermont, Burlington, VT) who discussed Magical Distraction. Anxiety in young children has been associated with a more painful postoperative recovery; overall, distraction techniques reduce distress and are low cost interventions. Benefits of magic include a drug-free alternative to reducing anxiety, fun activity, easy to learn, enjoyed by children, no side effects and inexpensive.

Magic can be performed everywhere (preoperative holding area, starting intravenous, operating room, recovery room, endoscopy suite, and oncology unit), drawbacks are few—being called the “Magic man” and being asked for assistance for children with preoperative anxiety. Overall, anesthesiologists should not be lulled into thinking magic will work for all children—some children do require pharmacological therapy—magic works for some but not all children, potentially offering benefits post hospitalization. Video footage from “Magical perioperative experience” was shown to the audience.

Brenda Golianu, M.D. (Stanford University, Stanford, CA) spoke on Acupuncture and Complementary Analgesic Therapy; the goal being that the cycle of affective input to cognitive framework to pain sensation can be attenuated with alternative modalities. Cognitive based therapy can be utilized. Common acupuncture accupoints were illustrated such as the P6 accupoint injection effective in decreasing postoperative nausea and vomiting. Noninvasive methods of acupuncture such as accupressure can be very useful in children. Acupuncture can also be used in those on chemotherapy. Functional MRI video footage demonstrated performance of real acupuncture and effect on change in blood flow.

Sam R. Sharar, M.D. (University of Washington, Seattle, WA) presented Virtual Distraction, using the Snow-World immersion virtual reality tool for treating burn victims. Audiovisual (AV) distraction runs the gamut from television to video games to immersion virtual reality (VR); while we are all cost-conscious, not all audiovisual distraction is as effective. During burn physical therapy, pain scores are 40-50% lower with VR than with video games, and hold patient attention better as well. (Lesser AV distraction is cheaper but offers less effective analgesia). Components of the VR distraction system include a human computer interface, user immersion in virtual world (3D high resolution visual display, stereophonic sound, tactile feedback devices), and user interaction with virtual world (head and limb

[See Annual Meeting, page 5](#)

---

## Annual Meeting, from page 4

tracking, navigation by joystick).

Benefits include ideal techniques for brief painful procedures of mild to moderate intensity (diagnostic procedures, lumbar puncture, intravenous, post operative physical therapy, dental pain, thermal ablation, cancer related procedures, and burn wound care.) as children find VR more immersive and real than adults. Limitations include little experience in extremes of age, simulator sickness with prolonged use, and significant cost of system (Hardware \$30-40,000).

Patrick Birmingham, M.D. (Children's Memorial, Chicago, IL) moderated the afternoon session "Pharmacological approaches to pain management," Julia C. Finkel, M.D. (Children's National Medical Center, Washington, DC) discussed Opioids and Non-steroidals (NSAIDs). A short review of the role of NSAIDs in premature and full term neonates and COX mediated prostaglandin (PG) production was followed with developmental implications of PG. Neonates treated with indomethacin have a 40% incidence of renal impairment. Sleep can be affected as PG suppresses nocturnal melatonin. COX-2 inhibition prevents prostacyclin and PGE formation, triggering pulmonary hypertension. Overall—little evidence for pediatric use of NSAIDs as first line analgesic, NSAIDs should be adjuvant to opioid analgesics.

Future analgesics, still in animal trials, include NO-releasing NSAIDs, which offer potent analgesia, decreased side effects and no hepatotoxicity (i.e. NO acetaminophen and NO flurbiprofen). On the subject of opioids, while neonates less than 7 days of age need less morphine, morphine does not provide adequate analgesia for procedural pain for premature babies and morphine use has not been found to reduce severe intraventricular hemorrhage, periventricular leukomalacia or death in preterm neonates on ventilators. Reasons postulated are immature receptors, morphine metabolism in liver. Overall there is insufficient data to determine pharmacokinetic and pharmacodynamic relationships for analgesia of NSAID or opioids.

Adrian T. Bosenberg, MB, ChB (Red Cross Children's War Memorial Hospital, Cape Town, South Africa) discussed regional anesthesia. The accuracy of a block can be improved with surface nerve mapping, nerve stimulation and ultrasound; pediatric challenges include definition of anatomy, complications not always apparent, toxicity and other complications. Paresthesias, which are only 38.2% sensitive, are not done in kids. Motor response to nerve stimulation less than 0.5 mA or even less than 0.2 mA are 74% sensitive, but are not necessarily "safe"—intraneural injection can occur at 0.6 mA (range 0.08-1.8 mA).

Nerve mapping can be used for the child under general anesthesia, as long as nondepolarizing agent is not administered until after the block. He proposes ultrasound to allow confirmation of placement, especially in locations where nerves are—benefits include fast onset, long duration, less pain, lower risk; drawbacks include high cost, learning curve, need space. Onset time of the block is reduced with ultrasound—a dose of 0.1ml/kg is the adequate dose for a successful block.

In case of a bupivacaine-related cardiac arrest, the use of 20% intralipid was advocated for resuscitation, through the mechanism of a lipid sink at the mitochondrial level. Resuscitation starts with 1 ml/kg of 20% intralipid over one minute, CPR, repeat intralipid every 3-5 minutes until total dose of 3 ml/kg. If patient responds, convert to 0.25 ml/kg/min. Propofol should be considered inappropriate for use as resuscitation i.e. not considered a substitute for 20% Intralipid.

Brenda C. McClain, M.D., DABPM (Yale New Haven Children's Hospital, New Haven, CT) discussed Newer Modalities for Pain Management. Perioperative uses of clonidine was reviewed including premedication, shivering, postoperative nausea, post operative pain, emergence delirium, and neuropathic pain. Dexmedetomidine is 1620:1 alpha 2 agonist with a wider dosing regimen effective in emergence agitation, premedication and procedural pain. Tizanidine is an alpha 2 agonist that can be used for chronic daily headaches, and is a muscle relaxant; lofexidine is pending for opioid withdrawal. Methadone has uses in decreasing neuropathic pain particularly in morphine tolerant burn patients (RAVE hypothesis) but we should be aware of potential toxicity if patient is on antifungals, antidepressants,

or alternatively diminished efficacy when on anti-seizure medications or reverse transcriptase inhibitors. Ketamine should be considered for PCA in concert with morphine, prepared as a 1:1 mixture.

John B. Rose, M.D. (Children's Hospital of Philadelphia, Philadelphia, PA) discussed Chronic Pain Management. No evidence-based reviews exist for pharmacological interventions for chronic pediatric pain. The analgesic effect of antidepressants is not established in chronic pediatric pain—when using tricyclics suicide, long QT syndrome, anticholinergic effects as well as tricyclic withdrawal syndrome are caveats to their use. Pizotifen is a serotonin antagonist/antihistamine not currently available in the USA. Anticonvulsants for pediatric pain, studied alone and in combination with tricyclics have limitations of higher adverse or serious adverse effects such as bone marrow suppression. Gabapentin is the preferred anticonvulsant with rare adverse effects, tramadol may decrease allodynia and paresthesias in neuropathic pain, lidocaine/mexiletine is superior to placebo for neuropathic pain with adverse effects 35% vs. 12 % placebo group. Propranolol and flunarizine may be effective in pediatric migraines. He recommended more multidisciplinary pain clinics with multi center collaboration to study pain conditions.

Tetsu Uejima, M.D. (Children's Memorial, Chicago, IL) moderated the final afternoon panel on "Medical informatics and quality assurance", and introduced Joseph P. Previte, M.D., F.A.A.P. (Cincinnati Children's, Cincinnati, OH) discussing Electronic Anesthesia Records, can we make them user friendly? He advises that President Bush proposed all hospitals have electronic documentation in 10 years, authorizing \$4 billion to study this nationwide, and many organizations such as Anesthesia Patient Safety Foundation ([www.apsf.org](http://www.apsf.org)), Institute of Medicine ([www.iom.edu](http://www.iom.edu)), and Society for Technology in Anesthesia ([www.anestech.org](http://www.anestech.org)) are promoting this initiative.

Computers will change the way we practice medicine—benefits will include formation of research databases, quality assurance tracking, education, and improved patient care. After an examination of many vendors with a site visit, our organization's expectations of a reliable, fast, mobile and secure enterprise-wide virtual tool have to be tempered with implementation considerations (workers, support staff, ancillary staff), equipment considerations (software, hardware), as well as education and training. Start-up costs can be 5% of a hospital's \$1 billion budget, with maintenance costs of 1% of budget/year (or approximately \$10 million/year). We should be aware that implementing an electronic anesthesia record in an average anesthesia department whose annual budget is \$30 million per year might cost between \$1-2 million in the first year.

Benjamin H. Lee, M.D., M.P.H. (John Hopkins, Baltimore, MD) discussed Minimizing Prescription-Writing Errors: Computerized Prescription Order Entry (CPOE). CPOE may decrease injury—the error rate in pediatric prescription practice has been estimated at 82%, with severe errors at 3.5%, and also save money. Reasons for the high error rate include weight-based drug dosing, misplaced decimals, and children having fewer developmental communication skills. Solutions include review by pharmacists, hospital review, computerized provider order entries, and clinical decision support systems. An Internet demonstration of a controlled substance scriptwriter highlighted the benefits to the audience.

David M. Polaner, M.D., F.A.A.P. (Children's Hospital, Denver, CO) substituting for Lynn D. Martin, M.D. (Children's Hospital, Seattle, WA), reported Database Management: the Pediatric Regional Anesthesia Consortium as Prototype. Retrospective studies report lumbar epidural complication rate as more than 1 in 1000, peripheral nerve block less than 1 in 1000; the ASA closed claims in pediatric regional anesthesia describes 0.3% of pediatric claims involved regional anesthesia, a French prospective study based on self-reporting reported an overall complication rate of 1 in 1000 with the risk highest for caudal epidural followed by lumbar then sacral epidural and last spinal. SPA is involved in a large prospective study to collect data by a web-based tool which is IRB anonymous and HIPAA

---

See Annual Meeting, page 6

# ASA 2006 Review: Scientific Papers & Oral Presentations

*Six abstracts listed, five presented*

Reviewed by Rita Agarwal MD, FAAP

Moderators: Zeev Kain MD and Sulpicio Soriano, MD, FAAP

## **Anesthetic Management of the Pediatric Bleeding Tonsil: A Review of 475 Patients**

Ryan G. Fields, D.O., M.B.A., Chadd Davidson, B.S., Ronald S. Litman, D.O. Department of Anesthesiology and Critical Care, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania

Data on the anesthetic management and complications of post tonsillectomy bleeds are limited. The authors of this study analyzed the computerized anesthetic records for 475 consecutive patients presenting for operative intervention, over a 7 year period (1998-2005). Amongst the variables they reviewed they found an incidence of hypoxia in 28 % of patients on induction of anesthesia, 15% intra-operatively and 1% in the postoperative period. There was a 2.7% incidence of failed intubation and 0.6% incidence of intra-operative blood transfusion.

## **A Multivariate Model To Predict Pediatric Sedation Failure**

Michael L. Beach, M.D., Ph.D., Joseph P. Cravero, M.D. Anesthesiology, Dartmouth Medical School, Lebanon, New Hampshire

## **Frequency of Inadequate Sedation/Anesthesia: Comparison between Provider Types and Procedures**

Joseph P. Cravero, M.D., George T. Blike, M.D., Susan M. Gallagher, B.S., Michael Beach, M.D., Ph.D. Anesthesiology, Dartmouth Hitchcock Medical Center, Lebanon, New Hampshire

Both of these presentations used data from the Pediatric Sedation Research Consortium- a group of 26 participating institutions which collect data on all pediatric sedations in a blinded fashion. The first presentation focused on the data collection techniques and tools, which included 24 question sets. Logistic regression was used to construct a multivariate model. The second abstract focused on the frequency of inadequate sedation and the influence of the type of procedure and provider. Both found that the incidence of sedation failure was very low across provider types, but was highest for radiology procedures and for non-anesthesiologists.

Both presentations elicited a great deal of commentary and questions from the audience. Dr Rob Smith from Alaska summed it up nicely when he

stated that in light of the fact that is an example of the failure of anesthesia to reach out to other specialties.

## **Cardiac Arrest in Pediatric Patients Undergoing Non-cardiac Surgery**

Tracy E. Harrison, M.D., Stephen J. Gleich, B.S., Randall P. Flick, M.D., M.P.H., Darrell R. Schroeder, M.S., Juraj Sprung, M.D., Ph.D.. Department of Anesthesiology, Mayo Clinic College of Medicine, Rochester, Minnesota

A retrospective chart review, using the Mayo Clinic Anesthesia Performance Improvement database was undertaken to identify cardiac arrest (CA) in pediatric patients either during surgery or within 24 hours of surgery. The study period was from 1988-2005, 88,504 anesthetics were delivered during this time and 26 cardiac arrests were identified. The overall incidence was 2.9/10,000 anesthetics. The majority of patients who suffered CA were ASA 3 or greater and the majority were either associated with their co-morbidity, hemorrhage or embolism. Only 4 episodes were thought to be caused by anesthesia. Overall survival was 46%; however 75% of patients whose cardiac arrest was related to anesthesia survived. All neonates who arrested died, however in all cases the cause of their arrest was not related to anesthesia.

## **The Neurotoxic Effects of Ropivacaine on the Spinal Cord of Pup Rabbits**

Qing-Quan Lian, M.D., Ph.D., Mei-Qin Di, M.S. Department of Anesthesiology, Huazhong University of Science and Technology, Wuhan Union Hospital, Wuhan, Hubei, China

These investigators randomly injected 3 different concentrations of ropivacaine, tetracaine or saline intrathecally into 45 day old Japanese white rabbit pups. The animals were sacrificed at 3 hours, 6 hours or 7 days after the injections and their spinal cord (L5-6 segment) examined for signs of apoptosis and the apoptosis correlated gene. With 0.25% ropivacaine, 0.5% ropivacaine and saline, there were minimal changes and swelling. 0.75 % ropivacaine and tetracaine had typical apoptotic changes at 3 hours, which increased at 6 hours and were still present but in lesser concentrations at 7 days. The authors conclude that 0.5% and 0.25% ropivacaine may not be injurious to the spinal cord in rabbit pups.

---

## **Annual Meeting, from page 5**

compliant using the Axio® research corporation system. He anticipates that this database will identify and define the best practice centers, gather feasibility data for randomized trials, and create a collaborative network of pediatric centers.

Peter J. Davis, M.D. (Children's Hospital, Pittsburgh, PA) lectured on Awareness under Anesthesia: Where are we in 2006? After a review of the causes, psychological sequelae, and risk factors for awareness, he contrasted the incidence of pediatric awareness (0.8%) with that of adults (0.13%)—reasons postulated for the six-fold higher figure included lack of anesthesia on transport from induction to operating rooms. JCAHO has mandated anesthesia providers to prevent awareness and educate their staff and identify patients with increased risk of awareness. Risk can be reduced with premedication of amnestics, administration of more than “sleep dose” of induction agents, avoiding total paralysis, avoiding muscle relaxants unless necessary, periodic maintenance of vaporizers and equipment, and being alert for patients on beta blockers and calcium channel blockers. Post op checks are critically necessary—half of all anesthesiologists do NOT perform them—medicolegally a “dead on arrival” for us. Patients who have risk factors for awareness (substance abuse, difficult intubation, chronic pain patients, cardiac patients, caesarian section patients, trauma, ASA IV-V and those hemodynamically unstable should have informed consent that awareness is a risk. Patients who nonetheless become aware

should be referred to counseling programs. Dr. Davis suggests hospitals through support from their infrastructure set up databases to determine their incidence of complications and side effects.

Marina Vassi Panos, LEED, AP (VOA Associates, Inc., Chicago, IL) concluded with Chicago Architecture from White City to Green City. She traced the architectural evolution of the metropolis of Chicago from post 1871 fire (the only surviving building being the water tower) to Daniel Burnham's design for Chicago with boulevard system connecting to parks and a forever-free lakefront. Early Chicago skyscrapers (Monadnock Building, Home Insurance Building, Wrigley Tower, Tribune Tower) as well as more recent buildings (IBM building, John Hancock, Sears tower, and Marina City) were presented. Future skyscrapers such as the Trump international tower (2008) which couple architecture to efficient energy design, and the Fordham spire were considered. Architectural considerations of McCormick Tribune, Navy Pier, Mill Park, Pritzker Pavilion, Crown Fountain and Cloud Gate were enjoyably examined. Chicago City Hall has a neoclassical style with a green roof and energy efficient design (look out New York City!). Websites were provided for additional architecture information ([www.architecture.org](http://www.architecture.org), [www.cityofchicago.org](http://www.cityofchicago.org), [www.chicagohistory.org](http://www.chicagohistory.org), [www.millenniumpark.org/artandarchitecture](http://www.millenniumpark.org/artandarchitecture).)

The conference was well received by the audience, who look forward to the Joint Winter meeting of the SPA and AAP Anesthesia section in Phoenix, AZ.

# PBLD Review: October 14-18 at the Annual Meeting

**Shahid Hussain, MD, FAAP**

University of Arkansas for Medical Sciences &  
Arkansas Children's Hospital, Little Rock, Arkansas

This year the 15<sup>th</sup> Annual Problem-Based Learning Discussions were presented on October 14-18 at the Chicago Hilton Hotel during the annual meeting of the American Society of Anesthesiologists.

During the beverage session, on October 14<sup>th</sup>, Dr. Tatyana C Strong, M.D. and the participants discussed a case of a 3-year-old boy who developed a sore throat, high fever and cough with respiratory distress before his presentation to the Emergency Room. In the ER his temperature was 39.2°C, heart rate 145/min, BP 104/49mmHg, 40/min and oxygen saturation of 89% on room air. Clinically he appeared lethargic and sleepy with significant stridor, intercostal retraction and use of the accessory muscles.

He was given 40% FIO<sub>2</sub> via mask with rise in oxygen saturation to 94%. A peripheral IV was started. He was also given nebulized albuterol and a dose of racemic epinephrine without effect. Heliox was also used with improvement in his symptoms and a rise in oxygen saturation to 97%. Lateral view of the chest and neck X-Rays revealed possible narrowing of the sub-glottic airway. Surgical plan was rigid bronchoscopy under general anesthesia due to suspected epiglottitis or bacterial tracheitis.

Patient was induced with halothane in 100% FiO<sub>2</sub> after standard ASA



Shahid Hussain

monitors were placed. Assisted ventilation was successful. Propofol infusion was started in addition to inhaled halothane and the airway was turned over to the surgeon. Rigid bronchoscopy was performed while spontaneous ventilation was maintained. A diagnosis of bacterial tracheitis was confirmed. The tracheal secretions were cleared with suction and forceps. After the completion of the procedure the patient was intubated with an appropriately sized endotracheal tube and transferred to the ICU. He remained intubated in the ICU for 48 hours and was extubated uneventfully. He was discharged home several days later.

Different questions were raised and discussed by the participants on how to provide anesthesia care to this child and how to manage his airway. Some of the issues discussed were:

- Do we need an IV before induction in these kind of scenarios and what if this patient didn't have the IV.
- How to induce this patient with an impending airway obstruction.
- Is IM Ketamine a good choice for induction.
- Benefit of letting the patient breathe spontaneously.
- Pros and cons of using paralysis for this patient.
- What anesthesia delivery options are available during the rigid bronchoscopy.
- Would awake tracheostomy be the first option.

All the participants agreed on having multiple options and tools available for securing the airway in patients who may have an impending airway emergency. Everyone agreed to proceed with inhalational induction after the placement of an intravenous line and letting the patient breathe spontaneously. ENT surgeon should be available on the bedside before any kind of manipulation of the airway is attempted.

## Poster Discussion: Pediatric Cardiac Anesthesia and Pain Management

Reviewed by **Rita Agarwal MD, FAAP**

Moderators: **Chandra Ramamoorthy MD; Myron Yaster MD**

### **Incidence of Perioperative Cardiac Arrest in Pediatric Patients Undergoing Complex Cardiac Surgery**

Stephen J. Gleich, B.S., Tracy E. Harrison, M.D., Randall P. Flick, M.D., M.P.H., Darrell R. Schroeder, M.S., and Juraj Sprung, M.D., Ph.D... Department of Anesthesiology, Mayo Clinic, Rochester, Minnesota

### **Sudden Cardiac Arrest in Patients with Congenital Heart Disease (CHD) Undergoing Cardiac Surgery**

Kirsten C. Odegard, M.D., James A. DiNardo, M.D., Peter C. Laussen, M.B.B.S.. Anesthesia, Children's Hospital Boston, Boston, Massachusetts

### **Aprotonin Decreases Blood Transfusion in Pediatric Heart Surgery: A Meta-Analysis**

Michael P. Eaton, M.D., Hongwei Zhao, Sc.D., Hongkun Wang, Ph.D. Department of Anesthesiology, University of Rochester School of Medicine, Rochester, New York

### **Cerebral Perfusion and Oxygenation after Norwood Procedure: RV-PA Conduit Versus Modified BT Shunt**

Barry D. Kussman, M.B.B.Ch., Kimberlee Gauvreau, Sc.D., James A. DiNardo, M.D., Jane W. Newburger, M.D., M.P.H., Peter C. Laussen, M.B.B.S.. Anesthesiology, Perioperative and Pain Medicine, Children's Hospital Boston, Boston, Massachusetts

### **A Comparison of Caudal Clonidine, Morphine or Hydromorphone in Pediatric Ureteral Reimplant Patients**

Thomas R. Vetter, M.D., Daniel Carvalho, M.D. Anesthesia, Indiana

University School of Medicine, Indianapolis, Indiana

### **Myringotomy and Tube Placement Pain: Comparison of a Regional Technique to Intranasal Fentanyl**

Polina Voronov, M.D., Michael Tobin, M.D., Melissa Jennings, R.N., Charles J. Cote, M.D., Santhanam Suresh, M.D.. Department of Pediatric Anesthesiology, Children's Memorial Hospital, Chicago, Illinois

### **Ultrasound-Guided Pediatric Epidural Anesthesia in the Nuss Procedure for Pectus Excavatum**

Nobuko Tsukigase, M.D., Shigekazu Sugino, M.D., Masanori Yamauchi, M.D., Makoto Asano, M.D., Ph.D., Akiyoshi Namiki, M.D., Ph.D.. Department of Anesthesiology, Sapporo Medical University School of Medicine, Sapporo, Hokkaido, Japan

### **Effects of Intraoperative Ketamine on Remifentanyl-Induced Opioid Tolerance after Scoliosis Surgery**

Thomas Engelhardt, M.D., Ph.D., Christian Zaarour, M.D., Basem Naser, M.B.B.S., Joost DeRuiter, M.B.Ch.B., Mark W. Crawford, M.B.B.S.. Department of Anesthesia, The Hospital for Sick Children, Toronto, Ontario, Canada

As an anesthesiologist with an interest in pain management but who does not practice cardiac anesthesia, I always find this session an enigma. I thought I would highlight a few of the posters that captured my attention, since in all honesty I don't feel qualified to comment on the cardiac anesthesia presentations. They were all well presented and worthwhile reading so I've included all their titles and authors.

See **Poster Discussion**, page 8

# Highlights of the SPA/AAP Breakfast Panel at the ASA Annual Meeting

*Panel sponsored for the first time by Society for Pediatric Anesthesia and American Academy of Pediatrics, Section on Anesthesiology and Pain Medicine*

**Constance S. Houck, MD**

Despite the particularly early hour, less than ideal weather, and the inconvenience of getting to the various venues in Chicago, 178 tickets were sold for this year's Breakfast Panel. This was the first year that the panel was co-sponsored by the Society for Pediatric Anesthesia and the American Academy of Pediatrics, Section on Anesthesiology and Pain Medicine. This year's topic, Minimally Invasive Surgery in Pediatrics: Smaller Scars and Different Problems, was particularly timely as increasing numbers and types of surgery are being performed via minimally invasive techniques.

The Panel was moderated by Dr. Constance Houck, Education Chair for the American Academy of Pediatrics, Section on Anesthesiology and Pain Medicine.

Dr. Lynda Means from Childrens Hospital Boston opened the session with a talk on the principles of laparoscopic and robotic surgery in children. She utilized a case-based approach to review the physiologic considerations when performing this type of surgery and to outline the issues unique to infants and young children. Special emphasis was placed on the importance of closely monitoring abdominal pressures during CO<sub>2</sub> insufflation as high pressures can greatly exacerbate the adverse cardiovascular and cerebrovascular effects in young children. Unique aspects of anesthesia for robotic surgery were also reviewed.

Dr. Chandra Ramamoorthy from Lucile Packard Children's Hospital continued the discussion with a review of thoroscopic surgery in infants

and children. She described the most common indications for thoroscopic surgery in infants and children and briefly reviewed the various techniques for one lung ventilation in infants.

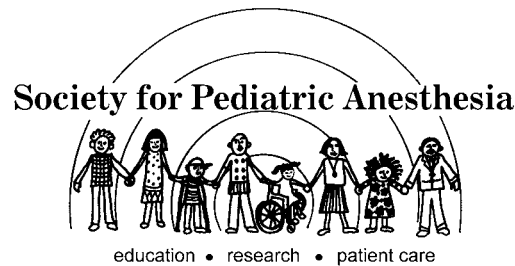
She particularly emphasized the importance of close monitoring of adequacy of ventilation in infants, as ETCO<sub>2</sub> in this setting often underestimates arterial CO<sub>2</sub>. She concluded her talk with a discussion of the advantages and disadvantages of this approach, the most striking of which appears to be the reduced incidence of scarring and subsequent chest deformity.

Dr. Scott Walker from Riley Children's Hospital wrapped up the session with a comprehensive discussion of the Nuss procedure. He described the many advantages to this approach (i.e. shorter surgical times, smaller and less conspicuous incisions), the potential surgical complications and the important and challenging disadvantage: severe and long lasting pain. The use of regional anesthesia techniques along with judicious use of adjunctive agents was emphasized

to provide pain relief in the initial postoperative recovery period and potentially improve longer term recovery.

Much of the discussion at the end of the Panel focused on the techniques used around the country to provide pain relief for the Nuss procedure both in the immediate postoperative period and over the rest of the convalescence. Significant pain has been noted for up to a month postoperatively and often requires a prolonged period of oral opioid analgesia. Several attendees emphasized the need for a combination of epidural analgesia (local anesthetic with or without clonidine) along with either intravenous patient-controlled opioid analgesia or the early initiation of oral opioids.

In their experience, this seems to provide the most successful long term pain control strategy for this procedure.



## American Academy of Pediatrics



---

## Poster Discussion, from page 7

Dr. Thomas Vetter presented his results comparing the use of caudal epidural ropivacaine with either clonidine, morphine or hydromorphone in patients undergoing ureteral re-implants. All other variables were standardized and the study was prospective, randomized and double masked. All blocks were performed prior to the surgical incision. The authors found that while caudal morphine provided more intense block initially (229 minutes to first dose IV morphine vs. 35 for clonidine and 102 for hydromorphone), caudal ropivacaine + clonidine resulted in less pruritus, less nausea and vomiting, but no increase in total morphine required, time to discharge or FLACC scores.

After years of doing myringotomy and tube placements, I am still looking for the ideal way to provide analgesia and comfort for these patients. Drs. Voronov and colleagues compared the use of the nerve of Arnold block (auricular branch of the vagus nerve) for providing analgesia to intranasal fentanyl (2mcg/kg). The patients' pain scores were lower in

the fentanyl group at 15, 20 and 30 minutes. However at 50 minutes the pain scores were the same. The block group had lower incidence nausea and vomiting but also required more rescue analgesics (acetaminophen). What remains unclear is if the similarity of the pain scores at 50 minutes are a reflection of the sedative effects of the fentanyl wearing off, the rescue analgesics, truly the block. This certainly seems to be a technique should be investigated further.

Finally the presentation by Nobuko Tsukigase on Ultrasound-Guided Pediatric Epidural Anesthesia in the Nuss Procedure for Pectus Excavatum was fascinating in that the ultrasound was used to identify the epidural space, angles of needle entry and depth prior to placement of a thoracic epidural. The authors found that it took less time, and required fewer attempts to access the space. They did not ultrasound while actually placing the needle. This would seem to be a quick and easy way to improve the speed and possibly safety of the block.

# Clinical Forum: Pediatric Anesthesia Challenges

Reviewed by Constance S. Houck, MD

It was a full house on Tuesday afternoon for the Clinical Forum entitled Pediatric Anesthesia Challenges moderated by Greg Hammer, MD from Lucile Packard Children's Hospital. This Forum presented two challenging, but not too uncommon, pediatric OR cases for the panel of experts to discuss. This year's panel included J. Michael Badgwell, MD from Texas Tech University, Laura Diaz, MD from the Division of Pediatric Cardiovascular Anesthesiology of Texas Children's Hospital and Myron Yaster, MD from Johns Hopkins University.

The first case was that of a 4-year-old boy with a bicuspid aortic valve and obstructive sleep apnea presenting for tonsillectomy. Initial discussion centered on what type of cardiac evaluation and "clearance" should be required in the preoperative period. The difficulty of gathering this information prior to surgery and the potential problems that can occur from not fully evaluating a cardiac lesion were debated. Discussion about the many aspects of the operative and postoperative course in infants and children with obstructive sleep apnea ensued. Some of the newer research in both animals and humans on obstructive sleep apnea and the signifi-

cantly lower perioperative opioid requirements after adenotonsillectomy were presented (Brown KA, et al. *Anesthesiology* 2006; 105:665–9 and Moss IR, et al. *Anesthesiology* 2006; 105:715–8).

The second case was that of a 4 month old presenting for repair of a single suture craniosynostosis. The family arrived after having driven 5 hours to get to the hospital that morning. The baby was noted to have mild URI symptoms and an occasional dry cough. Discussion in this case revolved around potential airway issues in this scenario, including the increased risks of perioperative hypoxemia, laryngospasm, bronchospasm, atelectasis and ET tube obstruction (Tait AR and Malviya S. *Anesth Analg* 2005;100:59–65). The panelists discussed strategies to assess the risks and reduce the complications in the presence of an upper respiratory infection. The recent studies on the use of CPAP and/or PEEP to decrease atelectasis associated with high inspired oxygen concentrations in the perioperative period were reviewed (Rusca M, et al. *Anesth Analg* 2003;97:1835–9, Benoit Z, et al. *Anesth Analg* 2002;95:1777–81). Some discussion also ensued about the potential value of higher concentrations of inspired oxygen in the perioperative period to promote healing and maintain immune function.

## Literature Reviews

### A Comparison of Epidural Bupivacaine-Fentanyl and Bupivacaine-Clonidine in Children Undergoing the Nuss Procedure

Cucchiari G, Adzick S, Rose J, et al. *Anesthesia & Analgesia* 2006;103:322-327.

Reviewed by: Cheryl K. Gooden, MD, FAAP

Mount Sinai Medical Center, New York, NY

#### Review:

The goal of the study was to test the hypothesis that the incidence of side effects of epidural clonidine compared with epidural fentanyl are decreased. The secondary goal of the study was to examine whether the analgesic efficacy of bupivacaine-fentanyl compared with bupivacaine-clonidine was similar. In addition, the investigators of this study examined whether a small dose of clonidine would enhance the effects of a small dose of fentanyl, while reducing the incidence of side effects. This randomized double-blind study consisted of 47 patients, aged 10 – 19 yrs old. The patients were scheduled for a Nuss procedure for correction of pectus excavatum. A thoracic epidural catheter was placed in these patients for postoperative pain management. Exclusion criteria for this study were patients in whom it was technically impossible to place an epidural catheter, patients with a malfunctioning epidural catheter, and also in patients where the epidural catheter was removed within eight hours of the end of surgery.

Prior to the induction of general anesthesia, the thoracic epidural was placed at the T 6 – 10 level. General anesthesia was induced with propofol (3 – 5 mg/kg) and endotracheal intubation was facilitated with vecuronium (0.1 mg/kg). Maintenance anesthesia consisted of desflurane in 40% - 50% air – oxygen. Patients were randomized to one of three groups that included bupivacaine + clonidine (BC),

bupivacaine + fentanyl (BF) or bupivacaine + fentanyl + clonidine

(BFC). The previously mentioned combinations of medications were injected via the epidural catheter as 0.3 mL/kg (maximum 10 mL) and an infusion with the same mixture of medications was started at a rate of 0.25 mL/kg/hr (maximum, 10 mL/hr) during the intra-operative period. Patients did not receive intravenous narcotics during the surgery. At the end of surgery, following tracheal extubation patients were transferred to the postanesthesia care unit (PACU) and connected to patient-controlled epidural analgesia device. The same medication combinations used during the intraoperative period were employed for PCEA.

Postoperative variables examined in this study included arterial blood pressure and heart rate; respiratory rate and oxygen saturation; sedation level using the De Kock scale; episodes of vomiting and pruritus; and level of pain at rest, on mobilization and coughing. This data was recorded at the time of arrival into the PACU, 1 hr after extubation, every 4 hrs for the first 24 hrs, and every 6 hrs for the next 48 hrs.

Although, 47 patients were initially enrolled in the study, eight patients could not be included in the final analysis. Four of these patients were not included in the final analysis due to an inability to place the epidural catheter. Another four patients were excluded because of ineffective analgesia from the epidural catheter. Patient demographics among the three groups were similar.

Of particular note, an interim analysis showed the incidence of vomiting and pruritus to be clinically and statistically more frequent in patients receiving epidural fentanyl compared with patients receiving clonidine. Due to these findings the investigators decided to conclude the study. Following final analysis of the data, this study showed that the occurrence of side effects associated with the use of epidural fentanyl may be significantly reduced by the use of clonidine. In addition, the study proved that epidural clonidine possess the same safety and analgesic efficacy as epidural fentanyl when used with a local anesthetic.

See [Literature Reviews](#), page 10

### Comments:

This study is one of very few to examine the use of epidural clonidine in children. More specifically, this study demonstrates that epidural clonidine is efficacious when compared with epidural fentanyl for use in children undergoing a pectus excavatum repair. Earlier studies describing the use of epidural clonidine centered on its optimal dose.

The use of clonidine in the pediatric population as noted in the medical literature is becoming more widespread. If you are not already using clonidine in your anesthesia practice you may want to consider its use. The results generated from this study point to the safety and effectiveness of epidural clonidine. The investigators also mentioned that another area of study for the future would be to examine whether the findings of their study have an impact on overall patient satisfaction with postoperative care. This is a great idea!

### The efficacy of a subhypnotic dose of propofol in preventing laryngospasm following tonsillectomy and adenoidectomy in children.

YK Batra, M Ivanova, SS Ali, M Shamsah, ARA Quattan, KG Belani. *Pediatric Anesthesia* 2005; 15:1094-1097

#### Reviewed by Hoshang J. Khambatta, M.D.

Columbia Presbyterian Medical Center, New York, NY

Laryngospasm is a well known problem typically occurring following tracheal extubation. Propofol is known to inhibit airway reflexes. The authors have sought to assess whether the use of a subhypnotic dose of propofol, prior to emergence, will decrease the occurrence of laryngospasm following extubation in children. The study comprised of 120 patients, ASA status I and II, aged 3–14 years undergoing elective tonsillectomy with or without adenoidectomy. The study design was randomized, double blinded, and placebo controlled. Solid intake was allowed until midnight before the day of surgery, with clear liquids until 3 h before the start of surgery. All patients were premedicated with atropine 0.015 mg/kg and meperidine 1 mg/kg IM 30 min before anesthesia. Anesthesia was induced with thiopentone 4–5 mg/kg IV or with oxygen, nitrous oxide and Sevoflurane depending on patient preference. Each patient received 1.5 mg/kg of suxamethonium to facilitate tracheal intubation. Anesthesia was maintained with isoflurane 1.5–2.5% in 66% nitrous oxide in oxygen. Each received 1–2 mcg/kg of fentanyl IV. All patients were encouraged to breath spontaneously until completion of surgery.

At the end of surgery the pharynx was suctioned and the child was allowed to breathe 100% oxygen. At the appearance of the first sign of tracheal reactivity the propofol group received 0.5 mg/kg, propofol IV and the randomized, double blinded control group received normal saline. Sixty seconds after the administration of the study drug tracheal extubation was performed and the children were administered oxygen. Occurrence of laryngospasm was recorded by another blinded investigator. Laryngospasm was graded as a condition occurring within 2 min after extubation, characterized by the following findings: (i) stridor; (ii) total occlusion of the cords, respiratory efforts with no air movement; (iii) cyanosis with evidence of airway obstruction at the level of vocal chords. Treatment of laryngospasm was standardized: 1) positive pressure ventilation with 100% oxygen with face mask; 2) aspiration of oropharynx and continued ventilation with 100% oxygen, if symptoms persisted; 3) administration of suxamethonium 1 mg/kg.

### Comments:

The authors noted an incidence of laryngospasm in 20% of the children in the control group (12 out of 60 patients). Seven had stridor, four demonstrated laryngeal occlusion and one had cyanosis. Of these twelve children eleven responded to positive pressure ventilation with 100% oxygen via face mask and one required suxamethonium to break the spasm. In the propofol group 4 out of 60 had laryngospasm, an incidence of 6.6%. Three of these had stridor and one had occlusion. None required suxamethonium.

The authors have quoted several studies that show a 20% incidence laryngospasm following tonsillectomy. However an informal poll amongst anesthesiologists in private practice felt that the 20% reported incidence is too high. They suggested, although it is difficult to argue that as most of these studies came from teaching institutions, it may be that resident physicians learning the art may play a roll in the high incidence. By the same token the experienced private physician may underestimate the frequency of laryngospasm, as in the majority of these cases the problem is typically relieved by a modicum of positive pressure ventilation, which may then pass off as routine management. The etiology of the problem, which indeed is real, is still not well understood. Hence, several strategies and drugs have been suggested. These include injection of IV lidocaine 1 mg/kg or IV magnesium sulfate 15 mg/kg. Since laryngospasm does not occur under deep anesthesia, it has been suggested the patients be extubated while under deep anesthesia. Interestingly, there are recent studies quoted by the authors that report a 25% incidence of laryngospasm in patients extubated while under deep anesthesia and an incidence of between 21 and 27% when the patients were extubated wide awake. By contrast, there is a study that reports a zero incidence in wide awake patients, but there were only 20 patients in that group. The authors have demonstrated that a subhypnotic dose of propofol significantly reduced the incidence of laryngospasm.

The mechanism of action of propofol is not well understood but has been suggested that it is effective by attenuating laryngeal reflexes. It has been shown that afferent input from the vocal cords and larynx can activate N-methyl-D-aspartate (NMDA) receptors in the brain stem stimulating an efferent vagal response of vocal cord adduction. The authors suggest that propofol may have been effective in inhibiting NMDA receptors in the brain stem, thus stimulating an efferent vagal response of vocal cord adduction. There are reports that in some instances even a smaller dose of propofol, 0.25 mg/kg was effective in treating extubation laryngospasm. It may be that a larger, dose response study will be required to determine just how to prevent this common but life threatening problem.

### Comparison of three sites to check the pulse and count heart rate in hypotensive infants.

Sarti A, Savron F, Ronfani L, Pelizzo G, Barbi E. *Pediatric Anesthesia* 2006; 16:394-398

#### Reviewed by Hoshang J. Khambatta, M.D.

Columbia Presbyterian Medical Center, New York, NY

Current international guidelines issued by the American Heart Association in 2000 state that, for health professionals, in order to diagnose cardiac arrest in infants and start chest compression, heart rate at the brachial pulse must be absent or less than 60 beats per min. Lay rescuers on the other hand, are instructed to look for signs of circulation, such as breathing, coughing, and movement.

# Book Corner

**By: Helen V. Lauro, M.D., F.A.A.P.**

**Syndromes, Rapid Recognition and Perioperative Implications**, editor-in-chief Bruce Bissonnette, M.D., editors Igor Luginbuehl, M.D., Bruno Marciniak, M.D., Bernard J. Dalens, M.D., 953 pages, \$185.00, ISBN 0071354557, New York, N.Y., McGraw Hill, 2006.

This is the first edition of this eagerly anticipated, recently published hardcover textbook on pediatric syndromes.

The text is formatted encyclopedia-style, listing over 2000 syndromes from A through Z. The sections on each syndrome are consistently examined from 14 vantage points: "at-a-glance", synonyms, history, incidence, classification, genetic inheritance, pathophysiology, diagnosis, clinical aspects, precautions before anesthesia, anesthetic considerations, pharmacological implications,

other conditions to be considered and references. Sections are written by thirty-six world-renowned pediatric anesthesiologists, from various children's hospitals in United Kingdom, Canada, Belgium, France, Singapore, Switzerland, Australia, Ireland, South Africa and the United States in a very structured but surprisingly clear and readable format, which allows deciphering essential information swiftly. Figures are mostly black and white; tables are shadow-boxed and are clearly demarcated from textual material. A 24 plate color portfolio at the center of the text is provided.

So very often, as pediatric anesthesiologists, we are called upon to deliver anesthesia to a patient with an esoteric syndrome that we know very little about, necessitating a rapid computer search to provide necessary information to deliver anesthetic care safely. This excellent text will certainly be a useful reference for all anesthesiology practitioners who care for children.

## Literature Reviews, from page 10

In clinical practice, difficulties are encountered in detecting pulses both in adults and in children. There are no data on cardiac activity assessment in hypotensive infants, which is the most likely real event requiring chest compression in this age group. The authors have prospectively compared three sites for pulse detection and measurement in hypotensive infants during anesthesia namely, carotid, brachial, and femoral pulses. Forty hypotensive infants aged 1-12 months undergoing major surgery under general anesthesia were studied. Four pediatric basic life support (PBLIS)-certified health professionals, two physicians and two nurses participated in the study as examiners. All infants had intra arterial pressure and electrocardiogram monitoring.

Transient hypotension is frequent in infants after induction of general anesthesia and usually reverses as surgery begins. Hypotension was defined as systolic blood pressure below 70 mmHg, according to pediatric advanced life support guidelines. Each examiner, without knowledge of the actual monitored data of the patient, was asked to find the infant's arterial pulse within 10 s and to count it for 15 s, using 3 methods; 1) palpating the brachial pulse between the inside of the elbow and the armpit with two middle fingers of one hand (current guidelines); 2) palpating the femoral pulse by pressing two middle fingers of one hand into the top of the thigh, halfway between the iliac crest and the groin; and 3) palpating the carotid pulse in the neck with two middle fingers between the inner side of the sternocleidomastoid muscle and the larynx.

During each examination the order of the three methods was randomized. In the whole sample, the proportion of successful heart beat detection was higher for the femoral site. The femoral site also proved to be the most rapid and accurate way of counting heart rate. The agreement between physicians and nurses was poor for brachial and carotid pulse determination and fair for femoral pulse detection. The mean discrepancy amongst the nurses was smaller than amongst the physicians. The discrepancy is not well explained.

### Comments:

These findings challenge the current international guidelines which specify the brachial pulse standard. It is interesting to note that the choice was based on only one study carried out more than 20 years ago on 25 healthy infants, whose brachial and apical pulses were palpated by their parents.

The authors have shown that there is indeed a time when accepted practices should be challenged. The overall success rate of detection of accurate pulse was only 50%. Thus excessive erroneous diagnosis of pulselessness is very probable under real clinical conditions, which often results in undesirable chest compression. However, once the pulse is detected, listening to precordial sounds may be the best way to count heart rate, because chest compression must be started at less than 60 times per min.

This study is not the final answer on the subject, but is a very good start for from time to time challenging entrenched guidelines.

**The SPA would like to thank the following supporters of the:**

**Winter Meeting,**  
Phoenix, AZ, March 8-11, 2007  
**& Annual Meeting,**  
San Francisco, CA, October 12, 2007

### PLATINUM:

Abbott Laboratories

*SPA Newsletter • SPA Website • CD-ROM Syllabus*

### SILVER:

Baxter Healthcare  
Endo Pharmaceuticals  
Smiths Medical, MD  
SonoSite, Inc.

### BRONZE:

Hospital Corporation of America, Inc. (HCA)  
Kaiser Permanente of Southern California  
Karl Storz Endoscopy America, Inc.  
King Systems Corporation  
LMA North America  
Mayo Clinic  
MEDRAD  
Phoenix Children's Hospital  
SonoSite, Inc.  
TIVA Healthcare, Inc.

**SUPPORTERS:** American Academy of Pediatrics; Lippincott, Williams & Wilkins

# PedsPassport: YOUR GLOBAL MEETING ITINERARY

By Helen V. Lauro, MD, FAAP



## February 9-11: Anaheim, California, USA

### *45th Clinical Conference in Pediatric Anesthesiology*

Tel: (323)-660-2797/(323)-669-2262, Fax: (323)-660-8983  
Information: Tivi Ortiz, Project Manager, Pediatric Anesthesiology Foundation, 4650 Sunset Blvd, Mailstop #3, Los Angeles CA 90027  
Website: <http://www.pac.chla-accm.org>

## February 21-25: Lake Buena Vista, Florida, USA

### *Tenth Annual Update on Pediatric Cardiovascular Disease New and Evolving Practices*

Tel: (215)-590-5263, Fax: 215-590-4342  
Information: Ms. Catrice Butler, Continuing Medical Education Department, The Children's Hospital of Philadelphia, 34th Street and Civic Center Boulevard, CHOP-North, Suite 1220, Philadelphia, PA 19104-4399  
Website: <http://www.chop.edu/cardiology2007>

## March 8-10: Manchester, United Kingdom

### *Association of Paediatric Anaesthetists of Great Britain and Ireland Annual Meeting*

Tel: 020 7092 1739, Fax: 020 7092 1733  
Information: The Membership Secretary, Association of Paediatric Anaesthetists of Great Britain and Ireland, Churchill House, 35 Red Lion Square, London, WC1R 4SG  
Website: <http://www.apagbi.org.uk>

## March 8-11: Phoenix, Arizona, USA

### *Society of Pediatric Anesthesia (SPA)/American Association of Pediatricians (AAP) 2007 Winter Meeting*

Tel: (804)-282-9780, Fax (804)-282-0900  
Information: Society of Pediatric Anesthesia, 2209 Dickens Rd., Richmond, VA 23220-2005  
Website: <http://www.pedsanesthesia.org>

## March 23-24: Annecy, France

### *Congres annuel de l'ADARPEF (Association of Paediatric Anaesthetists Reanimateurs of French Expression)*

Tel: +33 450 450 070, Fax +33 450 518720  
Information: Annecy Congres, 1, rue Jean-Jaures, 7400 Annecy, France  
Website: <http://www.adarpef.org>

## April 12-14: Philadelphia, Pennsylvania, USA

### *Pediatric Anesthesiology and Critical Care Medicine Conference: Perioperative Care of the Infant and Child*

Tel: (215)-590-5263, Fax: (215)-590-4342  
Information: Ms. Elizabeth Utsch, Meeting Planning Manager, Continuing Medical Education Department, The Children's Hospital of Philadelphia, 34th Street and Civic Center Boulevard, Philadelphia, PA. 19104  
Website: <http://www.chop.edu/cme>

## June 24-28: Geneva, Switzerland

### *5th World Congress on Pediatric Intensive Care*

Tel: +41 22 8398484, Fax: +41 22 839 8485  
Information: Symporg SA, Congress Organizers, Avenue Krieg 7, CH-1208 Geneva, Switzerland  
Website: <http://www.pcc2007.com>

## September 8-9: Seattle, Washington, USA

### *Regional Anesthesia in Children*

Tel: (206)-987-5379, Fax: (206)-987-5798  
Information: Kathie Kohorn, CME Coordinator, Children's Hospital & Regional Medical Center, M/S S-219, P.O Box 50020, Seattle, WA 98145-5020  
Website: [http://www.seattlechildrens.org/health\\_care\\_professionals/education/cme.asp](http://www.seattlechildrens.org/health_care_professionals/education/cme.asp)

## September 15-16: Boston, Massachusetts, USA

### *Pediatric Sedation Outside of the Operating Room*

Tel: (617)-384-8600, Fax: (617)-384-8686  
Information: Harvard Medical School, Department of Continuing Education, P.O. Box 825, Boston, MA 02117-0825  
Website: <http://www.cme.hms.harvard.edu>

## September 27-29: Amsterdam, The Netherlands

### *FEAPA European Conference on Paediatric Anaesthesia 2007*

Tel: +31 30 250 91 11, Fax: +31 30 254 18 28  
Information: Dr. Ton Schouten, Wilhelmina Children Hospital Room number KG 02.3070, Postbox 65090 3508 AB, Utrecht, the Netherlands  
Website: <http://www.feapa.org>

## October 6-8: Prague, Czech Republic

### *48th Annual Meeting of the European Society for Paediatric Research*

Tel: +41 22 908 0488, Fax: +41 22 732 2852  
Information: Kenes International, The Secretariat, 17 Rue du Cendrier, PO Box 1726, CH-1211 Geneva 1, Switzerland  
Website: <http://www.kenes.com/espr07>

## October 12: San Francisco, California, USA

### *Joint Society for Pediatric Anaesthesia/Association of Paediatric Anesthetists 21st Annual Meeting*

Tel: (804)-282-9780, Fax (804)-282-0900  
Information: Society of Pediatric Anesthesia, 2209 Dickens Rd., Richmond, VA 23220-2005  
Website: <http://www.pedsanesthesia.org>

## November 2-4: Fremantle, Perth, Western Australia

Society for Paediatric Anaesthesia in New Zealand and Australia (SPANZA) Ninth Annual Scientific Meeting  
Information: Dr. Craig Sims, Department of Anaesthesia, Princess Margaret Hospital for Children, PO Box D184, Perth, WA-6840  
Website: <http://www.spanza.org.au>

#### Footnote:

Please forward all information concerning congresses relevant to Pediatric Anesthesia to: Dr. Helen V. Lauro, M.D., F.A.A.P., Department of Anesthesiology, Long Island College Hospital, 339 Hicks Street, Brooklyn, New York 11201.