

Society for Pediatric Anesthesia



education • research • patient care

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- PedsPassport by Helen V. Lauro, MD, FAAP
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Society for Pediatric Anesthesia



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The complete communications committee roster and assistant newsletter editors can be found on the SPA website www.pedsanesthesia.org. © 2006 SPA

Editor's Corner

Rita Agarwal, MD, FAAP

Editor

The Children's Hospital/UCHSC, Denver, CO



The summer is well on its way, the days are longer and people are thinking about vacations. So, I'm especially grateful to my two new Associate Editors for helping with this issue of the newsletter, as well as the other assistant editors. The newsletter is a great way to contribute in a convenient and useful way to the society. I encourage anyone with an interest in writing to contact either one of the Communication Chair people (Drs. Malviya and Kinder-Ross) or myself.

We have another amazing letter from Africa from Dr. Mark Newton, my former colleague at Children's in Denver who has spent several years living and working in Kijabe, Kenya. I find his insights unique and thought provoking. Mark trained in traditional "American Medicine" in Houston and Colorado. He practiced as a pediatric anesthesiologist for a number of years at the Children's Hospital Denver, before fulfilling his life long dream of going to Africa to practice medicine. I have personally felt honored to know him and I truly hope you enjoy his letters as much as I have. If any of you have other unique medical experiences to share that you think the members of the SPA might enjoy, please let me know.

Dr. Mancuso has done his usual stellar job of moderating the debate between the pros and cons of Private Practice and Academic Practice in Point/Counterpoint.

Another somewhat different contribution in this issue is from a current resident at the University of Colorado, who hopes to be a Pediatric Anesthesiologist in the near future. He describes his experiences as an anesthesia resident at Tulane during and in the aftermath of Hurricane Katrina in this issue's Fellow's Corner.

Dr. Lauro's *Nuisance or Nightmare* is a look at what to do with the child with no IV access in an emergency situation. Drs. Gooden, Khambatta and Kussman have provided their usual excellent literature reviews.

I hope everyone has a great summer!

DON'T FORGET TO USE YOUR SPA MEMBER RESOURCES

SPA Link: 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)

President's Message

Francis X. McGowan, Jr., MD

President

Boston Children's Hospital, Boston, MA

Dear Friends and Colleagues,

By the time you read this, I am afraid that summer will be beginning to arrange its departure into fall. I like summer. I like being able to do things with my children late into the day and over the weekend, without the pressures of homework, school projects, soccer, etc. Boston and the surrounding environs really empty out, making the work commute as well as most activities a lot easier than when everyone is back in town. Yet, probably like you, summer is our busiest time at work, and the workload is compounded by colleagues' summer vacations. At times I think that prolonged exposure to the American school calendar--summers off--ruined me: It permanently etched in my soul the expectation for that day in June when the screen door seems to slam behind you on the way out and not to close with you back inside until the start of school. Of course, every year when September comes it hasn't happened and I feel somehow cheated; like the Cubs (or until recently Red Sox) fan, maybe next year will be the year.

Various SPA groups and committees have been pretty busy over the past several months. Our overall goal continues to be the recognized voice for perioperative pediatric patients and those who care for them, and to maximize the value of SPA membership. We had a very successful (record attendance, abstract submissions, and attendee reviews) winter meeting in Sanibel, FL. The program and plans for the annual meeting in Chicago are complete, and those for the next winter meeting in Phoenix close to the same. If you have not yet done so, please visit the SPA website for meeting and registration information---we'd love to see as many members as possible in Chicago in October and Phoenix in March, 2007. Please also take a look at the new web-based CME (free to SPA members). Our goal is to provide 1-2 credit hours per month of useful, clinically relevant CME on the web.

You should also be aware of the upcoming SPA Officer and Board of Director elections, which will also be conducted by email (specific information has been sent to you by email). Please note that it is imperative that the SPA office always have your correct email address, as we have shifted many important communications to this modality (saving fairly enormous printing and mailing costs).

The growth of the Congenital Cardiac Anesthesia Society (CCAS) has been particularly rewarding; there are now well over 150 individual members and nearly a dozen founding member departments or institutions. Plans are well underway for a one-day CCAS meeting at the beginning (on Thursday, March 8) of the 2007 winter SPA meeting. CCAS information, membership application, etc. can be found on the website.

The Finance Committee continues to work diligently to control expenses and manage SPA resources. In addition, they are hard at work developing a capital fundraising campaign; the goal is to endow the SPA mission and activities in order to be able to expand education, research, and advocacy abilities (and lessen dependence on outside financial support).

The Communications Committee and newsletter staff continue to do an outstanding job on the quarterly editions of this newsletter, as well as making steady improvements and updates on the website.



SPA members have participated with members of the FAER Pediatric Research Council to develop a FAER RFP (request for proposal) for pediatric anesthesia (detailed information on the website); others have worked with members of the ASA Committee on Pediatric Anesthesia to design the content of the Pediatric Anesthesia Track at the ASA Annual Meeting. Separate groups of SPA members have created pediatric anesthesia content and curriculum guidelines for resident and fellow trainees. A large and diverse group of members has made substantial progress toward developing a multi-institutional platform for outcome and quality assessment; SPA's goal is to deliver and support a consensus-validated program that members can use to meet QA/QI requirements in their own institutions and regulatory environments. The Research Committee is considering concrete ways to further teach and conduct pediatric anesthesia research, and will be exploring the possibility of an SPA-sponsored, multi-institutional pediatric anesthesia research training grant.

Well, that's a brief, thumbnail summary of some of the projects in which our members have been engaged. It continues to be a privilege and an honor for me to be able to participate in these efforts. We continue to need your input about activities and offerings that you need, and your hard work on the one(s) that particularly interest you. I strongly encourage you to contact me or any other member of the organization with suggestions, to find out more about any of these activities, and (I hope) to offer to work on one or more of them. I also hope that you get to spend a little more time outside the screen door doing other things that you care about before it is time to come back in.

With warm regards,

Frank McGowan

REMINDER:

SPA Administrative Office Address Change

Please be advised that Ruggles Service Corporation discontinued the use of the P.O. Box on July 18. (Might as well have the mail carrier deliver the mail to us rather than sending someone to the post office to pick it up!)

SPA and Ruggles mailing address is:
SPA or Ruggles
2209 Dickens Road
Richmond, VA 23230-2005

Please change your records accordingly. All mail sent to the P.O. box will be forwarded to us for one year.

Private Practice vs. Academic Practice

*I shall be telling this with a sigh Somewhere
ages and ages hence:*

*Two roads diverged in a wood, and I –
I took the one less traveled by,
And that has made all the difference*

— R Frost, 1920

I had been planning a point-counterpoint such as this one for some time but had not found authors whom I thought had the combination of interest, personality characteristics and worldview to see, not only the view from their own vantage point but also the view from a different point of view. I knew these two pediatric anesthesiologists would fully articulate the advantages of each path. I had the good fortune to work with both of the authors and can vouch that each is a thoughtful, careful pediatric anesthesiologist. In addition, I also am confident that each would have been very successful in either private or academic practice.

Thomas J. Mancuso, MD, FAAP

Private Practice

Patrick N. Olomu, MD, FRCA
*Methodist Children's Hospital
of South Texas, San Antonio, Texas*

Choosing a career path after a pediatric anesthesia fellowship is perhaps one of the most important decisions one would have to make. Many factors come into consideration in making this very individual decision. In my case, the decision to go into private practice was based largely on what I termed “academic fatigue”. Having trained in anesthesiology for 11 years in four countries, spanning three continents, I felt it was time to explore the other side!



Megan Olomu

Prior to going into private practice, I had heard so many “bad things” about private practice such as problems with contracting, partnership track or lack thereof, long hours, working in multiple locations and not least, issues of reimbursement and remuneration. Different private practice models exist and a thorough assessment of these is important before making a decision. In my case, the opportunity to join a practice as an “instant” partner and to grow the first exclusively pediatric anesthesia practice in a major US city was too attractive to pass up. Being able to do my own cases was also a big plus.

The fee-for service arrangement with no guaranteed income was quite scary in the beginning. I was fortunate to have a highly motivated and supportive partner. This was instrumental in building my practice from scratch. Filling out the ton of paper work required to sign on with the major insurance companies and to get on the medical staff of different facilities in the city also required a lot of guidance and tenacity. The term “application fatigue” readily comes to mind. Another important skill that I had to learn, and quickly too, was anesthesia coding and billing. This was not taught in residency or fellowship. Accurate and complete coding and billing is vital to success in any form of practice but more so in a fee-for-service private practice model.

Having now practiced for five years, I can look back and re-evaluate my decision in terms of the “good” and “bad” aspects of private practice. The

practice model and the way anesthesia groups are set up in the city are important considerations in making any judgments. Until very recently, there was no hospital based anesthesia practice in the children’s hospitals in the city. We therefore had to work in different hospitals and facilities in different parts of the city. You were basically following the surgeons around. In a competitive market, there was little choice but to move around. This would be considered by some to be an inefficient practice model because of the time wasted in commuting between locations. Being able to log an average of 1,100 cases per year was rather astonishing or disconcerting, depending on how you look at it. More recently, we have limited our practice to one location.

In terms of the “good” aspects of my choice, I would say that the most important for me has been the ability to do my own cases. I certainly enjoy working with residents, medical students and nurses but in private practice, the ability to do cases in a safe, efficient and expeditious manner is paramount. I have also been fortunate to work with some fantastic surgeons and specialists who are open to discussions and suggestions on the child’s best interest from an anesthesia standpoint. Team work is key to success and in avoiding complications and potential litigation.

Private practice pediatric anesthesiologists can, and do participate in academic endeavors and teaching. While it is less likely that they will be involved in large scale grant-supported research, clinical research is a very real possibility if one is interested.

In conclusion, careful consideration must be made before deciding on a career path following training. Regardless of your career choice, careful evaluation of your professional objectives should be undertaken at intervals in order to ensure that your career goals, professional satisfaction and personal happiness are being met.

Academic Practice

Samuel Wald, MD
*Associate Clinical Professor Pediatric Anesthesiologist
University of California, Los Angeles, CA*

Academic pediatric anesthesia practice can be an extremely satisfying career choice. I would like to make the following assumptions: First, that an academic practice is one that involves supervising trainees for the majority of one’s anesthetics. Second, that a pediatric anesthesiologist is someone whose patients consist of infants and children in the majority. Third, that this article is directed to future graduates who wish to practice pediatric anesthesiology. According to the ACGME there are currently 43 accredited pediatric anesthesiology fellowship programs with a total 113 trainees (2004-2005).¹



When I began my search for a job during my pediatric anesthesia fellowship, my primary goals were to find a practice in a suitable geographic area (which for me meant returning home to California) and to care for pediatric patients. Secondly, I wanted to join a children’s hospital. I had found during my residency and fellowship that I enjoyed teaching medical students and junior residents. It also appeared to me that in order to be a

Please see *Point/Counterpoint* on Page 5

Literature Reviews

Bispectral Index in Pediatrics: Fashion or a New Tool

I Murat and I Constant. *Pediatric Anesthesia* 2005; 15:177-180

Reviewed by: Hoshang J. Khambatta, M.D.
Columbia Presbyterian Medical Center, New York, NY

The authors in an editorial write that the bispectral index (BIS), as calculated from a computer program developed by Aspect Medical Systems, Inc. Newton, MA, is becoming the gold standard for assessing depth of anesthesia in adult patients. The BIS reference is derived from a large database of EEG traces obtained in adult patients receiving propofol and inhalation agents such as isoflurane, desflurane and sevoflurane. The database is regularly updated and the software is changed accordingly. The calculation of BIS is proprietary and hence kept secret, but the elements included in the algorithm are known. The index presented takes into account the frequency content of the EEG signal (the proportion of rapid to slow waves decreases with increasing hypnotic concentration), the synchronization of the wave form (ranging from virtually none in awake patients to a higher degree of synchronization with increasing depth of anesthesia), and percentage of burst suppression (increases with depth of anesthesia). The BIS is displayed as a dimensionless number between 0 (deep anesthesia) and 100 (fully awake) with 40 – 60 being suitable for surgical anesthesia in adults.

The BIS has well known limitations in adults. First, the BIS is insensitive to narcotics, it reflects only one component of the triad of anesthesia, namely hypnosis, and not analgesia or muscle relaxation. Therefore it is not surprising that the specificity of BIS for predicting the response to noxious stimuli such as laryngoscopy or surgical incision under balanced anesthesia is low. Second, the BIS algorithm was validated mainly against propofol alone or combined with volatile agents currently in use, isoflurane, desflurane and sevoflurane. The index is not evaluated against ketamine, and has a much higher value for a given MAC with halothane as compared to sevoflurane. These drawbacks are not surprising as the EEG tracings with these agents are very different from those obtained using propofol and the more recent volatile agents.

The BIS monitor was developed to decrease the incidence of awareness under anesthesia. As such, it would be useful when volatile anesthetics are used, and would also help in reducing recovery time. However, the BIS was conceived as a monitor for adults and not for pediatric use. The question is does it work in the pediatric patient? But first we must recognize that awareness is as yet poorly described or understood in children. EEG tracings in young children differ from those in adults. From infancy to adulthood, the amplitude of the EEG decreases and the dominant frequency increases. However, the effects of anesthetic agents on EEG tracings are comparable throughout life. BIS values recorded in pediatric patients are inversely correlated with endtidal sevoflurane and isoflurane. BIS values are better correlated with sevoflurane concentration than with heart rate and blood pressure in preschool children. In infants the endtidal sevoflurane corresponding to a BIS value of 50 is higher than with that for children aged over two years. In infants during recovery,

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“pediatric anesthesiologist” there were many more academic versus private practice opportunities.

The limitations of location and opportunity left me with two jobs that had openings for a pediatric anesthesiologist, one academic and one private practice. The private practice offered no guarantee for pediatric cases (they went to the senior pediatric anesthesiologists) and was not associated with a children’s hospital. I decided on an academic setting (Mattel Children’s Hospital at UCLA), which consists of a children’s hospital within a general tertiary care hospital. The pediatric operating rooms and cases are included among the adult ones. My current job consists of a majority of pediatric cases involving supervision of residents and medical students, but not pediatric fellows. I did not have any set plan for research, but knew that I wanted to be involved in complex pediatric cases and that I would enjoy teaching. The gratification and the difficulty, like many things, emanates from the same source.

It has now been more than six years and I find it extremely worthwhile to teach residents and see their thought process and technique change under my tutelage. Knowing that my instruction may filter to the care of future patients treated by the residents I have trained is extremely satisfying. As residents and medical students ask questions that I may not have thought about previously, I learn too, as I try to find good explanations. Also, I strive to closely examine my own techniques and so I can break them down to basic concepts to explain them thoughtfully and clearly. How, exactly, does one best mask ventilate or intubate a neonate through someone else’s hands? I have noticed my own practice change through not only trial and error but through teaching to someone else.

The challenging part is supervising two complex anesthetizing locations with residents, sometimes, junior ones. The struggle is, of course, that one could do any given case with fewer IV or intubation attempts without a trainee, but that would leave many graduates without a full pediatric anesthesia experience. There is also the stress of having a trainee not listen to or understand a medical directive when caring for a patient. I firmly believe that the myth among residents that academicians lose their skills is entirely false. As an academic anesthesiologist, your turn comes after someone else has failed which often increases the difficulty of any given procedure. Lastly there are days that a faculty member may feel unappreciated by his or her residents for all of their hard work. I have found that these frustrating situa-

tions will occur but the majority of the time working with trainees has been an enjoyable experience.

I would like to briefly mention the apparent large difference in salary when comparing academic practice to private practice. Although, the absolute amount paid annually is usually higher in private practice there are two important caveats. First, many academic departments allow for extra hours of work, which can significantly bolster one’s salary. Second, one cannot compare the offered salary without strong consideration of the benefit package. Careful consideration of the benefits provided at many universities may reveal a salary commensurate with private practice when retirement, benefits, prepaid malpractice insurance and billing fees are added.

An academic practice is also a means to support pediatric anesthesia research. I am currently starting to develop myself as a researcher, and I believe that there are always important questions we can ask and attempt to answer. A PubMed search with the term “anesthesia” and “randomized controlled clinical trial” will list 13,582 articles. The same search with “pediatric anesthesia” lists 260 publications.² I have been active as a clinician-teacher and for future endeavors I hope to optimize the resources inherent to an academic institution to contribute to research in our field. A number of senior residents have expressed concern about “having to do research” in an academic practice. My answer is that it should not be viewed as a burden, but as an exciting opportunity for the advancement of our field.

The overall advantages of academic practice are the prospect of teaching, an increased number of practice opportunities and possibly a more likely guarantee of complex pediatric cases and certainly research. The challenges are teaching trainees in two locations and living up to research expectations. I think that with the proper motivation and reasonable expectations that pediatric anesthesia in the university setting is a truly rewarding endeavor.

References

1. ACGME (www.acgme.org) Suite 2000, 515 North State St., Chicago, IL 60610
2. National Center for Biotechnology Information (www.pubmed.gov) U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894

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BIS changes are less progressive and exhibit an on-off profile, whereas changes are more progressive in older children and adults. Thus, BIS guided anesthetic appear to be only helpful in children over three years of age.

Specific limitations of the index have been observed in children. BIS values describe a paradoxical profile during inhalational induction in children, and are correlated neither with clinical events nor with clinically assessed depth of anesthesia. The typical BIS during rapid inhalational induction with sevoflurane shows an early and abrupt drop after loss of consciousness followed by an increase with deepening anesthesia. The nadir of BIS is usually observed 120 – 180 s after the beginning of induction which reflects the very low EEG frequency observed around the second minute of induction. This subsequent increase in BIS reflects the shift of EEG to a higher frequency. Also, BIS displays a paradoxically high value during seizure activity, a special concern in children anesthetized with high concentration of sevoflurane. Thus, one of the potential uses of the BIS monitor in children may be to avoid deep levels of anesthesia, BIS below 20. Such monitoring would help reduce the risk of possible brain function impairment associated with deep anesthesia in young children.

Comments: Perhaps the use of BIS monitoring seems most promising during sedation procedures in children. The prerequisite to correctly interpret BIS changes is to be aware of specific effects of anesthetic agents on the EEG and to know the specific EEG changes associated with anesthesia. One must also remember that under balanced anesthesia, (narcotics are used in the majority of patients), the BIS does not reflect the adequacy of the analgesics administered. Much more study is needed to evaluate the usefulness of BIS monitoring in children.

Development of Acute Opioid Tolerance During Infusion of Remifentanyl for Pediatric Scoliosis Surgery

Crawford M, Hickey C, Zaarour C, et al. *Anesthesia & Analgesia* 2006;102:1662-1667

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 continuous intraoperative infusion of remifentanyl is associated with the development of acute opioid tolerance. The investigators of this study examined postoperative morphine consumption, pain scores and sedation scores in adolescents who received for their intraoperative pain management either continuous infusion of remifentanyl or intermittent morphine boluses for scoliosis surgery. This prospective, randomized, double-blind study consisted of 30 patients, aged 12 – 17 yrs old. The patients were American Society of Anesthesiologists (ASA) physical status I or II, and scheduled to undergo posterior instrumentation for correction of idiopathic scoliosis. Exclusion criteria for this study were opioid use within three months prior to surgery, inability to self-administer the opioid using a patient-controlled analgesia (PCA) device, elective postoperative ventilation, or obesity.

Patients were randomized to receive either remifentanyl (15 patients) or morphine (15 patients, control group), during the surgery. In the preoperative period, the patients received instruction on the use of a PCA device and a numeric rating scale (NRS) for assessment of postoperative pain intensity. Patient characteristics were similar between treatment groups.

Premedication was not administered to either group of patients. Seventy percent nitrous oxide in oxygen was administered for intravenous (IV) catheter insertion. Subsequently, an IV induction with propofol 4 mg/kg was performed. In addition, glycopyrrolate 10mcg/kg, morphine 100 mcg/kg, and rocuronium 0.6 mg/kg were administered. For the patients in the remifentanyl group, anesthesia was maintained using a mixture of air and oxygen (70% : 30%), propofol infusion at a rate of 80 – 100 mcg/kg/min, and remifentanyl infusion starting at 0.25 mcg/kg/min and titrating in increments

of 0.05 mcg/kg/min on the basis of hemodynamic response. For the patients in the morphine group, anesthesia was maintained using a mixture of air and oxygen (70% : 30%), propofol infusion at a rate of 150 – 200 mcg/kg/min, and intermittent morphine boluses of 50 mcg/kg on the basis of hemodynamic response. In the remifentanyl group, approximately 30 minutes prior to the completion of surgery, morphine 100 mcg/kg IV was administered. At skin closure the remifentanyl infusion was discontinued. Following tracheal extubation patients were transferred to the postanesthesia care unit (PACU), and assessed by either an anesthesiologist or nurse who was blinded to the treatment groups. The patient's pain was assessed and morphine 50 mcg/kg was administered at 5-min intervals until made comfortable. This was followed by initiation of PCA.

The postoperative outcome data included the cumulative morphine consumption, pain scores at rest and on coughing, and sedation scores were recorded every hour for 4 hrs and then every 4 hrs for a total of 24 hrs. Also, episodes of postoperative nausea, vomiting, pruritus, and pyrexia were noted.

Following final analysis of the data this study show that the overall consumption of morphine in the remifentanyl group was significantly greater than in the morphine group throughout the first 24 hrs after surgery ($P < 0.0001$). At 4 hrs following surgery, the cumulative morphine consumption in the remifentanyl group was double that in the morphine group. At 24 hrs after surgery the findings for cumulative morphine consumption in the remifentanyl group was 30% more than that in the morphine group. The incidence of all other variables examined in this study were statistically insignificant.

Comments: This study is the first to demonstrate the development of acute opioid tolerance in adolescent patients undergoing scoliosis surgery. Earlier studies that suggest the occurrence of acute opioid tolerance following intraoperative infusion of remifentanyl were performed in the adult population. On the contrary, there are also a few studies in the adult population that dispute these findings. Additional studies in the pediatric population are necessary to examine the issue of acute opioid tolerance and its association with the use of a continuous remifentanyl infusion.

The use of remifentanyl in the pediatric population as noted in the medical literature is becoming more widespread. The results of this study are important to the pediatric anesthesia provider. The results generated are truly worthy of consideration in one's clinical practice. Whether or not these results alter your current anesthesia practice will be your decision.

Near-Infrared Spectroscopy to Monitor Cerebral Oxygen Saturation in Single-Ventricle Physiology

Ricci M, Lombardi P, Schultz S, Galindo A, Coscarella E, Vasquez A, and Rosenkranz E. *J Thorac Cardiovasc Surg* 2006;131:395-402

Reviewed by: Barry D. Kussman, MD
Children's Hospital, Boston, MA

This study examined the relationship between cerebral oxygen saturation (rSO₂) measured by near-infrared spectroscopy and arterial oxygen saturation (SaO₂), jugular venous oxygen saturation (jvSO₂), arterial oxygen content (CaO₂), cerebral oxygen delivery, and cerebral blood flow (CBF) in a newborn piglet model of single ventricle physiology (SVP).

SVP was created by means of an aortopulmonary shunt, atrial septostomy, tricuspid valve avulsion, and main pulmonary artery occlusion. Measurements were performed at baseline and after conversion to SVP (30 minutes, 120 minutes, and during afterload augmentation by inflation of a balloon in the descending thoracic aorta).

Creation of SVP resulted in lower rSO₂, jvSO₂, CaO₂, and cerebral oxygen delivery. Afterload augmentation increased rSO₂, jvSO₂, and CaO₂, but cerebral oxygen delivery was unaffected because of a lower CBF. Linear relations were observed between rSO₂ and jvSO₂, SaO₂ and CaO₂, but no association was found with cerebral oxygen delivery, which decreased in parallel

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with rSO₂ when the SVP model was established but failed to increase during afterload augmentation. The authors concluded that in SVP changes in rSO₂ need to be interpreted in the context of changes in arterial oxygenation.

Comment: Changes in rSO₂ should always be interpreted in the context of changes in arterial oxygenation. With biventricular physiology and unchanging pulmonary function, SaO₂ and CaO₂ are likely to be stable, so that if cerebral oxygen consumption remains constant, changes in cerebral venous oxygen saturation and therefore rSO₂ can be assumed to reflect changes in CBF and cerebral oxygen delivery. However, with SVP, changes in SaO₂ can occur rapidly because of varying pulmonary and systemic vascular resistance. As demonstrated by an increased pulmonary-to-systemic blood flow ratio associated with the increased systemic vascular resistance caused by balloon inflation, cerebral perfusion decreased although the SaO₂ and rSO₂ increased. In other words, an increase in rSO₂ in the setting of SVP is not always associated with an increase in cerebral oxygen delivery. A practical application in which the situation from this study could be observed is lowering the pulmonary vascular resistance and increasing pulmonary blood flow by ventilation with 100 % O₂ in a patient with a parallel circulation.

Intubation Techniques. Operative Techniques in Otolaryngology

Lane, G. *Head and Neck Surgery* 16 (3) 166-170, 2005

Reviewed by: Rita Agarwal, MD, FAAP
Children's Hospital, Denver, CO

This is a very nice, succinct review of managing the child with the difficult airway. It is the first article in a monograph dedicated to Sleep Disordered

Breathing in Neonates and Toddlers and is therefore aimed at Pediatric Otolaryngologists. The article starts with a basic review of the anatomy in a child that might make intubation challenging (Pierre Robin, Treacher Collins etc. The author reminds the readers that managing the difficult airway in a child is often much more difficult than in an adult. Awake intubation while great in theory is often not possible; percutaneous cricothyrotomy or tracheostomy are rife with their own risks. Sometimes the wisest course is to avoid intubation and proceed with an LMA or other supraglottic airway device.

Dr. Lane introduces the COPUR airway score. Significant anatomical or physiologic variables are given points from 1-4, past history or pertinent medical history are taken into consideration. The more points a child accumulates, the more challenging the airway will probably be.

C= Chin—from the side, how much is it recessed,

O= Opening -space between upper and lower front teeth),

P= Previous intubations, history of OSA,

U= Uvula-how much is visible

R = Range—cervical range of motion

Modifiers include prominent front teeth, very large tongue, macroglossia, extreme obesity or a mucopolysaccharidoses, and can add 1-2 points.

Next the author describes maneuvers to optimize intubation with direct laryngoscopy, including the “BURP” (Backwards, Upwards, Rightward Pressure) technique. Finally several types of different of supraglottic airway devices are reviewed as well as indications for and techniques used with fiberoptic intubation are discussed.

Comment: This is a nice review article with good diagrams to introduce the anesthesia care provider to a simplified approach to the difficult airway in a child. Since this article is aimed at the otolaryngologists there is not a lot of detail on performing specific techniques, however it is worthwhile to look over the COPUR score. It provides a great way to organize one's approach to evaluating a potentially difficult airway.

Society for Pediatric Anesthesia



education research patient care

Letters From Africa

Mark Newton, MD
Kijabe Hospital, Kenya

As the dust swirled into large red-dish clouds behind my Land Rover, I maneuvered down the animal path to Oiti dodging the whistling Acacia bushes. I once again contrasted my present life with those early morning commutes in Denver following a snow plow to the hospital. The differences made me imagine that we had moved to another planet eight years ago.

We no longer are invited out to a nice restaurant but get calls of another kind: "Daktari Newton, we are very hungry and we need food. All of our cows are dying (even the zebras) and last night the elephants came after midnight to eat our crops." A man's garden (life line) was being eaten by the elephants, and while attempting to scare them off, he was killed. We are no longer eating Colorado buffalo burgers but treating patients who have been attacked by buffalos. We had three Cape buffalo attack victims arrive at the hospital last week (33% mortality, thus far) due primarily to drought conditions, which force wild animals and humans into tighter living conditions. The drought in Kenya prompted us to deliver relief food to the needy. Chilean Sea Bass is overrated anyway!

Since I moved to East Africa, I have never been asked if I needed nitric oxide for a patient. Instead, I have developed an understanding of the various pitches of low oxygen alarms from multiple aging anesthesia machines. When I hear the squeal which is only dampened by the Rift Valley winds creeping through the window cracks, I know that I have five minutes to remedy the low oxygen problem in room 2 before the saturation drops and my pulmonary hypertension kills me. Everyone should get a regional block and at least, we have nitrous oxide!

I no longer prepare lectures on Propofol or the components of the circle system while watching Sports Center. In Kijabe, I sit on my porch preparing lectures for the University of Nairobi residents while observing small groups of children from the local village rummaging through the hospital's garbage pit looking for food. Why am I preparing a lecture on TIVA when children are starving and Propofol is not even available to most patients in Africa?

I recall the days as a Pediatric Anesthesia fellow rushing to OR number 8 to do a myelomeningocele closure because they are so rare. This last year (2005) at Kijabe Hospital, we did 680 VP shunts and 240 myelomeningoceles. Yes, 240 in twelve months. Two weeks ago we had a day with 8 VP shunts and 4 myelomeningoceles which were to be done in our one pediatric neurosurgical room. The nomadic peoples, with a vegetable deprived diet, tend to have a skewed number of these congenital nervous system defects but we do not have the resources and



time to work on this issue. An intrauterine surgical team could be very busy in East Africa but we probably need a person passing out folic acid by the tons more urgently.

(The included photo was taken in Kijabe Hospital, 2005, of children with encephaloceles on the pediatric ward waiting for surgery by a visiting Pediatric Neurosurgeon.)



As the dust clouds settled and my truck rolled to a screeching halt (bad brakes!), a six-year old orphaned Maasai girl emerged from her mud walled hut and greeted me with a welcoming smile. She had been in our five-bed ICU two weeks earlier, treated for pneumonia, and diagnosed with HIV. We were able to bring 1 kg of goat meat, prophylactic antibiotics, multivitamins, and a promise that we would continue to help her. Although at times it seems like we are living on a different planet than the snow-plowed streets of Denver, I know that the smile of a six-year old girl in the

Maasai village of Oiti produces the same effect as a child on the oncology ward in a Philadelphia, Chicago, or San Francisco hospital. I have adjusted to the bumpy roads but not to the irreconcilable discrepancies between the medical care of this six-year old African bush girl and the high quality of care provided to our children in the west.

An addition to the "Keeping Up with Kids" section, my five children enjoy swimming in the Indian Ocean, camping on the edge of the Maasai Mara where they can see a lion kill and eating roasted/salted flying termites during the rainy season (your kids would love them).

Have a great day and if you need someone to go out to eat Chilean Sea Bass and tell some African stories, please ask us!

Fellow's Corner

I met Jimmie in April. He had come over to Children's to meet me and express an interest in our Pediatric Fellowship Program. While we were talking he mentioned some of his experiences in New Orleans during and after Hurricane Katrina. I found the conversation fascinating and I hope you do too. He discusses both the personal and educational impact of this incredible natural disaster.

Please all of you who have fellowship programs encourage your fellows to write for this Corner. Our goal was to try and make the Newsletter accessible and friendly to everyone who is interested in pediatric anesthesia and that particularly includes the fellows. This Corner has become extremely "Denvercentric", but that is truly only out of necessity. (It is hard for fellows or future fellows to deny their Program Director!)

Rita Agarwal, MD
Editor

Hurricane Katrina: My Story

Jimmie Colon, MD
CA-2 Anesthesiology Resident

Many people have asked for my Hurricane Katrina "story". Although I am now in Denver, I cannot say that I have left the storm behind. As you can see, even though the waters receded months ago, and the national media has moved on to more pressing current events, those of us who were affected by the storm are still struggling to figure out how to pick up the pieces.

On Friday, Aug. 26th, my wife, Beth, and I went out with friends for dinner. We discussed Hurricane Katrina and her expected path, but most felt that we'd end up being on the west side of the storm and far away from danger. Living in New Orleans, you are CONSTANTLY bombarded with the possibility that this one may be "THE ONE". It is because of this, that people just don't get too worked up about a hurricane that maybe, possibly, might be headed your way.

Saturday morning rolled around and things were not looking any better. Usually by this time, the hurricane would've turned...but it hadn't and we needed to get ready. We scrambled to board up the windows with wood we had left over from renovating the house and from a neighbor who was kind enough to donate some extra plywood he had in his garage. I have to say that at this point I was more concerned with the holes we were about to make in our newly renovated house and the time it would take to refill and repaint, than the approaching hurricane. It's amazing how the list of what's important in life can change so quickly. After boarding up the house, we packed our bags, STILL THINKING we probably weren't going anywhere, and settled in for the night. We didn't leave because at this point there was no where to go. All of the hotels had been booked and our closest relative was fourteen hours away (without evacuation traffic). Evacuating when you don't have a place to go is extremely difficult; you have to drive straight through because the lack of hotel rooms, it's difficult, if not impossible to find gas, and going to the bathroom...many gas stations just lock them up to avoid the volume of people. We decided that if things STILL looked bad in the morning that we would leave.

We woke up Sunday morning and realized that we needed to go. Keep in mind, however, that the City of New Orleans still hadn't called for a mandatory

evacuation. And just to let you know our state of mind, WE still didn't think the hurricane was going to hit New Orleans, but just the sheer possibility that it could made us want to get out. A friend of ours who was called in to work at Children's Hospital was kind enough to invite us to stay with her parents in Crowley, LA and after 8+ hours, we made it there (for those of you not familiar with LA, it should've only taken us 2.5 hrs). We arrived to big hugs, a fresh pot of gumbo, and warm beds....gotta love Cajun hospitality!

Monday morning rolled around and it appeared New Orleans had dodged a bullet. We began making plans to return to New Orleans, deciding that we'd stock up with supplies and head back into town either Tuesday or Wednesday. Monday afternoon is when all of the looting began and things took a turn for the worse. Our friend at Children's Hospital became very fearful as time passed. They had power, water, food, television, and drugs... and lots of them. Ironically, they had no security and where does a drug addict go when he hasn't had his fix?...where do the looters go when the water takes over the city?... We were able to communicate with some of our friends on Monday, but once the water began to flow into the city, everything changed. Communication was almost nonexistent. After seeing areas become overtaken by flood water we began to wonder about our friends who had decided to rough it out in their homes. Were they okay? Had they evacuated at the last minute? Horrible thoughts run through your head. I knew the minute I saw aerial views of UNO Lakefront Arena and the water that surrounded it that all of our lives would be changed forever.

Tuesday we decided that we had to go rescue our friend at Children's. The fear in that hospital was so intense. Children's Hospital still had TV, so unlike the other hospitals, which were where the majority of our other friends were, they could see what was unfolding throughout the city. Physically, Children's was a better place to be than say Charity or Tulane, however mentally it was a whole different story. They still didn't have security... even after the report of looting at the hospital, which by the way, was a last ditch effort to get help. There was no looting, but it was only a matter of time.

After getting a flat bottom boat and registering it with the local Sheriff's department, our friend drove down to New Orleans Wednesday morning to rescue his girlfriend from Children's. Amazingly, he was able to drive up to hospital. This shocked the entire hospital staff. They thought that they were on an island and were surrounded by water. It was after this rescue they realized they could evacuate their patients using their own vehicles. So by Thursday, I believe all patients were evacuated. I'm sure the critically ill were evacuated by helicopter or ambulance...but I don't know the exact details.

We knew by Wednesday that we wouldn't be back in New Orleans for awhile, but we also knew that we still had a lot of friends in the hospitals and we couldn't just leave them. I can't remember what day it was, but we started getting phone calls from our friends and their fellow co-workers. They were starting to be evacuated from the hospitals, but they were being dropped off at shelters. We'd get the call, pick them up from the shelter, bring them home to a hot meal and help them arrange for travel or provide them with clothing. Surprisingly, they were all in pretty good shape. They luckily didn't have access to TV, so many had no idea what had fallen upon the city. After all of our friends had left and all of the hospitals had been evacuated, we decided that we needed to figure out what we were going to do.

We decided to go back to New Orleans on Sunday to assess the damage and gather some more of our things. At that point, we realized it'd be awhile before we were able to live in our own home. We were able to get in to the city using my medical ID. There were four of us and everyone was armed.



Please see Fellows Corner on Page 11

Fellows Corner, from Page 10

Our house suffered only minor wind damage, but it was dry and hadn't been looted. We went around to a few of our friends' houses to gather clothes, empty out fridges, and assess damage. The city was still very dangerous, it stunk, people were stranded and desperate, and it was sad, terribly sad.

After our trip back to New Orleans, we moved on to Dallas. My wife's business partner had evacuated there and at that point we had no direction or communication from Tulane GME on where to go. Thinking we'd be there for a couple of months, my wife began to work at the local UBS Financial Services office and I went to Parkland Hospital to see if they would allow me to do a couple of months of rotation there. They were full and I soon learned not only had our program director resigned, but that I had to report to Houston October 1st.

We had signed a lease in Dallas and my wife's work was there so she had to stay. I, along with two other anesthesiology residents, found an apartment in Houston. Housing was not provided, so we were extremely lucky to even find an apartment. It seemed as if the city of Houston had been taken over by evacuees.

As residents in a new city, at new hospitals with new staff, we felt like we were starting over. We were on our own and worried. Overnight, our environment had changed without warning. It's amazing how you adapt and figure things out under pressure. All of my fellow residents were in different hospitals so we got together on the weekends to support each other. The stress was incredibly high and we felt completely lost. The uncertainty about our training was killing us and many of us were separated from our significant others. I cannot speak for the rest of the residents, but I know that I personally gained a lot from this



experience. Working in at least five different hospital operating rooms, with different equipment and staff, you learn very quickly how to adapt. We didn't know what the next week would bring for us, where we would be or who we would be working with, so we concentrated on staying focused on that day's work.

After a few weeks in Houston, we finally heard from our chairman. We had meetings once a month to discuss our situation, but no specific plans were ever mentioned. The initial talk was that we'd be back at Tulane in three months. Then it changed to four, five, six...and finally no estimated date was even mentioned. As talk surfaced that our training at Tulane would most likely suffer, residents began to look for other programs. Our experience in Houston was phenomenal, but at some point we'd be asked to return to New Orleans, and no one wanted to return to a program that was suffering.

My search led me to Denver. Not only are the anesthesiology and pediatric anesthesiology fellowship programs among the best in the nation, but my sister-in-law lives in Winter Park and my wife and I have always loved Colorado.

It has been a long road since Hurricane Katrina. My wife and I have lived in two separate states since October. She is now back in New Orleans, however I had to remain in Houston until I moved here to Denver. After we sell our house in New Orleans, she will join me in Denver. We haven't

seen some of our friends since before the storm and the city that we grew to love is forever changed. However, there is also good that comes out of tragedy. We are expecting our first child in October. After the storm, our priorities changed. We realized that nothing in life is certain and at a moment's notice, you can lose it all.

Book Corner

Smith's Recognizable Patterns of Human Malformation

Kenneth Lyons Jones, M.D., 976 pages, \$89.00, ISBN 0721606156, Philadelphia, PA, Elsevier, 2006.

By: Helen V. Lauro, MD, FAAP

While this textbook was primarily written for pediatricians as a resource for guidance on diagnosis, prognosis, management and genetic counseling, it is by no means restricted to this specialty. Pediatric anesthesiologists will find it an invaluable and essential reference on a wide spectrum of developmental anomalies and malformations that they are called on to manage on a day-to-day basis in the operating room.

The new sixth edition, like its predecessor almost ten years ago, continues to provide concise but complete information on numerous common and rare disorders that cause human malformation. Twenty-two sections (including chromosomal abnormalities, short stature, facial defects, facial-limb defects, craniosynostosis syndromes, storage disorders and connective tissue disorders) make up the first portion of the textbook, under the title Recognizable pat-

terns of malformation, and these are further broken down into the individual malformation topics. Each topic includes an outline encompassing the specific abnormality, with a systems-based approach, as well as material on occasional associated abnormalities, natural history (including such important associations as sudden death), etiology (including pertinent genetic loci), comments and references. Opposing pages feature several descriptive color photographs which are novel to this edition. The section on miscellaneous associations provides a succinct treatise on the important information on the VATER and MURCS association, and is followed by an alphabetical listing of syndromes. Five smaller portions of the book discuss Approaches to Categorical Problems; Morphogenesis and Dymorphogenesis; Genetics, Genetic Counseling and Prevention; Minor Anomalies; and Normal Standards of measurement. The textbook is plainly written and accompanied by many multicolor print and shaded box figures and tables that provide emphasis from textual material. The appendices cover patterns of malformation and differential diagnosis by anomalies, and nomenclature for chromosomal syndromes.

The authors have achieved their goal stated in the introduction of a book lending itself to practical clinical application, as well as education of those interested in a better understanding of alterations in morphogenesis. It is an unparalleled resource to necessary information.

PedsPassport: YOUR GLOBAL MEETING ITINERARY

By Helen V. Lauro, MD, FAAP



2006

August 18-20: Queenstown, New Zealand

8th Annual Society for Pediatric Anaesthesia in New Zealand and Australia (SPANZA) Scientific Meeting

Tel: +64 3 379 0390, Fax: +64 3 379 0460

Information: Arna Wahl Davies, Event Manager, Conference Innovators,
P.O. Box 13 494 Christchurch, New Zealand

Website: <http://www.spanza.org.au>

August 31-September 3: Vellore, India

5th Congress of the Asian Society of Paediatric Anaesthesia

Tel: 0091-416-2282105, Fax: 0091-416-2232035

Information: Dr. Rebecca Jacob, Faculty of the Department of Anaesthesia,
Christian Medical College, Vellore 632004
Tamil Nadu, India

Website: <http://www.aspa-2000.com>

October 5-7: Budapest, Hungary

FEAPA European Conference on Paediatric Anaesthesia:
"Safe anaesthesia for children"/7th Conference of Hungarian
Paediatric Anaesthesia and Intensive Care Society

Tel: + 36 1 327 1000 ext 2538, Fax + 36 1 411 6370

Information: Mrs. Klára Papp, Bethesda Children's Hospital,
Budapest Hungary

Website: <http://www.bethesda.hu>

October 7-10: Barcelona, Spain

Europaediatrics 2006

Tel: +41 22 908 0488, fax: +41 22 732 2850

Information: Kenes International Global Congress Organizers and
Association Management Services, 17 Rue du Cendrier, P. O. Box 1726,
CH-1211 Geneva 1, Switzerland.

Website: <http://www.kenes.com/europaediatrics>

October 12-15: Hobart, Tasmania, Australia

31st Australian & New Zealand Annual Scientific Meeting on
Intensive Care and 12th Australian & New Zealand Paediatric
and Neonatal Intensive Care Conference

Tel: +61 3 6224 3773, Fax: +61 3 6224 3774

Information: Conference Design Pty Ltd, P.O. Box 342, Sandy Bay
Tasmania 7006, Australia

Website: <http://www.anzics.com.au>

October 13: Chicago, Illinois, USA

Society for Pediatric Anesthesia (SPA)
20th Annual Meeting

Tel: (804)-282-9780, Fax (804)-282-0900

Information: Society of Pediatric Anesthesia, 2209 Dickens Road,
Richmond, VA 23220-2005

Website: <http://www.pedsanesthesia.org>

2007

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>

March 8-11: Phoenix, Arizona, USA

Society for Pediatric Anesthesia (SPA)/American
Association of Pediatrics (AAP) 2007 Winter Meeting

Tel: (804)-282-9780, Fax (804)-282-0900

Information: Society for Pediatric Anesthesia, 2209 Dickens Road,
Richmond, VA 23220-2005

Website: <http://www.pedsanesthesia.org>

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 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>

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 Road,
Richmond, VA 23220-1086

Website: <http://www.pedsanesthesia.org>

Footnote:

Please forward all information concerning congresses relevant to Pediatric Anesthesia to: Helen V. Lauro, MD, FAAP, Department of Anesthesiology, Long Island College Hospital, 339 Hicks Street, Brooklyn, New York 11201.