



# Society for Pediatric Anesthesia

## NEWSLETTER

Volume 3 Number 2

July, 1990

### ANNUAL MEETING AGENDA

By Randall C. Wetzel, M.D.

The Board of Directors of the Society for Pediatric Anesthesia is proud to announce the agenda for another exciting SPA Annual Meeting to be held on Thursday, October 18, 1990 at the Las Vegas Hilton. Please note that the Annual Meeting will be on Thursday—not Friday, as in previous years. This year's session again will be divided into a morning and an afternoon session. The morning session will focus on the development of the respiratory system and the clinical implications for the pediatric anesthesiologist. The afternoon session will address multiple current topics of clinical interest.

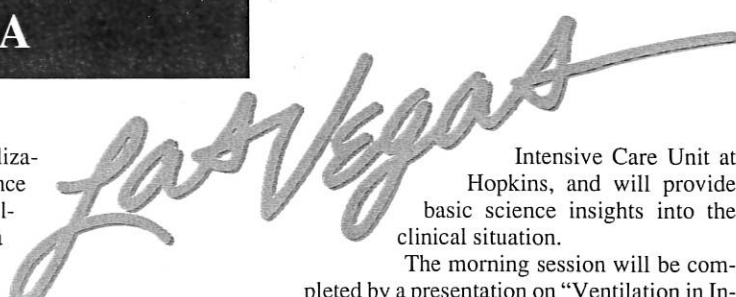
The morning session will be chaired by Aubrey Maze, M.D., President-Elect, and promises to be an exciting mix of state-of-the-art science and clinical application. The opening speaker will be Martin Joyce-Brady, M.D. from Boston University School of Medicine. His topic will be "The Biology of Lung Development." Dr. Brady's background especially suits him to address this topic.

Victor Chernick, M.D. from the University of Manitoba in Winnipeg, Canada, an internationally recognized expert on respiratory control in children, will speak on the "Control of Respiration in Infants and Children." Dr. Chernick's decades of research in the regulation of respiration in children will be brought to bear on this topic, which has become critically important over the last few years, espe-

cially with the realization of the occurrence of neonatal apnea following anesthesia and surgery.

The morning's talks will be rounded off by Bradley Thatch, M.D. from Washington University in St. Louis, talking about "Upper Airway Function in Infants and Children." Dr. Thatch is nationally known for his work defining the physiologic circumstances by which neonates maintain upper airway patency, and his talk promises to be an interesting and relevant one for pediatric anesthesiologists.

Following a morning break, David Nichols, M.D. of The Johns Hopkins University will be talking on "Respiratory Muscle Function in Infants and Children." Dr. Nichols has used NMR spectroscopy to analyze the developmental aspects of diaphragmatic function for the last several years. He also is a clinical anesthesiologist and Director of the Pediatric



Intensive Care Unit at Hopkins, and will provide basic science insights into the clinical situation.

The morning session will be completed by a presentation on "Ventilation in Infants and Children" by Etsuro Motoyama, M.D. from the Children's Hospital of Pittsburgh. Dr. Motoyama is well known to all pediatric anes-



David Nichols, M.D.

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### BOARD OF DIRECTORS REPORT

By Myron Yaster, M.D.

As stated in its charter and bylaws, the Society for Pediatric Anesthesia was formed to promote a scientific basis for the specialty and to educate its membership in current advances in pediatric anesthetic practice. To meet these goals, the Society has an Annual Meeting held in conjunction with the ASA Annual Meeting and publishes a newsletter biannually.

At the recent Board of Directors meeting held in Seattle, the Society's Officers and Board decided to strengthen and expand these endeavors in the following ways:

1) The Society will honor the best resident/fellow research project in an area related to pediatric anesthesia that is submitted to the ASA resident/fellow research contest. This contest, established more than 10 years ago by

the ASA, is designed to promote young investigators in both basic and clinical research. We have asked the ASA to allow us to use its contest to reward the best submitted project in an area related to pediatric anesthesia. We plan to announce the winner at our Annual Meeting and provide the winner a cash prize of \$500. Additionally, we will ask the author to submit a synopsis of the research for publication in the spring issue (see 2 below) of our newsletter. This will be accompanied by comments by distinguished physician scientists in the field. William Greeley, M.D. of Duke University and Treasurer of the Society, spearheaded this decision and deserves a great deal of credit and thanks.

2) The newsletter will be expanded to three issues a year starting in 1990-91. The first

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### SPA Annual Meeting Note

Please note that the Society for Pediatric Anesthesia Annual Meeting will be held on Thursday, October 18 at the Las Vegas Hilton Hotel and not on Friday, as in previous years.

# BOARD OF DIRECTORS REPORT

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The information presented in the SPA Newsletter has been obtained by the Editors. Validity of opinions presented, drug dosages, accuracy and completeness of content are not guaranteed by SPA.

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## Dues and Costs

Membership dues for the Society for Pediatric Anesthesia are \$100 per fiscal year. The costs of the SPA Annual Meeting (guest speaker stipends, meeting place expenses and food) are underwritten by membership dues and by generous contributions from corporate donations and sponsors.

For more information, interested physicians should write to:

THE SOCIETY FOR  
PEDIATRIC ANESTHESIA  
515 Busse Highway  
Park Ridge, IL 60068-3189

## Help Wanted for Projects

The Officers and Board of Directors are interested in the continuing involvement of the Society's membership. Members interested in running for office or participating in the SPA Newsletter are encouraged to write to the Society for Pediatric Anesthesia in care of the Park Ridge, Illinois office. We hope to continue to expand the Newsletter with features, articles and commentaries on issues that may be of interest to our membership.

issue of the newsletter (Winter, 1990) is primarily a synopsis of the Society for Pediatric Anesthesia's annual program. The second issue (Spring, 1991) will be devoted to pediatric-related highlights of the scientific sessions of the ASA's Annual Meeting. In this issue, 10 to 15 of the most important abstracts and poster presentations presented at the ASA's scientific sessions will be reviewed. Additionally, the implications of these abstracts will be discussed by invited experts. The third issue (Summer, 1991) provides the program for the upcoming SPA Annual Meeting, committee and Board of Directors reports and a literature review. Candidates for Board and Officer positions also are announced in this issue.

The expansion of the newsletter has important implications to the Society's membership and to its editors. In order to encourage participation of the membership in the writing and editing of our newsletter, a special meeting will be held at the conclusion of this year's Annual Meeting for all interested members. The newsletter's editor-in-chief, Randall Wetzel, M.D. of The Johns Hopkins Hospital will chair this meeting. Additionally, two new

associate editors will be chosen. Roger Moore, M.D. of the Deborah Heart and Lung Center will be stepping down from his position in 1990 after two years of outstanding service as co-editor.

3) In 1992, SPA will have a spring meeting held in conjunction with the American Pediatric Surgical Association (APSA). This three-day meeting will be held in Colorado. On one of the three days, we plan to have a combined morning session with our surgical colleagues devoted to a topic of common interest. On the other two days, we will follow the format of SPA's fall meeting. Afternoons will be "free" and will allow the Society's membership ample time to relax and to cement the social relationships that have developed over the past few years.

The program committee will be appointed by Aubrey Maze, M.D., President-Elect, and will be announced at the business meeting, which will be held at 5 p.m. on Thursday, October 18 at the Las Vegas Hilton. Suggestions for program topics and speakers should be addressed to these program committee members. □

## OFFICER ELECTION NOMINATIONS

The Board of Directors and the Nominating Committee of the Society for Pediatric Anesthesia are proud to announce the nominations for officers for the Society in 1991 to be elected at the Annual Meeting in October, 1990. The Nominating Committee consisted of Heidi Jerome, M.D. from the University of California, Charles Haberkern, M.D. from the Children's Hospital and Medical Center in Seattle, Shirley Graves, M.D. from the University of Florida and Herrold Lerman, M.D. from the Hospital for Sick Children in Toronto. The nominations are:

### Vice President:

Charles H. Lockhart, M.D.  
Department of Anesthesiology  
Denver Children's Hospital

### Secretary:

William J. Greeley, M.D.  
Department of Anesthesiology  
Duke University, Durham

### Treasurer:

Salvatore R. Goodwin, M.D.  
Department of Anesthesiology  
University of Florida, Gainesville

Mark A. Rockoff, M.D.  
Department of Anesthesia  
The Children's Hospital, Boston

# ANNUAL MEETING AGENDA

(Continued from page 1)

esthesiologists for his years of work in understanding pulmonary function in children, although he may be best known to clinical anesthesiologists as the editor of Smith's *Anesthesia for Infants and Children*. His research



*Etsuro Motoyama, M.D.*

background is impeccable, and his long-standing clinical involvement at the Children's Hospital of Pittsburgh gives him an excellent perspective on his topic.

The morning session will be followed by a panel discussion that should allow exciting interaction between the morning speakers and the members.

Following this, a luncheon will be provided. It will be extremely difficult to even begin to approach the pinnacles of gastronomic delight which have been achieved in the past. It can be expected that the Committee will provide the members of the Society with a truly bounteous feast. We all eagerly await the culinary delights.

The afternoon sessions will focus on several controversial topics in clinical pediatric anesthesia. Linda Jo Rice, M.D. from the Children's National Medical Center in Washington, D.C. will kick off the afternoon with the subject of "Ketamine—Does It Have a



*Linda Jo Rice, M.D.*

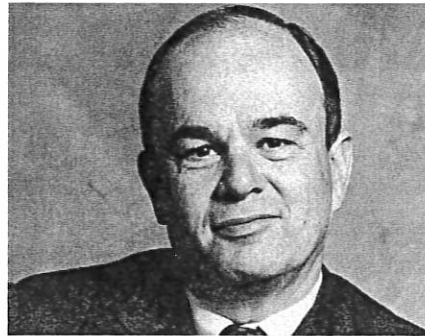
Place in Pediatric Anesthesia?" She will be reviewing the extensive past experience with ketamine and delineating its current role.

Steven Serlin, M.D. from Phoenix, Arizona will review the recent experience in the

pediatric literature with epidural narcotics and ask the question, "Epidural Morphine—Is One Dose Enough?"

John J. Mulroy, M.D. from the Children's Hospital and Medical Center in Seattle, Washington will address "Premedication and Induction Agents in Outpatient Pediatric Anesthesia" and review for us some of the newer options available.

Theodore Striker, M.D. from the Children's Hospital in Cincinnati, Ohio and Rosemary Orr, M.D. from the Children's Hospital and Medical Center in Seattle, Washington will face off concerning the question "Should All Adolescent Females be Pregnancy Tested Prior to Anesthesia?" Dr. Striker takes the adamant



*Theodore Striker, M.D.*

"PRO" stance arguing that they ought to be, while Dr. Orr just says "NO!" Knowing these two individuals assures us that this promises to be a lively and interesting confrontation.

Another question which continues to become increasingly important is that of providing anesthesia outside of the operating room. This topic will be discussed by Charles Coté, M.D. from Massachusetts General Hospital. Dr. Coté will address the pleasures and perils of providing anesthesia in such arcane places as the cardiac cath lab, radiology suite, MRI room and other nontraditional operative sites.

We are quite fortunate to have Charles Lockhart, M.D. from Denver Children's Hospital, address the topic, "Evaluation of the Patient with Upper Airway Obstruction." Dr. Lockhart's years of experience in pediatric anesthesiology, from the vantage point of one of the leading children's centers in the country, will bring to us his seasoned perspective on this common pediatric challenge.

Michael Badgwell, M.D. from Texas Tech University Health Sciences Center in Lubbock, Texas will clarify the issues of capnography in children and provide for us an easy approach to capnography. All of us who have to deal with end tidal CO<sub>2</sub> monitoring in neonates and small children know that this topic is not readily dealt with, and we are looking forward to Dr. Badgwell's comments.



*Charles Lockhart, M.D.*

Finally, the afternoon will be rounded off by Mark Rockoff, M.D. from the Children's Hospital in Boston, presenting his approach to anesthesia for Siamese twins. Dr. Rockoff will present some of his personal experiences and summarize details gleaned while preparing his recently published article in *Anesthesiology* concerning this topic.

All in all, this promises to be a meeting that provides us with an excellent academic approach in the morning, followed by well-recognized clinical experts addressing topics of interest to pediatric anesthesiologists, no matter where they practice.

The meeting will be followed by our annual business meeting from 5:00 to 5:45 p.m. at the same site. See the Board of Directors Report (page 1) for topics to be addressed. Following the business meeting, there will be a brief meeting of individuals who would like to be editors and contributors to future SPA Newsletters from 5:45 to 6:00 p.m. All of those interested may attend the Wine and Cheese Party which traditionally follows the conclusion of the exciting and stimulating Annual Meeting. We look forward to seeing all of you there. □

## Editorial Meeting:

Members of the Society who are interested in contributing to, editing, supporting or having input about the Society's Newsletter are invited to an editorial meeting following the annual business meeting of the Society on October 18, 1990. - RW



# PEARLS AND PERILS

This issue of the SPA Newsletter inaugurates a new column: **PEARLS AND PERILS**. The purpose of this column is to allow communication by practitioners of pediatric anesthesiology of clinical pearls, patient care nuggets and tips about the art and essence of the practice of pediatric anesthesiology. Because Steve Audenaert, M.D. suggested this idea, he has been rewarded with the inaugural column. He also has kindly consented to act as

the column coordinator. On a purely volunteer basis, if you have anything that you would like to share with your colleagues, please mail it to Steve M. Audenaert, M.D., Director of Pediatric Anesthesia, University of Kentucky, Chandler Medical Center, Lexington, Kentucky 40536-0084. We will publish your contribution(s) on a space-available basis. I hope that the members of the Society find this feature useful and enjoy Dr. Audenaert's clinical PERIL - RW

## The Peril of Atlanto-Axial Subluxation

By Steve M. Audenaert, M.D.  
and Tom E. Schmidt, M.D.

### THE STORY:

A 2-year-old child comes to the operating room for drainage of a retropharyngeal abscess. He has been ill for a week, but was previously the typical wild toddler. Anesthesia and surgery are uneventful (perhaps a bit prolonged by the junior ENT resident). In the recovery room, though, the child is noted to hold his neck stiffly in extension. Further exam suggests decreased strength in the lower extremities. Cervical spine films confirm the diagnosis of atlanto-axial subluxation. Cervical traction is instituted, and the child recovers without sequelae.

This is an example of atlanto-axial subluxation (AAS), which can be perfectly silent one minute and cause quadriplegia the next. AAS occurs in a wide variety of conditions and circumstances. Displacement of C1 or C2 may be rotatory, lateral or most commonly antero-posterior. The pediatric anesthesiologist must be particularly attuned to AAS because children are at the highest risk. When we see our patients preoperatively, we must know who is at risk, how to screen for AAS, how to proceed when it is present and when to consult our colleagues in orthopedics or neurosurgery. We must take appropriate precautions intraoperatively with airway manipulations and patient positioning. Postoperatively, we must be attuned to the early warning signs of subluxations as well as to the more ominous neurologic signs.

### WHO IS AT RISK?

Children, by virtue of being children, are at risk. That marvelous flexibility of youth unfortunately includes the transverse ligament of the cervical spine. This laxity, combined with immaturity of the odontoid process, puts children at risk for AAS, particularly in trauma. C1-C2 subluxation is the most common type

of cervical spine injury in children. This is true at least until the odontoid fuses to the axis at about age 4. In fact, even our definition of AAS is age specific, with young children being allowed a greater "normal" movement of the axis and atlas relative to one another.

Combined with the anatomic predisposition to AAS is an epidemiologic factor. Young children, like the one in the example, suffer a greater frequency of upper respiratory infections and surgeries. Because of the close proximity of the posterior pharyngeal mucosa and the transverse ligament, pharyngeal processes may cause serious complications in the cervical spine. Not only infectious processes but pharyngeal tumors and surgeries as well have been implicated in the pathogenesis of AAS. Prolonged unusual positioning, as is required for some ENT procedures, also may lead to rotatory, transverse or anterior-posterior subluxation.

Finally, a number of disease processes and congenital conditions predispose to the development of AAS. Examples of the former include rheumatoid arthritis (juvenile or adult) and ankylosing spondylitis. The pathophysiology of rheumatoid arthritis in the cervical spine is complex, while ankylosing spondylitis seems to cause C1-C2 injury simply by forcing all cervical motion to occur in this single vulnerable joint. As might be predicted, a congenital condition which reduces movement in other cervical joints likewise increases movement at C1-C2, thereby predisposing to AAS. Klippel-Feil anomaly is an example of such a condition. Other congenital problems, such as Down Syndrome, are linked to AAS by multiple, complex factors. A more complete list of conditions known to be associated with AAS is found in Table 1.

### WHAT ARE THE SIGNS?

While it is true that AAS can be entirely asymptomatic, it is important to recognize the warning signs. Neck pain or stiffness, torticol-

is and virtually any neurologic change should be heeded and investigated. Complete cervical spine films, including odontoid and **nonforced** flexion views, should be obtained. This may serve as screening for patients in the high risk groups, but it is even more important in the child presenting postoperatively with subtle changes.

### WHAT TO DO?

- 1) Screen patients at risk for AAS. Neutral, extension, flexion and odontoid views of the cervical spine should be obtained and reviewed by a pediatric radiologist informed of the concern.
- 2) Have a high "index of suspicion" in patients with upper respiratory pathology.
- 3) Be alert for postoperative symptoms and signs, especially after surgery in the cervical or pharyngeal area.
- 4) Take meticulous care during intubation and positioning. Remember that excess flexion is especially dangerous.

By being aware of the problem and taking appropriate precautions, the rare but potentially tragic peril of atlanto-axial subluxation can be avoided or treated early and effectively.

TABLE 1

#### Patients at Risk for Atlanto-Axial Subluxation

##### Pathologic States:

- Rheumatoid arthritis (adult and juvenile)
- Trauma (especially in young children)
- Postoperative complications (especially ENT)
- Infections (especially pharyngeal)
- Ankylosing spondylitis
- Tumor

##### Congenital Conditions:

- Down Syndrome
- Klippel-Feil Syndrome
- Larsen Syndrome
- Mucopolysaccharidosis
- Spondyloepiphyseal Dysplasia
- Metatrophic Dwarfism
- Kniest Syndrome
- Chondrodysplasia Puncta
- Chondrodystrophia calcificans congenita

# SPA ANNUAL MEETING PROGRAM SCHEDULE

Thursday, October 18, 1990 - Las Vegas Hilton Hotel

7:00-8:15  
Registration and Continental Break-  
fast—Ballroom B

## MORNING SYMPOSIUM BALLROOM C

*Development of the Respiratory  
System: Clinical Implications for the  
Pediatric Anesthesiologist*

8:15-8:30  
Introduction  
Robert K. Crone, M.D.  
University of Washington

8:30-9:00  
*Structural Development of the Lung*  
Martin Joyce-Brady, M.D.  
Boston University

9:00-9:45  
*Control of Respiration in the Infant  
and Child*  
Victor Chernick, M.D.  
University of Manitoba

9:45-10:15  
*Upper Airway Function in Infants  
and Children*  
Bradley Thatch, M.D.  
Washington University

10:15-10:30  
BREAK

10:30-11:00  
*Respiratory Muscle Fatigue in Infants  
and Children*  
David Nichols, M.D.  
The Johns Hopkins University

11:00-11:45  
*Ventilation in Infants and Children*  
Etsuro Motoyama, M.D.  
University of Pittsburgh

11:45-12:15  
Panel Discussion

12:15-1:30  
LUNCHEON  
BALLROOM B

## AFTERNOON PANELS BALLROOM C

1:30-2:30  
*Pediatric Anesthesia and  
Pharmacology*

15 minutes  
*Ketamine—Does It Have a Place in  
Pediatric Anesthesia?*  
Linda Jo Rice, M.D.

15 minutes  
*Duramorph—Is One Dose Enough?*  
Steven Serlin, M.D.

15 minutes  
*Premedication and Induction Agents in  
Outpatient Pediatric Anesthesia*  
John J. Mulroy, M.D.

15 minutes  
Panel Discussion

2:30-3:00  
*Controversies in Pediatric Anesthesia:  
Should all adolescent females be  
pregnancy tested prior to anesthesia?*

10 minutes  
*Yes*  
Theodore Striker, M.D.

10 minutes  
*No*  
Rosemary Orr, M.D.

10 minutes  
Panel Discussion

3:00-3:30  
*Anesthesia Outside the Operating  
Room*  
Charles Coté, M.D.

3:30-3:50  
BREAK

3:50-4:30  
*Clinical Respiratory Problems*

20 minutes  
*Evaluation of the Patient with Upper  
Airway Obstruction*  
Charles Lockhart, M.D.

20 minutes  
*An Easy Approach to Capnography  
in Children*  
Michael Badgwell, M.D.

4:30-5:00  
*Clinical Vignette: Anesthesia for  
Siamese Twins*  
Mark Rockoff, M.D.

5:00-5:45  
Business Meeting—Ballroom C

6:00-7:00  
WINE AND CHEESE  
BALLROOM B

The 1990 SPA Annual Meeting is co-sponsored by Children's Hospital and Medical Center, Seattle, Washington and the Washington State Medical Association. It is designated as meeting the criteria for 6.75 credit hours in Category I toward the Physician Recognition Award of the American Medical Association. The deadline for registration is Monday, October 8, 1990.

SPA Members .....No Charge  
(However, to attend the meeting you must be registered. No CME certificates will be issued to individuals who fail to register for the meeting.)

Nonmembers .....\$100.00  
(Membership in SPA is included in this registration fee.)

# ASK THE EXPERTS

By Roger A. Moore, M.D.

*Now is your opportunity! All arcane knowledge on pediatric anesthesia subjects is available to you. Just submit your questions to the Editors of the Society for Pediatric Anesthesia Newsletter to get an expert's answer.*

## Double Standard

**QUESTION:** What's all the fuss about regional anesthesia in pediatrics? Why should I bother adding a regional anesthetic to a patient already anesthetized with a general anesthetic?

**ANSWER:** from Myron Yaster, M.D., Assistant Professor of Pediatrics and Anesthesiology, The Johns Hopkins University.

Children have long been considered unsuitable candidates for regional anesthesia despite the greater difficulty in providing general anesthesia to them when compared to adults. There are several reasons for this.

First, hospitalization and the entire surgical experience are particularly frightening experiences for most children and their families. This fear is the result of several factors, including a fear of separation and pain, the potential for mutilation and even death and, in older children, anxiety over the loss of control. Furthermore, the overactive imagination of children heightens this fear, particularly when needles (the "shot") are necessary to administer medications. Indeed, I have always been fascinated by the hysterics displayed by children when a medication is injected into the **administration port** of an already established peripheral intravenous catheter.

Thus, most pediatric anesthesiologists have developed an approach that minimizes or eliminates painful procedures, such as intramuscular injections or nerve blocks on conscious patients.

Second, it is presumed that greater manual dexterity and technical excellence are required to perform nerve blocks in children compared to adults.

Third, there is a real desire to avoid providing complicated anesthetics and thereby increasing the risk of producing an untoward complication.

Fourth, there is an underlying concern about the medicolegal implications of performing a nerve block in children. Will the anesthetic be implicated if **future** complications occur? For example, if a caudal anesthetic is used in an infant who has not yet started to walk, will the anesthesiologist be sued if there is a delay in gross motor development?

Fifth, there is a need for an "extra pair of hands" to support the airway and monitor the

patient during the performance of a block.

Finally, since it is difficult to calm children without completely obtunding them with the concomitant use of general anesthesia, why bother to perform a nerve block at all?

Despite all of this, I and other pediatric anesthesiologists believe that there is an important role for regional anesthesia in a pediatric anesthesia practice,<sup>1,2</sup> and I strongly advocate increasing its use. Why?

Regional anesthesia provides complete analgesia with minimal physiologic alterations. Indeed, even major conduction blocks, such as caudal or lumbar epidural anesthesia, are rarely, **if ever**, associated with any hemodynamic changes, even when high thoracic (T4) levels of anesthesia are achieved. Obviously, this is very different than the adult anesthesia experience, in which hypotension following a major conduction block is commonplace.

Interestingly, this phenomenon was discussed at the last Annual Meeting of the Society for Pediatric Anesthesia. Among the 300 anesthesiologists present, not a single episode of hypotension (or any other complication for that matter) could be cited, despite a cumulative experience of several thousand applications. Furthermore, the most commonly performed blocks are extraordinarily easy to perform. Anatomical landmarks are easily palpated, and the lack of calcification of ligaments makes needle placement disarmingly simple. In fact, almost all blocks that need to be performed in children can be achieved with "off-the-shelf" equipment, usually a 22-gauge, short-bevel, 1-1/2-inch needle.

Regional anesthesia can supplement general anesthesia and decrease the total amount of general anesthetic agents required for surgery. This hastens wake-up and provides for very rapid recovery from anesthesia. Typically when a caudal anesthetic is administered, less than a quarter of a MAC concentration of a volatile anesthetic agent (0.2-0.3 percent halothane) is required even for the most extensive types of lower abdominal or lower extremity surgery. In this way, I and my colleagues use local anesthetics as an adjunct to general anesthesia, much the same way that we may use a neuromuscular blocking agent or an intravenous opiate.

On the other hand, a special group of patients exists in which regional anesthesia may be the only anesthetic technique used. These are patients who are considered to be at high risk to develop complications when general anesthetics are used. Examples include (but are not limited to) premature infants with (or without) a history of apnea, older children presenting for muscle and/or nerve biopsy

because of weakness or to rule out malignant hyperthermia, children with chronic lung disease and children with a "full stomach" requiring emergency surgery on an extremity (for example, an axillary block for a fracture reduction). Postanesthetic apnea, a life-threatening complication associated with general anesthesia in infants less than "X" (pick either 47, 52 or 60) weeks of postconceptional age, may be avoided by the use of spinal or epidural anesthesia. I would urge caution though in assuming this, since the prevention of postanesthetic apnea by regional anesthetic techniques has not been completely established. Furthermore, the concomitant use of sedatives, particularly ketamine, in placing a block may completely eliminate the purported advantage of this technique in premature infants.<sup>3</sup>

Additionally, regional anesthesia can effectively provide complete postoperative analgesia and improve the quality of recovery as well. Even an awake, alert child finds it difficult to deal with pain. A child emerging from general anesthesia is often confused, frightened and in a strange environment. Coping with pain makes this even more difficult. A pain-free postoperative period may improve the quality of the child's recovery and the entire psychologic response to hospitalization. In fact, emergence delirium is rarely, if ever, seen when an **effective** regional block is in place. Finally, since the duration of action of most nerve blocks is fairly predictable, subsequent analgesia may be provided as both the block and physiologic effects of general anesthesia wear off.

Regional anesthetic techniques instituted intraoperatively can provide the major source of postoperative pain relief, especially for situations in which it is difficult to treat pain with opiates. For example, the bladder spasms that frequently occur several days after complex genitourinary surgery in children often require massive amounts of opiates, smooth muscle relaxants and sedatives for control. This leaves the child nauseous, obtunded and at some risk for respiratory depression. Very young infants ( $\leq 2$  months of age) are particularly difficult to treat because of their greater susceptibility to respiratory depression. Epidural (either caudal or lumbar) anesthesia can completely eliminate this pain without the inherent risks of systemic opiates and sedatives.

Children also may be afraid of requesting pain relief in the postoperative period because it is still, regrettably, prescribed as an intramuscular injection by many of our surgical colleagues. It is well known that children will suffer in silence rather than be subjected to yet another pain, namely, the "shot." Furthermore, nurses and family members may allow a child



to suffer because of their (unwarranted) fears of addicting a child to systemic narcotics. An indwelling epidural catheter can provide complete analgesia in the absence of systemic side effects and without the risk of addiction or tolerance. In fact, because the concentrations of local anesthetics can be diluted (either 0.25, 0.125 or even 0.0625 percent), we can provide pure sensory blockade and leave motor function largely unaltered. Issues concerning the safety of indwelling epidural catheters, where patients with these catheters need to be nursed, and how they need to be monitored require more formal research.

Based on these advantages, my colleagues and I at The Johns Hopkins Hospital approach regional anesthesia from a different vantage point than many of our colleagues who provide anesthesia for adult patients. We do not approach regional anesthesia as an alternative to general anesthesia; rather, we think of it as an adjunct to general anesthesia. In this way, we prefer to think of it as regional **and** general anesthesia, rather than regional **or** general anesthesia.

#### References:

1. Yaster M, Maxwell LG: Pediatric regional anesthesia. *Anesthesiology* 70:324-328, 1989.
2. Dalens B: Regional anesthesia in children. *Anesth Analg* 68:654-672, 1989.
3. Welborn LG, Rice LJ, Hannallah RS, Broadman LM, Fink R: Postoperative apnea in former preterm infants: Prospective comparison of spinal and general anesthesia. *Anesthesiology* 72:838-842, 1990.

#### Why NPO?

**QUESTION:** We are concerned about children getting dehydrated while waiting their turn for surgery. Is it really safe to allow children to drink less than six hours prior to surgery?

**ANSWER:** from Mark S. Schreiner, M.D., Assistant Anesthesiologist, Children's Hospital of Philadelphia, and Assistant Professor of Anesthesia, University of Pennsylvania.

The purpose of keeping patients NPO prior to the induction of anesthesia is to reduce the gastric fluid volume and thereby reduce the risk of vomiting, regurgitation and aspiration pneumonia. The question is: Does a prolonged fast accomplish this purpose?

Solid food empties from the stomach slowly, with half of the contents emptied in eight to 12 hours. On the other hand, clear

liquids empty much more rapidly. Half the volume of a clear liquid test meal empties in seven to 15 minutes. Logically then, drinking clear fluids two or more hours (more than five half times) prior to induction should not increase the volume of gastric fluid in the stomach compared to a prolonged fast.

In a 1989 survey of the feeding guidelines at 14 children's hospitals conducted by Dr. Steven E. Berdock (Toronto Sick Children's Hospital), the range in practice was quite variable. Three institutions allowed clear fluids until three hours prior to induction, nine allowed clear fluids until four hours prior to induction, and two institutions insisted on six hours without clear fluids prior to induction. Eight institutions had more stringent guidelines for older infants and children, with six to eight hours being the minimum NPO period for these children. Although these guidelines give the minimum acceptable NPO period, in actuality, many children fast for much longer periods. In a study performed at The Children's Hospital of Philadelphia, comparing conventional fasting with clear liquids ingested two to four hours prior to the induction of anesthesia, we found that the average period of starvation in control patients was 13.5 hours. This was substantially longer than the intended six to eight hours.

Several investigators have now reported the results of prospective randomized clinical trials comparing prolonged fasting to drinking clear fluids. In these studies, children were fed clear liquids between two to four hours prior to the induction of anesthesia.<sup>1,2,3,4</sup> None of these four studies reported a difference in the gastric fluid volume or pH between the children subjected to a prolonged fast compared to the children who had been allowed to drink. Including the drinkers and nondrinkers, between 20 - 56 percent of all children had both a gastric fluid volume  $\geq 0.4$  ml/kg and a pH  $\leq 2.5$ . Some consider that these factors indicate an increased risk of aspiration pneumonia, but that relationship is uncertain.<sup>5</sup> Since large gastric fluid volumes and low gastric fluid pH are common in children and aspiration pneumonia is very uncommon, one could argue that children are not at risk for aspiration despite the presence of relatively large gastric fluid volumes. Drinking clear liquids does not diminish the percentage of patients with a large gastric fluid volume, but it does not appear to increase the percentage either.

My institution (The Children's Hospital of Philadelphia) had the most conservative policy in Berdock's survey. Our practice has changed since August of 1989, and we now allow all PS I and II day surgery patients to drink clear fluids until two hours prior to the induction of anesthesia. More than 5,000 children have been anesthetized since our change in policy, and we have not had a clinically

apparent episode of aspiration pneumonia. In fact, we cannot identify a clinically significant episode of aspiration pneumonia in the past 3-1/2 years (more than 30,000 patients).

We distribute written instructions to all patients on the day of the preoperative visit. For institutions interested in altering their feeding guidelines, I suggest the following be stated explicitly in writing:

1) List foods that are to be stopped and at what time (we forbid milk products, solid food, candy, orange juice and juices with pulp);

2) List examples of clear fluids that are allowed (we allow water, apple juice, clear juice drinks, Pedialyte, ice popsicles and plain gelatin); and

3) Give the time that clear fluids may be continued until.

It takes a minimum of 30 to 45 minutes to process a patient from the time of arrival in our day surgery unit until induction of anesthesia. We originally wrote our orders to allow clear fluids until 1-1/2 hours prior to arrival. Unfortunately many parents could not subtract correctly, and we were forced to delay the induction of anesthesia for several patients. We therefore specify that clear fluids may be continued until two hours prior to arrival at the hospital. The simplification prolongs the NPO interval slightly but has decreased arithmetic errors.

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3. Schreiner MS, Triebwasser A, Keon TP: Ingestion of liquids compared with preoperative fasting in pediatric outpatients. *Anesthesiology* 72:593-597, 1990.
4. Splinter WM, Stewart JA, Muir JG: Large volumes of apple juice preoperatively do not affect gastric pH and volume in children. *Can J Anaesth* 37:36-39, 1990.
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# LITERATURE REVIEW

By Randall C. Wetzel, M.D., and James Viney, M.D.

The following literature reviews have been selected from various issues of *Anaesthesia*, *Anesthesia and Analgesia*, *Anesthesiology*, the *British Journal of Anaesthesia*, the *Journal of Pediatrics*, the *Journal of Pediatric Surgery* and the *New England Journal of Medicine*.

## Postoperative apnea in full-term infant with a demonstrable respiratory pattern abnormality

*Anesthesiology* 72:559-561, 1990  
Coté and Kelly

Drs. Coté and Kelly present a case of a full-term infant at 16 days of age who had several postoperative apneic incidents and was found on further study to have episodes of obstructive apnea and elevated CO<sub>2</sub> while asleep. The infant was treated with theophylline for three months and at 18 months of age was completely normal. The authors suggest that the persistence of periodic breathing in this case distinguishes this patient from the few other term babies reported to have an apneic episode postoperatively without evidence of underlying respiratory control abnormality. As the authors point out, with so few of these cases in the literature, it is hard to make any firm recommendations. - JV

## Cardiac transplantation in infancy: Donors and recipients

*Journal of Pediatrics* 116 (2):171-176, 1990  
Boucek et al.

## Coronary arteriosclerosis in pediatric heart transplant survivors: Limitation of long term survival

*Journal of Pediatrics* 116 (2):177-183, 1990  
Pahl et al.

## Cardiac transplantation in infants and children

*Journal of Pediatrics* 116 (2):266-268, 1990  
Gersony (editorial)

These three articles from the same issue of *J Peds* look at the nice outcome at least to the 40-month follow-up of infant heart transplant recipients and the disturbing occurrence of early arteriosclerosis in older children receiving heart transplants. Just as some adult transplant recipients have needed CABG surgery or retransplantation for arteriosclerosis, will this be the case with some older children also? There is the suggestion that this is a rejection-related phenomena; will better agents to treat rejection prevent this? Of interest in the infant recipients was a 72-percent history of cardiac arrest requiring CPR in the donors, and a third of the donors needed inotropic support at time of donation, with good results in the recipients. - JV

Summertime and the use of skateboards, bicycles, ATVs, motorcycles and hoards of children out of the schools and out into the streets, parks and swimming pools all mean: the trauma season. The following three articles are—sadly enough—of interest for this time of year.

## Plasma epinephrine concentrations after intraosseous and central venous injection during cardiopulmonary resuscitation in the lamb

*Journal of Pediatrics* 116 (2): 312-315, Feb. 1990

Andropoulos, Soifer and Schreiber

These investigators compared central versus intraosseous infusion of epinephrine in lambs both at rest and during CPR. At rest, 0.01 mg/kg had the same effects on systolic arterial pressure and heart rate and same onset time via either route. Plasma concentrations were the same in both groups. During CPR, a slightly lower peak concentration and slower onset were found with intraosseous injection suggesting the dosage does not have to be adjusted. - JV

## Extremity tourniquet deflation increases end-tidal Pco<sub>2</sub>

*Anesth and Analgesia* 70: 457-458, 1990  
Dickson et al.

Dr. Dickson et al. looked at 12 patients with upper extremity tourniquets and 12 with lower extremity tourniquets and evaluated the effect of tourniquet release on end tidal Pco<sub>2</sub>. They found a significant increase in ETPco<sub>2</sub> (up to 18 torr) after tourniquet release for the first five minutes after release. The increase was greater after lower extremity release and unrelated to tourniquet time (all patients had tourniquets in place for at least 42 minutes). They suggest this may be an important consideration in the head-injured patient. - JV

## Perioperative management of the multi-organ donor

*Anesth and Analgesia* 70:546-556, 1990  
Robertson and Cook

Many of us are involved in organ transplantation at least from the organ donation end if not the receiving end. These authors nicely present many of the considerations for the management of the organ donor perioperatively to ensure the recipient is given a well-

functioning organ—a sad but necessary task. - JV

## Mobile anxiolysis for pediatric ambulatory surgery patients

*Anesth and Analgesia* 67:1015-1021, 1988  
Rauscher, Quarmby and Schmitt

I liked this article because we, too, use a Radio Flyer Town and Country Red Wagon to bring kids to the OR, and the kids in Salt Lake like it just like the kids do in Cooperstown, New York. (It has a nice picture of the wagon for those who have forgotten what they look like.) - JV

## Preoperative laboratory testing of children undergoing elective surgery

*Anesth and Analgesia* 70:176-180, 1990  
O'Connor and Drasner

Drs. O'Connor and Drasner looked at 486 elective patients having general or spinal anesthesia. They conclude that preoperative Hgb screening can be of value in determining anemia, that preoperative UAs probably do not contribute to patient management in the absence of a suspected urine infection, that there is a high degree of lack of follow-up on mild abnormalities of CBC and UA discovered on preoperative screening, and that most preoperative cancellations were on the basis of findings on history and physical. Of interest was the finding of sperm in the urine of one 13-year-old girl. Is a preop pregnancy test in the appropriate group a routine screening test that should be considered? - JV

## Postoperative analgesia in children: A prospective study of intermittent intramuscular injection versus continuous intravenous infusion of morphine

*Journal of Pediatric Surgery* 25 (2):185-191, Feb. 1990

Hendrickson, Myre et al.

This group looked at postoperative pain control after major chest, abdominal or orthopedic surgery in 46 randomly assigned non-ventilated children, comparing a continuous infusion of MS at 10 to 40 mcg/kg/hr to an intermittent IM group receiving 0.1 mg/kg q 3 hrs prn. Pain was scored by parents and nurses. Pain scores were higher in the IM group. The IV group received a higher average hourly dose of MS. There were no significant differences between the groups in nausea, urinary retention, drowsiness or time to first bowel movement or flatus. No patient needed naloxone. They had no neonates in their study. They showed the strongest correlation in pain esti-



mation was between the nurse and patient; this is important since the nurse is adjusting the dosage. It is good to look at the literature of our surgical colleagues on topics of mutual interest. Of note, this approach does not involve a pain service but does involve staff education and appropriate precautions for medication side effects. - JV

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#### **Efficacy of an epidural test dose in children anesthetized with halothane**

*Anesthesiology* 72 (2): 249-251, Feb. 1990  
Desparmet, Mateo, Ecoffey and Mazoit

Dr. Desparmet et al. looked at children anesthetized with 1 percent halothane and 50 percent N<sub>2</sub>O. They found an intravenous dose of 0.1 ml/kg of 1 percent lidocaine without epinephrine raised neither heart rate nor blood pressure. An intravenous dose of 0.1 ml/kg 1 percent lidocaine with 1/200,000 epinephrine (simulating an epidural test dose) in 15 of 21 patients raised heart rate greater than 10 beats per minute but only at 45-60 sec. If 10 mcg/kg of atropine was given five minutes prior to the test dose, then 20/21 had an increase in heart rate >10 beats per minute for a longer time period, up to 120 sec. The test dose was not totally reliable but improved with the use of prior IV atropine. It would be interesting to know how other dosages of atropine, such as 20 mcg/kg IV or as a premedication or oral atropine 40 mcg/kg, affected a test dose. - JV

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#### **Metoclopramide reduces the incidence of vomiting following strabismus surgery in children**

*Anesthesiology* 72 (2): 245-248, Feb. 1990  
Broadman et al.

Dr. Broadman et al. studied 126 unpremedicated randomized children for eye muscle surgery who received placebo or metoclopramide .15 mg/kg IV over one minute in the recovery room. They all received halothane, N<sub>2</sub>O, O<sub>2</sub>, atracurium, IV fluid, atropine 0.02 mg/kg IV, stomach decompression and reversal with atropine and neostigmine. The incidence of vomiting was 37 percent in the treatment group and 59 percent in the placebo. Eight in the placebo group and none of the treated group needed therapy (70 mcg/kg of droperidol) for protracted severe vomiting. The time to discharge was significantly shorter in the treated group. There were no adverse reactions to metoclopramide, and none of the children was drowsy or sedated. Whether you view postoperative vomiting as a very serious problem or as a social disease, it is certainly unpleasant for the child and parents. The lack of sedation with metoclopramide may make this a preferable treatment to droperidol. - JV

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#### **Ingestion of liquids compared with preoperative fasting in pediatric outpatients**

*Anesthesiology* 72 (4):593-597, Apr. 1990  
Schreiner, Treibwasser and Keon

#### **NPO after midnight for children—a reappraisal**

(accompanying editorial, 589-592)  
Coté

#### **Why are children starved?**

*Brit J Anaes* 64 (4):409-410, 1990  
Miller

Dr. Schreiner et al. compared two groups of children randomized to receive clear liquids either six to eight hours prior to surgery or two hours prior to surgery. No solids were given after 8 p.m. the night before surgery. They received the same preop of oral meperidine, diazepam and atropine and a halothane, N<sub>2</sub>O and O<sub>2</sub> anesthetic. There were no significant differences between the groups with respect to gastric volumes aspirated or pH. Parents rated their children as less irritable and their overall experience more favorable in the group receiving fluids two hours prior to surgery. As others have reported, although the requested NPO time was six to eight hours depending upon age, the actual NPO time averaged 13.5 hours, probably due to the inconvenience of waking in the middle of the night to feed the child. They were quite clear in not advocating solids and fatty or pulpy liquids, but clear liquids only; if the parents couldn't read the prior night's 76'ers or Eagles score through the liquid, the child shouldn't get it.

Dr. Coté presents a nice overview of the history of NPO, aspiration risk and management and points out that in the elective healthy pediatric patient, the risk of aspiration is very low. Not only will the children be more comfortable but also better hydrated with a shorter NPO time. He encourages a large prospective study to decide optimal management. - JV

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#### **Paediatric glucose homeostasis during anaesthesia**

*Brit J Anaesth* 64:413, 1990  
Aun, Panesar

In 20 healthy 1- to 5-year-olds, perioperative blood glucose regulation was assessed. The fasted patients were fasted for a minimum of eight hours, while the glucose-fed group was given 10 ml/kg of 5 percent Dextrose orally. They detected no changes in plasma glucose concentration, insulin, cortisol, growth hormone and glucagon. Gastric residual volumes were greater in those who were fed four to six hours preoperatively. The authors conclude that feeding within four to six hours before surgery may increase the risk of pulmonary aspiration while inferring no benefit for glucose homeostasis on children.

Just another article in the continuing debate concerning fasting or feeding; for how much and how long. Apparently normal 1- to 5-year-olds do not suffer, at least with regard to glucose homeostasis, when fasting for eight

hours. This study, although not as a major point, did demonstrate an increase in gastric residual volumes in those patients fed four hours prior to surgery. This is in conflict with numerous articles previously published. This article, in contrast to others, suggests caution in turning to feeding all children four hours prior to surgery. - RW

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#### **Influence of fluid regimens on perioperative blood-glucose concentrations in neonates**

*Brit J Anaesth* 64:419, 1990

Larsson, Nilsson, Niklasson, Andreasson, Ekstrom-Jodal

In 30 neonates undergoing major surgery during the first week of life, blood glucoses were serially measured for the first eight hours. Half of these infants received Ringer-acetate without glucose, compared to 15 patients who received a 10-percent glucose solution. Blood glucose in those not receiving dextrose was 3.1 - 4.3 mmol/liter during surgery, whereas in those receiving glucose, it rose from 3.4 to 6.3 mmol/liter. Surprisingly, hypoglycemia occurred in both groups: in three out of 15 in the Ringer's group and one out of 15 in the glucose group. Hypoglycemia, interestingly enough, only occurred in neonates less than 48 hours of age during the first hour of anesthesia.

This paper is a nice (albeit small) experience of studying blood glucose shifts perioperatively in neonates undergoing major surgery. The authors conclude (although I feel their numbers are too small to be certain about this) that perioperative hypoglycemia only occurs during the first 48 hours of life. They do wisely, however, add that blood glucose should be monitored in neonates throughout surgery and postoperatively, to avoid both hypo- and hyperglycemia. - RW

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#### **Pediatric anesthesia morbidity and mortality in the perioperative period**

*Anesth and Analgesia* 70:160-167, 1990  
Cohen, Cameron and Duncan

Drs. Cohen, Cameron and Duncan reviewed the anesthetics for 29,000 children at the Winnipeg Children's Hospital between 1982 and 1987. Children less than 1 month had the greatest risk for major problems, such as cardiac arrest or other cardiovascular or renal problems; however, a greater percentage of these patients were having major surgery and were sicker patients. The cardiac arrest rate in the under-1-year group was 24/10,000. There was a higher incidence of respiratory events in young children and higher frequency of vomiting in older children. They were able to identify specific problems such as temperature regulation in small prematures leading to modification of procedures to address this particular problem. - JV

(Continued on page 10)

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## LITERATURE REVIEW

(Continued from page 9)

**Use of continuous caudal block to relieve lower-extremity ischemia caused by vasculitis in a child with meningococemia**  
*Journal of Pediatrics* 115 (6):1019-1021, Dec. 1989

Tobias, Haun, Helfaer and Nichols

Dr. Tobias et al. report the significant improvement in peripheral perfusion to the lower extremities in a 3-month-old with meningococemic vasculitis through the use of a continuous caudal. They documented increase in toe temperature, capillary refill and return of palpable pulses. Of note was that they waited until after the patient was out of the acute shock state of her illness, her coagulopathy had resolved and cultures were negative on antibiotics. -JV

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**Retinal hemorrhage after cardiopulmonary resuscitation in children: An etiologic re-evaluation**

*Pediatrics* 85:585, 1990

Goetting, Sowa

In this "Experience and Reason" from Drs. Mark Goetting and Bonnie Sowa, there are multiple observations made on children following cardiopulmonary resuscitation who have had single retinal hemorrhages. The question addressed here is whether retinal hemorrhages can indeed occur in children following cardiopulmonary resuscitation in the absence of apparent head trauma. They conclude: YES! They report that this is consistent with the presence of retinal hemorrhage in 20 to 50 percent of vaginally delivered newborns.

The importance of this article is that, although pediatricians have suspected for a long time that violent chest compressions and changes in intrathoracic and intracranial pressure which accompany CPR could be associated with retinal hemorrhages, there has never been any conclusive evidence that this is so. This question can be quite serious when child abuse is a consideration in the etiology of the child's arrest. Those children who may have been asphyxiated or allegedly found apneic or arrested at home and received CPR during transport who are subsequently found to have retinal hemorrhages provide the pediatrician with a dilemma: "Was this child abused?" Classic teaching in the past has been that retinal hemorrhages only arise from significant head trauma, not CPR. This contribution to the literature will be welcome news to attorneys who are defending the parents of allegedly abused children. Frankly, from reading this article, I am only convinced that in one or two extremely rare cases (one allegedly SIDS, the other one a near drowning—[was this abuse?]) and in one addendum case, single

retinal hemorrhages may occur during CPR. The massive, multiple retinal hemorrhages associated with the "shaken child syndrome" have not been reported as a result of CPR. -RW

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**Percutaneous catheterization of axillary vein in infants and children**

*Pediatrics* 85:531, 1990

Metz, Lucking, Chaten, Williams, Mickell

In this article, 52 separate axillary venous catheters were placed in 47 different patients in a pediatric critical care facility. The vein was found parallel and inferior to the artery and blindly punctured. A thin-walled teflon catheter was inserted as for other central venous lines. The median age of patients was 0.9 years, ranging from 4 days to 12 years. A third of these were performed in children under 6 months of age. The authors report a 79-percent success rate. The complications reported include a small pneumothorax in one child and an axillary hematoma in another. They also say that on several occasions the axillary artery was punctured; however, they claim this was not a problem. The incidence of infection did not appear to be significantly different from that previously reported for other central catheterizations.

Those of us who have used the axillary artery in preference to the femoral artery are not surprised to hear that the axillary vein can be readily cannulated in small children. Although this route has the advantage of avoiding soiling, we continue to be nervous about this approach. The close approximation of the brachial plexus, as we all learned in medical school, causes anxiety about approaching the vessels in the axilla. Even so, there is no report of neural damage following axillary vessel cannulation. The extremely rich collateral circulation around the shoulder makes arterial occlusion, a much dreaded complication in the lower limb, of little concern. It is possible that this may provide a useful alternative for central venous access in selected patients; however, the awkward placement of lines in the axilla while the child flings his arm about postoperatively is of some concern. I also fear that with widespread cannulation of the axillary vessels, it will only be a matter of time before our first septic pyoarthritis of the shoulder is reported as a complication of this approach. -RW

## JOIN SPA TODAY

The Society for Pediatric Anesthesia has grown to more than 700 members since its formation in 1986. This growth is extremely satisfying to those of us who conceived the idea of the Society on the premise that there were many other anesthesiologists who shared our interest in pediatrics and who support a specialty society that focuses its efforts on the unique challenges of pediatric anesthesia.

Your Society will be expanding its programming in the coming years to bring to its members a diverse agenda of topics dealing with the unique needs of the specialty. The Society will continue to encourage research in our specialty and will begin to support new investigators through funding and through dissemination of their work to practitioners (see related articles on research, education and the newsletter). Additionally, we hope to continue the format of our Annual Meeting (see meeting program schedule, page 5) in which scientific and clinically relevant symposia will be presented by experts from both the academic and private sectors.

We are constantly trying to improve our performance and deliver real value to our membership. Clearly not all of our members can attend the Annual Meeting. Starting in 1990, the educational materials and handouts distributed at the Annual Meeting will be mailed to all of the Society's active members who are unable to attend. Additionally, as we have in the past, we plan to abstract the highlights of the meeting and to publish them in our newsletter. We also plan to print a written synopsis of the business meeting held at the conclusion of the Annual Meeting in the newsletter as well.

We are committed to make this year's meeting in Las Vegas our best ever. Because of the popularity of the meeting (and its luncheon), we plan to book a bigger room and to have more clerical help than we have had in the past. Additionally, we will have a surfeit of handouts, badges and food available. Obviously, preregistration will greatly help us in both our planning and our execution. Please preregister and make sure you note that the meeting will be held on a **Thursday** and not a Friday this year!

Finally, CME certificates will be distributed and mailed to the members who attended within one month of the meeting. Indeed, our goal is to have these certificates available at the meeting itself in the near future. - *The SPA Board*

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