Perinatal-Pediatrics Bulletin
Nov./Dec. '00

American Association for Respiratory Care

On a Final Note . . .

by Peter Betit, RRT, FAARC

It is difficult for me to imagine, but this is my last official communiqué as section chair. I would like to express my thanks to the AARC for providing me with the opportunity to serve the Association and the members of the Perinatal-Pediatric Section. It truly has been a very fulfilling experience. I have particularly enjoyed meeting new colleagues from around the country and working with them on our section's various activities. I would like to specifically thank Doug Petsinger for his contributions as co-editor of this *Bulletin* and Mike Czervinske for his continued work with the Resource Panel.

I have very few regrets, but one that I do have is not being able to convince more section members to get involved in our activities. Indeed, this is one of the most difficult challenges facing any chair. One unattained goal in this area was my bid to get more of our Resource Panel members to contribute items for our *Bulletin*. Unfortunately, only a few did so. I think this is still an important goal and hope that section members will make a renewed effort in this area.

I would like to congratulate Tim Myers on his election to the chair. It is very exciting to have our section chair participating on the AARC Board of Directors. I recently met Tim at the meeting in Cincinnati, and I am confident that we are in good hands. Best of luck, Tim!

In closing, I would like to make one last plea that all section members support Tim, get involved, and continue to fuel this section's success. You truly are a talented group. Thank you all for allowing me to serve as chair; again, it has been a great experience. ■

Notes from the Co-Editor

by Doug Petsinger, BS, RRT/RT IV

Greetings, and happy holidays to all! First, I feel that we must all applaud Peter Betit for the tremendous job he has done as the Perinatal-Pediatric Section chair over the past two years. I am honored to have worked with him on the *Bulletin*. Peter, you are a credit to our profession, and we wish you well in your future endeavors. Next, I would like to welcome another professional to the section leadership who I'm sure will continue to enhance our specialty — our incoming chair, Timothy Myers. I know I will enjoy working with him on the *Bulletin* as well.

Kim Simmons, RRT, recently emailed me concerning the case study I presented in the last issue. Specifically, she was inquiring about the baby's eventual outcome. As I last stated, he was limping along still ventilated. After several bouts of sepsis and near-miss NEC, we had a period of stability. He weaned down to a rate of 10, then we employed our usual pressure support "sprints," as tolerated. Our experience over the years has been that these long-term ventilated patients require higher levels of pressure support — usually 12-15cmH2O pressures. Then we slowly increase the duration of these trials, as well as slowly wean the level of the pressure support. Also, if the patient is PEEP-sensitive we extubate to nasopharyngeal CPAP (NP CPAP) or bi-level support as a bridge to unassisted ventilation.

This was certainly the case in this situation. We extubated to +15cmH2O of NP CPAP with 0.25 FiO2 successfully. Over the next three days the CPAP was weaned to +6cmH2O and he was placed on a 2.5LPM at 25% blended nasal cannula for "psuedo CPAP." He continued to look good, his

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mom got to rock him for hours, and we started to transition him to the floor. Then he unexpectedly arrested the day of discharge and expired. The post revealed a clotted shunt. We all were very saddened. I'm sorry I could not have given you better news.

Since I don't want to end on such a sad note, let me tell you a little about what you'll find in this issue. As always, the *Bulletin* is packed with all sort of goodies. You will hear from Peter, Timothy, and of course, yours truly with another case study. Now, I'm pretty sure that we, at the Egleston Campus of Children's of Atlanta, are not the only clinicians out there with interesting patients or experiences. I'd like to encourage all of you to start writing about your experiences and submitting them to me for this *Bulletin*. It's a great way to get started in publishing and demonstrates your professionalism to your organization as well.■

Perinatal-Pediatric Section Meets in Cincinnati

by Peter Betit, RRT, FAARC

Perinatal-Pediatrics Bulletin
is published by the
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The 46th AARC International Congress held in Cincinnati in October was, once again, a productive meeting for perinatal-pediatric RTs. Attendees conveyed positive feedback regarding the programs related to perinatal and pediatric respiratory care. Some of the highlights included presentations on inhaled nitric oxide, mechanical ventilation, long-term ventilator care, pediatric respiratory failure, asthma, diagnostics and monitoring, and cystic fibrosis. There were also over 40 abstracts related to neonatal and pediatric respiratory care presented during the Open Forum.

I was once again pleased at the attendance at our section's membership meeting. There were about 40 members present, representing over 15 centers. Despite the brevity of our meeting, were able to discuss a number of topics. Most importantly, we discussed the program content for the 2001 Congress to be held in San Antonio, TX. Some of the topics that were kicked around included newborn resuscitation, sickle cell disease, modes of ventilation and how they relate to pediatrics, critical airway management, care of the child with neuromuscular disease, an update on surfactant therapy, and nasal CPAP. All section members are encouraged to submit topics and speaker recommendations to the AARC Program Committee. If you have any topic recommendations, please e-mail them ASAP to Tim Myers at timothy.myers@uhhs.com. The deadline for program submissions is December 31.

Also discussed was membership involvement in section activities. Section members were encouraged to participate in the Resource Panel, submit items for the *Bulletin*, act as guest editor, and/or act as listserve coordinator.

There was a brief discussion regarding the NBRC Perinatal-Pediatric Specialty Exam. Some attendees expressed concern that the exam was open to all RTs and felt that RTs sitting for the exam should have verification of direct involvement in perinatal and pediatric care. This concern was expressed because some centers now utilize the exam as a contingency of employment. Attendees were encouraged to contact the NBRC with recommendations of this nature.

We were fortunate to have Mark Wilson, MD, our section's medical advisor, in attendance. Dr. Wilson reported on the Medical Advisors meeting that he attended. He conveyed the advisors' concerns regarding a declining membership in the AARC. Dr. Wilson further expressed his commitment to the section and offered his assistance with all section activities, including recruitment of new members.■

Notes from the Chair-Elect

by Timothy R. Myers BS, RRT

I would like to take this opportunity to introduce myself to the members of the Perinatal-Pediatric Section. My name is Tim Myers, and I am truly honored to have the opportunity to represent all RTs who specialize in the care of newborns and children with cardiopulmonary disorders.

I am a native of Northeastern Ohio and received my Bachelor of Science degree in Allied Health Professions from The Ohio State University in 1989. While enrolled in this four-year program, I had the opportunity to focus on two specialty tracks: neonatal-pediatrics and management.

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After spending a brief portion of my early career at Ohio State University Hospitals in Columbus, I had the good fortune to land "my dream job" as a staff therapist at Rainbow Babies and Children's Hospitals in Cleveland. Rainbow is a 244-bed comprehensive medical and surgical center that exemplifies its mission statement: To Heal, To Teach, To Discover.

Over the course of my 12 years at Rainbow Babies, I have held a variety of positions in the respiratory care department, including staff therapist, unit primary therapist, asthma disease manager, and my current role as the pediatric administrative manager. I also have the good fortune and opportunity to hold a position in the department of pediatrics as the clinical studies coordinator, where my work is concentrated on facilitating studies that involve pediatric asthma and infant pulmonary function testing.

The opportunities that have been available to me at Rainbow Babies have been both rewarding and professionally enhancing. I have had the opportunity to participate in pioneering research and developments in a 38-bed NICU that utilized high-frequency ventilation, surfactant therapy, and nitric oxide in their early stages of development. In our 16-bed PICU I have witnessed a variety of therapies and developments in pediatric care, including cardiothoracic surgery, high frequency ventilation, indirect calorimetry, nitric oxide, waveform graphics, alternative airway clearance techniques, and non-invasive ventilation. In the non-intensive care settings, I have witnessed cutting edge developments in the management of asthma, bronchopulmonary dysplasia, chronic ventilator management, and cystic fibrosis.

While taking advantage of these opportunities, I have been privileged to be surrounded by individuals of excellence in respiratory care. My mentors in the department of respiratory care alone encompass four of the current 52 Fellows of the American Association of Respiratory Care (FAARC). They have by their example and leadership demonstrated on a daily basis the meaning of professionalism and leadership in areas of management and research. My peers in the department - both past and present — have demonstrated to me the professionalism and leadership expected in the NICU, PICU, emergency room, labor & delivery, outpatient clinics, and acute care areas of our institution.

I have been a proud member of the Perinatal-Pediatric Section since its origin. We have come a long way over the years. The section now has a listserve on the AARC website (www.aarc.org) that allows for a rapid transfer of ideas and questions. I encourage each and every one of you to sign up for this valuable (free to section members) resource. Also, due to a change in the AARC Bylaws, our section has obtained a seat on the AARC Board of Directors along with the Management Section. This will be an exciting endeavor for us as a section. Unfortunately, since my first Board meeting was scheduled at the same time as our section meeting at the recently completed International Congress in Cincinnati, I was unable to attend the section meeting. Our outgoing section chair, Peter Betit, presided over the meeting and presents the details for you elsewhere in this *Bulletin*.

The Perinatal-Pediatric Section and its members have been a great source of information on both clinical and research issues over the past several years. We have benefited from the excellent leadership of Peter Betit, Katie Sabato, and those who went before them. Utilizing my experiences both within the section and at Rainbow Babies, I hope to build on this solid foundation over the next four years to strengthen the position of perinatal-pediatric therapists nationwide. I encourage each of you to take full advantage of the benefits of section membership and to share those benefits with your colleagues at work. Each of us should encourage fellow staff members at our institutions to join the AARC and our specialty section.

I look forward with great anticipation to working with the members of the Perinatal-Pediatric Section and the AARC over the coming years. I encourage each of you to actively participate in the section through the listserve, by writing articles for the *Bulletin*, or by submitting neonatal/pediatric proposals for next year's International Congress to be held in San Antonio.■

Specialty Practitioner of the Year: *Justin L. Twitchell, RRT*

Justin Twitchell, RRT, has had a very busy year. As manager of neonatal respiratory care services at St. Mark's Hospital in Salt Lake City, UT, he's spent the last several months transforming a 15-bed Level I nursery into a soon-to-be-opened 32-bed, Levels II and III NICU. During the course of this transformation, the "hats" he's had to wear have run the gamut — from educator to unit design.

In addition to recruiting RTs and training them in the areas of intubation, ventilation management, neonatal resuscitation, and high risk delivery attendance, he's played a major role in planning the physical components of the unit. Justin participated in the design of the electrical, gas, and floor layout of the NICU and was responsible for purchasing all supplies and equipment, from nasal cannulas to high frequency ventilators. He also provided training to the nursing staff in the care of critically ill respiratory patients.

His biggest source of pride, however, lies in the degree of freedom that he believes is being fostered for RTs in the new unit. "Most importantly, an atmosphere of autonomy has been created where RTs can practice their profession; where their services, skills, and opinions are not only respected but sought out."

Justin, who has been a member of the AARC off and on since 1975 and a section member for the past two years, credits his professional organizations with affording him "a connection with other therapists with the same interests, goals, and desires." The AARC and its advocacy for RTs nationwide, he says, "gives me the opportunity to practice my profession without having to 'look over my shoulder.' It is because of the AARC that respiratory care as a profession exists."■

Cardiomyopathy with Severe Mitral Regurge: A Case Study

by Doug Petsinger, BS, RRT/RT IV

A 12.3 Kg, two-month-old black male arrived in the ED shocky and in respiratory distress. The day prior to the admission he was treated for RAD with Ventolin MDI for wheezing. This admission, chest film revealed cardiomegaly and hepatospleenomegally. As the cardiac intensavist was being notified of the patient, the child went into complete cardiac-respiratory arrest.

After a 45-minute. on-and-off "code" in the ED, the patient was transferred to the Sibley Heart Center's CICU. His admission drips consisted of Dopamine at 3, Dobutamine at 10, Epi at 2.0, and Milrinone at 0.7. Initial ventilatory support was PCV, 80%, 30BPM, 28/10 cmH2O, 1.0 sec It., and Paw of 18.6 cmH2O. The first blood gas after a short period of "stabilization" revealed both hypoxemia, respiratory, and metabolic acidosis. We treated with NaHCO3 — and increased ventilator support to 100% and 30/10 cmH2O pressures. Acid-base balance continued to reflect a metabolic acidosis from poor cardiac output (C.O.), despite frequent NaHCO3-boluses. A Tham gtt. was started at 10cc/Hr with the hope of normalizing the pH to enhance inotropic support.

Hemodynamically, the baby's heart rate was in the low 200s, with barely acceptable blood pressures and mean arterial pressures ranging from mid-30s to 50s and the CVP ranging from 11 to 18 mmHg. The patient's status further deteriorated with ventricular dysrhythmias and hypotension. Norepinephrine was started at 1.0mcg/Kg/min, and Lidocaine was started at 20 mcg/Kg/min. It was also felt that we could optimize his care with a 5.5 Fr. Oxymetric Swan Ganz catheter. The opening Wedge pressure was 34 mmHg and the SVO2 was 58%. Over the next hour his oxygenation worsened, and we converted to HFOV. The initial settings were 7 Hz, 62 ΔP, 24cmH2O Paw, and 100%, with favorable results, including a lessening A-a gradient and an improved CO2 clearance.

After a rocky 24-hour period marked by periods of respiratory acidosis, hypotension, and cardiac arrests, he started to stabilize hemodynamically and in acid-base. Both norepi and epinephrine were weaned significantly. Ventilatory support had also stabilized with the Paw of 23 cmH2O on 40%, 10Hz, and 45 ΔP. A failed attempt to transition to conventional ventilation occurred 48 hours later, requiring reinstitution of HFOV.

The infant continued to be very labile, with ventilation and oxygenation requiring heroic amounts of HFOV support: 100%, 5Hz, 80ΔP, and Paw of 32 cmH2O. Blood gases slowly improved, and the FiO2 and the Hz were slowly weaned. Hemodynamically, over 72 hours the PA wedge pressures decreased from mid-30s to mid-teens. He progressively became more bradicardic overnight, and Isuprel was started. There was concern of a CNS insult due to hypotension, acidosis, and hypoxia.

HFOV support was weaned to place on conventional support for a much needed CT scan. He was placed on PCV, 100%, rate of 20, 38/15 cmH2O, 1.5 sec It, and Paw of 25 cmH2O. We also started him on continuous aerosol of 20 mg albuterol per hour. Off HFOV, we were able to suction copious-tenacious secretions for which we started DNase. His CT was normal, to our great joy. Over the next three days conventional support was slowly weaned from PCV to SIMV with PS. He was successfully extubated to low flow O2 and transferred to the floor. ■

FYI . . .

Prenatal steroids and RDS

A study by Dutch investigators has for the first time shown that prenatal corticosteroid treatment increases surfactant phosphatidylcholine (PC) production from the precursor glucose in preterm infants who have RDS. Prenatal corticosteroid administration in women at risk for very premature delivery reduced the incidence and severity of RDS in their babies after birth.

The researchers found significantly increased surfactant PC synthesis with glucose in the study, which involved 27 preterm infants with RDS. Their data showed an increase of 40% per dose of prenatal corticosteroid in the 16 infants who received the steroids. (American Journal of Respiratory and Critical Care Medicine, 9/00)

Studies indicate LOS guidelines are not evidence-based

Two clinical research studies comparing recommended hospital stays for pediatric patients with actual pediatric hospital stays have found that the recommended hospital stay guidelines are consistently shorter than the actual practices of the nation's hospitals — even those listed in the HCIA-Sachs Institute's *100 Top Hospitals*.

The studies compared the pediatric "goal length of stay" guidelines published by Milliman & Robertson, Inc., an actuarial and consulting company, to actual lengths of hospital stay for 45 conditions from both a national sample of pediatric inpatient data and 100 Top Hospitals pediatric benchmarks. Results showed that nearly two-thirds of uncomplicated pediatric patients stayed in the hospital longer than the Milliman & Robertson goals suggested was appropriate. In some cases, the hospital stays were markedly longer.

Milliman & Robertson's pediatric hospital stay guidelines are used by a number of national managed care organizations. "Managed care organizations and other insurers use published guidelines to help determine how long patients should stay in the hospital," says Jean Chenoweth, executive director of the HCIA-Sachs Institute. "Milliman & Robertson recommend that their guidelines be used only for uncomplicated cases. However, according to the Institute's studies, their guidelines recommend shorter stays for some diseases in which as high as 85% of the children admitted to hospitals have complications. The use of Milliman & Robertson's pediatric

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guidelines could create a huge potential for putting the sickest children at risk unnecessarily."

Both studies were conducted using 1998 data from HCIA-Sachs' all-payer inpatient database, which contains over 3.5 million pediatric discharges. (HCIA-Sachs)

New test classifies bacteria in CF lungs

A laboratory test developed by University of Iowa researchers indicates that the lungs of cystic fibrosis patients are infected primarily with bacterial biofilms, organized communities of bacterial cells that are extremely resistant to antibiotic treatment. The bacterial cells produce signaling molecules that allow the cells to communicate with each other. At a critical cell density, these accumulated signals trigger the expression of a specific set of genes, which results in the formation of the biofilm. By growing as a biofilm, bacteria can survive and thrive in hostile environments.

Although the *P. aeruginosa* isolated from the lungs of CF patients looks like a biofilm and acts like a biofilm, until now there has not been an objective test available to confirm that it is a biofilm. In this study, researchers developed a sensitive new test which shows that from CF lungs produce the telltale, quorum-sensing molecules that are the signals for biofilm formation. They believe the most exciting implication of this result is that it could be used to develop automated processes to test thousands of compounds for the ability to disrupt biofilm formation. Says lead study author, E. Peter Greenberg, PhD, "I think this will attract interest from industry where they are very interested in being able to use high throughput, automated processes to rapidly identify compounds that inhibit biofilm formation." (Nature, 10/12/00)

Much ado about nothing?

Recent publicity about positional plagiocephaly or "flat heads" among infants as an indirect result of the Back To Sleep campaign aimed at preventing Sudden Infant Death Syndrome (SIDS) has spurred a corresponding surge in the number of medical and technological interventions being offered up as solutions to the problem — including the use of "reshaping" helmets, headbands, and surgeries. But even though medical experts acknowledge the need for intervention in a small percentage of flat head cases that do not resolve over time, for the most part they say flat heads are harmless and easily treated.

According to Thomas Keens, MD, of Los Angeles Children's Hospital, "In general, there seems to be an over-reaction to what is largely a temporary problem which tends to resolve by six months to one year of age as babies become more active." Some physicians have even suggested a need to change our perspective of what is normal. Throughout his ongoing SIDS studies, for example, Dr. Keens has seen large numbers of parents who had previously lost a baby to SIDS proudly display the slightly flattened heads of their subsequent infants as a sign that they were doing everything possible to reduce the risk of a SIDS recurrence.

The ultimate the solution to the problem in most cases may be as simple as ensuring adequate tummy-time when the baby is awake and being watched, and varying the baby's orientation while sleeping on his or her back. Parents should be encouraged to position the baby's head toward one side and then the other on alternating days or weeks, or to move the crib periodically so that the baby must turn his or her head to look toward an activity, such as mom entering the room. (SIDS Alliance) ■

Resource Kit Aims to Upgrade Pediatric Emergency Care

In an effort to provide medical professionals with the resources they need to deliver state-of-the-art pediatric emergency care, representatives from more than 19 government, national, and professional organizations recently released a comprehensive Resource Kit designed to bring organizations, communities, and states into compliance with accepted standards for pediatric emergency care. Available in CD-ROM format, the Kit contains more than 2,000 pages of critical information on pediatric injury and illness prevention, treatment, and rehabilitation. Included in the package are:

- A collection of protocols, training courses, guidelines, and procedures that address illness and injury prevention, patient care training and safety, equipment guidelines, medical direction, and public policy.
- A reference guide of additional resources and where to obtain them.
- Contact information for organizations in the emergency medical services for children (EMSC) community that are committed to strategic partnership building.

The Resource Kit was produced as part of a three-year national educational campaign to help reduce pediatric disability and death from injury and illness. The next phase of the campaign will focus on outreach to parents, caregivers, and children. Emphasis will be on methods to prevent and prepare for pediatric medical emergencies, such as identifying illness warning signs, choosing the best hospitals for pediatric emergencies, and guidelines for treating ill or injured children.

The Kit, which is currently being distributed to more than 5,000 emergency care decision-makers throughout the nation, is available free of charge at www.ems-c.org. (EMSC) ■

AARC Wants to Know Your Top Five Areas of Concern

The AARC is currently seeking input from section members regarding the top five areas of concern unique to our specialty area. Please mail, email, or fax your top five concerns *related specifically to the specialty* (not to the AARC or the practice of respiratory care in general) to: Kelli Hagen, 11030 Ables Lane, Dallas, TX 75229, email: hagen@aarc. org, FAX (972) 484-2720 or (972) 484-6010. The Association will utilize our input in determining priorities for the coming year. ■

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