American Association for Respiratory Care's

Neonatal Pediatrics

November / December 2002 Bulletin

Notes from the Co-Editor

by Melissa K. Brown, RCP, RRT

We had a wonderful time at the 48th International Respiratory Congress in Tampa, Fla. Those of you who missed this year's Congress missed a great convention! The Tampa Convention Center was a nice venue and the conference was well run. There were some interesting lectures, some lively discussions in the Open Forums, quite a bit of new equipment to see in the Exhibit Hall and some big parties as well! At the Awards Ceremony, AARC Executive Director Sam Giordano challenged all AARC members to recruit one new member this year. We need all the new members we can get if we are going to have the power to lobby for legislation that affects both reimbursement issues and RT jobs.

We had a great turnout at this year's section business meeting. I always enjoy visiting with other members of the Neonatal-Pediatric Section. Often the AARC convention is the only opportunity I have to see old friends and meet new email friends in person. It was great to see all of you there! Tim Myers, our section chair, ran the meeting and shared a lot of valuable information.

First and foremost, Tim announced that the NBRC will be soon be awarding a credential for RTs who pass, or have already passed, the Neonatal-Pediatric Specialty Examination. The NBRC is currently researching the "NPS" (Neonatal Pediatric Specialist) acronym to ascertain trademark status. Assuming no trademark restrictions are found, the NPS credential will be added to your current CRT or RRT credential with a hyphen: "CRT-NPS" or "RRT-NPS". The whole section owes a debt of thanks to former section chair, Peter Betit, RRT, who worked diligently with the NBRC to acquire a credential

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Controlled Ventilation in the Delivery Room: What's Old is New Again

by Wade Rich, RCP, NICU manager, University of California San Diego Medical Center, San Diego, CA

In the late 1970s a group of physicians in England looked at the effectiveness of hand ventilation in establishing FRC in the term newborn.[1] These studies, though small, significantly increased our knowledge of the physiology of newborn resuscitation. If one reads closely, it becomes apparent that these studies were not done exclusively with anesthesia bags or self-inflating bags, as is the practice in most delivery rooms today, but in fact used a t-piece resuscitator attached to a manometer and a spring-loaded pop-off, a concept first developed by Flagg in New York in 1928.[2] Using this method, the physicians at The City Hospital in Nottingham were able to study prolonged inspiratory times and slow versus fast rise times.

Having observed significant inter-operator variability in the use of anesthesia bags during our video review of resuscitations, yet wanting to study further delivery room CPAPand the observations of Vyas and Boone,[3] we felt it necessary to find a system which would be simple, yet provide consistent pressures. We rediscovered a commercial device (Neopuff(tm) Fisher and Paykel, Auckland, NZ), which was based on the T-piece format. We proceeded to test the ability of a variety of operators to provide consistent ventilation using the anesthesia bags we were currently using and the Neopuff.[4]

We studied a disposable anesthesia bag, a Jackson-Rees type anesthesia bag fitted with a Norman elbow and a flow-control tail-piece, and the Neopuff. We utilized a neonatal manikin and a clear cushioned mask to evaluate neonatal nurses, pediatric house staff, attendings and respiratory therapists over two days. Each prospective resuscitator was already familiar with the anesthesia bags and was instructed in the use of the Neopuff. This device has a t-piece that attaches to a mask and to a low-compliance flow-controlled pressure-limited delivery system. Flow is provided from a gas supply line through two series-connected and adjustable spring-loaded pressure valves to a patient supply line, with the delivered pressure monitored via a fast-acting manometer. The inspiratory pressure can be set to a determined level and a twist valve at the top of the t-piece determines the end-expiratory pressure. A maximum pressure relief can also be set.

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Ethical Issues Concerning Low Birth Weight or Handicapped Infants: Part Two

by Alan Roth, MS, MBA, RRT, FAARC, director of clinical operations; clinical instructor, school of medicine, department of anesthesiology, Mount Sinai Medical Center, New York, NY

Editor's Note: In our last issue, Alan Roth presented a case study involving an infant born with extreme prematurity and a devastating congenital defect. In this issue, he explores some of the ethical principles for continuing or discontinuing treatment in these cases.

Ethically and legally, decisions to withhold or withdraw medical treatments are weighty and justified on very similar grounds. Clinicians working on teams that deal with the critically ill often face tough issues and are likely to focus on a probable outcome of treatment without regard to its invasiveness, inherent trauma, pain, expense or even scarcity of available resources. Although they work diligently, too often they are forced to do things that do not seem right, or they omit personal feelings concerning the newborn. This sometimes

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makes it better to withhold treatment than withdraw a failed treatment. These treatments are defined as those at the "margin of the impossible" — that often ambiguous borderline separating the beneficial from the medically futile.

Culture and ethnicity also play a role in the decision-making process. Clinicians may or may not be sensitive to these issues, especially when it come to the attitudes of non-Europeans such as Asians, Hispanics or Native Americans towards birthing and the death of newborns. Yet these varying cultural viewpoints impact the decision-making ability of certain family members regarding treatment decisions.

Ambiguities and differences of opinion, however, should not preclude reaching consensus on some ethical principles. The most basic principle is the physician's primary obligation to the child. While the needs and interests of parents, as well as those of the larger society, are proper concerns, those of the newborn child are paramount. Withholding or withdrawing life-sustaining treatment is justified only if such a course serves the interests of the patient. Withdrawing medical treatment that causes significant pain and suffering for an infant highly unlikely to survive would clearly outweigh the very slight potential benefit of the treatment.

Treatment should not be withheld for the primary purpose of improving the well being of others. Pressure from family or personal biases should not interfere with medical judgment and decisions affecting the infant.

It is proper for parents to withhold treatment when the prognosis for a "meaningful life" for the newborn is poor or hopeless. In these cases, the decision on whether to treat a severely defective infant and exert maximal efforts to sustain life should lie with the parents. The parents should be told of the options, expected benefits, risks, limits of proposed care and how the potential for human relationship will be affected by the infant's condition. All their questions should be answered in ways that are understandable.

The concept of quality of outcome is complex because it must include both the quality of life of those associated with the life in question and the quality of life of the individual living it; there will be circumstances when it is proper to let the child die. The duty to preserve the life of a newborn is overcome as the chance for success diminishes.

Finally, the progress of technology raises questions as to the rights of parents to forbear the use of this technology. New technologies have advanced our ability to preserve the lives of endangered near term or seriously ill newborns born with major physical handicaps and the promise of mental handicaps, who would not have been able to survive in the past. We have the ability not only to save these infants, but also to salvage them, at times, with dim prospects of a normal life and a significant likelihood that they will suffer from severe mental retardation or cerebral palsy. The resultant quality of life is so low that it raises questions about whether aggressive management has produced more harm than benefit for the patient. The question has become whether or not to respect parents'choices to stop treatment and to allow a child to die who would have died before the advent of current technologies.

In Part Three of his series, Alan will examine the factors involved in making treatment decisions in cases involving seriously ill or premature infants. ◆

Send Us Your Email Address!

Beginning next year, the Bulletin will be published on a quarterly, rather than bimonthly, basis. But that doesn't mean we'll be communicating with you less often than before. The plan is to increase communication to members via a monthly email which will feature items of interest to the section. If you're already receiving email messages from the AARC, you will automatically receive these emails. If you aren't getting AARC email, that means we don't have your email address. To ensure you don't miss out on these timely publications, send your email address to: mendoza@aarc.org. ◆

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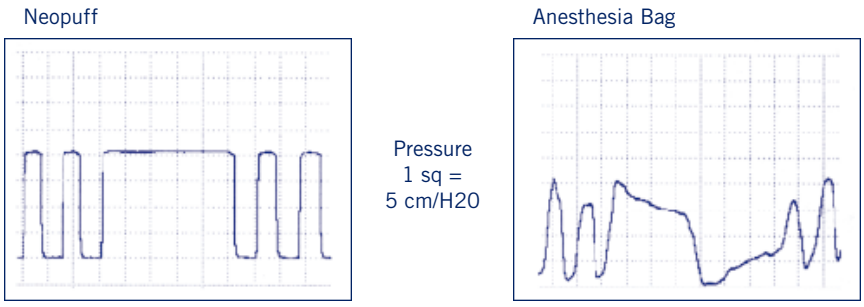
CONTROLLED VENTILATION IN THE DELIVERY ROOM: WHAT'S OLD IS NEW AGAIN

Participants were asked to ventilate the manikin using all three devices for 30 seconds at a rate of 30 breaths per minute and a peak inspiratory pressure (PIP) and positive end-expiratory pressure (PEEP) of 25 and 5 cmH2O, respectively. Then they were to deliver a breath of 5 seconds duration, followed by a further 30 seconds of bag and mask ventilation and another 5 second inflation. Analysis showed that only therapists were able to consistently deliver PEEP with the anesthesia bags, whereas all operators could generate the target PEEP with the Neopuff (P_0.05). PIP was also more consistent using the t-piece.

Figure 1 shows tracings of ventilating with an anesthesia bag and the Neopuff. We noted that inspiratory times and rate varied during the study, but we did not analyze this data. Two other studies which bench-tested the Neopuff and studied its use for pediatric transport also observed this variability.[5,6]

FIGURE 1



An important limitation of a t-piece observed during our study is that determining whether or not a seal has been achieved is not as easy as it is with a bag. Our training includes making sure that a PEEP level is achieved on the manometer before moving on to positive pressure ventilation, and using two hands to make the mask seal when necessary, a significant attribute of this device not possible with a hand bag.

At least two randomized controlled trials are underway using the Neopuff to study the effects of CPAPand PEEPon infant resuscitation. It is our observation that, with a proper seal, the Neopuff will provide a consistent level of CPAP and peak inspiratory pressure which may easily be maintained during the transport of the infant to the NICU. This consistency will allow researchers to make more informed decisions about the most appropriate types of ventilation for infants during delivery room resuscitation. ◆

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NOTES FROM THE CO-EDITOR

to recognize our specialty. Thanks Peter!! We've been waiting a long time for this!

The Neonatal-Pediatric Section is one of only a few Specialty Sections to have a seat on the AARC Board of Directors. Each section with at least 1,000 active members in the year before their chair elections gets a seat on the Board. Having our chair sit on the Board provides invaluable access for our group. Tim has worked tirelessly representing us since he became both our chair and a Board member. This year Tim helped arrange the first-ever Pediatric Journal Conference and did a fantastic job helping to ensure great neonatal-pediatric content at our conference in Tampa. However, we are in danger of losing our Board seat if we do not maintain our membership numbers, especially through the end of this year. Please remember to renew your membership in the section when you renew your AARC membership! Even better, invite a friend or colleague to join us! I am repeatedly impressed by the high quality of respiratory therapists involved with neonatal-pediatric respiratory care, and I am proud to be part of such an elite group of clinicians!

I want to thank Wade Rich for contributing another quality article to our Bulletin, "Controlled Ventilation in the Delivery Room: What's Old is New Again." Wade is the NICU manager at the University of California San Diego Medical Center and has done quite a bit of quality research into delivery room resuscitation.

When surfactant arrived in the NICU in the1980s, most clinicians believed it marked the end of neonatal chronic lung disease (CLD). Unfortunately, that has not been the case, and CLD remains a significant problem. We have made so many changes in the NICU care of neonates, but very few changes over the years in the delivery room. In the past, I frequently cautioned our new RTs about the damage that can occur during the first few mechanical breaths and the potential to deliver extremely high tidal volumes and inadequate PEEP.

I have spoken with many other centers over the years that have also been concerned about the variability of pressures being delivered with flow-inflating bags. Many institutions have decided to switch to self-inflating bags, due to high operator variability for the flow-inflating bags. Most studies have shown RTs to be the best at bagging at consistent pressures, but we are not always the first to arrive, and some places don't utilize RTs in the delivery room. I have resisted replacing flow-inflating bags in my institution. Luckily, something better has come along, and like Wade's hospital, we now also utilize the Neopuff Infant Resuscitator. The RTs in my institution love the device and rave that it is the best new piece of equipment we have ever acquired.

We have made many other changes in our delivery room, including aggressive early surfactant for all neonates less than 30 weeks EGA (without a mature lung profile) and consistent CPAP from birth all the way to the NICU, and will soon have blended gas in all delivery suites. We will be monitoring our CLD rates. I have great confidence that these changes can make a difference in our neonatal outcomes. Let's hope the evidence confirms it! ◆

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