

Bits & Bites

Rob Graham, R.R.T./N.R.C.P.

I dedicate this column to the late Dr. Andrew (Andy) Shennan, the founder of the perinatal program at Women's College Hospital (now at Sunnybrook Health Sciences Centre). To my teacher, my mentor and the man I owe my career as it is to, thank you. You have earned your place where there are no hospitals and no NICUs, where all the babies do is laugh and giggle and sleep.

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It has been an exciting month between the Pediatric Academic Societies (PAS) annual meeting and posts from various neonatal groups. This month I share several things that have come across my proverbial desk, some of which relate to previous columns in Neonatology Today (NT).

A presentation at PAS showed a discrepancy between set and delivered pressures using the RAM® cannula interface. Delivered pressure was found to be lower than set pressure, the difference increasing with increasing set pressure. This confirms my findings in a bench study I shared in NT in October 2020 (1,2).

In April's edition of NT, I discussed non-invasive ventilation in the micro-premature and its relationship with the gastrointestinal system (3). A recent study on transpyloric versus gastric feeding found a significant difference in the number and severity of hypoxemic episodes in those infants receiving transpyloric feeds, but only if non-invasively ventilated. It is not stated whether this is related to decreased reflux, but it is a reasonable thought. While the study did not involve infants of less than 26 weeks post-menstrual age (PMA), it may hold promise in improving NIV outcomes in the sub-26-week PMA cohort (4).

March's NT column discussed dexmedetomidine use in the NICU. A PAS presentation showed improved respiratory stability in preterm infants receiving the drug, another plus for this relatively new pharmacological intervention (5).

Continuing with pharmacological interventions, an ultrasound assessment of diaphragmatic contractility indicates it increases with caffeine administration. We know this is true in the adult population, and this confirms similar results in the premature population (6).

“An ultrasound assessment of diaphragmatic contractility indicates it increases with caffeine administration.”

Nitric oxide (iNO) use in the premature population is controversial. Although Dr. Roberta Ballard showed a decrease in chronic lung disease with early administration of iNO (7), these results have not been replicated, and using iNO in the preterm population is not recommended (8). A recent study showed that infants in hypoxic respiratory failure who respond favourably to iNO have better outcomes (9). This debate is not over.

That smoking during pregnancy is a bad thing has been known for decades. An evaluation of lung function at five years of age showed a decrease in function in children whose mothers smoked during their gestation, and that risks are decreased with maternal vitamin C supplementation (10).

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As the use of non-invasive ventilation (NIV) increases, the PMA of babies receiving it as a first-line mode of respiratory support has decreased. The likelihood of requiring surfactant administration increases with lower PMA, but many of these babies (particularly those >25 weeks PMA) will not require an endotracheal tube. While the "INSURE" method allows for first-line use of NIV, it still requires intubation and subjects the baby to potential pulmonary injury and the physiological effects of ETT placement. Using "less invasive" means of surfactant administration has increased dramatically, but laryngoscopy is required to pass a catheter through the vocal cords. The physiological effects of laryngoscopy are well known, particularly if no medications are

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given to mitigate them, and a clinician with this skill is required. In the NICU, this is not usually a problem (we hope!), but this may not be the case in tertiary hospitals.

Using a laryngeal mask (LMA) for surfactant administration is effective in the patient population studied and does not require laryngoscopy (11). LMAs are relatively easy to insert; however, the smallest LMAs are too big for tiny babies. This may change. However, a group from India reported the successful use of a size 1 LMA on a 1335-gram former 28-week PGA baby for surgery (12).

When extubating babies to nasal CPAP or other NIV modes, we have been advised to use a CPAP level equal to the mean airway pressure (MAP) prior to extubation. A recent study indicates greater success using pressure 2-3 cm H₂O higher than pre-extubation MAP (13). I suggest therefore re-evaluating what MAP is appropriate to extubate from since as NIV pressure increases, the difficulty in maintaining that pressure also increases.

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Lastly, blood loss due to testing in infants <28 weeks PMA is significant, equal to 24-30% of circulating blood volume (14). Bloodwork is often done without considering the necessity, significantly contributing to the need for transfusions. Before transfusing, infants may be subject to an increased risk of anemia-related sequelae such as necrotizing enterocolitis (14).

For example, serial blood gases are often ordered "for metabolic reasons" on stable babies in room air or low CPAP and 21% oxygen. If metabolic acidosis is present, it will often resolve without treatment and trigger more blood gases "just to be sure." Casting a large net will catch a few fish and much nothing; the catch is not worth the effort.

I have treated many infants of Jehovah's Witness parents. Very little bloodwork is drawn on these babies (even when intubated) with no apparent detrimental effect. Non-invasive monitoring can usually be followed to guide ventilation without routine blood gases. When bloodwork is ordered, many tests can be run on the same sample. Coordination and communication between those asking for tests can reduce the number of pokes and the volume of blood taken, and clinicians should know the minimum amount of blood required for any tests.

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May is Mother's Day month, and in northern regions heralds the return of flowers and greenery. I wish all the mothers out there a happy Mother's Day and urge everyone to stop occasionally and smell those flowers.

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Disclosures: The author receives compensation from Bunnell Inc for teaching and training users of the LifePulse HFJV in Canada. He is not involved in sales or marketing of the device nor does he receive more than per diem compensation. Also, while the author practices within Sunnybrook H.S.C. This paper should not be construed as Sunnybrook policy per se. This article contains elements considered “off label” as well as maneuvers, which may sometimes be very effective but come with inherent risks. As with any therapy, the risk benefit ratio must be carefully considered before they are initiated.

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