



Highlights from this issue

Ben J Stenson, *Edition Editor*

RESEARCH WITHOUT PRIOR CONSENT

Vohra and colleagues report secondary information from their trial of heat loss prevention with polyethylene wrap. The focus of their report is to show that the two models for enrolment that were used resulted in the inclusion of populations of infants that were different. The main method of inclusion in the trial followed the obtaining of antenatal informed parental consent. In four centres, approval was granted for the inclusion of infants without prior consent. Compared with babies enrolled after antenatal consent, a smaller proportion of babies enrolled without prior consent were born to mothers who had received antenatal steroids. More of the mothers whose babies were enrolled without prior consent were college educated. The babies recruited without prior consent had lower Apgar scores. These are not the first authors to note the impact of different consent procedures on the characteristics of the infants enrolled. Similar observations were made in the SUPPORT Trial.¹ This phenomenon is scientifically important and is discussed in detail by Vohra and colleagues and in an accompanying editorial by Louise Owen and Peter Davis. Researching the effect of interventions that begin close to birth is very challenging and the traditional model of prior informed consent slows recruitment, results in the enrolment of biased populations with different risk profiles, and decreases the generalisability of the results obtained. Conducted properly, research without prior consent aims to overcome these issues whilst maintaining respect for autonomy and patient protection. There is work to be done by regulatory and funding bodies, patient groups and ethics advisory committees to establish a wider acceptance of the approach. *See pages F116 and F118*

OUTCOMES OF OUTBORN VERY-LOW-BIRTH-WEIGHT INFANTS IN JAPAN

Katsuya Hirata and colleagues present data from the Neonatal Research Network of Japan, which gathers data from 192 institutions, including 83 tertiary neonatal intensive care units (NICU), and 70% of very low birth weight infants born in Japan. They used propensity score matching and compared the outcomes of infants who were born in centres with a NICU with those who were outborn and admitted to a NICU within the first 3 days after birth. They excluded infants who died before transfer. Amongst 15,842 very low birth weight infants born between 2012 and 2016, 668 were outborn and transported to the NICU within 3 days

of birth. Outborn infants had higher rates of severe IVH (8.2% vs 4.1%; OR, 3.45; 95% CI 1.16 to 10.3). No significant differences in mortality or other morbidities (IVH, PVL, CLD, ROP requiring treatment, NEC or sepsis) were identified. These findings match observations from the UK and elsewhere and should further motivate efforts to optimise in-utero transfer so that the most vulnerable infants can be cared for in tertiary centres without early postnatal transfer. *See page F131*

HIGH FLOW OR CPAP?

Most respiratory support provided to preterm infants is now 'non-invasive' and there is variation in clinician preference for CPAP or high flow. The relative importance of delivered pressure versus dead space washout is debated. In a delightfully simple study, Cameron Payne and colleagues measured the gas flow delivered during bubble CPAP. With this technique gas bubbles escape when the resistance to flow through the device and into the patient nose results in a delivered pressure that exceeds the set pressure level. If the gas flow rate is reduced to the point when the bubbling stops, the remaining flow is passing through the device and into the nose. The team made measurements on 44 infants with mean gestation 28 weeks. At a set CPAP level of 5 cmH₂O the mean flow at which bubbling ceased was 3.5 litres per minute and at a CPAP level of 8cmH₂O it was 6.3 litres per minute. These data show that at typical CPAP pressures there is nasal gas flow and presumably dead space washout occurring at flow rates comparable with those during high flow. As Payne and colleagues point out, others have demonstrated that nasopharyngeal pressures comparable to those generated during CPAP are demonstrable during high flow therapy. There is less to choose between these treatments physiologically than some might think. *See page F156*

DIALING UP CHANGES IN FIO₂

Schwartz and colleagues measured the time taken between a change in FiO₂ being selected at the control and 95% of that change in FiO₂ reaching the patient in a bench system where a Leoni plus ventilator was being used to deliver CPAP with a dual limb circuit flow of either 5 or 8 L per minute. The oxygen sensor at the patient respiratory output was capable of detecting changes in FIO₂ within 1 s. They studied manual and automated oxygen adjustments and two different humidifier set-ups resulting in

higher and lower circuit volumes. Times for the change in set FiO₂ to be reflected in the FiO₂ measured at the patient connector were 17 to 31 s. They point out that the response to a change in FiO₂ is not usually measured in the patient circuit but is detected through changes in the patient SpO₂ and this will add a further delay that is likely to vary between patients. These times for the circuit FiO₂ to change are likely device specific but are much longer than you might have guessed. They are relevant to clinicians manually adjusting FiO₂ to chase SpO₂ and to the design of automated systems for adjusting FiO₂ in response to SpO₂. *See page 205*

ASYNCHRONOUS VIDEO MESSAGING

Sandy Kirolos and colleagues report parent and staff experience of a secure video messaging service to promote contact between babies in neonatal units and their families. Amongst 42 families evaluated 88% perceived a benefit of the service on their neonatal experience, rating a positive impact on anxiety, sleep, family involvement and relationships with staff. Staff rated the service as easy to use, with minimal impact on workload. These experiences were gathered before the pandemic when there were no visiting restrictions. This approach has taken the UK by storm since lockdown. *See page 172*

AUTOMATED OXYGEN CONTROL IN PRETERM INFANTS, HOW DOES IT WORK AND WHAT TO EXPECT

Systems for automated adjustment of FiO₂ are increasingly available as options with ventilators and non-invasive respiratory support devices. The technology is here to stay. There is work to be done on how best to use it and this requires an understanding of how it works as well as research to trial the risks and benefits of different settings. Hylke Salverda and colleagues provide an informative narrative review describing six commercially available systems, how they work and the preliminary data that has been published regarding their use. It would be a mistake to consider that these devices can be used interchangeably with an assumption that they will deliver similar achieved SpO₂ patterns. *See page 215*

REFERENCE

- 1 Rich WD, Auten KJ, Gantz MG, *et al*. Antenatal consent in the support trial: challenges, costs, and representative enrollment. *Pediatrics* 2010;126:e215–21.