

# Highlights from this issue

Ben Stenson, Deputy Editor

## Fetal awareness and fetal pain

Few involved in the care of extremely preterm infants born at the limits of viability would doubt their capacity to experience discomfort in some way even though it is impossible to relate this meaningfully to all of the dimensions of pain in older children and adults. In a provocative editorial Martin Ward Platt discusses fetal pain and awareness prior to 24 weeks gestation in relation to the evidence review on the subject that was published by the Royal College of Obstetricians and Gynaecologists in 2010. *See page F236*

## Minimally invasive surfactant therapy

Following several influential randomised controlled trials, many more preterm infants are now managed with CPAP as their primary respiratory support without first being intubated and given prophylactic surfactant. This has given rise to interest in techniques for administering rescue surfactant that are less invasive than intubation and ventilation. Dargaville *et al* collectively call these approaches minimally invasive surfactant therapy. They describe a pilot evaluation of a technique whereby a 16 gauge vascular catheter was used. This was passed through the larynx under direct vision using a laryngoscope and the surfactant was given as a bolus. CPAP was then continued. The procedure was performed by senior neonatologists. Around half the infants required a short period of mask ventilation. Indications were that the surfactant delivery was effective. This technique is similar to that described by Kribs except that the use of

a stiffer catheter enables the procedure to be completed without the need for Magill forceps. An accompanying editorial by Kribs summarises the experience to date with the technique that she described. There are two randomised controlled trials in progress in Germany evaluating these techniques in a total of around 400 preterm infants that should soon report their findings. These procedures incorporate most of the elements of intubation with the exception that ventilation is not administered via an endotracheal tube and may be avoided altogether in some cases. Whether this is advantageous in comparison with intubation for surfactant treatment and rapid extubation remains to be demonstrated. Both Kribs and Dargaville mention the need to consider how analgesia and sedation might be incorporated into these procedures. The need for highly skilled operators would also limit further the opportunities for less experienced clinicians to develop intubation skills beyond simulation. *See pages F243 and F238*

## Mask ventilation is difficult in preterm newborns

Schmolzer *et al* measured tidal volume and airway pressures in preterm babies during their initial stabilisation after birth using a respiratory function monitor. Clinical staff could not see the data in real time but were given feedback about mask leak and obstruction while they worked on the babies. In 25% of babies significant periods of airway obstruction were observed, when previously acceptable tidal volumes fell to a very low level. Simultaneous video recordings suggest that a significant proportion of these

events occur when the nose and mouth are squashed by the mask. The median duration of the episodes was 22 s and they often ended in the baby being intubated. *See page F254*

## Physiological effects of transfusion on preterm infants

The appropriate transfusion thresholds for preterm infants remain uncertain. Two randomised trials indicate that more restrictive approaches reduce the total number of transfusions but not the number of donor exposures. Data from these trials raise the possibility that neurological outcomes may be better when higher haematocrits are maintained but are not conclusive. Concern persists over a possible role for blood transfusion in the pathogenesis of NEC. Fredricksen *et al* studied cardiac output, fractional oxygen extraction and lactate in a small group of infants who were randomised to higher or lower transfusion thresholds in the Iowa trial of high and low haematocrit thresholds for transfusion. Cardiac output and fractional oxygen extraction fell after transfusion in infants who were transfused at lower haematocrit but not in those transfused at higher haematocrits, suggesting that the lower haematocrit thresholds required the infants to make physiological adaptations to maintain oxygen delivery. Given the enormous number of transfusions that are ordered for preterm infants and the degree of uncertainty about the balance of risks and benefits, a definitive trial in a large population of preterm infants with power to look at long term outcomes should be a priority for the neonatal research community. *See page F249*