Respiratory distress syndrome (RDS) is primarily due to surfactant deficiency in preterm infants. Surfactant treatment is the standard of care in preterm neonates with RDS. Surfactant therapy has been shown to decrease pneumothorax and improve newborn and infant survival. Timing of surfactant administration, fraction of inspired oxygen (FIO₂) criteria for first dose of surfactant, and method of surfactant administration using a thin catheter or an endotracheal tube are evolving after more than 3 decades of using surfactant in preterm infants. The study by Challis et al describes different surfactant strategies, such as early surfactant (within 2 hours of birth), off-label use, and no treatment when it was indicated, and examines outcomes associated with these strategies using a large population-based cohort from Sweden. The study population was a more recent cohort of newborns born between 2009 and 2019, making the findings from this study more relevant to current practice. Surfactant used in this population was limited to porcine surfactant, poractant alfa. Studies comparing porcine vs bovine surfactants have shown better outcomes with porcine surfactant, especially when a higher initial dose of 200 mg/kg was used.

In the study by Challis et al, early rescue treatment within 2 hours of birth was associated with lower odds for pneumothorax, severe grades of intraventricular hemorrhage, and need for postnatal corticosteroid use and with shorter duration of mechanical ventilation, which are consistent with previous studies. However, the Challis et al found lower survival in infants treated earlier. It is likely that preterm infants who were intubated for respiratory failure or had more severe RDS were treated earlier, accounting for this increased mortality. In term infants with meconium aspiration syndrome (MAS), surfactant treatment was not associated with improved outcomes. This may be owing to the small number patients with MAS in the study by Challis et al. A 2021 randomized clinical trial by González et al that enrolled 100 term neonates with MAS and hypoxemic respiratory failure treated with porcine surfactant in combination with inhaled nitric oxide found a significant reduction in the combined outcome of death or need for extracorporeal membrane oxygenation.

Limitations in the study by Challis et al include lack of data on the method of surfactant administration. For example, in a systematic review, Aldana-Aguirre et al reported that a less invasive surfactant administration technique, compared with the intubation, surfactant, extubation technique for surfactant delivery in preterm infants, was associated with less bronchopulmonary dysplasia, less of a composite outcome of bronchopulmonary dysplasia or death at 36 weeks, and less need for invasive mechanical ventilation.

The findings by Challis and colleagues provide a strong rationale to use this extensively studied treatment of RDS with surfactant as an early rescue therapy within 2 hours of birth when preterm infants are receiving FIO₂ of 0.30 or greater to improve overall outcomes.
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REFERENCES


