Oxygen Saturation Targeting In Preterm Infants Receiving Continuous Positive Airway Pressure
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Objective
The precision of oxygen saturation (SpO2) targeting in preterm infants on continuous positive airway pressure (CPAP) is incompletely characterized. We therefore evaluated SpO2 targeting in infants solely receiving CPAP, aiming to describe their SpO2 profile, to document the frequency of prolonged hyperoxia and hypoxia episodes and of fraction of inspired oxygen (FiO2) adjustments, and to explore the relationships with neonatal intensive care unit operational factors.

Study Design
Preterm infants <37 weeks' gestation in 2 neonatal intensive care units were studied if they were receiving CPAP and in supplemental oxygen at the beginning of each 24-hour recording. SpO2, heart rate, and FiO2 were recorded (sampling interval 1-2 seconds). We measured the proportion of time spent in predefined SpO2 ranges, the frequency of prolonged episodes (≥30 seconds) of SpO2 deviation, and the effect of operational factors including nurse-patient ratio.

Results
A total of 4034 usable hours of data were recorded from 45 infants of gestation 30 (27-32) weeks (median [IQR]). When requiring supplemental oxygen, infants were in the target SpO2 range (88%-92%) for only 31% (19%-39%) of total recording time, with 48 (6.9-90) episodes per 24 hours of severe hyperoxia (SpO2 ≥98%), and 9.0 (1.6-21) episodes per 24 hours of hypoxia (SpO2 <80%). An increased frequency of prolonged hyperoxia in supplemental oxygen was noted when nurses were each caring for more patients. Adjustments to FiO2 were made 25 (16-41) times per day.

Conclusion
SpO2 targeting is challenging in preterm infants receiving CPAP support, with a high proportion of time spent outside the target range and frequent prolonged hypoxic and hyperoxic episodes.