

CHANGING OXYGEN CONCENTRATION IN THE DELIVERY ROOM: YOU MAY NOT GET WHAT YOU EXPECT

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Background: Supplemental oxygen is often given to infants in the delivery room. Clinicians adjust oxygen concentration (FiO₂) in order to prevent hypoxia and hyperoxia. Using an animal model, we aimed to measure the delivered FiO₂ when using a T-piece and a self-inflating bag (SIB) and oxygen via a blender.

Method: Preterm lambs were ventilated using a T-piece (gas flow 8L/min, PIP 30cm H₂O, PEEP 5cm H₂O) or a SIB (gas flow 8 L/min, targeted PIP 30cm H₂O, no PEEP) at a rate of 60 inflations/min. FiO₂ was set at the blender and measured close to the ETT. Delivered oxygen concentration was measured for both devices using various combinations of incremental changes (every 15s, 30s, 60s and increments of 10%, 20% or air-to-100%).

Results: 234 combinations were analysed. Delivered FiO₂ was always less than that set at the blender when increasing FiO₂. The T-piece took significantly less time than the SIB to deliver an increase of at least 80% of each desired change: mean(SD) 12(5) versus 19(4) seconds (P< 0.001). When decreasing FiO₂, the set level was never reached using the SIB if changes were made every 15 seconds. It took a mean (SD) of 38 (8) seconds to reach 21% when oxygen was changed straight from 100% to 21%.

Conclusions: There are important differences between set and delivered FiO₂ when using a blender. Clinicians should be aware of the considerable time delay between making changes on a blender and the infant receiving the desired oxygen concentrations.