

**Title:** EVALUATION OF PULSED OPEN OXYGEN DELIVERY IN PREVENTING OPERATING ROOM FIRES DURING MONITORED ANESTHESIA CARE

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**Background/Introduction:** Operating room fires represent major risks for patients and clinicians<sup>1,2</sup>. The risk is especially high for chest and neck procedures in monitored anesthesia care with open oxygen delivery via nasal cannula. In these procedures oxygen accumulates under drapes and may ignite when electrocautery is applied<sup>2</sup>. Burk et. al developed a pulsed nasal cannula oxygen delivery system that limits delivery to inhalation and demonstrated that this system significantly reduces the risk of oxygen under drapes<sup>3</sup>. The purpose of this study was to evaluate if residual oxygen left in the cannula between pulses still represents a fire hazard using a pulsed, open oxygen delivery system.

**Methods:** We attempted to ignite nasal cannulas when flowing 100% oxygen at 2L/min, with static 100% oxygen, with 100% oxygen delivered in 44mL pulses every 3 seconds, with pulsed oxygen that is paused upon initial ignition, and with 30% oxygen flowing at 2L/min.

**Results:** Even with 100% oxygen concentration, cannulas would not ignite static oxygen. Cannulas burnt most rapidly and completely with 100% oxygen flowing at 2L/min. When 100% oxygen was delivered in 44mL pulses the tubing would not ignite until the second pulse. Once ignited, flames continued to travel up cannulas at a much slower rate if pulses continued to be delivered. When pulses stopped flames were not sustained for more than a few seconds.

**Conclusion:** Our tests demonstrated that 100% open continuous oxygen delivery is a major hazard in the OR. We found that pulsed 100% open oxygen delivery is a safe alternative to 100% continuous oxygen for patients who cannot be managed on 30% oxygen as recommended by the joint Commission and the American Society of Anesthesiologists<sup>4,5</sup>.

**References:**

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