

**Abstract Title:** The Effect of Suction on Passive Oxygenation for a novel, 3D-printed Laryngoscopy Sleeve

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**Introduction:** Suction and oxygen administration are commonly used during emergent intubations[1]. We created a novel 3D-printed laryngoscopy sleeve combining these two elements, but it is unknown what extent does suction limit the creation of a passive, oxygen-rich environment. We examined the end-tidal oxygen concentration (et-O<sub>2</sub>) at various points along the respiratory tract during an intubation of an airway manikin with the IVOS BOSS G4 video laryngoscope sleeve.

**Methods:** An airway manikin was intubated with our IVOS BOSS G4 sleeve to achieve a grade 1 Cormack-Lehane view. Average et-O<sub>2</sub> was measured using mass spectrometry at the carina. Under constant suction (-200 mmHg), the oxygen flow was increased from 6, 10, to 15 L/min. Measurements were also repeated with suction off. The manikin's airway was washed out with air in between each trial.

**Results:** Without suction, et-O<sub>2</sub> was greatest at 6 L/min at the carina (100%) and least with 15 L/min. However, it remained at 21% when maximum suction was applied, regardless of oxygen flow rate.

**Conclusion:** Maximum suction on the IVOS BOSS G4 appears to prevent the passive increase in end-tidal oxygen at the carina, despite maximal oxygen flow rate. 6 L/min appears to be the best flow rate to achieve 100% et-O<sub>2</sub>. Further studies are required to determine which suction pressure is optimal for maintaining 100% et-O<sub>2</sub> while providing simultaneous suction to remove bodily fluids.

**References:**

1. Fiore et al. Three Airway Management Techniques for Airway Decontamination in Massive Emesis: A Manikin Study. *West J Emerg Med.* 2019;20(5):784-790. Published 2019 Aug 6. doi:10.5811/westjem.2019.6.42222