

REBEL Cast “Boot Camp” Edition Shownotes

Topic: Delayed Sequence Intubation (DSI) of the Hypoxic and Agitated Patient

Clinical Question: Is DSI a safe and effective alternative to RSI in patients who cannot be adequately pre-oxygenated?

Article: Weingart et al. Delayed Sequence Intubation: A Prospective Observational Study. Ann Emerg Med 2015; 65 (4): 349 – 55. [PMID: 25447559](#)

Background: Delayed Sequence Intubation or DSI for short is a concept that Scott Weingart from the EmCrit podcast developed in order to safely intubate patients who are hypoxic, delirious, or combative. Since we cannot adequately pre-oxygenate these patients they are at high risk for hypoxia, dysrhythmias, anoxic brain injury, and even death. The concept of DSI is that it is procedural sedation for the purposes of pre-oxygenation. DSI is most useful for those patients who cannot tolerate pre-oxygenation with either high flow nasal cannula and non-rebreather or non-invasive ventilation.

Details:

- **Population:** Adult ED patients >18 years of age requiring emergency airway management and not predicted to have an anatomically difficult airway
- **Intervention:** Delayed Sequence Intubation (DSI)
- **Comparison:** Rapid Sequence Intubation (RSI)
- **Outcome:** Difference in Oxygen Saturations after maximal attempts at preoxygenation before DSI compared with saturations just before intubation

Results:

- 64 adult patients were enrolled (2 were excluded due to incomplete pulse oximetry data)
- 19 patients received DSI with a non-rebreather (NRB)
- 39 patients received DSI with a non-invasive positive pressure ventilation (NIPPV)
- 4 patients required nasogastric tube placement
- The oxygen saturations increased from a mean of 89.9% pre-DSI to 98.8% after DSI (Absolute increase of the oxygen saturation of almost 9%)
- Zero complications were observed in patients receiving DSI

Strengths:

- Multi-center study which allows demonstration that hospitals outside of the author's own institution can make DSI work safely

Weaknesses:

- This was a small study of only 62 patients and a convenience sample, which means some patients could have been missed
- This was an observational study, which draws inferences about the effect of an "exposure," in this case DSI. But it is important to mention that confounding factors may be the reason a given result occurred.
- Authors of this paper have experience and interest in DSI, which could cause a Hawthorne effect
- No children were used in this study, so makes it hard to extrapolate the results to a pediatric population

Clinical Bottom Line: DSI is a safe and effective method of intubation while the purists would argue that a RCT is warranted, this practice should be widely adopted and considered for any patient who cannot be adequately pre-oxygenated prior to intubation.