

- 4 phases of RSI are pre-medication, sedation, paralysis, and post-intubation.
- **Pre-medication**
 - Goal is to prevent reflex sympathetic response to laryngoscopy (RSRL).
 - LOAD (Lidocaine, opioids, atropine, and defasciculating dose)
 - Give 3-5 mins prior to sedation.
 - Lidocaine is dosed at 1.5 mg/kg intravenously, and the duration of action is approximately 10-20 minutes (100mg to a 70kg person). Good for people with increased ICP or bronchospasm/asthma. **No evidence currently to show that it improves outcomes.** Don't use in someone who is bradycardic or hypotensive.
 - Fentanyl, dosed at 1-3 mcg/kg, lasts for 30-60 mins. Avoid in shock states and in children.
 - Atropine has fallen **out of favor**. Was dosed at 0.02mg/kg.
 - Defasciculation is **no longer recommended**.
- **Sedation**
 - Etomidate - has a positive hemodynamic profile, has become the sedative of choice. Dose is 0.3 mg/kg IV. Onset is in 15-30s and lasts 3-12 mins. Has **minimal effects on blood pressure and heart rate**. There are two patient populations where etomidate may not be the best choice, those are sepsis and seizures. Has been shown to increase seizure activity and should be avoided in status epilepticus. Not good in sepsis because of its transient cortisol suppression. Increased mortality has been seen to correlate with degree of adrenal dysfunction. Should be noted there are **no trials or research to support this as of yet**.
 - Ketamine, dosed at 1.5 mg/kg IV. Onset in 45-60s and lasts 10-20 mins. Bronchodilates making it ideal for patients with **reactive airway disease**. Produces a catecholamine surge, **viable option for people with sepsis**. Dissociates people and provides analgesia and amnesia, making it the ideal agent if needing to perform an **awake intubation or a delayed sequence intubation**. **Relatively contraindicated in patients who are normo or hypertensive with ischemic heart disease and in elderly patients**.
 - Propofol, dosed at 1.5 mg/kg. Onset in 15-45 seconds and lasts 5-10 mins. Good for the **hemodynamically stable seizure** patient as it potentiates GABA activity. Also bronchodilates which can make it good for patient with reactive airway disease. Drawback is that it can cause **profound hypotension**.
 - Thiopental, this is a barbiturate. Dose at 3mg/kg IV. Onset is 30s and lasts for 5-10 mins. Has a similar pharmacologic profile to propofol, also causes **myocardial depression and venodilation**. Decreases cerebral oxygen consumption and cerebral blood flow. Is considered neuroprotective. Will cause secondary histamine release, **avoid in patients with reactive airway disease**.
 - Midazolam (Versed) - dose is 0.2-0.3 mg/kg. Onset is in 60-90 secs and lasts 15-30 mins. **Negative effect on systemic vascular resistance and the myocardium**.

Due to poor side effect profile and slow onset of action, **not usually used for sedation in RSI.**

- **Paralysis**

- Can use depolarizing or non-depolarizing neuromuscular blockers.
- **DEPOLARIZING** NMBA (neuromuscular blocking agent) is succinylcholine. Dose is **1.5 mg/kg IV or 4 mg/kg IM**. Onset is 45 seconds and it lasts for 6-8 mins. This is going to be your most widely used paralytic in the ED due to its rapid onset and short duration of action, allowing relatively quick return of airway reflexes.
 - Historically it has been taught to avoid SCh in patients with renal failure, reviews and meta-analysis has shown that there were **no incidents of dysrhythmias or adverse events in the setting of renal failure**. Average increase in serum potassium was **0.5 meq/L**. You also want to avoid SCh use in patients with upregulation of acetylcholine receptors. These patients are people who have **crush injuries, burns > 5 days old, prolonged ICU stays, upper or lower motor neuron injuries, and muscular dystrophies**.
 - Can cause malignant hyperthermia, however there has never been a reported case of this in the ED. Treatment is cooling and 1 mg/kg IV dantrolene.
 - Be careful if having to **repeat administration** of SCh as this can lead to **bradycardia**. If pt becomes bradycardic, give atropine.
- **NONDEPOLARIZING** NMBA. If contraindicated to use SCh, you can use rocuronium, which is dosed at 1 mg/kg IV. Onset is in 1 minute and it lasts 40-60 minutes.
 - Can also use vecuronium, dosed at 0.1 mg/kg. Has no cardiac effects. Can still cause hypotension through blockage of sympathetic ganglia.
 - Atracurium - dosed at 0.5 mg/kg. Good for patients with hepatic or renal failure. Causes histamine release which can lead to bronchospasm and hypotension.

- **Post-intubation**

- Must achieve good anxiolysis and analgesia after intubation – see Weingart’s podcast.
- This can be done with the same agents used for sedation.

References

1. Tintinalli J, Stapczynski J, Ma OJ et al. Tintinalli's Emergency Medicine: A Comprehensive Study Guide, Seventh Edition (Book and DVD). Mcgraw-hill; 2010. Pgs 202-205.
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3. <http://emcrit.org/podcasts/post-intubation-sedation-2014/>
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