Indications for intubation and mechanical ventilation:
- Inadequate oxygenation, inadequate ventilation, to protect the airway, based on expected clinical course
- ETT size age/4 + 3.5 cuffed, 1 blade neonate/infant, 2 blade starting at 2yo, 3 blade starting in 3rd grade (8yo), check light & cuff
- All patients: prepare Suction, Oxygen for preoxygenation, Airway equipment for backup (eg video laryngoscope), ETCO2 detector
- Perform apneic oxygenation by applying nasal canula O2 during RSI: 5 L/min infant, 10 L/min child, 15 L/min adolescent/adult

RSI and Ventilator Settings Algorithm

**Seizures**
- Ativan 0.1 mg/kg
- Rocuronium 1 mg/kg

**Routine / Trauma**
- Incl. submersion
- Etomidate 0.3 mg/kg
- Succinyllcholine 1.5 mg/kg or Rocuronium 1.2 mg/kg

**Status Asthmaticus**
- Ketamine 1.5 mg/kg
- Succinyllcholine 1.5 mg/kg or Rocuronium 1.2 mg/kg
- *Last resort, try NIV, Max medical tx first*

**Cardiogenic shock**
- Fentanyl 1 mcg/kg or Etomidate 0.3 mg/kg
- Rocuronium 1.2 mg/kg
- *Consider pre-treat w/ push-dose pressor = 1/10 to 1/2 dose epi*

**Crashing Neonate**
- Fentanyl 1 mcg/kg
- Succinyllcholine (if K+ OK) 2-3 mg/kg or Rocuronium 1.2 mg/kg or No paralytic

**Sepsis/shock**
- Ketamine 1.5 mg/kg
- Succinyllcholine 1.5 mg/kg or Rocuronium 1.2 mg/kg
- *Fluid resuscitate first 20cc/kg or more if time*

**DKA/ severe acidosis**
- Ketamine 1.5 mg/kg
- Rocuronium 1.2 mg/kg
- *Last resort, try NIV, awake intubation. Use most skilled intubator Consider bicarb dose*

**Single ventricle**
- Fentanyl 1 mcg/kg or Etomidate 0.3 mg/kg
- Glenn/Fontan last resort
- Norwood/BT/Glenn: wean O2 to sat 75-85%

**Routine**
- FiO2 1.0 & wean
- PEEP 4-5
- TV 8-10 cc/kg
- Rate: Neonate 25-35
- Infant 20-30
- Child 15-25
- Adol/adult 12-16

**If ARDS**
- FiO2 1.0 & wean
- PEEP 8-10+
- TV 5-8 cc/kg
- Start at 8, decrease as tolerated

**Obstructive**
- FiO2 1.0
- PEEP 3-4,
- TV 6-8 cc/kg
- Rate 60/time in sec to fully exhale (or start at ½ routine)

**Acidosis**
- FiO2 1.0
- PEEP 4-5
- TV 8-10 cc/kg
- Hyperventilate to match pre-RSI rate & ETCO2

**Rate**: Neonate 25-35
- Infant 20-30
- Child 15-25
- Adol/adult 12-16

**I-time**: Neonate 0.5 sec
- Toddler/child 0.7
- Adol/adult 0.8-1

**Ventilator Settings**

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**Succinylcholine contraindications**

- Hyperkalemia (Succinylcholine raises serum K+ by up to 0.5 mEq/L)
- Neuromuscular disease involving denervation, muscular dystrophy (receptor upregulation leads to risk of hyperkalemia)
- Burn, Trauma, or Stroke > 72 hours old (receptor upregulation)
- Severe infection with toxin production eg botulism, tetanus (receptor upregulation)
- Rhabdomyolysis (risk of hyperkalemia)
- Malignant hyperthermia history or family history

***When unsure and there is a reasonable possibility of one of the above conditions, avoid succinylcholine (eg seizure patient)***

**Rocuronium**: Fastest intubating conditions with 1.2 mg/kg

Sugammadex is available as reversal agent (not approved for < 18 years old yet)

- Emergent reversal w/in about 3 min of 1.2 mg/kg rocuronium: 16 mg/kg
- Otherwise 2-4 mg/kg depending on twitch response to train of four stimulation

**Etomidate**: Quick onset and offset sedative with minimal hemodynamic effects, no adjustment needed for renal insufficiency

However, contraindicated in sepsis in children due to it causing transient adrenal insufficiency

**Ketamine**

- Increases heart rate and blood pressure, so good for situations involving hypotension
- Bronchodilating, so good for obstructive airways disease
- Patient maintain spontaneous respiration typically
- Contraindicated in infants < 3 months of age

**Fentanyl**: An alternative sedative with minimal hemodynamic effects for young infants with possible sepsis (can’t use etomidate) and too young for ketamine

**Mechanical positive pressure ventilation** will reduce venous return (preload), a potential problem in hypotension, cardiogenic shock, and single ventricle patients with Glenn or Fontan physiology (depend on passive venous return for pulmonary blood flow)

**Severely acidotic patients** (DKA, salicylate toxicity) are dependent on their hyperventilation to compensate; even brief periods of apnea during RSI may worsen acidosis and lead to arrest. Apneic period should be minimized and hyperventilation / ETCO2 pre-intubation should be matched with post-intubation settings

**Asthma patients**: accept higher CO2s if improving and avoid intubation if possible, low rates may be needed to avoid breath stacking