RSI and Ventilator Settings Algorithm

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 2 yo, 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

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

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

Routine / Trauma
- Incl. submersion
- Etomidate 0.3 mg/kg
- Succinylcholine 1.5 mg/kg or Rocuronium 1 mg/kg

Sepsis/shock
- Ketamine 1.5 mg/kg
- Succinylcholine 1.5 mg/kg or Rocuronium 1 mg/kg
- *Last resort, try NIV, Max medical tx first*

Status Asthmaticus
- Ketamine 1.5 mg/kg
- Succinylcholine 1.5 mg/kg or Rocuronium 1 mg/kg
- *Consider pre-treat w/ push-dose pressor = 1/10 to 1/2 dose epi

Cardiogenic shock
- Fentanyl 1 mcg/kg or Etomidate 0.3 mg/kg
- Rocuronium 1.2 mg/kg

Single ventricle
- Fentanyl 1 mcg/kg or Etomidate 0.3 mg/kg
- Rocuronium 1.2 mg/kg or Glenn/Fontan last resort

Succinylcholine
- (if K+ OK)
- 1.5 mg/kg or Rocuronium 1.2 mg/kg or

Sepsis/shock
- 1 mg/kg

Obstructive
- FiO2 1.0
- 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

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

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 3-4
- TV 6-8 cc/kg
- Low rate 12-18
- Glenn: keep PCO2 40-45 (for CBF)
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