# Barnes-Jewish Hospital Adult Intubation Pharmacologic Considerations for ICU/ED Patient Care Areas

**Pretreatment (Optional)**
Consider in patients with high ICP to blunt catecholamine mediated elevations in BP, HR and ICP in response to intubation

| Agent | Dose | Onset | Duration | Considerations |
|---|---|---|---|---|
| Fentanyl | 1-2 mcg/kg | <30 sec | 0.5-1 hr | • Avoid: Decompensated shock or hemodynamic instability<br>• Caution: May blunt sympathetic response leading to cardiac arrest<br>• Obesity Dosing: Consider using AdjBW if BMI ≥30, otherwise use TBW |

**Induction**

| Agent | Dose | Onset | Duration | Considerations |
|---|---|---|---|---|
| Etomidate | 0.2-0.3 mg/kg | 10-15 sec | 4-10 min | • Caution: may cause adrenal suppression<br>• ↑ EEG activity, ↓seizure threshold, myoclonic movements, minimal cardiorespiratory depression<br>• Obesity Dosing: Consider using AdjBW if BMI ≥40, otherwise use TBW |
| Ketamine | 1-2 mg/kg | 10-30 sec | 5-15min | • Caution: Heart failure, hypertension, angina<br>• Consider use in shock or reactive airway disease<br>• May cause ↑ heart rate/blood pressure, emergence phenomenon, salivation, bronchorrhea<br>• Obesity Dosing: Consider using AdjBW if BMI ≥40, otherwise use TBW |
| Propofol | 0.5-1.5 mg/kg◊ | 15-45 sec | 3-10 min | • Caution: Profound hypotension (titration of induction dose helps prevent severe hemodynamic changes), pulmonary arterial hypertension<br>• Preferred induction agent for status epilepticus<br>• ◊Consider lower dose in patients at increased risk for hypotension or premedicated with benzodiazepine and/or opioids<br>• Obesity Dosing: Consider using AdjBW if BMI ≥30, otherwise use TBW |
| Midazolam | 0.2-0.3 mg/kg | 60-90 sec | 1-4 hr | • Consider lower dose in elderly patients<br>• Obesity Dosing: Consider using AdjBW if BMI ≥30, otherwise use TBW |

**Paralysis (Optional)**
Indicated for use in rapid sequence intubation in patients without contraindications.
Consider use to facilitate endotracheal intubation in patients that can be rescued with bag mask ventilation AND without contraindications

| Agent | Dose | Onset | Time to return of first twitch on TOF | Considerations |
|---|---|---|---|---|
| Rocuronium | 0.6-1.2 mg/kg♦ | 60-120 sec | 0.6 mg/kg dose: 30-40 min<br>1.2 mg/kg dose: 40-95 min | • ↑ in duration with liver and renal dysfunction; May cause bronchospasm or anaphylaxis<br>• Obesity Dosing: Consider using IBW if BMI ≥30-39, AdjBW if BMI ≥50, otherwise use TBW<br>• ♦Decrease dose by 50-90% in myasthenia gravis (use lower dose for more severe disease)<br>• Ensure proper deep sedation is initiated after administration given longer duration of action |
| Succinylcholine | 1-1.5 mg/kg | 60 sec | 3-5 min | • May cause arrhythmias, anaphylaxis, malignant hyperthermia, ↑ serum potassium 0.5-1 mEq/L△<br>• Obesity Dosing: Consider using AdjBW if BMI ≥60, otherwise use TBW |
| | Absolute contraindications: Hyperkalemia△, conditions that predispose to hyperkalemia△, conditions that affect acetylcholine receptor expression at the neuromuscular junction, or history of malignant hyperthermia.<br>AVOID: Stroke, immobilization ≥7 days, any myopathy, spinal cord injury, renal failure, digoxin toxicity, crush injuries, burns, muscular dystrophy, Guillain-Barré syndrome, meningitis, necrotizing pancreatitis, catatonic schizophrenia, purpura fulminans<br>NeuroICU ONLY: NNICU Attending MUST be contacted and ALL listed contraindications and warnings reviewed PRIOR to using succinylcholine. | | | |

Disclaimer: This document serves as an educational reference but should not supersede clinical judgment with respect to appropriate and necessary care for an individual patient.
Revised: June 1, 2023

<table>
<tr><th colspan="2">Reversal of Paralysis</th></tr>
<tr><td>Rocuronium or Vecuronium Reversal</td><td>
Sugammadex<br>
• RESTRICTED USE: Use in ED/ICU patient care areas is restricted to emergent reversal after failure to intubate/ventilate (i.e. impending hypoxic arrest) OR neurologic exam REQUIRED to prevent acute neurologic sequelae (i.e. impending herniation)<br>
• CAUTION: Administration of sugammadex should NOT delay a surgical airway when appropriate
<table>
<tr><th>Level of NMB based on TOF Monitoring</th><th>Agent</th><th>Sugammadex Dose*</th></tr>
<tr><td>TOF count ≥ 2</td><td>ROC or VEC</td><td>2 mg/kg</td></tr>
<tr><td>TOF count = 0-1†</td><td>ROC or VEC</td><td>4 mg/kg</td></tr>
<tr><td>Reversal required for failed airway immediately after ROC administration</td><td>ROC only</td><td>16 mg/kg</td></tr>
<tr><td colspan="3">*Dosed on TBW. Round to nearest 200 mg<br>† PTC should be ≥ 1 prior to reversal if patient has 0 twitches on TOF</td></tr>
</table>
• Reversal typically occurs within 2-3 minutes. Inadequate dose for depth of blockade may result in delayed neuromuscular recovery (10-20 minutes)<br>
• Adverse effects: Bradycardia, hypersensitivity reactions<br>
• Drug interactions: Impairs effectiveness of hormonal contraceptives for up to 7 days therefore patients with childbearing potential must be counseled<br>
• Recommend waiting at least 4 hours for re-paralysis with rocuronium or vecuronium after reversal with 2-4 mg/kg of sugammadex (in patients with normal renal function), otherwise, use cisatracurium or succinylcholine (if no contraindications)<br>
• Contact central/satellite pharmacy for expedited delivery
</td></tr>
<tr><td></td><td>
Neostigmine (given with glycopyrrolate due to muscarinic adverse effects)
<table>
<tr><th>Level of NMB based on TOF monitoring</th><th>Neostigmine Dose*</th></tr>
<tr><td>TOF count = 4 twitches (TOF ratio 0.4-0.9)</td><td>30 mcg/kg</td></tr>
<tr><td colspan="2">*Dosed on TBW. Max dose 5 mg.</td></tr>
</table>
• Recommended for reversal of minimal depths of neuromuscular blockade only (TOF 4/4, no fade)<br>
• Reversal typically occurs within 10 minutes if sufficient spontaneous recovery was achieved before administration. Deeper blocks will require more time to attain full neuromuscular recovery.<br>
• Adverse effects: Bradycardia, increased oral and respiratory secretions, GI symptoms, hypersensitivity reactions<br>
• Contraindications: Peritonitis, mechanical obstruction of intestinal or urinary tract<br><br>
Glycopyrrolate (used to minimize neostigmine adverse drug reactions)<br>
• Dose: 0.2 mg IV per 1 mg of neostigmine administered<br>
• Give immediately prior to neostigmine dose
</td></tr>
<tr><td>Succinylcholine Reversal</td><td>• No reversal agent<br>• Brief duration of paralysis (≤5 min) after one dose</td></tr>
</table>

ICP: intracranial pressure; BP: blood pressure; HR: heart rate; NMB: neuromuscular blockade; TOF: train of four; ROC: rocuronium; VEC: vecuronium; PTC: post-tetanic count; TBW: total body weight; AdjBW: adjusted body weight; IBW: ideal body weight


Revised: June 1, 2023