



University of Missouri Pediatric Service Line

Pediatric Emergency • Clinical Practice Guidelines

Pediatric Rapid Sequence Intubation Guideline

Concern for respiratory failure and/or inability to protect airway^a (see exclusion criteria)^b

Obtain IV access x 2, apply cardiac monitors, continuous pulse ox, ETCO₂ capnography
Consider blood work including VBG and POC glucose

Optimize hemodynamics prior to intubation:

Give 20 ml/kg NS or LR bolus^c

Pre-oxygenate with 100% O₂ via NRB or BVM for ≥2-3 minutes¹

Assemble and verbalize team prior to intubation:

Primary and back-up laryngoscopist (positioned to see CMAC screen)

RN administering meds

RT (call 771-7000)

ED pharmacist if available (call 771-7819)

If concern for difficult airway,^d consult anesthesia (call 771-8233)

Confirm presence of intubation checklist prior to intubation:

Yankauer attached to continuous wall suction

CMAC turned on and in optimal position with appropriately sized laryngoscope^e

Appropriately sized ETT^e + one size smaller with stylet inserted

In-line ETCO₂ capnography

Appropriately sized back-up LMA^e

BVM with O₂ turned on

Optimize patient positioning prior to intubation:

Align ear to sternal notch^f

Extend neck to obtain sniffing position^f

Maintain in-line C-spine stabilization for trauma patients^g

Proceed to RSI (page 2)



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Guidance for Choosing RSI Sedation Medications^{2,3}

Hemodynamically stable patient

Yes

No

Status asthmaticus

No

Yes

Ketamine
1-2 mg/kg
(max
100mg)

Status epilepticus

Yes

No

Midazolam
0.2-0.3 mg/kg
(max 10mg)
Or
Propofol
1-2 mg/kg
(max 100mg)

Ketamine
1-2 mg/kg
(max 100mg)

Catecholamine-depleted shock (eg persistent ↓BP despite vasopressors)

Yes

No

Fentanyl 1-3 mcg/kg (max
100mcg) given over 30-60 sec
to avoid chest wall rigidity

Ketamine
1-2 mg/kg
(max 100mg)

Sepsis

Yes

No

Cardiogenic shock

Yes

No

Fentanyl 1-3 mcg/kg (max 100mcg)
given over 30-60 sec to avoid chest
wall rigidity

Ketamine
1-2 mg/kg
(max 100mg)

Guidance for Choosing RSI Paralytics

Drug	Dose	Route	Onset	Duration	Comments
Succinylcholine	IV: 2mg/kg infants 1 mg/kg children IM: 4 mg/kg (max 150 mg)	IV, IM	IV: 30-60 sec IM: 60 sec	IV: 4-10 min IM: 10-30 min	NOT recommended if: skeletal muscle disease (eg muscular dystrophy), neuromuscular disease (eg cerebral palsy) or unknown past medical history, extensive crush, burn or other cause for hyperkalemia, personal or family history of malignant hyperthermia ^h
Rocuronium	1 mg/kg	IV	60 sec	25-40 min	Sugammadex can be given if paralytic reversal is needed (see footnote for dosing) ⁱ

Proceed to Intubation & Post-Intubation Care (page 3)



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Intubation and Post-Intubation Care⁵

Intubation

Perform time-out with verbalization of team members and roles^j

Confirm presence of intubation checklist equipment

Confirm optimization of patient hemodynamics and positioning

Pre-treat with atropine 0.02 mg/kg (min 0.1mg, max 0.5mg) for infants and/or pre-intubation ↓HR⁴

Give sedative followed by paralytic in rapid succession

Limit laryngoscopy to < 30 seconds/attempt with maintenance of O₂ sats ≥92%

Successful endotracheal intubation

Yes

No

Confirm ETT placement

Visualization of ETT passing through vocal cords

ETCO₂ color change with waveform present within 20 seconds

Bilateral breath sounds auscultated

Confirm appropriate ETT depth (3x ETT size)

Post Intubation Care:

Secure ETT with benzoin and tape

Portable CXR to confirm ETT placement

NG/OG tube placement

Placement on vent by RT

Proceed to Post-Intubation Sedation/Analgesia (page 4)

Re-optimize patient and repeat intubation attempt

Team leader verbalization of change in approach

Re-position patient as needed

Re-oxygenate via BVM

Re-dose sedative/paralytic if patient movement or >10 min since last dose given

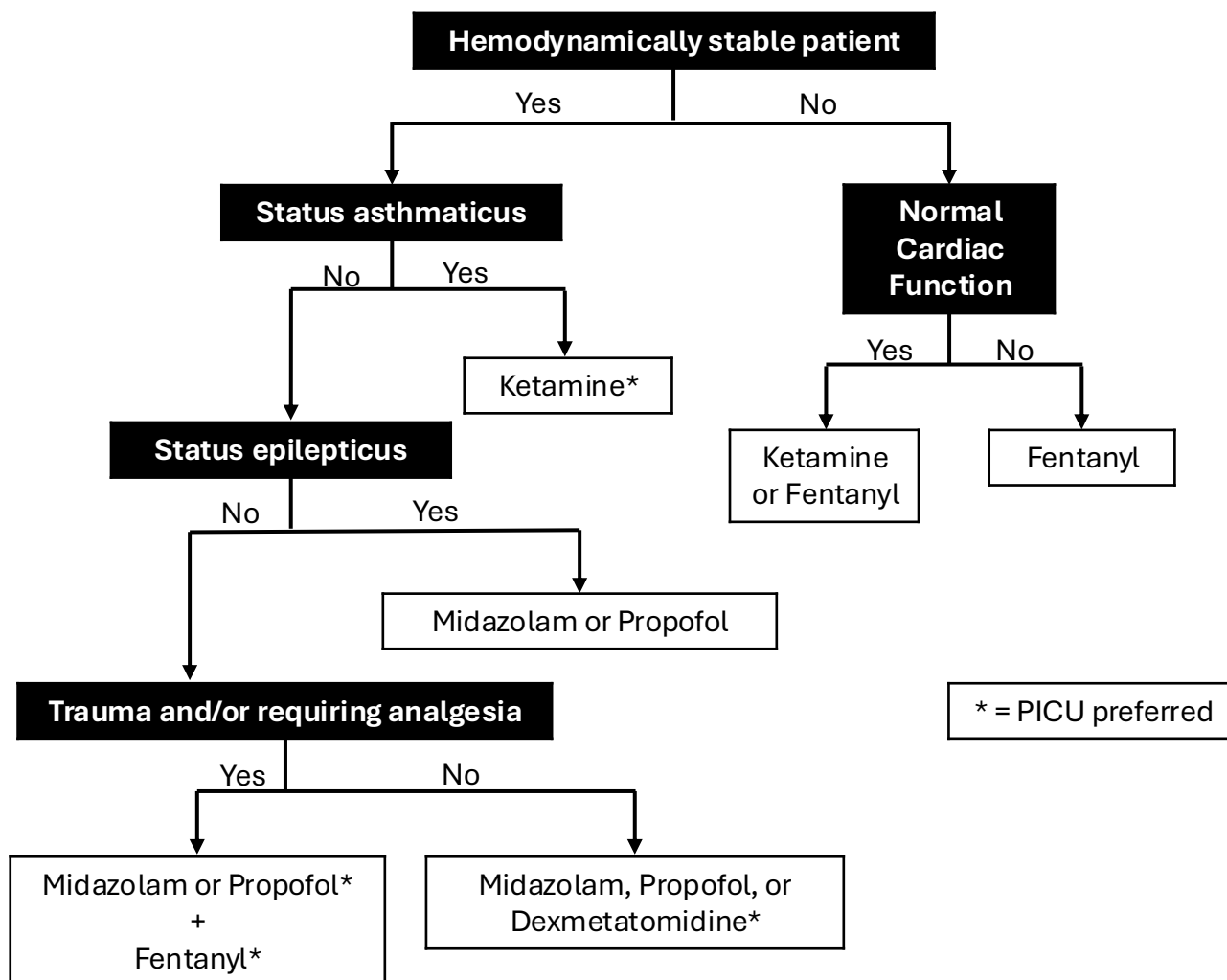
Give atropine 0.02 mg/kg (max 0.5mg) if re-dosing succinylcholine²



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Guidance for Choosing Post-Intubation Sedation/Analgesia Medications



Sedative/Analgesic Dosing

Drug	Starting Dose	Titrate q30 min	Max Dosing	Comments
Dexmedetomidine (Precedex)	Load 0.25-1 mcg/kg over 10 min (0.1-1 mcg/kg/hr)	0.2 mcg/kg/hr	1.5 mcg/kg/hr	↓HR, ↓BP, no analgesia
Fentanyl	<40kg: 0.5-3 mcg/kg ≥40kg: 20-200 mcg/hr	0.5 mcg/kg/hr	<40kg: 5 mcg/kg/hr ≥40kg: 200 mcg/hr	Chest wall rigidity if pushed quickly
Ketamine	1-2 mg/kg/hr (0.3-3 mg/kg/hr)	0.5 mg/kg/hr	4 mg/kg/hr	↑HR, ↑BP
Midazolam (Versed)	<40kg: 0.1 mg/kg/hr ≥40kg: 0.5-4mg	0.05 mg/kg/hr	<40kg: 0.3mg/kg/hr ≥40kg: 6mg/hr	↓HR, ↓BP, no analgesia
Propofol	Load 1-2 mg/kg, max 50mg (20-100 mcg/kg/min)	5-10 mcg/kg/min	250 mcg/kg/min	↓BP, Propofol Infusion Syndrome, no analgesia, CI: egg/soy allergy, ketogenic diet



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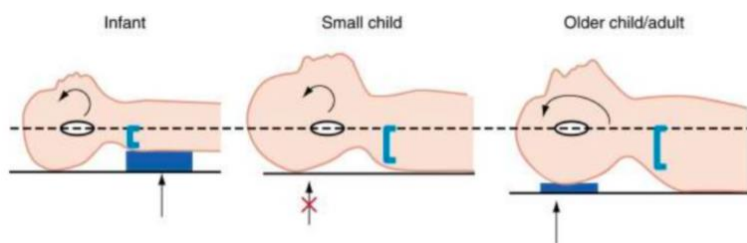
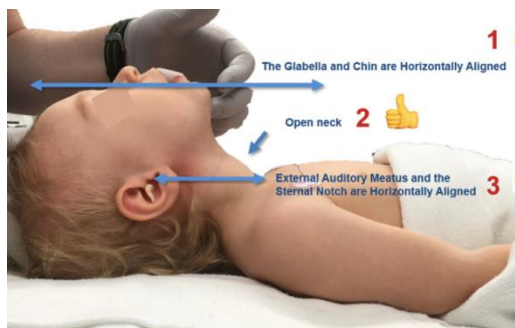
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Footnotes:

- Respiratory failure may be hypoxemic ($\text{PaO}_2 < 60 \text{ mmHg}$) or hypercapnic ($\text{PaCO}_2 > 50 \text{ mmHg}$)⁵
- Exclusion criteria: adult patients >18 years
- Consider 5-10ml/kg IVF boluses if concern for cardiac dysfunction including myocarditis, congenital heart disease or other causes of congestive heart failure or fluid overload.²
- Difficult airway indicators: history of difficult airway, small chin or receded jaw, inability to fully open mouth, short neck or poor neck mobility, facial or upper airway trauma, signs of upper airway obstruction (i.e. hoarseness, stridor, drooling, tripod position), facial anomalies and/or syndromes such as Pierre Robin, Treacher Collins, Goldenhar²
- ETT, laryngoscope, blade and LMA sizes based on age:

Age	Uncuffed ETT	Cuffed ETT	Miller	Mac	LMA
Premature $<1\text{kg}$, <28 wk EGA	2.5	-	0	-	1
Premature 1-2kg, 28-34 wk EGA	3.0	-	0	-	1
Premature 2-3kg, 34-36 wk EGA	3.5	-	0	-	1
Term newborn-3 months		3.0	0-1	-	1
4-12 months		3.5	1	-	1-1.5
1-2 years		3.5-4.0	1-2	1-2	1.5-2
2-4 years		4.0-4.5	2	2	2
4-6 years		4.5-5.0	2	2	2-2.5
6-8 years		5.0-5.5	2	2	2.5
8-10 years		5.5-6.0	-	2-3	2.5-3
10-12 years		6.0-6.5	-	3	3
Adolescent		7.0-7.5	-	3-4	3-4

- To align the oral, pharyngeal and tracheal axes, horizontally align the tragus of the ear to the sternal notch while maintaining "sniffing position" (i.e. horizontally aligning chin to glabella/space between eyebrows):²



May require shoulder roll for infants
or pad under head for older children/adolescents



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Footnotes (continued):

g. In-line C spine stabilization:²



h. Relative contraindications to use of succinylcholine include: increased IOP, increased ICP (controversial), known pseudocholinesterase deficiency (eg, organophosphate poisoning, congenital enzyme deficiency)²

i. Sugammadex dosing:

- Emergent paralytic reversal needed within 3 min of Roc administration: 4mg/kg
- TOF 0-1: 4mg/kg
- TOF 1-3: 2mg/kg
- TOF 4 and high risk: 2 mg/kg

j. EM Resident Participation in Pediatric Endotracheal Intubation Policy

Emergency Medicine Resident Participation in Pediatric Endotracheal Intubation

General Principles:

1. Pediatric airway management represents a critical competency for emergency physicians. Because pediatric intubations are uncommon yet potentially lifesaving procedures, residents should be afforded meaningful opportunities to perform them under supervision. Resident participation in pediatric airway management is expected and encouraged whenever clinically appropriate.
2. The presence of PEM faculty, EM faculty, anesthesia personnel, NICU personnel, critical care transport personnel, or other airway experts should enhance resident education rather than routinely replace resident involvement. Educational opportunities should be maximized whenever patient condition and clinical circumstances permit.
3. The attending physician directing the resuscitation maintains ultimate authority regarding airway management decisions and resident participation. Patient safety remains the primary consideration in all airway management decisions.

Resident Eligibility:

1. Residents may perform pediatric endotracheal intubation under direct attending supervision when:
 - a. The attending physician determines that resident participation is appropriate.
 - b. Necessary personnel, equipment, and backup airway resources are immediately available.
 - c. The patient's condition allows for supervised attempts without unacceptable risk.
2. The PEM/EM attending may limit or defer resident participation based on:
 - a. Severity of physiologic instability and/or need for immediate first-pass success.
 - b. High-risk patient populations (i.e. premature infants <30 weeks EGA).

References:

1. Patel et al, "Age and the onset of desaturation in apneic children," Can J Anaesth, 1994.
2. Agrawal et al, "Rapid sequence intubation (RSI) in children for emergency medicine: Approach," UpToDate, 2025.
3. Indian Academy of Pediatrics, "National Treatment Guidelines," 2025.
4. Fastle et al, "Pediatric rapid sequence intubation: incidence of reflex bradycardia and effects of pretreatment with atropine," Pediatric Emergency Care, 2004.
5. Nationwide Children's Hospital, "Rapid Sequence Intubation & Post Intubation, Sedation and Analgesia: Emergency Department," 2024.