

PEDIATRIC EMERGENCY CARE GUIDE

Pediatric Parameters & Equipment											
Age	Neonate	3mo	6mo	1 yr	2 yr	3 yr	4 yr	6 yr	8 yr	12 yr	14 yr
Wt (kg)	3.5	6	8	10	12	14	16	20	25	40	50
~ BSA (m²)	0.24	0.34	0.42	0.49	0.56	0.62	0.68	0.79	0.92	1.3	1.5
HR	80-190	80-160	80-160	80-160	80-130	80-130	80-120	75-115	70-110	65-110	60-105
RR	30-50	24-38	24-38	22-30	22-30	22-30	20-24	20-24	18-24	16-22	14-20
SBP*	60-90	70-110	70-110	70-110	74-110	76-110	78-115	82-115	86-120	94-125	98-130
DBP	35-60	40-60	40-60	40-60	45-60	50-65	50-70	55-75	60-80	60-80	65-85
BP Cuff	Neonate	Infant	Small Child	Small Child	Child	Child	Child	S. Adult	S. Adult	Adult	Adult
BVM	Infant	Infant	Child	Child	Child	Child	Child	Child	Child/Adult	Adult	Adult
Oral Airway	Infant 50mm	Small 60mm	Small 60mm	Small 60mm	Child 70mm	Child 70mm	Med 80mm	Med 90mm	Med 90mm	Large 100mm	Large 100mm
ETT Blade	#0-1	#1	#1	#1	#2	#2	#2	#2	#2-3	#3	#3
ETT Size**	2.5-3.5	3.5-4.0	3.5-4.0	4.0-4.5	4.0-4.5	4.5-5.0	4.5-5.0	5.0-5.5	5.5-6.5	6.0-7.0	7.0-8.0
Suction Cath	6 Fr	8-10 Fr	8-10 Fr	8-10 Fr	10 Fr	10 Fr	10 Fr	10 Fr	10 Fr	12 Fr	14 Fr
NGT	5-8 Fr	5-8 Fr	8-10 Fr	8-10 Fr	10 Fr	10 Fr	10-12 Fr	12-14 Fr	14 Fr	14-18 Fr	14-18 Fr
Foley	6 Fr	8 Fr	8 Fr	8 Fr	8 Fr	8 Fr	8 Fr	10 Fr	12 Fr	14 Fr	14 Fr
IV Access	22-24g	22-24g	20-24g	20-24g	18-22g	18-22g	18-22g	18-20g	18-20g	16-20g	16-20g
Central Line	4 Fr 8cm	4 Fr 9cm	4 Fr 12cm	5 Fr 8cm	5 Fr 8cm	5 Fr 12cm	5 Fr 12cm	5 Fr 15cm	5 Fr 15cm	7 Fr 15cm	7 Fr 15cm

*Hypotension = Systolic BP $\leq 70 + (2 \times \text{age in years over 1 year})$; $< 1 \text{ mo}$ SBP ≤ 60 ; $1 \text{ mo} - 1 \text{ yr}$ SBP ≤ 70
 **ETT Size = $[\text{Age (years)} + 16] / 4$; Use cuffed tube for ≥ 6.0 ; ETT Depth = $3 \times \text{ETT I.D.}$ or $(\text{age in years}/2) + 12$

Glasgow Coma Scale			
Activity	Infant	Child/Adult	Score
Eye Opening	Spontaneous	Spontaneous	4
	To speech	To speech	3
	To pain only	To pain only	2
	No response	No response	1
Best Verbal Response	Coos and babbles	Oriented, appropriate	5
	Irritable cries	Confused	4
	Cries to pain	Inappropriate words	3
	Moans to pain	Incomprehensible sounds	2
	No response	No response	1
Best Motor Response	Moves spontaneously and purposefully	Obeys commands	6
	Withdraws to touch	Localizes painful stimulus	5
	Withdraws to pain	Withdraws in response to pain	4
	Abnormal flexion posture to pain	Flexion in response to pain	3
	Abnormal extension posture to pain	Extension in response to pain	2
	No response	No response	1

RESUSCITATION

Adenosine	0.1 mg/kg/dose (max 6mg) rapid bolus IV/IO If no effect, repeat 0.2 mg/kg/dose (max 12mg) rapid IV/IO
Amiodarone	5 mg/kg/dose IV/IO bolus (max 300mg) if pulseless arrest (VF/pulseless VT) If pulse present, give over 20-60 minutes (max 300mg); May repeat to daily max 15 mg/kg (or 2.2g)
Atropine	0.02 mg/kg/dose IV/IO or 0.04 – 0.06 mg/kg/dose ETT Min dose 0.1 mg, max dose child 0.5 mg, max dose adolescent 1 mg; Repeat q 5 mins to max total dose 1 mg child, 2 mg adolescent
Calcium Chloride (10%)	20 mg/kg/dose (0.2 mL/kg/dose) IV/IO slow push during arrest (max 2000 mg); central line preferred
Calcium Gluconate (10%)	100 mg/kg/dose (1 mL/kg/dose) IV/IO slow push during arrest (max 2000 mg)
Dextrose	0.5 to 1 g/kg/dose IV/IO D ₁₀ 5-10 mL/kg for < 2 mo; D ₂₅ 2-4 mL/kg for 2 mo to 2 yrs; D ₅₀ 1-2 mL/kg for > 2 yrs
Epinephrine	Pulseless Arrest, Bradycardia (symptomatic) <ul style="list-style-type: none"> • 0.01 mg/kg/dose (0.1 mL/kg/dose) 1:10,000 IV/IO q 3 to 5 minutes (max 1 mg; 10 mL) • 0.1 mg/kg/dose (0.1 mL/kg/dose) 1:1,000 ETT q 3 to 5 minutes Anaphylaxis <ul style="list-style-type: none"> • 0.01 mg/kg/dose (0.01 mL/kg/dose) 1:1,000 IM (max 0.5 mg) • Auto-injector 0.3 mg/dose (wt ≥ 30 kg) or Auto-injector Jr. 0.15 mg/dose (wt 10-30kg) IM
Insulin (Hyperkalemia)	0.1 units/kg/dose IV/IO following 0.5 g/kg/dose of dextrose
Lidocaine (1%)	1 mg/kg/dose IV/IO, 2-3 mg/kg/dose ETT
Magnesium sulfate	25 – 50 mg/kg/dose IV/IO bolus (pulseless VT) or over 10 to 20 minutes (VT with pulses)
Sodium bicarbonate (8.4%)	1 mEq/kg/dose (1 mL/kg/dose) IV/IO; dilute 1:1 with sterile water for neonates
Vasopressin	0.5 units/kg/dose (max 40 units) IV/IO push for pulseless arrest
CARDIOVERSION / DEFIBRILLATION	
SVT or VT w/ pulse	CARDIOVERT: 0.5 – 1 joules/kg synchronized x 1; if no response, 1-2 joules/kg synchronized
VF or Pulseless VT	DEFIBRILLATE: 2 joules/kg x 1, 4 joules/kg x 2; adult: monophasic 360 joules, biphasic 200 joules
REVERSAL	
Naloxone	Respiratory depression <ul style="list-style-type: none"> • 0.001 mg/kg/dose IV/IO/IM/SQ every 1-2 minutes until respirations are adequate Respiratory arrest / full reversal <ul style="list-style-type: none"> • 0.1 mg/kg/dose IV/IO/IM/SQ (max 2 mg/dose)
Flumazenil	0.01 mg/kg/dose (max dose 0.2mg) IV/IO Repeat q1 min to max total dose 0.05 mg/kg/dose or 1 mg as necessary
POST-RESUSCITATION	
DOBUTamine	2 – 20 mcg/kg/min IV/IO
DOPamine	2 – 20 mcg/kg/min IV/IO
Epinephrine	0.03 – 1 mcg/kg/min IV/IO
Milrinone	Loading dose: 50 mcg/kg/dose IV/IO over 5 minutes Infusion: 0.25 – 1 mcg/kg/min IV/IO
Norepinephrine	0.05 – 1 mcg/kg/min IV/IO
Phenylephrine	0.1 – 4 mcg/kg/min IV/IO
Vasopressin (Pressor)	0.3 – 2 milliunits/kg/MIN (18 – 120 milliunits/kg/HOUR) IV/IO

RAPID SEQUENCE INTUBATION

ADJUNCTS

Atropine	0.01 – 0.02 mg/kg/dose IV/IO for < 5 yo to blunt vagal reflex Min dose 0.1 mg, max dose child 0.5 mg, max dose adolescent 1 mg
Lidocaine	1 mg/kg/dose IV/IO for patients at risk for increased ICP

INDUCTION

Etomidate	0.3 mg/kg/dose IV/IO
Fentanyl	2 – 4 mcg/kg/dose IV/IO/IM
Ketamine	1 – 2 mg/kg/dose IV/IO; 2-4 mg/kg/dose IM
Midazolam	0.1 – 0.3 mg/kg/dose IV/IO (max 4 mg)
Propofol	2 mg/kg/dose IV/IO
Thiopental	4 – 7 mg/kg/dose IV/IO if normotensive; 2 – 4 mg/kg/dose IV/IO if hypotensive

PARALYTICS – Intubation

Rocuronium	0.6 – 1.2 mg/kg/dose IV/IO
Succinylcholine	1 – 2 mg/kg/dose IV/IO; 2 – 4 mg/kg/dose IM (Premedicate with atropine for < 5 yo)
Vecuronium	0.1 – 0.2 mg/kg/dose IV/IO

PARALYTICS – Maintenance

Cisatracurium	0.1 – 0.2 mg/kg/hr IV/IO
Pancuronium	0.1 mg/kg/hr IV/IO
Vecuronium	0.1 mg/kg/hr IV/IO

ACUTE PAIN MANAGEMENT

ANALGESICS

Acetaminophen	10 – 15 mg/kg/dose (max 1000 mg) PO/PR q 4 – 6 hours PRN Max 90 mg/kg/day up to 4000 mg/day
Ibuprofen	10 mg/kg/dose PO q 4 – 6 hours PRN (max dose 40 mg/kg/day)
Ketorolac	0.5 mg/kg/dose IV/IM (max 30 mg) q 6 hours x 72 hours (do not exceed 5 days)
Trisalicylate	7.5 – 15 mg/kg/dose (max 1.5 g) PO q 6 – 8 hours PRN

NARCOTICS

	Morphine 0.1 mg = Methadone 0.1 mg = Hydromorphone 0.02 mg = Fentanyl 0.001 mg
Fentanyl	0.5 – 2 mcg/kg/dose IV/IO q 1 - 2 hours PRN
Hydromorphone	0.015 mg/kg/dose IV/IO q 4 – 6 hours PRN
Morphine	0.05 – 0.1 mg/kg/dose IV/IO q 2 hours PRN
Oxycodone	0.05 – 0.15 mg/kg/dose (max 5 mg) PO q 4 – 6 hours PRN

Patient-Controlled Analgesia (PCA)*

	Bolus	Basal	Max Dose (recommended: 0 – 5 doses / hour)
Fentanyl	0.25 – 1 mcg/kg/dose	0.25 – 1 mcg/kg/hour	3 doses / hour; lock out q 10 min
Hydromorphone	0.003 – 0.006 mg/kg/dose	0.003 – 0.006 mg/kg/hour	5 doses / hour; lock out q 7 – 15 min
Morphine	0.01 – 0.03 mg/kg/dose	0.01 – 0.03 mg/kg/hour	5 doses / hour; lock out q 7 – 15 min

*Child should be ≥ 5 yo and able to understand the PCA concept. Start low and titrate to effect. Use of basal may improve overall analgesia steady-state to include sleep pattern. Consider naloxone infusion for side effect alleviation (below).

SEDATIVES (MAINTENANCE)

NARCOTICS

Infusion (Titrate as necessary)

Fentanyl	1 – 6 mcg/kg/hour IV
Hydromorphone	0.010 – 0.015 mg/kg/hour IV
Morphine	0.06 – 0.2 mg/kg/hour IV
Remifentanyl	Load: 0.5 – 1 mcg/kg/dose IV x 1; Infusion: 0.05 – 0.5 mcg/kg/min IV
Naloxone	Anti-pruritic dosing: 0.25 – 1 mcg/kg/hour IV

OTHER

Load / PRN

Infusion (Titrate as necessary)

Dexmedetomidine	Load: 0.5 mcg/kg/dose IV x 1	0.2 – 2 mcg/kg/hour IV
Ketamine	0.5 – 2 mg/kg/dose IV q 1 – 2 hours	0.5 – 2 mg/kg/hour IV
Midazolam	0.05 – 0.1 mg/kg/dose IV q 1 – 2 hours	0.05 – 0.1 mg/kg/hour IV
Pentobarbital	1 – 3 mg/kg/dose IV or 2 – 6 mg/kg/dose PO/PR/IM q 2 – 4 hours (max 150 mg)	1- 2 mg/kg/hour IV

ADJUNCTS

Clonidine	5 mcg/kg/day topical patch (in 50 mcg intervals up to 300 mcg patch) Consider enteral load: 2.5 mcg/kg/dose PO q 12 hours x 4 doses
Diphenhydramine	0.5 – 1 mg/kg/dose (max 50 mg) IV/PO q 6 hours
Lorazepam	0.05 – 0.1 mg/kg/dose IV/PO q 4 – 8 hours PRN
Methadone	0.1 mg/kg/dose IV/PO q 4 hours x 3 doses, then q 6 – 12 hours (max dose 10 mg)

ANTI-HYPERTENSIVES	
Amlodipine	0.1 mg/kg/dose (usual max 10 mg) PO daily to BID
Esmolol	Load: 500 mcg/kg IV x 1; infusion: 25 – 300 mcg/kg/min IV, repeat load as needed
Hydralazine	0.1 – 0.5 mg/kg/dose (max 20 mg) IV/IM q 4 – 6 hours PRN
Labetolol	0.25 – 1 mg/kg/dose (usual max 20 mg) IV q 10 min PRN Infusion: 0.25 – 1 mg/kg/hour IV
NICARDipine	0.5 – 5 mcg/kg/min IV
NitroGLYCERIN	0.5 – 5 mcg/kg/min IV
NitroPRUSSIDE	0.5 – 10 mcg/kg/min IV; monitor cyanide and thiocyanate for > 4 mcg/kg/min
DIURETICS	
Bumetanide	≤ 6 mo: 0.01 – 0.05 mg/kg/dose (max 1 mg) IV/PO daily > 6 mo: 0.02 – 0.1 mg/kg/dose (max 10 mg) IV/PO daily Adult: 2 mg IV/PO daily - BID
Chlorothiazide	10 – 20 mg/kg/dose IV/PO q 12 hours (max IV 500 mg/dose; max PO 188 mg/dose for < 2 yo; max PO 1000 mg/dose for > 2 yo)
Furosemide	1 – 2 mg/kg/dose IV/PO q 6 – 24 hours (usual starting max 20 mg) Infusion: 0.05 – 0.3 mg/kg/hour
Spirolactone	1 mg/kg/dose (max 100 mg) PO q 12 hours
ENDO / METABOLIC	
Vasopressin (DI)	0.5 – 3 milliunits/kg/HOUR; titrate to maintain UOP < 2 ml/kg/hour
STEROIDS	Dexamethasone 1 mg = Methylprednisolone 5 mg = Hydrocortisone 20 mg
Dexamethasone	Airway edema: 0.1 – 0.6 mg/kg/dose (max dose 10 mg) IV q 6 hours x 4 – 6 doses Croup: 0.6 mg/kg IM/PO x 1
Methylprednisolone	Loading dose for asthma: 2 mg/kg/dose IV x 1 Maintenance: 0.5 – 1 mg/kg/dose (usual max 60 mg) IV q 6 – 12 hours
Hydrocortisone	Stress Dose: 50 mg/m ² /dose (usual max 100 mg) IV x 1, then 25 mg/m ² /dose (usual max 75 mg) IV q 6 hours Maintenance dose: 5 mg/m ² /dose (usual max 10 mg) IV q 8 hours
NEURO / SEIZURE	
Diazepam	0.1 – 0.2 mg/kg/dose IV/IO q 15 – 30 minutes PRN; < 5 yo: 0.5 mg/kg/dose PR q 2 hours PRN; 6 – 11 yo: 0.3 mg/kg/dose PR q 2 hours PRN; ≥ 12 yo: 0.2 mg/kg/dose PR q 2 hours PRN
Fosphenytoin	Load: 20 mg PE/kg/dose IV x 1; Maintenance: 2 mg PE/kg/dose IV q 8 hours
Lorazepam	0.05 – 0.1 mg/kg/dose (usual max 4 mg) q 15 min PRN
Phenobarbital	Load: 20 mg/kg/dose IV x 1; Maintenance: 2.5 mg/kg/dose IV/PO q 12 hours
CEREBRAL EDEMA	
Hypertonic saline (2 or 3% NaCl)	3 mL/kg IV over 30 minutes; Note: 1 mL/kg of 3% NaCl will increase serum sodium ~ 1 mEq/L
Mannitol	0.25 grams/kg/dose IV over 20 – 30 minutes PRN x 1
RESPIRATORY	
Albuterol	2.5 mg/dose in 3 mL NS nebulized; may repeat q 20 minutes x 3 or continuous Continuous: 0.5 mg/kg/hour (usual max 20 mg/hr) < 7.5 kg: 2.5 mg/hour INH 7.5 – 14.9 kg: 5 mg/hour INH 15 – 29.9 kg: 10 mg/hour INH > 30 kg: 20 mg/hour INH
Epinephrine	0.01 mg/kg (0.01 mL/kg) 1:1,000 SQ/IM (max 0.5 mg)
Ipratropium	0.25 – 0.5 mg/dose INH q 4-6 hours
Magnesium sulfate	75 mg/kg/dose IV x 1 over 15 – 20 minutes (max 2000 mg); monitor for hypotension
Terbutaline	Load: 10 mcg/kg/dose IV x 1 over 30 minutes; Infusion: 0.4 – 6 mcg/kg/min IV
MISCELLANEOUS	
Albumin	0.5 g/kg/dose (5% = 10 mL/kg; 25% = 2 mL/kg)
Heparin (DVT treatment)	Load: 75 units/kg IV x 1; Infusion: For < 1yr: 28 U/kg/hour; For ≥ 1 yr: 20 U/kg/hour Check coags 4 – 6 hours after change. Adjust dose to give PTT 1.5 – 2.5 times control.

EMERGENCY MANAGEMENT ALGORITHMS

INTUBATION MANAGEMENT ALGORITHM

“LEMON” Airway Assessment:

Always ask: Is this a potentially difficult mask-ventilation and/or difficult intubation?

- **Look externally:** Midface/palatal/mandibular abnormalities (micrognathia, obesity, trauma, etc.)?
- **Evaluate 3-3-2 Rule** (using patient’s fingerbreadth as “ruler”):
Mouth opening > 3 fingers, hyoid-chin > 3 fingers, and thyroid cartilage to floor of mouth > 2 fingers
- **Mallampati score**
- **Obstruction:** Evaluate for stridor, foreign bodies, and other evidence of obstruction
- **Neck mobility:** Should be able to extend at least 35 degrees
- **Assess last oral intake:** Clears > 2 hours, breast milk > 4 hours, solids > 6 hours
- **Position patient:** Align external auditory meatus with the clavicle (consider shoulder roll < 2 yo)
- **Assess vascular access**



Needed Personnel:
Laryngoscopist, medications, cricoid pressure, recorder, respiratory therapist, and charge RN

Monitors
EKG leads hooked-up and working
SpO₂ probe placed and set to AUDIBLE tones
EtCO₂ monitor turned on and ready

Equipment: “SOAP”
Suction – Yankauer functional and on
Oxygen – Appropriate bag and mask
Airways – Laryngoscope, ETT tubes (1 size above and below), and oral/nasal airways (1 size above and below)
Pharmacology Considerations (next box)



Medications (see RSI section above)	
Premedications:	
Atropine: All < 5 yo & if using ketamine or succinylcholine	Lidocaine: All patients with increased ICP or head injury
Sedatives/hypnotics:	
Normotensive: Thiopental, midazolam, etomidate, or propofol Status asthmaticus: Ketamine ± midazolam	
<p style="text-align: center;"><u>Hypotension</u></p> Mild: Etomidate, ketamine, or midazolam Severe: Etomidate, ketamine, or none	<p style="text-align: center;"><u>Head injury</u></p> Normal BP: Thiopental, propofol, or etomidate Low BP: Etomidate or low-dose thiopental



Management

Preoxygenate with 100% O₂
 Premedicate (wait 3 min)
 Sedate and hold cricoid pressure
 Paralyze
 Intubate trachea
 Confirm placement: auscultate, EtCO₂, CXR
 Determine maintenance sedation plan

ACUTE MANAGEMENT OF ASTHMA EXACERBATION

Airway - Breathing – Circulation
 Continuously monitor vital signs and pulse oximetry
 Administer supplemental oxygen to maintain SpO₂ ≥ 92%
 Obtain brief history (prior admissions, ICU admits, intubations?)
 Conduct focused physical exam (respiratory rate, work of breathing, auscultation, PEF)



Acute Asthma Category:			
Clinical Finding	Mild	Moderate	Severe
Wheezing	None or mild	Moderate	Severe or absent
Air Entry	Good	Fair	Poor or absent
Work of Breathing	Mild	Moderate	Severe
Expiratory Prolongation	Normal or mild	Moderate	Severe
Tachypnea (above mean)	30 %	30 – 50%	> 50% or slow
Mental Status	Normal	Agitated	Drowsy
PEF	> 70%	40 – 69 %	< 40%

Adapted from: Gorelick MH, Stevens MW, Schultz TR, Scribano PV. Performance of a novel clinical score, the Pediatric Asthma Severity Score (PASS), in the evaluation of acute asthma. Acad Emerg Med. 2004 Jan;11(1):10-8.

Moderate to Severe? Yes



Albuterol 2.5 – 5 mg INH q 20 minutes x 3
 AND
Methylprednisolone 2 mg/kg/dose (load) IV/IM x 1 (max dose 80 mg)
 AND
Ipratropium 0.25 – 0.5 mg INH q 6 hours



Continuous nebulized albuterol: 0.5 mg/kg/hour (usual max 20 mg/hr)
 (< 7.5 kg: 2.5 mg/hour INH; 7.5 – 14.9 kg: 5 mg/hour INH;
 15 – 29.9 kg: 10 mg/hour INH; > 30 kg: 20 mg/hour INH)



Magnesium sulfate 75 mg/kg IV x 1 over 20 minutes (max 2000 mg), monitor for hypotension



Terbutaline 10 mcg/kg/dose (load) IV x 1 over 30 minutes,
 followed by and infusion at 0.4 – 6 mcg/kg/min IV
 → Monitor EKG q 24 hours and cardiac enzymes q 6 – 12 hours



Heliox 70/30, monitor for hypoxia



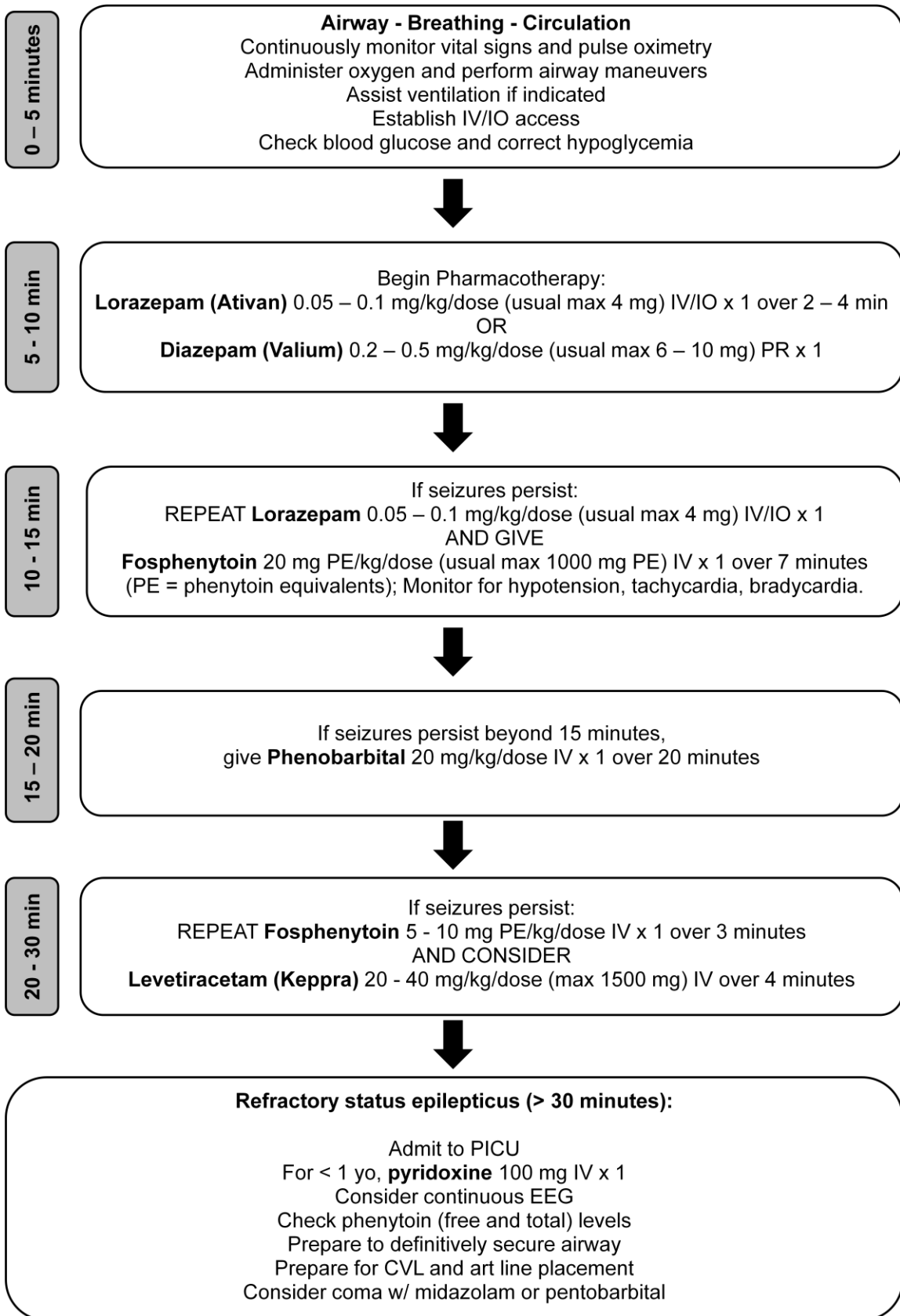
Consider **CPAP/BiPAP**, may use ketamine



Consider **intubation and mechanical ventilation** as a last resort effort in the asthmatic
 ** As the patient improves, remember the “last on, first off” approach!

EMERGENCY MANAGEMENT ALGORITHMS

ACUTE MANAGEMENT OF SEIZURES ALGORITHM



EMERGENCY MANAGEMENT ALGORITHMS

ACUTE MANAGEMENT OF INCREASED INTRACRANIAL PRESSURE (ICP) ALGORITHM

GCS \leq 8 in absence of: hypotension, hypoxemia, hypothermia

Remember: Cushing's Triad (HTN, bradycardia, abnormal respirations) is a late /preterminal event

Airway - Breathing - Circulation

Continuously monitor vital signs and pulse oximetry
Administer oxygen and perform airway maneuvers
Assist ventilation if indicated
Establish IV/IO access and begin NS at maintenance
Use rapid sequence protocol for intubation
Obtain emergent head CT
Neurosurgery consult for EVD / ICP monitor placement

PATIENT CARE GOALS:

SpO₂ 100%; **Temperature** 35 - 37° C; **PaCO₂** 35 - 40 mmHg
MABP: < 1 yo = 50 mmHg; 1 - 4 yo = 60 mmHg; 4 - 9 yo = 70 mmHg; > 9 yo = 80 mmHg
CVP: 5 - 10 mmHg; **ICP:** < 20 mmHg
CPP (MAP - ICP): < 4 yo mmHg > 50; 4 - 9 yo > 60 mmHg; > 9 yo > 70 mmHg
Serum sodium > 140 < 155; **Serum osmolarity:** > 290 < 320; **Glucose** < 180

ICP > 20 mmHg? Yes

Tier 1 Therapies:

CSF diversion with EVD
HOB at 30 degrees
Maintain PaCO₂ 35 - 40 mmHg
Optimize sedation / paralysis
Consider thiopental for ICP spikes
Consider lidocaine IV prior to suctioning

ICP Remains > 20 mmHg? Yes

Tier 2 Therapies:

Repeat head CT
Fluids / Pressors to maintain CPP
Mannitol therapy (if serum Osm < 320)
Hypertonic saline therapy (if serum Osm < 370)
Mild hyperventilation (PaCO₂ 30 - 35 mmHg)
Consider barbiturate coma

Refractory ICP > 20 mmHg? Yes

Tier 3 Therapies:

Decompressive craniectomy
Moderate hypothermia (32 - 34° C)
Transient hyperventilation to PaCO₂ < 30 mmHg

EMERGENCY MANAGEMENT ALGORITHMS

ACUTE MANAGEMENT OF HYPERKALEMIA

