Pediatric Protocols

General Approach to the Pediatric Patient

Airway-Respiratory Failure

Respiratory Distress

Allergic Reaction

Altered Mental Status

Behavioral

Bradycardia

BRUE/ALTE

Cardiac Arrest

Post ROSC

Drowning

Hypoglycemia/Hyperglycemia

Neonatal Resuscitation

Pain Management

Refusals/Non-transports

Regular Narrow Complex Tachycardia

Wide Complex Tachycardia

Seizures

Sepsis

Shock

SIDs

Suspected Stroke

Suspected Abuse

Tracheostomy

Toxin/Overdose

Transport

Unaccompanied Minor

Pediatric- General Approach

Inclusions:

- Trauma 15 years and 364 days
- Medical Transport Destination <18 years old
- Medication dosing: pediatrics= less than 50 kg (exceeds length based tape)

Scene Safety & Scene Survey

Utilize jumpSTART in MCI
Observe environment for signs of maltreatment (see NAT Protocol)

Obtain Parental or legal guardian consent

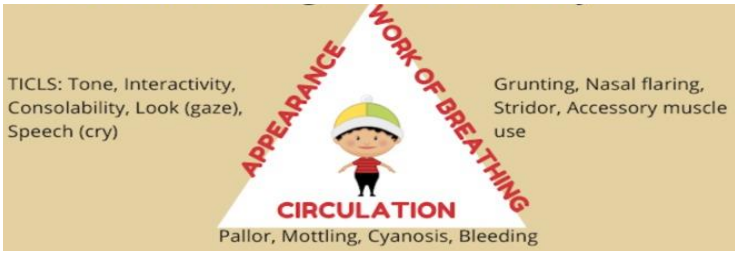
- In the case of a life or limb threatening emergency, provide transport and treatment while obtaining consent (see Care of an Unaccompanied Minor Protocol)
- If parent or legal guardian refuses to provide consent, See Refusals Protocol

Full ALS Assessment & Treatment when condition warrants

Identify if any special needs, involve caregiver and tailor approach as needed (see Care of Special needs protocol)

Identify age/developmentally appropriate behaviors to aid in assessment (see Pearls)

Observational Assessment



Physical Exam & Treatment (by ABCDE)

Obtain required Vital Signs: Required: HR, RR, BP, O2 Sat
As appropriate: Temperature, BGL & ETCO2
Pay close attention to age appropriate values (see chart)

	Airway	Breathing	Circulation	Disability	Exposure
Considerations:	BVM as or more effective than intubation in kids	Most common cause of arrest is respiratory	Bradycardia= impending cardiac arrest	APGAR, AVPU, GCS	Prevent heat loss

Repeat Assessment

At least every 5 minutes for unstable patients and every 15 minutes for stable patients. Much of the assessment can be performed via observation (see Pediatric Triangle above)

Medial Consultation

A)shall be obtained when required by a specific protocol (i.e. BRUE, Refusals, Unaccompanied Minor)
B)Should be obtained when adequate treatment effects haven't been reached by the end of the protocol
C)Available at any time for any reason

Utilize appropriate restraint device
Ensure parent/caregiver appropriately restrained
View Transport Protocols for appropriate destination

PEARLS

- Infant: avoid anything distressing until after assessment is complete. >6 months of age best examined in parents arms (if appropriate)
- Toddler: Approach slowly. Sit or squat next to them. Allow them to remain in parent's lap when possible. Give them limited choices. Speak slowly & use simple, age appropriate terms. Do not expect them to cooperate (be flexible).
- Preschooler: allow child to handle equipment. Do not lie to the child. Play games with immobilized preschoolers for distraction.
- School Age: allow them to be involved in care, however do not negotiate unless they really have a choice. Provide reassurance.
- Adolescent: Treat as an adult. Explain what you are doing and why. Show respect & speak to the adolescent directly.

Pediatric Emergencies

Pediatric Airway- Respiratory Failure

Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

NO

- Spinal Motion Restriction if indicated
- Pediatric Tracheostomy Protocol if indicated
- Pediatric Respiratory Distress Protocol for Foreign Body Obstruction if indicated

Basic Maneuvers
- Open airway chin lift / jaw thrust
- Nasal or oral airway

YES

Supplemental oxygen
Goal oxygen saturation ≥ 90%
Preferably ≥ 94%

Exit to
Appropriate Protocol(s)

Breathing / Oxygenation Support needed

Do not delay BVM in patient's with altered mental status, decreased respirations or elevated ETCO2 (>45)

High flow oxygen at 1-2 L/kg via the nasal cannula added to the Non-rebreather

Consider CPAP (10cm) for patients with significant dyspnea or hypoxia if size allows

Contraindications:
-decreased LOC
-Lack of spontaneous respirations

2 Rescuer BVM w/ OPA/NPA
Maintain Oxygen Saturation ≥ 90 %

Unable to Ventilate and/or Oxygenate → Supraglottic Device Procedure

Unable to Ventilate and/or Oxygenate → Tracheal Intubation (no more than 2 attempts)

MANDATORY- If the alveolar waveform is not initially present or disappears after 3-5 breaths, the device MUST be removed

Can't Intubate AND Can't Ventilate → **CONTACT MEDICAL CONTROL**
Cricothyrotomy Procedure

If unstable airway and/or clinical instability will not allow for safe transport to a Pediatric Comprehensive Center, proceed to the closest appropriate ED. See Transport Destinations Protocol.

Pediatric Emergencies

PEARLS

- **In Pediatric patients, BVM is an acceptable end point of airway management if successful**
- If strong suspicion for tension pneumothorax, consider: Chest Decompression Procedure if indicated
- Notify the medical director within 24 hours of the Cricothyrotomy procedure (follow agency contact procedures)
- HOPs Killers- Hypotension, Oxygenation (hypoxia), Ph (Acidosis)- if not addressed, increases the chances of cardiac arrest during intubation
- If first intubation attempt fails, make an adjustment and then try again: Different laryngoscope blade; Gum Elastic Bougie; Different ETT size; Change cricoid pressure; Apply BURP; Change head positioning
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90% or stable/improving values consistent with clinical condition (e.g. pulse oximetry in the mid 80s post-drowning), it is acceptable to continue with basic airway measures instead of using a SGA or Intubation
- Continuous Waveform capnography is mandatory with all methods of airway management.
- Surgical cricothyrotomy is only used in patients >12 years of age. Needle cricothyrotomy is utilized under this age
- It is important to secure the endotracheal tube well and utilize tube holder to better maintain ETT placement. **Manual stabilization of endotracheal tube should be used during all patient moves / transfers.**
- Many patients who cannot be intubated easily may be sustained by basic airway techniques and BVM, with stable if not optimal Oxygen Saturation, i.e. stable (not dropping) SpO2 values as expected based on pathophysiologic condition with otherwise reassuring vital signs (e.g. consistent pulse oximetry of 85% with otherwise normal or near-normal vitals in a post-drowning patient)

Pediatric Respiratory Distress

Follow HandTevy dosing guidelines

Full ALS Assessment & Treatment

Pediatric Airway Protocol(s) as indicated
Oxygen as indicated
(high flow via Non-rebreather, CPAP 10cm, or BVM)

Pediatric Allergic Reaction Protocol as indicated

Differential Diagnosis based on assessmet:

WHEEZING / Asthma

Albuterol Nebulizer
2.5 mg
+/- Ipratropium 0.5 mg
Repeat as needed x 2

Methylprednisolone (Solumedrol) 2mg/kg IV/IM (max 125mg)

Persistent & severe

Magnesium 50 mg/kg IV / IO in NS (max 2g) over 10 minutes

Imminent respiratory arrest

Epinephrine 1:1000 solution 0.01mg/kg **IM** (max dose 0.5mg)
Repeat q 15 min. x 2 additional if needed

STRIDOR / Croup

Albuterol Nebulizer
2.5 mg
+/- Ipratropium 0.5 mg
Repeat as needed x 2

Methylprednisolone (Solumedrol) 2mg/kg IV/IM (max 125mg)

STRIDOR at rest

Epinephrine **Nebulizer**
1 mg (1:1000) in 2 mL NS
May repeat x 3
Or Racemic Epinephrine 2.25%/0.5ml if available

Imminent respiratory arrest

Epinephrine 1:1000 solution 0.01mg/kg **IM** (max dose 0.5mg)
Repeat q 15 min. x 2 additional if needed

Fluid Overload

Oxygen as indicated (high flow via Non-rebreather, CPAP 10cm, or BVM) see Pediatric Airway Protocol

Complete Foreign Body Obstruction

Conscious

- <1 y/o: 5 back blows & 5 chest compressions
- >1 y/o: abdominal thrusts

Unconscious

Start Compressions (round of 30)

Attempt removal w/ Magill forceps

Unable to ventilate w/ BVM

Exit to Pediatric Airway Protocol

Pediatric Emergencies

If clinical instability will not allow for safe transport to a Pediatric Comprehensive Center, proceed to the closest appropriate ED

PEARLS

- Important Hx: Time of onset, possibility of foreign body, fever/illness, sick contacts, hx of trauma, possibility of choking, Ingestion/OD, congenital heart disease
- Exam findings of respiratory distress: Nasal Flaring / Retractions / Grunting
- **Do not attempt foreign body removal in partial obstruction**
- CPAP contraindications: altered mental status & lack of spontaneous respirations
- If epiglottitis is suspected (i.e. drooling with respiratory, contact medical control for guidance)
- **If button battery ingestion suspected and child 12 months of age and older: give 2 teaspoons of Honey every 10 minutes.**

Leads to life - threatening esophageal burns and perforation.

Pediatric- Allergic Reaction/Anaphylaxis

Follow HandTevy dosing guidelines

Full ALS Assessment & Treatment

Classify as mild, moderate or severe (anaphylaxis)

Mild

Localized swelling/itching at the site

1 mg/kg IV/IO/IM Diphenhydramine (Benadryl) max of 50mg

Moderate

Only 1 system affected: Mild wheezing or hives

1 mg/kg IV/IO/IM Diphenhydramine (Benadryl) max of 50mg

Albuterol 2.5mg/3ml via nebulizer
Repeat x 2 for continued wheezing

Severe

Acute onset after exposure w/ 2 or more or hypotension alone:
Hives or mucosal swelling
Respiratory symptoms
Hypotension
GI symptoms

Anaphylaxis

Administer FIRST w/o delay

Epinephrine 1:1000 solution
0.01mg/kg **IM** (max dose 0.5mg)
Repeat q 3 min. x 2 if needed

Albuterol 2.5mg/3ml via nebulizer
Repeat x 2 for continued wheezing

1 mg/kg IV/IO/IM Diphenhydramine (Benadryl) max of 50mg

Methylprednisolone (Solumedrol) 2mg/kg IV/IM (max 125mg)

Anaphylactic Shock

Refractory to above and signs of hypoperfusion

20ml/kg NS IV/IO
Repeat as needed (total 60cc/kg)

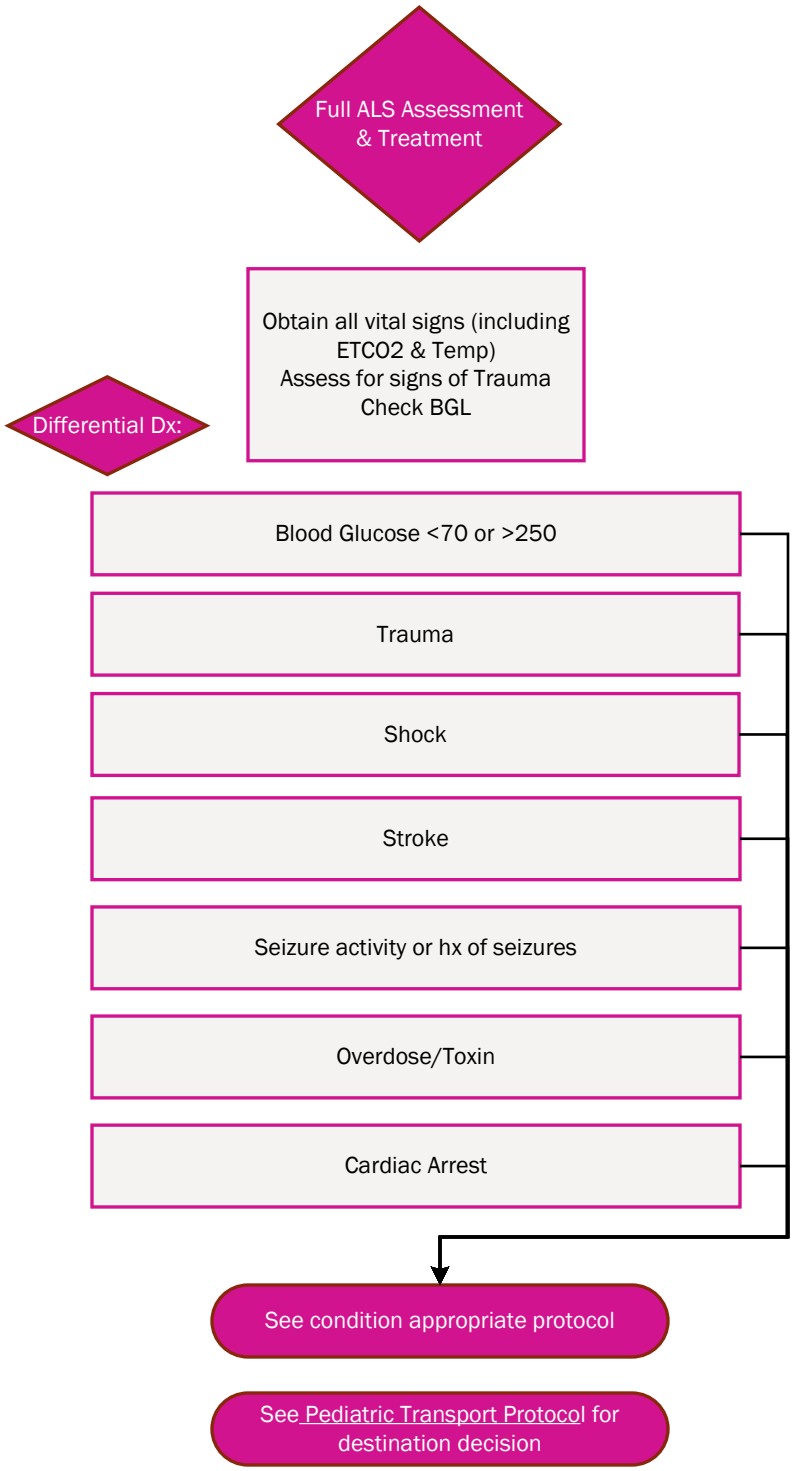
Epinephrine Spritzer

Pediatric Emergencies

PEARLS

- EMT may assist in administering patient's own autoinjector
- If history of life-threatening allergic reaction to the same allergen, administer Epinephrine IM
- Epinephrine 1:1000 is appropriate for the IM route ONLY
- Recheck dosing and concentration prior to administration of Epinephrine.
- Maintain SBP >70 + (age in years x 2)mmHg
- Anaphylaxis may occur with only respiratory + GI symptoms and not have a rash/skin involvement
- Push Dose Epinephrine in Pediatrics is not the same dosing as Adults, since it is weight based. Example: take the Pediatric cardiac arrest dose (0.01mg/kg of the 1:10,000 Epi up to 1ml) and dilute in 9ml NS syringe. Administer 1 ml q 2minute= 0.5mcg/kg/min Epinephrine.

Pediatric- Altered Mental Status



Pediatric- Behavioral

Full ALS Assessment & Treatment

Identify underlying causes (i.e hypoxia, post-ictal, hypoglycemia) & refer to appropriate protocol

Consider multi-disciplinary coordination with LEO to attempt verbal de-escalation techniques

Apply physical restraints if needed to ensure patient/crew safety

Ensure "P-SNORES"

- Position (NEVER PRONE or "hog tied")
- SpO2 Monitoring
- Nasal Capnography (ETCO2)
- Oxygen (6L)
- RASS
- EKG
- Sugar (BGL)

Pediatric Emergencies

For severe agitation compromising patient care or patient/crew safety or continued struggle against physical restraints:

Medications

Chart vitals before and after administration of medications when feasbile

Moderate
RASS +2/+3

Versed
0.1 mg/kg IV
0.2 mg/kg IM
2.5 mg max initial dose, 5mg max total dose

OR

Droperidol
> 13 y/o
2.5mg IV or 5mg IM

Severe
RASS +4

Versed
0.1 mg/kg IV
0.2 mg/kg IM
2.5 mg max initial dose, 5mg max total dose

PLUS

Droperidol
> 13 y/o
2.5mg IV or 5mg IM

RASS +4/ AND EXTREMELY VIOLENT= chemical takedown

Versed
0.1 mg/kg IV
0.2 mg/kg IM
5 mg max initial dose, 10 mg max total dose

OR

Ketamine
>13 y/o
4 mg/kg IM
0.5 mg/kg IV (50mg max)

**Airway equipment must be readily available*

If an inadequate response (i.e. patient remains with a RASS of +3/+4), an additional dose may be administered in 5 minutes (adhere to max)

All patients must have a RASS level documented after administration

**Any patient who is handcuffed by LEO & transported by EMS must be accompanied by LEO*

PEARLS

- Limit stimuli, genuine respect for feelings/circumstances, use your body language to convey listening, ask open-ended questions
- Antipsychotics are best for history of psychiatric emergencies or acute alcohol intoxication
- Versed is best for sedation when drug use is suspected
- Droperidol is contraindicated in pregnancy
- **RASS** +4 Combative| +3 Very Agitated| +2 Agitated| +1 Restless| 0 Alert & Calm
- **RASS** -5 Unarousable| -4 Deep Sedation (movement to stimulation)| -3 Moderate Sedation (eye opening to voice w/o eye contact)| -2 Light Sedation (brief eye contact to voice)| -1 Drowsy (eye opening & contact >10 seconds)

Pediatric Bradycardia <60

Follow HandTevy dosing guidelines

Full ALS Assessment & Treatment

Airway management as needed

Identify & treat reversible causes

Unstable: age related hypotension, altered mental status, signs of shock

YES

NO

Start Compressions

Epinephrine 0.01mg/kg 1:10,000 IV/IO

Atropine 0.02 mg/kg (min 0.1mg, max 0.5mg) x repeat once

Consider Transcutaneous Pacing

Sedation:
Fentanyl 1 mcg IN/IM/IV/IO (max 100mcg) may be administered prior to cardioversion if normotensive
Or
Ketamine 0.5mg/kg IV/IO max (50mg)

Pulseless Arrest

Exit to Pediatric Cardiac Arrest Protocol

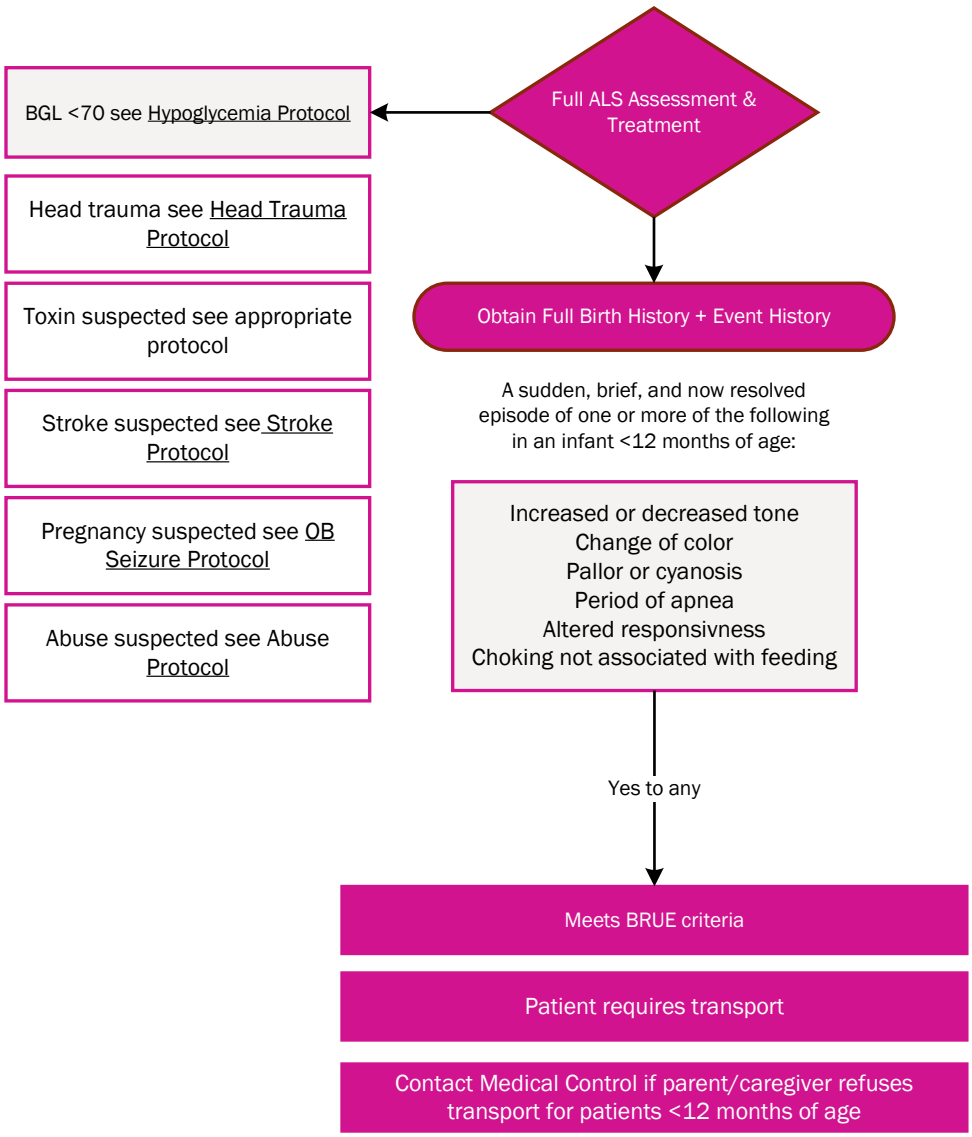
Observe & monitor

Reversible Causes:
Hypoglycemia
Hypoxia
Hypothermia
Hypovolemia
Hydrogen Ion (acidosis)
Hyperkalemia
Tamponade
Tension Pneumothorax
Trauma
Temperature
Thrombosis
Toxins

Pediatric Emergencies

PEARLS
- Set pacemaker to age-appropriate heart rate:
- infant: 120 bpm
- Child: 100 bpm
- Adolescent (>13): 80 bpm

Pediatric- BRUE/ALTE



Pediatric Emergencies

PEARLS

- History: Prematurity, complications at birth, circumstances surrounding event, length of episode, any parental intervention required, previous episodes, family hx of sudden infant death syndrome (SIDS), vaccine history, position of sleeping, recent infections, GERD, recent trauma, inappropriate mixture of formula
- Patients with BRUE criteria will have at least 1-2 hours of continuous pulse ox & cardiac monitoring in the ED. Higher risk infants are likely to be admitted.
- BRUE can be caused by many different entities; many of which can be life threatening. These include undiagnosed congenital heart disease, respiratory disease, seizures, infection, and many more. This is why it is paramount that these children be evaluated.

Pediatric Cardiac Arrest <13 years old

*Follow HandTevy dosing

Criteria for withholding resuscitation or DNR?

YES → To be valid, DNR must be signed & on yellow paper *contact Medical control for assistance if needed*

NO

EMS witnessed arrest

YES → Begin compressions & shock immediately without delay if indicated

NO

Withhold resuscitation attempt

Unresponsive, pulseless, apneic & any of the following:

- Decomposition
- Rigor mortis
- Dependent lividity
- Incineration
- Decapitation
- Hemicorporectomy

Begin compressions & ventilations 15:2 with BVM + 02

LUCAS may be applied only after 4 minutes of chest compressions if > 13 years old

High quality CPR
1. Push hard (>1.5 Infant; 2 inches children)
2. Push fast (100-120/min)
3. Push down, pull up (recoil)
4. Minimize interruptions
5. Avoid hyperventilation (1 q 3 seconds)

Change compressors every 2 minutes for rhythm check and monitor ETCO2 for quality

Vascular access with Peripheral IV or IO (attempt IV first)

0.01mg/kg 1:10,000 IV/IO Epinephrine every 3-5 minutes

20 minutes high quality CPR on scene

Ventricular Fibrillation or Pulseless Ventricular Tachycardica

1st Shock → 2 J/kg

Amiodarone 5mg/kg IV/IO
Or
Lidocaine 1mg/kg IV/IO

2nd Shock → 4 J/kg

May repeat Amiodarone 5mg/kg IV/IO or Begin Lidocaine Infusion 20mcg/kg/minute

3rd Shock → 10 J/kg

4th Shock → 10 J/kg

Magnesium 50mg/kg IV/IO over 2 min (max 2g)

Sodium Bicarbonate 1 meq/kg (max 50meq)

Asystole/PEA

- Hypovolemia
- Hypoxia
- Hydrogen Ion (acidosis)
- Hypoglycemia
- Hyperkalemia
- Hypo/Hyperthermia
- Tension Pneumothorax
- Toxins
- Thrombosis

Transport to closest ED (excludes free standing unless inadequate airway or traumatic arrest)

Pediatric Emergencies

PEARLS

- Utilize Newborn Resuscitation Protocol if <31 days old
- When the scene is safe, ALL cardiac arrest resuscitation attempts should be worked **on scene** for 20 minutes prior to transport unless refractory v-fib or v-tach.
- **Distal Femur is the preferred IO site in children less than 10 years old**
- If pads overlap or within 1 inch of each other, use anterior and posterior placement
- Continue compressions while charging for defibrillation
- If ETCO2 <10 improve chest compressions
- Special Considerations
- Maternal arrest: >20 weeks gestation, manually displace the uterus to the left.
- Renal Failure/Dialysis patient: consider hyperkalemia: Calcium Chloride 20mg/kg slow IV/IO max 1 gm, Sodium Bicarbonate
- Toxins: TCA Overdose- Sodium Bicarbonate; Opiate/Clonidine- Narcan;
  Beta Blocker- Glucagon, Calcium Chloride, Sodium Bicarbonate; Calcium Channel Blocker- Calcium Chloride

Post-Resuscitation (ROSC)

Follow General Approach to Cardiac Arrest Protocol if reassest

ROSC

Obtain vital signs

Perform 12 lead EKG

Address reversible causes

- Hypoglycemia
- Hypoxia
- Hypothermia
- Hypovolemia
- Hydrogen Ion (acidosis)
- Hyperkalemia
- Tamponade
- Tension Pneumothorax
- Temperature
- Thrombosis
- Toxins

Continuous pulse check & ETCO2 monitoring

Increased chances of re-arrest

Continuous rhythm monitoring
*continue any antiarrhythmic drips that were started during cardiac arrest

dsyrhythmias after cardiac arrest are common. If they persist, follow appropriate protocol

Transport to Pediatric Comprehensive Center

- Nemours Children's Health
- Arnold Palmer

Maintain SpO2= 94-99%
Avoid hyperventilation (ETCO2 35-45)

Age-related ventilation rates (w/ a pulse)
<1 y/o: every 1-2 seconds
1-5 y/o: every 3 seconds
5-12 y/o: every 4 seconds
>13 adult rate

Age Specific BP indicating hypotension:
0-28 days: SBP < 60
>1 month: SBP <70
1-9: SBP < 70 +(2 x Age in years)
>10: SBP < 90

Hypotension: 20cc/kg IV/IO NS bolus repeat x 2 (total 60cc/kg)
Reassess lung sounds
Proceed to vasopressor if fluid unresponsive or if signs of fluid overload

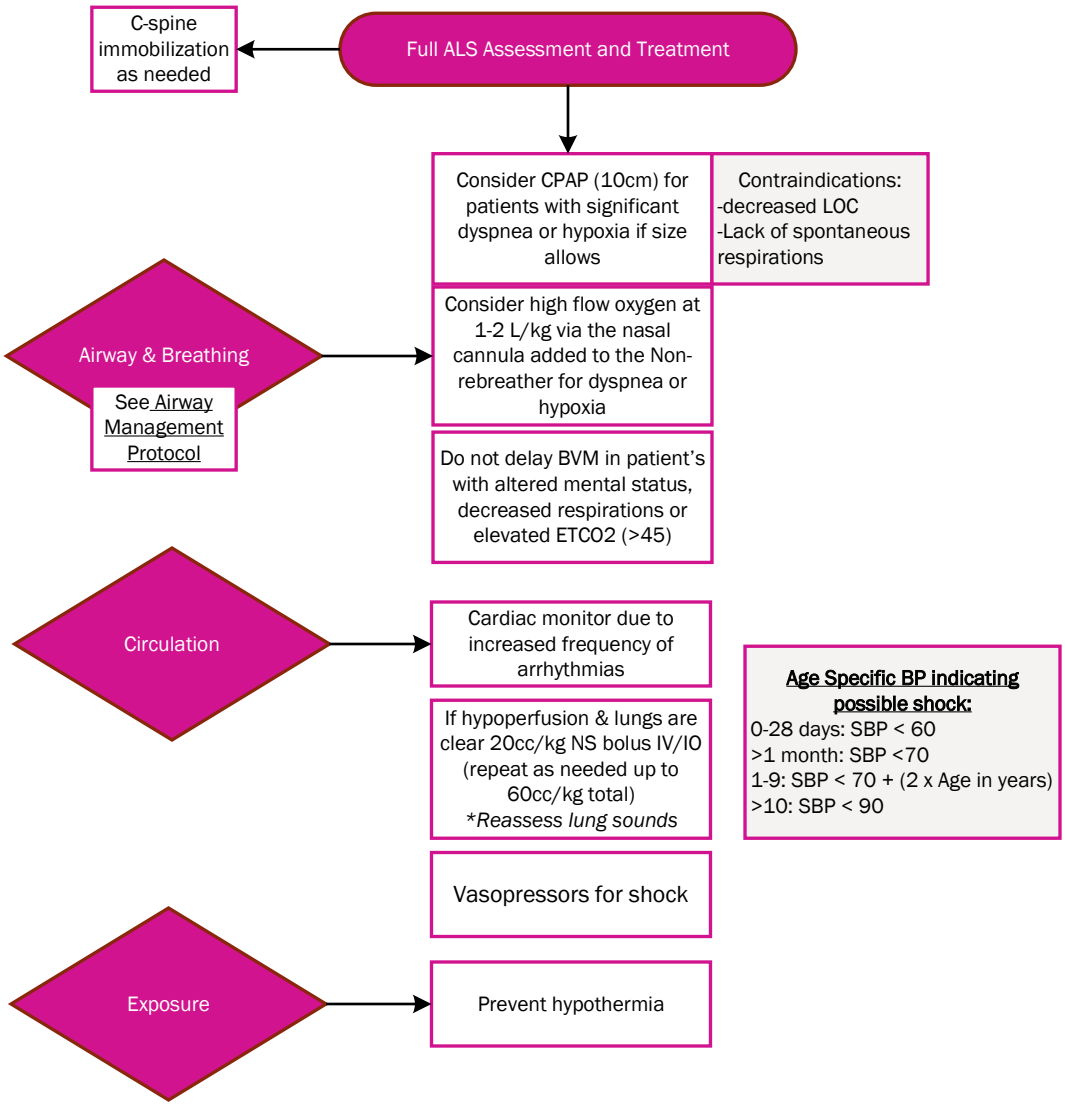
Epinephrine Spritzer 1mL q2 min. max 10mL
Transition to Vasopressor drip as needed

***Follow HandTevy dosing (use actual weight if known)**

Pediatric Emergencies

PEARLS
- Keep a finger on the pulse to quickly identify re-arrest.
- Preferred vasopressor in Pediatric cold shock (cool, clammy, cyanotic)= Epinephrine 0.05-5mcg/kg/min IV/IO; Preferred vasopressor in warm shock (warm, vasodilated)= Norepinephrine 0.1-2mcg.kg/min IV/IO

Pediatric- Drowning



Transport to Trauma Center for diving injury
Transport to Comprehensive Center for possible admit
Transport to Pediatric ED for minor submersion with a likely discharge

Medical Control contact required if parental refusal

Pediatric Emergencies

PEARLS

- Even if the patient looks well they should be transported. There is a delayed risk of pulmonary edema
- Pediatric Drownings are not considered trauma alerts unless they meet the specific Trauma Alert criteria
- When feasible, transporting the patient to the definitive care destination is best
- Push Dose Epinephrine in Pediatrics ("Epinephrine Spritzer") is not the same dosing as Adults, since it is weight based. Example: take the Pediatric cardiac arrest dose (0.01mg/kg of the 1:10,000 Epi) and dilute in 9ml NS syringe. Administer 1 ml q 2minute= 0.5mcg/kg/min Epinephrine
- Norepinephrine IV/IO 0.1-2 mcg/kg/min. Titrate to age appropriate BP

Pediatric- Hypoglycemia & Hyperglycemia

Altered mental status, combative, diaphoresis, seizures, abdominal pain, nausea/vomiting, rapid breathing, weakness, dehydration

BGL ≤69

Hypoglycemia

- Awake, alert, tolerates oral agent: give oral glucose solution
- IV/IO established: Dextrose 10% (Follow HandTevy dosing)
- Unable to obtain IV/IO Glucagon 0.5-1mg IM/IN (Follow HandTevy dosing)
- Reassess q 5 minutes until BGL >80

Hyperglycemia

BGL≥ 250

- If ETCO2 < 25 consider Diabetic Ketoacidosis
- 10ml/kg IV/IO NS Bolus if signs of hypoperfusion

Pediatric Emergencies

Medical Control contact required for Refusal after ALS intervention unless

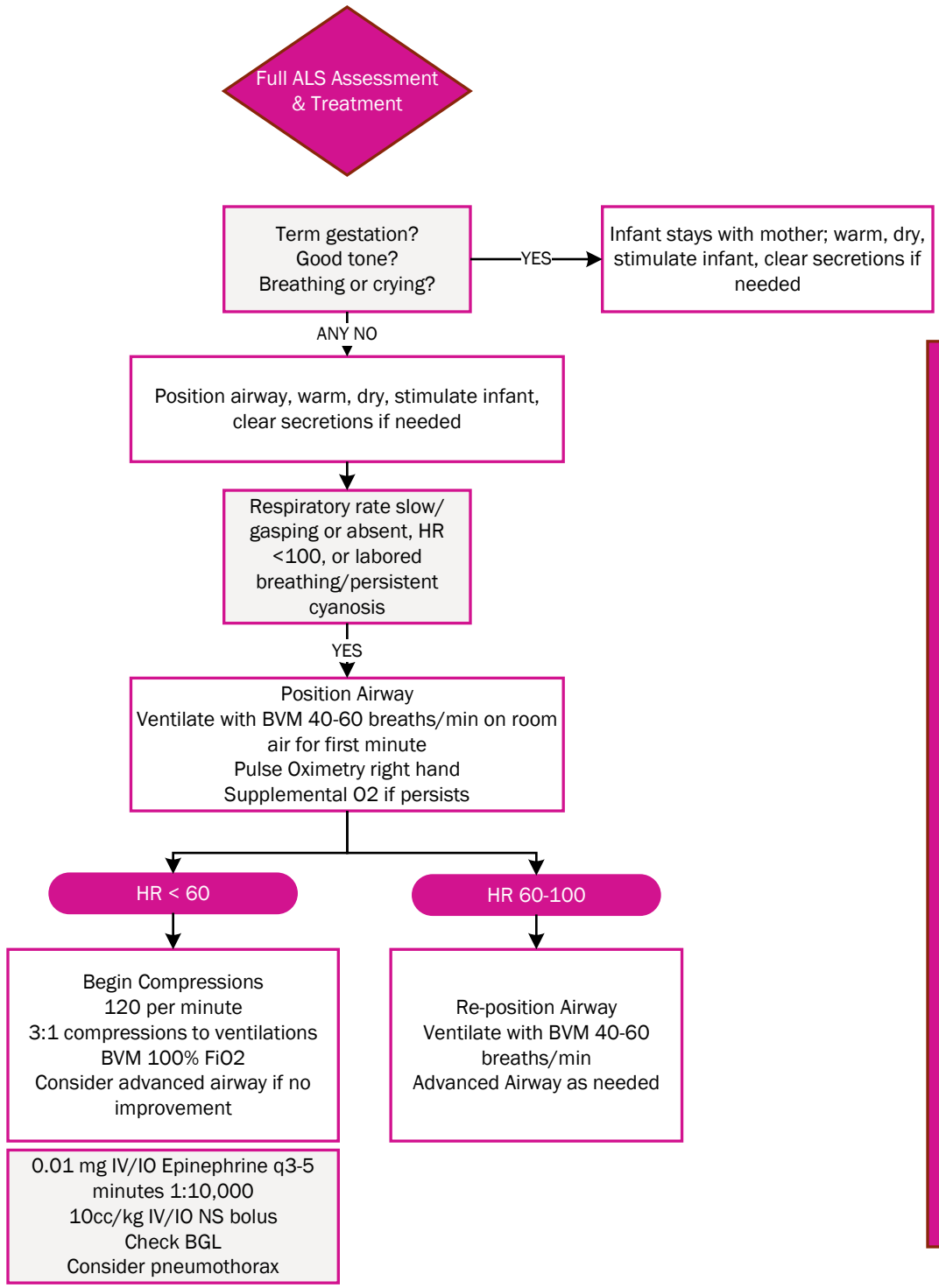
- Patient with known hx of Diabetes & not taking any oral diabetic agents
- Baseline mental status and no new neurological deficits
- Adult caregiver must be with patient
- BGL >80 plus ability to eat & availability of food on scene
- Parent/caregiver has the capacity to make informed health decisions

PEARLS

- New onset DKA can present as flu like illness with normal lung sounds and tachypnea. Take precaution to check BGL in these patients if appropriate.
- DKA is usually precipitated by an acute illness (infection, dehydration)
- Patients on long-acting oral medications and long acting Insulin places the patietn ast risk for recurrent hypoglycemia even after normal BGL established. Metformin is not a long-acting oral medication.

Pediatric- Newborn Resuscitation

Follow HandTevy dosing guidelines



Pediatric Emergencies

PEARLS

- BVM is the most important treatment with poor respirations or persistent bradycardia
- Compressions- 2 thumbs encircling the chest and back
- Document 1 and 5 minute APGAR however do not delay resuscitation to obtain APGAR score
- If labored breathing or persistent cyanosis with a normal heart rate, consider CPAP
- Targeted SpO2 after Birth for infants requiring resuscitation
- 1 min 60%-65%
- 2 min 65%-70%
- 3 min 70%-75%
- 4 min 75%-80%
- 5 min 80%-85%
- 10 min 85%-95%

Pediatric- Pain Management

Follow HandTevy dosing guidelines

Full ALS Assessment & Treatment

Pain Rating

MODERATE TO SEVERE

Fentanyl 1mcg/kg IN (max 100mcg, total max 200mcg)
IM/IV/IO if IN not accessible

Document pain level after administratoin

Monitor ETCO2, O2 SAT, BP, HR

Nausea or Vomiting

Inhale Isopropyl Alcohol wipe 3 times every 15 minutes

Odansetron (Zofran) 0.1 mg/kg SLOW IV over 2-5 minutes
13-17 y/o 4mg IV or ODT

Pediatric- Refusals/Non-Transports

Parent/legal guardian requests non-transport

Full ALS Assessment as allowed

Life or limb threatening

NO

A parent or legal guardian can refuse treatment of the minor if they demonstrate capacity AND there is no life-theatening immediate danger

Capacity Assessment

- ☐ AAO x 4, GCS 15
- ☐ Insight and judgement
- ☐ No psychiatric decompensation
- ☐ No signs of intoxication

YES

Lacks capacity

Has capacity

Assess Risk of Refusal

High Risk or < 12 months of age

Low risk & > 12 months of age

Contact Medical Control

Contact LEO for assistance (temporary custody under neglect or abuse)

Allow refusal/non-transport & document evidence of decision making capacity such as:

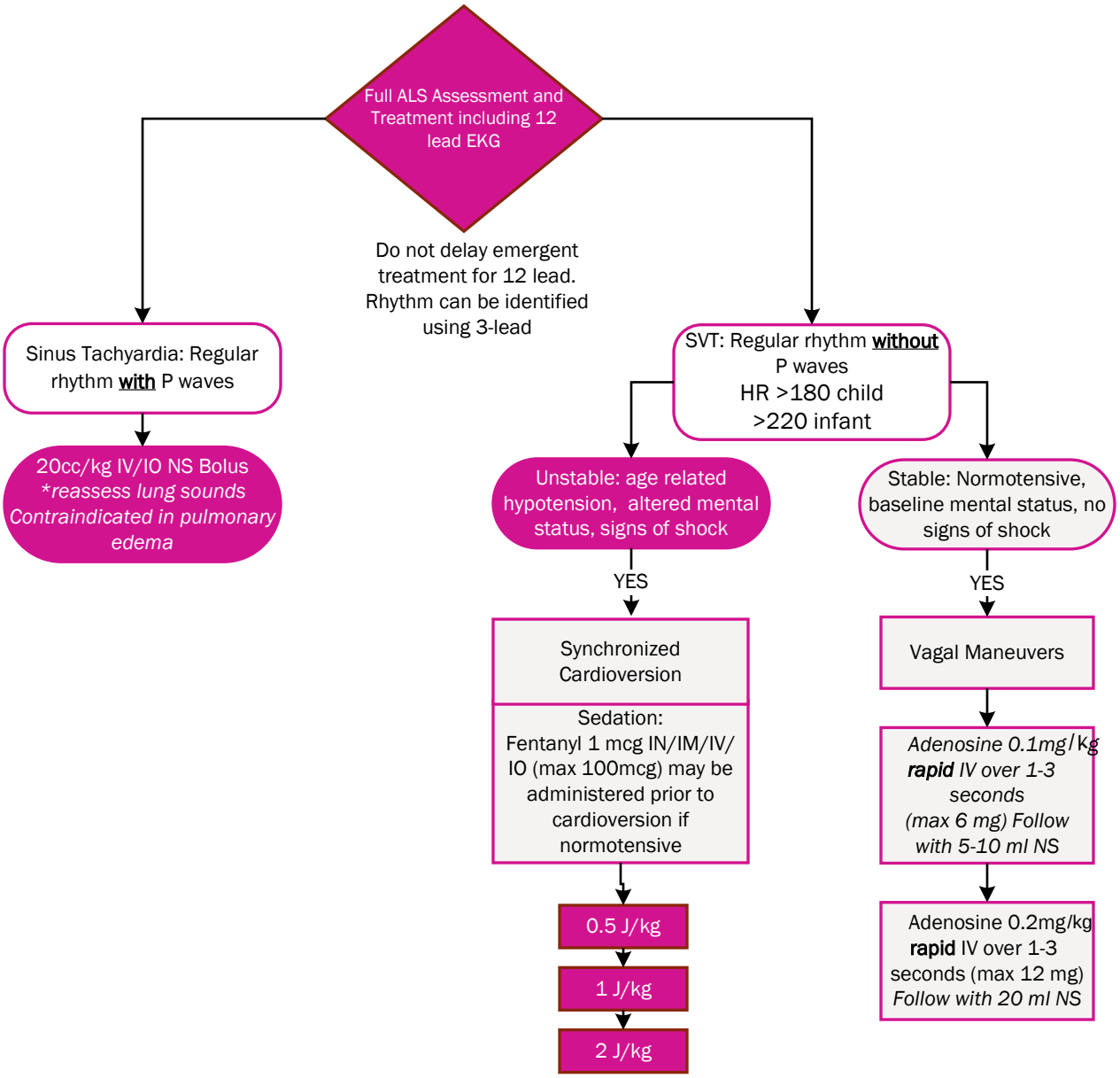
- The legal Guardian is alert, oriented and understands and answers questions appropriately
- The physical assessment with any specific findings
- The specific potential consequences told to the Legal Guardian of not receiving medical care/ evaluation
- The alternatives to care (contacting private physician immediately, POV, etc.)

Pediatric Emergencies

PEARLS

- See Care of Unaccompanied Minor Protocol as needed
- Laws regarding informed consent are state specific. It is important to be familiar with your state's regulations.
- See infographic above for important elements to include in medical control consultation
- Medical control contact not required for a minor MVC in <12 months of age where 911 was activated by an outside party and there are no complaints or injuries in any of the passengers and the infant has a normal assessment and is without injury.

Regular Narrow Complex Tachycardia

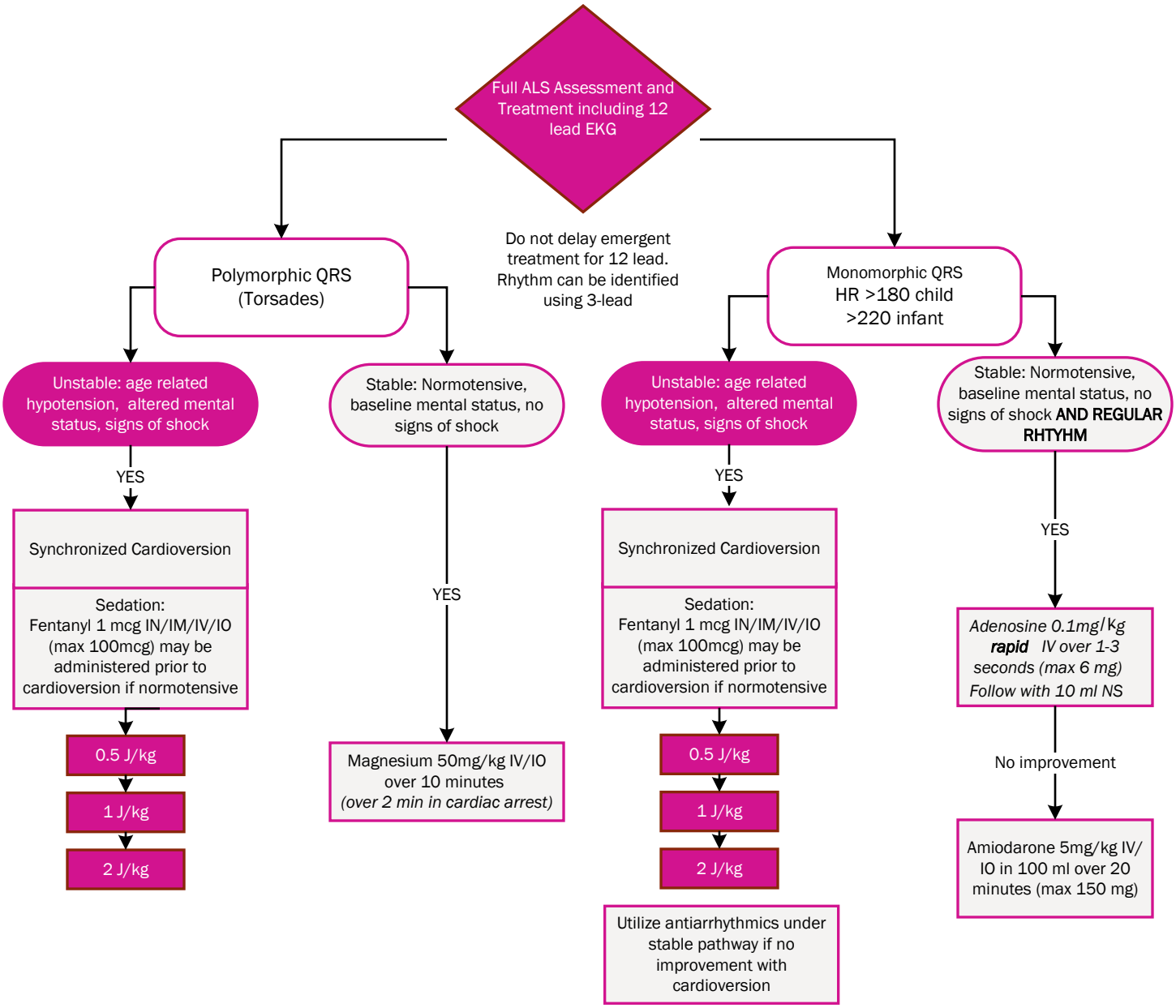


Pediatric Emergencies

PEARLS

- DDx: Arrhythmia, Dehydration, Sepsis, Fluid Overload, Pulmonary Embolism, Thyrotoxicosis, Toxin/Ingestion, Acute Coronary Syndrome, Electrolyte abnormality
- Sinus tachycardia can be a compensatory mechanism for an underlying illness. Removing this compensation by treating with medications or cardioversion may cause the patient to acutely decompensate. For this reason, it is important to analyze the rhythm carefully. If the rhythm is regular and there are no P-waves, it is safe to treat as Supraventricular Tachycardia.
- Treat only if symptomatic, otherwise monitor and reassess
- Unstable/Cardiopulmonary compromise= weak, thready or absent peripheral pulses, decreasing consciousness, tachypnea/ respiratory difficulty, central cyanosis and coolness, hypotension

Wide Complex Tachycardia

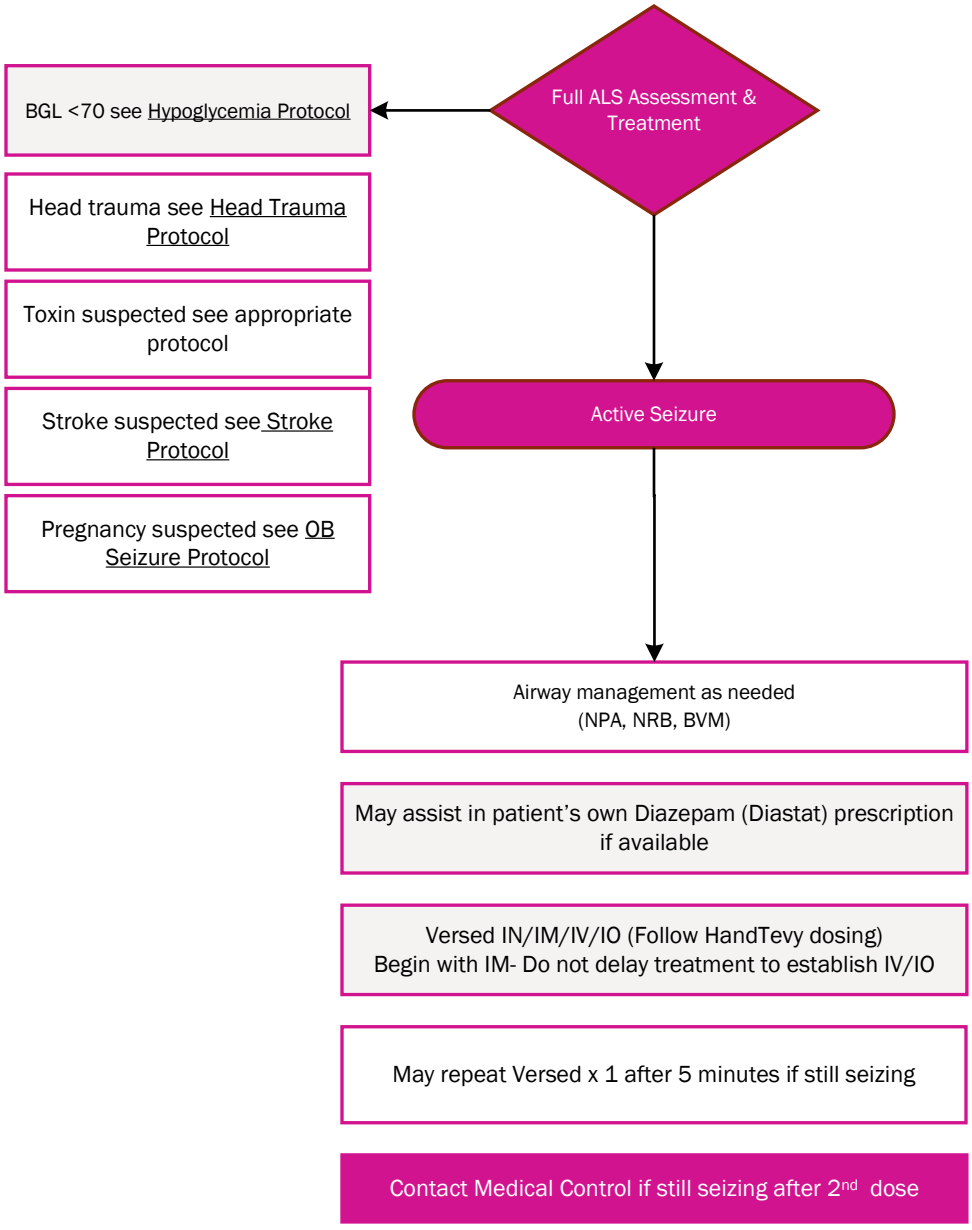


Pediatric Emergencies

PEARLS

- DDx: Arrhythmia, Dehydration, Sepsis, Fluid Overload, Pulmonary Embolism, Thyrotoxicosis, Toxin/Ingestion, Acute Coronary Syndrome, Electrolyte abnormality
- Wide Complex is usually SVT with Aberrancy in kids. Vtach is typically in patients with underlying heart disease.
- Sinus tachycardia can be a compensatory mechanism for an underlying illness. Removing this compensation by treating with medications or cardioversion may cause the patient to acutely decompensate. For this reason, it is important to analyze the rhythm carefully. If the rhythm is regular and there are no P-waves, it is safe to treat as Supraventricular Tachycardia.
- Treat only if symptomatic, otherwise monitor and reassess
- Unstable/Cardiopulmonary compromise= weak, thready or absent peripheral pulses, decreasing consciousness, tachypnea/ respiratory difficulty, central cyanosis and coolness, hypotension

Pediatric- Seizures



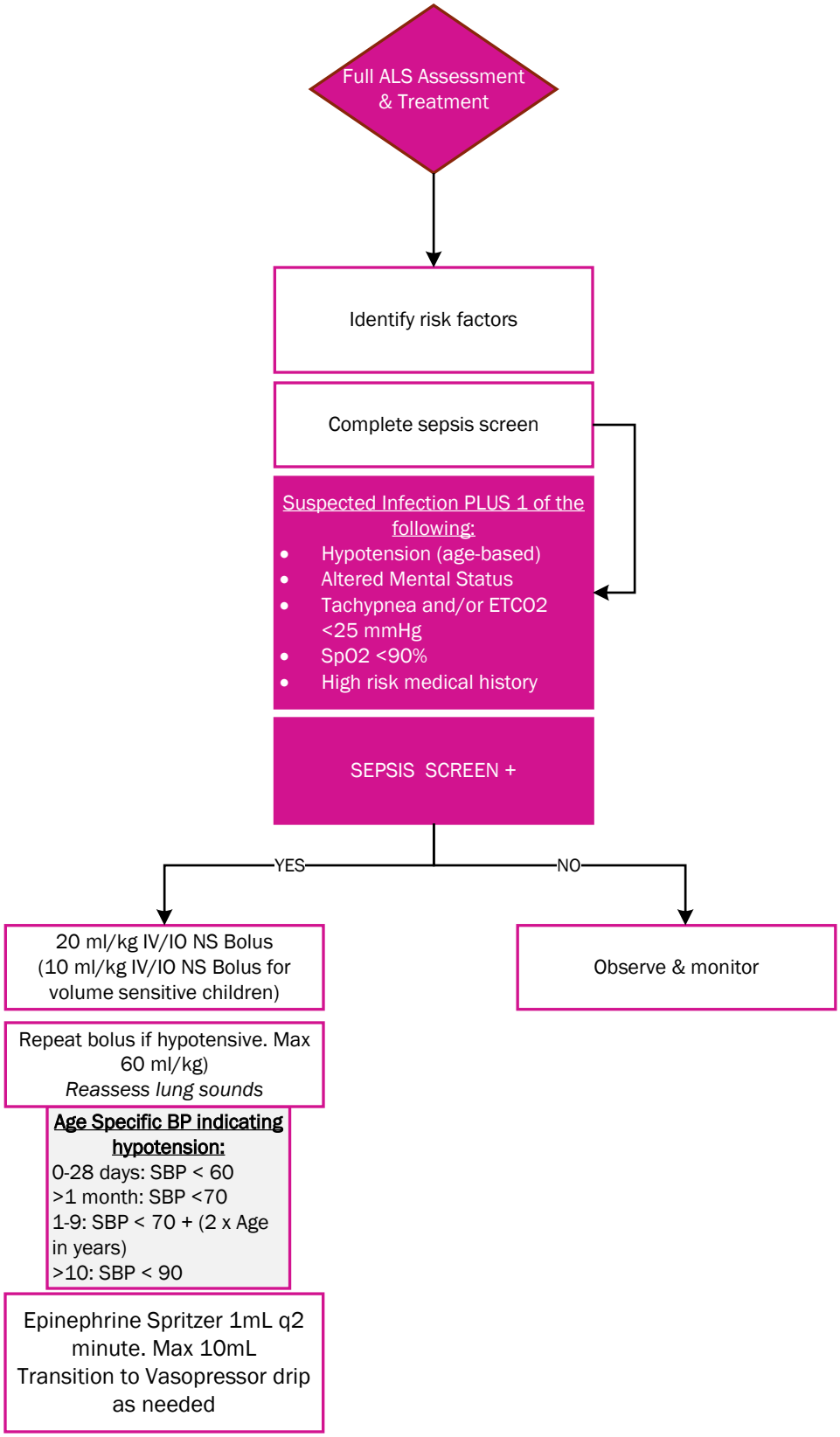
Pediatric Emergencies

PEARLS

- Ddx: Epilepsy (Hx of seizures), medication non-compliance, toxin, hypoxia, hypoglycemia, fever, head trauma, infection
- Febrile seizures: diagnosed in kids 6 months- 5 years old
- Status Epilepticus: two or more episodes of seizure activity between which the patient does not regain consciousness or a seizure lasting longer than 5 minutes
- Some patients with a diagnosed seizure disorder will have their own Diazepam rectal gel (Diastat). This can be given if no IV is available.

Pediatric Suspected Sepsis

Follow HandTevy dosing guidelines



PEARLS

- High risk medical history: altered mental status, asplenia, organ transplant, cancer, cerebral palsy, sickle cell, indwelling catheters, immunodeficient, bed bound, mental delay, organ transplant, indwelling catheter
- Volume-sensitive children: neonates, congenital heart disease, chronic lung disease, chronic renal failure
- Norepinephrine IV/IO 0.1-2 mcg/kg/min. Titrate to age appropriate BP
- Push Dose Epinephrine in Pediatrics ("Epinephrine Spritzer") is not the same dosing as Adults, since it is weight based. Example: take the Pediatric cardiac arrest dose (0.01mg/kg of the 1:10,000 Epi up to 1ml) and dilute in 9ml NS syringe. Administer 1 ml q 2 minute= 0.5mcg/kg/min Epinephrine

Pediatric- Shock

Full ALS Assessment and Treatment

Evaluate for signs and symptoms of Shock

- Hypotensive for age (although late sign)
- Bradycardia or Tachycardia
- Cool extremities
- Mottled skin appearance
- Pallor
- Delayed capillary refill
- Diaphoresis
- Altered mental status
- Poor feeding

Age Specific BP indicating possible shock:
0-28 days: SBP < 60
>1 month: SBP <70
1-9: SBP < 70 + (2 x Age in years)
>10: SBP < 90

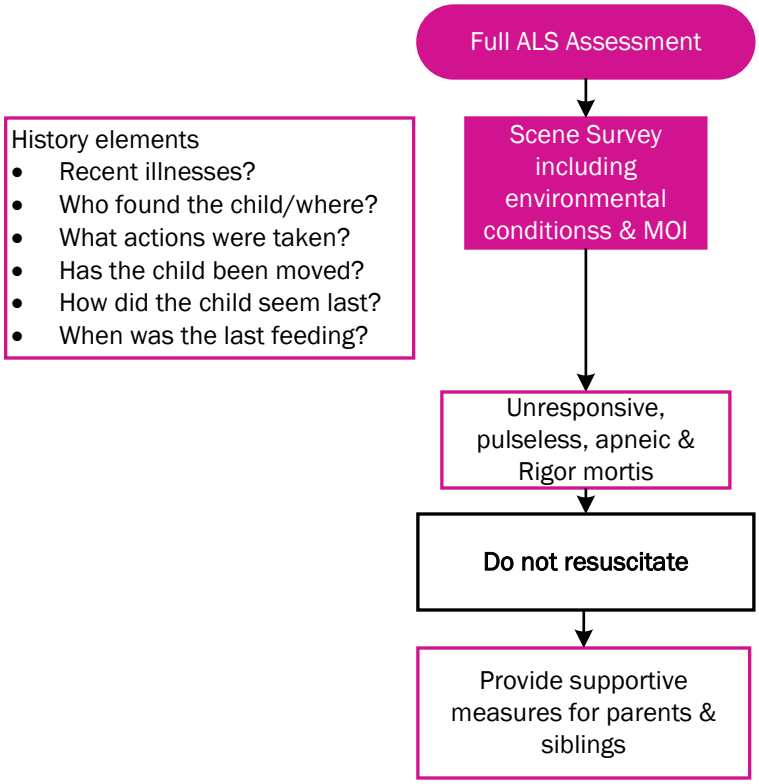
Treat possible causes of Shock

Distributive Shock (i.e. sepsis, anaphylaxis)	20cc/kg NS bolus IV/IO (repeat as needed up to 60cc/kg total) *Reassess lung sounds*	See specific Protocol
Cardiogenic Shock (i.e. Congenital Heart Disease, Congestive Heart Failure, Myocarditis, STEMI)	5-10cc/kg NS Bolus IV/IO *Reassess lung sounds & repeat If improvement	Vasopressors
Adrenal Insufficiency or Congenital Adrenal Hyperplasia	2 mg/kg IV/IO Methylprednisolone (Solumedrol) max 125mg or use patient's prescribed steroid carried by patient < 1 y/o :25 mg, 1-12 y/o: 50 mg or >12 y/o: 100mg)	Vasopressors
Obstructive Shock (i.e. Tension Pneumothorax, Cardiac Tamponade, Pulmonary Embolism)	20cc/kg NS bolus IV/IO (repeat as needed up to 60cc/kg total) *Reassess lung sounds*	Vasopressors
	*Utilize ultrasound as available to confirm diagnosis	
	Needle Decompression for Tension Pneumothorax	
Hypovolemic Shock (i.e. hemorrhage, dehydration)	20cc/kg NS bolus IV/IO (repeat as needed up to 60cc/kg total) *Reassess lung sounds*	Vasopressors
	≥ 5 y/o: 15 mg/kg TXA (max 2g) if suspected cause is hemorrhagic (i.e. miscarriage, postpartum, post tonsillectomy, traumatic indications)	

Pediatric Emergencies

PEARLS
- Shock may be present with normal blood pressure
- Tachycardia may be the first and only sign of Pediatric shock
- Push Dose Epinephrine in Pediatrics ("Epinephrine Spritzer") is not the same dosing as Adults, since it is weight based. Example: take the Pediatric cardiac arrest dose (0.01mg/kg of the 1:10,000 Epi up to 1ml) and dilute in 9ml NS syringe. Administer 1 ml q 2 minute= 0.5mcg/kg/min Epinephrine.

Death of a Child & Sudden Infant Death (SIDS)



- Reassure parents that there was nothing they could have done to prevent death
- Allow the parents to see the child & say goodbye
- Maintain a supportive, professional attitude no matter how the parents react
- Whenever possible, be responsive to parental requests. Be sensitive to ethnic and religious needs or responses and make allowances for them

Consider CISM for prehospital personnel

PEARLS

- SIDS is the leading cause of infant mortality in the United States and the causes are unknown
- Refrain from asking judgmental or leading questions. Do not place blame or make accusations

Pediatric- Stroke

Full ALS Assessment & Treatment

BGL <70 see Hypoglycemia Protocol

Head trauma see Head Trauma Protocol

Actively seizing see Seizure Protocol

Proactively Avoid Hypotension, Hypoxia, & Hypocapnia/Hypercapnia

Airway management as indicated
(BVM is an acceptable end point in Pediatric airway management)

20ml/kg of NS if hypotensive (based on age). May repeat at 20ml/kg bolus to a total max of 60ml/kg

Refractory Hypotension- Utilize HandTevy for Vasopressor dosing

Acute Signs of Herniation?

- Unilateral or bilateral dilation of pupils
- Posturing
- Cushing's Triad: Hypertension, Bradycardia, abnormal breathing pattern

Elevate stretcher to 30 degrees

Temporarily increase ventilations with an ETCO2 goal of 30-35 mm Hg

Complete Stroke Assessment for any of the following:

"Worst headache of their life", unilateral weakness or numbness, difficulty speaking or walking, vision loss, seizures, vertigo

Stroke Screen Positive when:
Absence of trauma
+
Facial Asymmetry
Arm Drift
Abnormal Speech
And/or
Abnormal Finger to Nose/gait

Obtain "Last Known Well"

Obtain family contact information & med list if available

Transport to Pediatric Comprehensive Center

Pediatric Emergencies

PEARLS

- Ddx/Causes: Subarachnoid Hemorrhage, Intraparenchymal Hemorrhage, TIA, Seizure, Todd's Paralysis, Hypoglycemia, Tumor, Trauma, Sickle Cell Anemia, other causes of altered mental status (toxin, infection, hypoxia, shock)
- "Last Known Well" or "Time of Onset" (report an actual time, i.e. 16:45)
- Attempts at establishing a "last known well" is important on scene, as family may arrive to the hospital later. Without this information, patients may not be able to receive htrombolytics or intervention.
- "Wake Up Stroke": time starts when patient was last awake or symptom free

Pediatric- Suspected Abuse & Neglect

All health care clinicians are obliged by law to report cases of suspected child or vulnerable adult abuse and/or neglect to local police or adult/child protective service agencies.
Please call DCFS (1-800-25-ABUSE) (1-800-252-2873) and also report suspicions to the ED physician & ED charge nurse

Full ALS Assessment and Treatment

Treat obvious injuries & refer to condition specific protocol

Document:
Environmental surroundings
Child's interaction with parents
Caretakers description of event
Physical assessment findings
Discrepancies in history and injures

Physical

- Unexplained bruises
- Numerous bruises
- Cigarette burns
- Bleeding, irritation or pain of the genitals
- Child with repeated injuries/multiple calls to the same address
- Flat/bald spots on head (infants)
- Unexplained wet clothing

Behavioral

- History of minor incident inconsistent with major injury
- MOI inconsistent with developmental age
- Inappropriate fear of parent
- Inconsistent explanation for injury
- Nervous disorders (rash, hives, stomachaches) Age-inappropriate behaviors (bedwetting)
- Lack of adult supervision
- Delay in seeking medical care

Sexual Abuse

- May be present without apparent signs of physical abuse
- Discourage patient from going to the bathroom
- Don't allow patient to change clothes or wash
- Bring clothing to hospital

Parent/caregiver requests refusal:
If possible, remain at the scene
Call police to request protective custody
Do not confront caregivers
Call Medical Control

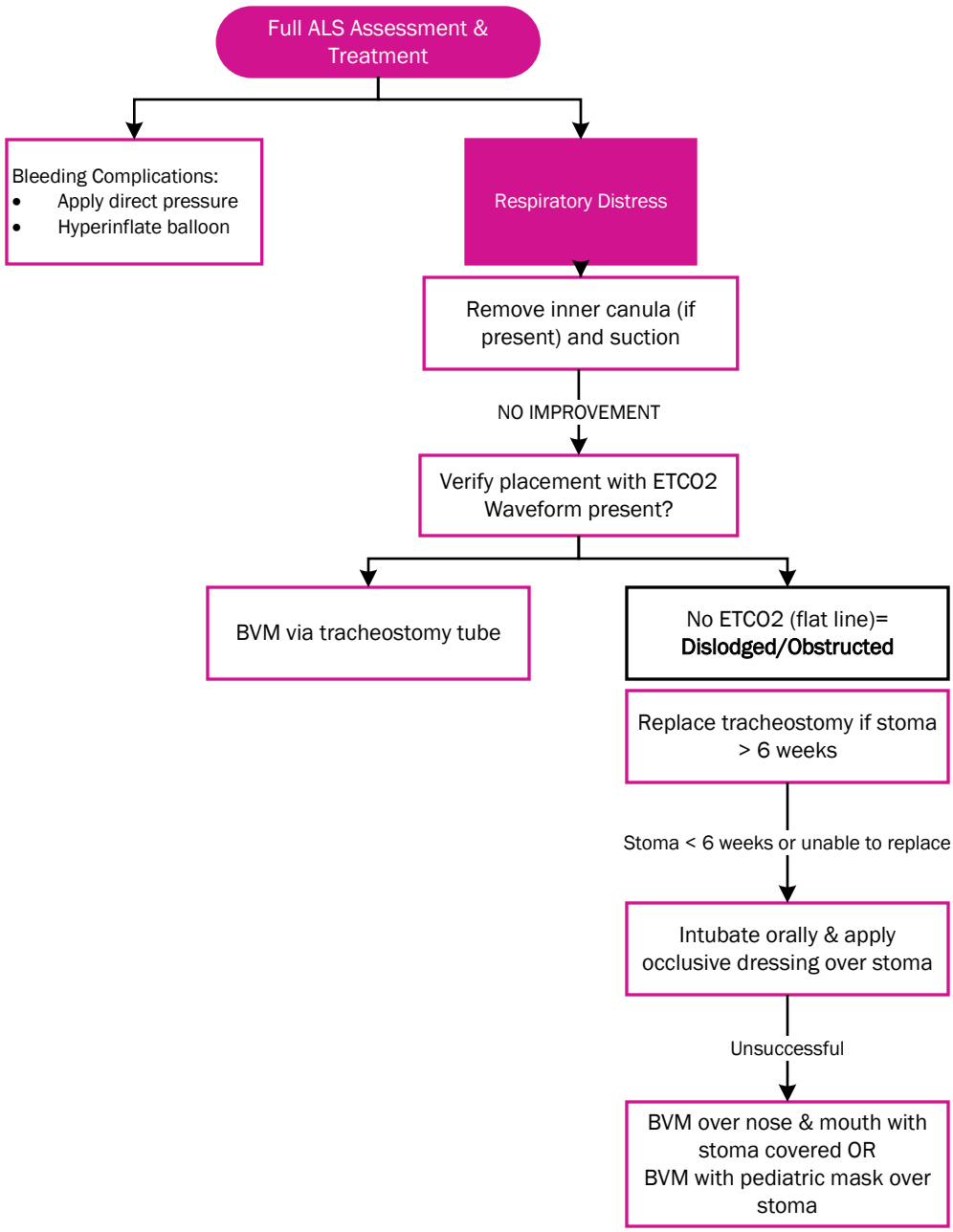
Pediatric Emergencies

PEARLS

- The following are some common forms of neglect:
- Environment is dangerous to the child (e.g. weapons within reach, playing near open windows without screen/guards, perilously unsanitary conditions, etc.).
- Caretaker has not provided, or refuses to permit medical treatment of child's acute or chronic life-threatening illness, or of chronic illness, or fails to seek necessary and timely medical care for child.
- Caretaker appears to be incapacitated (e.g. extreme drug/alcohol intoxication, disabling psychiatric symptoms, prostrating illness) and cannot meet child's care requirements.
- Child appears inadequately fed (e.g. seriously underweight, emaciated, or dehydrated) inadequately clothed, or inadequately sheltered.
- Child is found to be intoxicated or under the influence of an illicit substance(s).

Tracheostomy Complications

**Follow HandTevy dosing*



Pediatric Emergencies

PEARLS

- If laryngectomy patient, you will only be able to ventilate with BVM at the stoma site. Oral intubation is also not possible
- Many caregivers will have extra appropriately sized tracheostomy tubes
- If ventilatory dependent, first detach the ventilator and administer Bag Valve Mask ventilations

Toxin/Overdose

**Follow HandTevy dosing*

Overdose, Poisoning, Ingestion

NO

Consider need for HAZMAT alert

Contact Poison Control 800-222-1222

Full ALS Assessment & Treatment

Airway Protocol as indicated

See Seizure Protocol

If BGL<70 see Hypoglycemia Protocol

If signs of shock see Shock Protocol

Pediatric Emergencies

Beta Blocker/Calcium Channel Blocker

- Glucagon 0.1 mg/kg IV/IO as availlable
- Calcium Chloride 20 mg/kg IV/IO over 2 minutes *Contraindicated in Digoxin*
- See Bradycardia Protocol
- Treat signs of Hyperkalemia
  - Calcium Chloride 20 mg/kg IV/IO over 2 minutes
  - Albuterol 2.5mg via nebulizer
  - (signs of acidosis) Sodium Bicarbonate 1 meq/kg (max 50meq)

Organosphosphate

- Atropine 0.02 mg/kg IM/ IV/IO repeat every 5 minutes until dry secretions & adequate oxygenation

Carbon Monoxide/ Cyanide

- High Flow Oxygen
- Consider transport to Hyperbaric facility
  - CO level >25%
  - CO level > 15% & pregnant
  - CO level > 15% + AMS
  - CO level >15% + syncope or seizures
- Consider Cyanokit for serious smoke inhalation victims (altered, hypotension, respiratory failure, dysrhythmias)

TCA's

- Sodium Bicarbonate 1 meq/kg (max 50meq) Repeat every 3-5 minutes until QRS narrows

Opiate

- Narcan 0.1mg/kg IN/IM/ IV/IO Titrate to adequate ventilation & oxygenation *(not to restore consciousness)*

PEARLS

- Always try to obtain TIME of ingestion
- Bring bottles/contents to the ED
- Beta Blockers (Atenolol, Timolol, Carvedilol, Metoprolol)- bradycardia, hypotension, altered mental status, seizure, hypoglycemia
- Calcium channel blocker (Amlodipine)- bradycardia, hypotension
- TCA (Amitriptyline): seizure, dysrhythmias, hypotension, altered mental status
- Stimulants: tachycardia, hypertension, hyperthermia, dilated pupils, seizures (Versed is the drug of choice for severe symptoms)
- Anticholinergic: tachycardia, hyperthermia, dilated pupils, altered mental status
- Opiates/Depressants: bradycardia, hypotension, hypothermia, respiratory depression
- Insecticides (Cholinergics/Organophosphates): increased secretions, nausea, vomiting, diarrhea, pinpoint pupils, bronchospasm, defecation
- Contraindications to Hyperbaric chamber: cardiac arrest, burns, trauma
- Odors: Almond=Cyanide, Fruit=Alcohol, Garlic= Arsenic, Parathion, Mothballs= Camphor, Rotten eggs= Hydrogen Sulfide, Wintergreen= Methyl Salicylate

Pediatric- Transport

Safe Transport

Any child who fits on a length-based resuscitation tape must be properly restrained in a safety seat or harness

Child where spinal immobilization is not required:
Size appropriate child restraint system (CRS) that complies with FMVSS 213 for passenger vehicles, cot mounted devices, commercial immobilization devices and long board/harness immobilizer systems.

Condition where Spinal Immobilization and/or lying flat is required:
Secure board w patient to the stretcher head first with three horizontal restraints across torso & vertical restraint across each shoulder.

Multi-patient scenario:
When possible transport each as a single patient according to the above. For mother & newborn, transport newborn in appropriate CRS device in rear-facing provider seat w/ forward facing belt path that prevents forward & lateral movement, leaving stretcher for mother.

It is unacceptable to transport a Pediatric patient in the arms of an adult.

Destination

Closest ED/Freestanding ED

- Medical Cardiac Arrest (excludes Freestanding ED's)
- Minor injuries, stable vitals, no O2 requirement, not likely to be admitted
- Unstable where additional transport time to Specialty center could negatively impact care (excludes Freestanding ED's)
- Unstable/Non-patent airway
  - -Unable to successfully oxygenate/ventilate with airway adjuncts & BVM techniques by most experienced
  - -Advanced airway immediately required to prevent death

Pediatric Emergency Departments (24 hrs):
-Advent Celebration
Pediatric Comprehensive Centers:
-Nemours Children's
-Arnold Palmer
Pediatric Trauma/Burn Center:
-Arnold Palmer

Pediatric Comprehensive Center

- Post-ROSC
- Stroke
- Likely to be admitted (see examples)
- Emergency related to a known condition previously treated at their medical home

Ex. Admits
-altered mental status
-more than 2 seizures w/o known hx
-respiratory distress
-BRUE
-fever less than 60 days old
-shock with abnormal Pediatric Assessment Triangle
-prolonged or unstable submersion

Pediatric Trauma Center

- Meets Trauma Alert Criteria
- Meets any 1 red criteria
- Meets any 2 blue criteria alone
- Meets any 1 local criteria
- Meets Trauma Gray criteria
- Meets any 1 blue criteria with a high risk mechanism
- Multisystem injury
- Pelvic or Femur Fracture
- Complex hand or wrist fractures
- Chest wall instability
- Blunt abdominal injury (seatbelt sign or firm or distended abdomen)
- Death in the same vehicle
- Any crash > 35mph with pregnancy
- Fall from 10 foot height or more
- Ejected from vehicle
- Pedestrian/Bicyclist thrown, crushed, run over, or with significant impact (with complaints)
- Paramedic Judgement

Pediatric Emergencies

Pediatric- Unaccompanied Minor

Unaccompanied Minor < 18 years old

All efforts should be made to contact the parent(s) or legal guardian to obtain informed consent

Emergency evaluation and treatment may begin while attempting to obtain consent, only in cases of life or limb threatening emergencies. This falls under "implied consent".

If unavailable

Delay all nonurgent diagnostic and treatment decisions until the parent or legal guardian can be reached for informed permission or consent.

If available

EMS personnel should document all informed consent discussions, including the identity of the person providing consent and the efforts made to obtain consent from the patient's legal guardian, if unavailable.

Florida decision makers

1. Parent or Step-parent
2. Grandparent
3. Adult Sibling
4. Adult aunt or uncle

Emancipated Minors

- Married
- Pregnant when decision relates to pregnancy
- Legally emancipated

Parent/caregiver requests refusal:
If possible, remain at the scene
Call police if needed
Call Medical Control if high risk

Pediatric Emergencies

PEARLS

- Treat emergently if delay in medical care would endanger the health or well-being of the minor
- Although unemancipated minors are unable to provide consent, it is important to include them in the plan of care, as appropriate for the patient's age, stage of development, and level of understanding.