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PEDSI GLOBAL HEALTH (USA)

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PALS Systematic Approach Algorithm



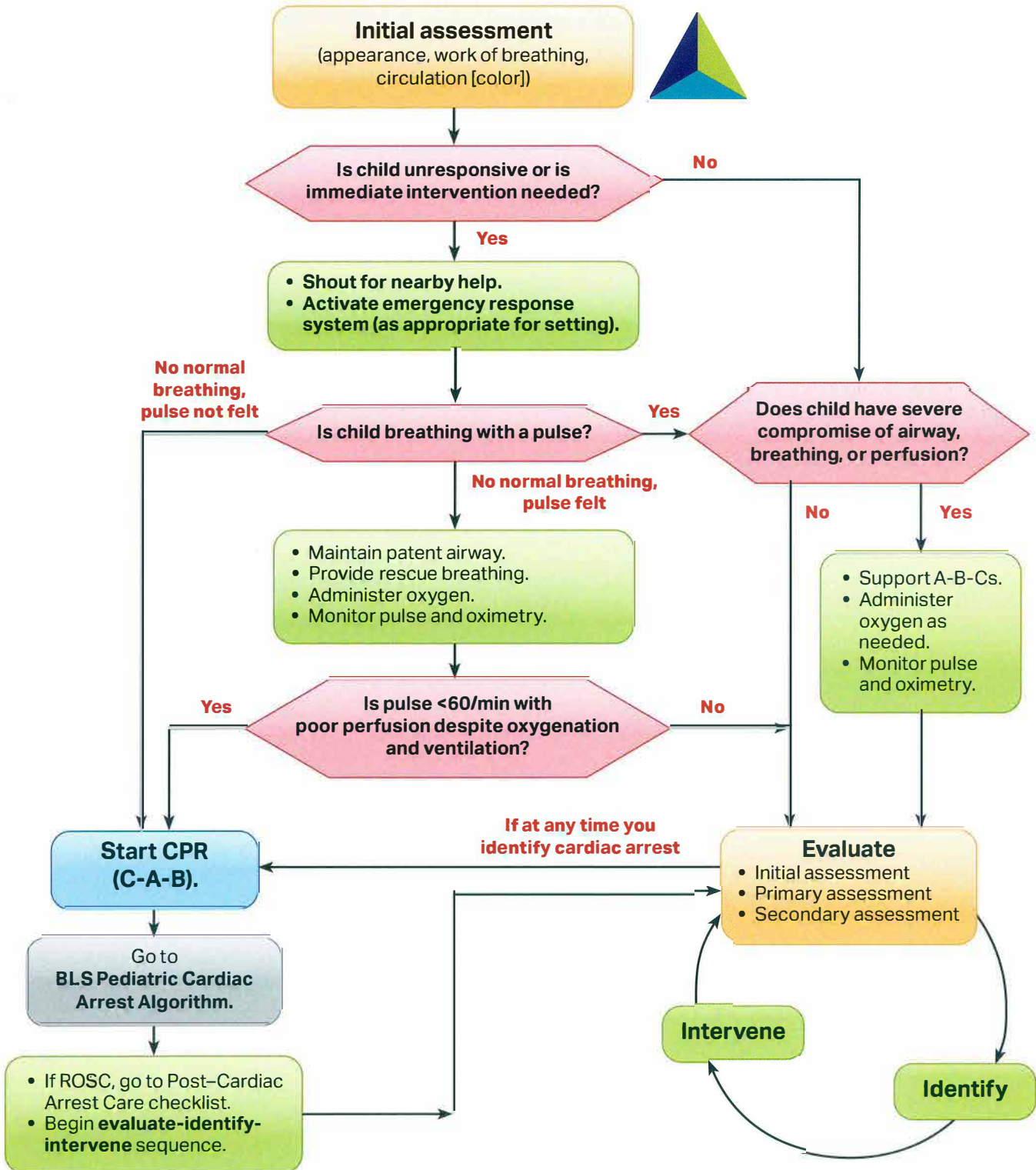
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Pediatric Advanced Life Support





BLS/PALS/NRP UPDATE © 2024-01 WH

Pediatric BLS Guidelines: Overview of 2020 International Guidelines
Waseem Hafeez, MD – Cofounder & Medical Director, PEDSI Global Health

Summary of 2020 BLS Maneuvers for Infants, Children, and Adults

MANEUVER	INFANTS 1 Mo to < 1 YR	CHILD 1 Yr to Puberty	ADOLESCENT / ADULTS
SCENE SAFETY	Make sure environment is safe for Rescuer and Victim		
RECOGNITION of CARDIAC ARREST	Check for Responsive (? Unresponsive) No Breathing or Gaspings No pulse palpated within 10 seconds Breathing and Pulse check performed simultaneously		
ACTIVATE Emergency Response System If mobile phone - call EMS	Unwitnessed Arrest: CPR 5 cycles in 2 mins then call EMS Witnessed Sudden Arrest: Activate EMS & get AED - start CPR Activate after verifying that victim is Unresponsive	Activate EMS & get AED – start CPR Activate if victim found unresponsive If asphyxia arrest likely, call after CPR 5 cycles in 2 minutes	
CPR Sequence	C – A – B (COMPRESSION – AIRWAY – BREATHING)		
C: CIRCULATION Pulse check in < 10 sec	Brachial or Femoral	Femoral or Carotid	Carotid
Compression Landmark	Just below Nipple line 1 Rescuer: 2 fingers 2 Rescuers: 2 thumb-encircling chest	Center of chest, Mid sternum between nipples 1 Hand: Heel of 1 hand only 2 Hands: Heel of 1 hand with second on top	
Compression Depth	Atleast One-Third AP diameter About 1½ inches (4 cm)	Atleast ⅓ rd AP diameter About 2 inches (5 cm)	At least 2 inches (5 cm) But Less than 2.4 ins (6 cm)
Compression Rate	100 - 120 / min Push hard and fast / Allow complete recoil between compressions		
Compression -Ventilation ratio	1 rescuer = 30 : 2 2 rescuer = 15 : 2	30 : 2 1 or 2 rescuers	
A: AIRWAY	Head tilt–Chin lift Suspected trauma: use Jaw Thrust - if unable, protect C-spine then Head tilt–Chin lift		
B: BREATHING Initial	2 effective breaths at 1 second / breath - Visible Chest rise		
Rescue breathing without chest compressions	12 to 20 breaths / min (approximately 1 breath every 3 - 5 seconds)	10 to 12 breaths / min (approx 1 breath every 5 - 6 secs)	
Rescue breaths with advanced airway	10 breaths / min (1 breath every 6 seconds) - Continuous Chest compression 100 - 120 / min		
Foreign-body airway obstruction	Back slaps and Chest thrusts	Abdominal thrusts	
D: DEFIBRILLATION AED Witnessed Sudden Collapse	Infants <1 year of age / < 10 kg Manual Defibrillator preferred Give 1 Shock and resume CPR	Child 1 to 8 years Use Pediatric dose-attenuator pads Give 1 Shock & resume CPR	Adolescent / Adult Use adult pads. Do not use child pads. Witnessed arrest – use AED Give 1 Shock and resume CPR Unwitnessed arrest or AED unavailable – start CPR 5 Cycles in 2min before shock



Infant / Child / Adult CPR

Waseem Hafeez, MD

PEDSI Global Health

1. Assess victim and activates emergency response system (this *must* precede starting compressions) within a maximum of 30 secs. After determining that the scene is safe:

- Check for responsiveness by tapping and shouting
- Shout for help / direct someone to call for help *and* get emergency equipment.
Use mobile device to call 9-1-1
- Get Automatic External Defibrillator (AED)
- **Use Manual Defibrillator for Infants**
- Check for no breathing or no normal breathing (only gasping)
— Scan from the head to the chest for a minimum of 5 seconds and no more than 10 seconds
- Check Brachial pulse (**INFANT**)
- Check Femoral or Carotid pulse (**CHILD**)
- Check Carotid pulse (**ADULT**)
— Can be done simultaneously while checking for breathing
— Check for a minimum of 5 seconds and no more than 10 seconds

2. Perform high-quality chest compressions (initiate compressions within 10 secs of identifying cardiac arrest)

- **Correct placement** of hands / fingers in center of chest (**INFANT**)
— 1 rescuer: 2 fingers just below the nipple line
- **Correct hand placement (CHILD)**
— Lower half of breastbone
— 1- or 2-handed (second hand on top of the first)
- **Correct hand placement (ADULT)**
— Lower half of sternum
— 2-handed (second hand on top of the first or grasping the wrist of the first hand)
- **Compression rate of 100 to 120/min**
— Deliver 30 compressions in 15 to 18 seconds (**Adults & 1 Rescuer in Infant or Child**)
— Deliver 15 compressions in 7 to 9 seconds (**2 Rescuer in Infant or Child**)
- **Adequate depth for age**
— At least one third the depth of the chest = about 1½ inches = 4 cm (**INFANT**)
— At least one third the depth of the chest = about 2 inches = 5 cm (**CHILD**)
— At least 2 inches = 5 cm and avoid compressing more than 2.4 inches = 6 cm (**ADULT**)
— Use of a commercial feedback device or high-fidelity manikin is highly recommended

- **Allow complete chest recoil after each compression**

- **Appropriate Ratio for age and number of rescuers**
 - 1 rescuer: 30 compressions to 2 breaths (**INFANT**)
 - 2 rescuer: 15 compressions to 2 breaths (**INFANT AND CHILD**)
 - 1 OR 2 rescuer: 30 compressions to 2 breaths (**ADULT**)

- **Minimize interruptions in chest compressions**
 - Deliver 2 breaths each breath over 1 second
 - Start chest compression in less than 10 seconds between last compression of one cycle and first compression of next cycle

3 **Switch compression technique at appropriate interval (after 5 cycles)**

Switch should take about 5 seconds

4. **Perform same steps for compressions and breaths for Cycle 2**

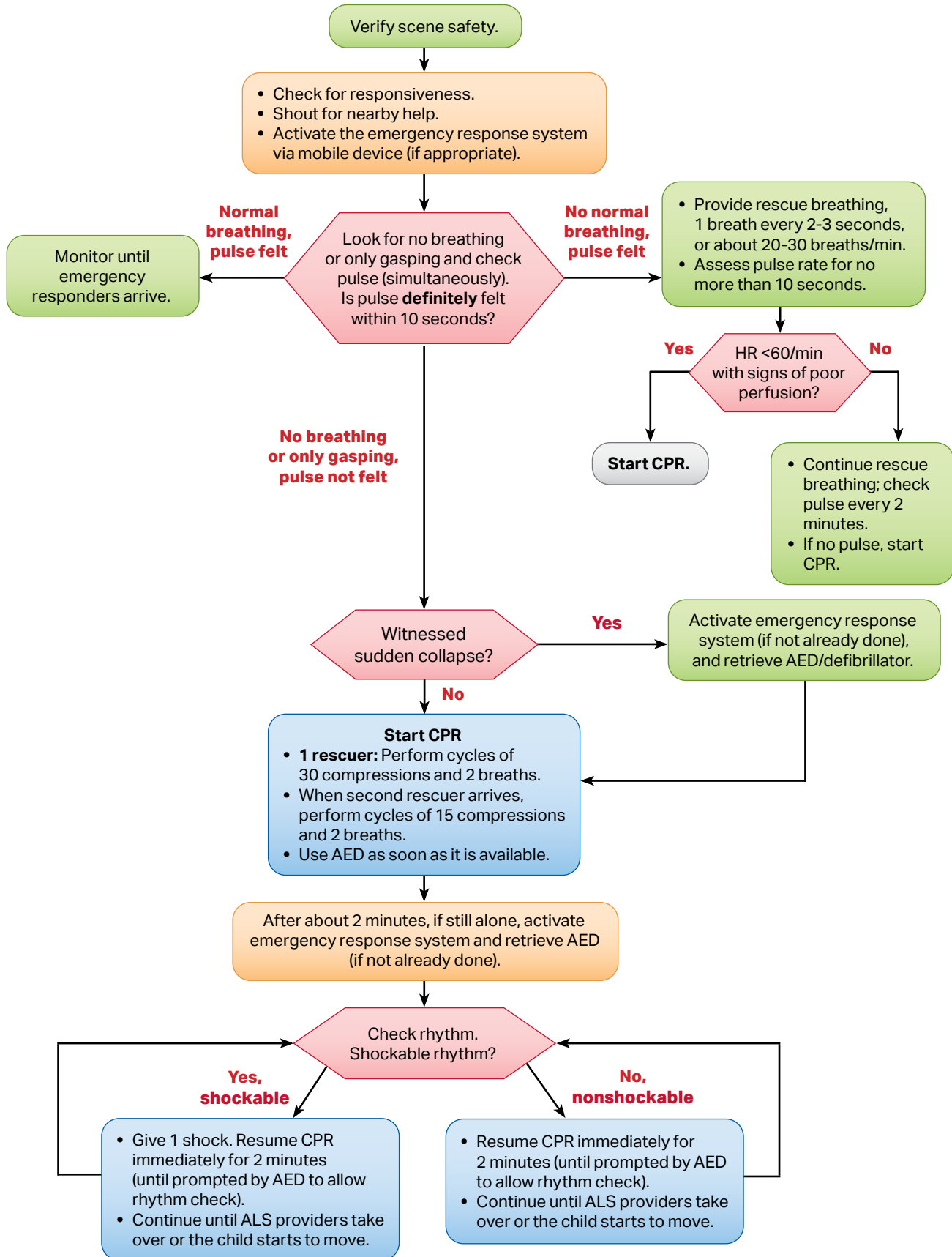
5. **AED use**

- **Use Manual Defibrillator for Infants**
- Power on AED
 - Turn AED on by pushing button or lifting lid as soon as it arrives
- Correctly attach pads (follow direction of AED)
 - Place proper-sized (**Child**) pads for victim's age under 8Yrs or < 25Kg in correct location
 - Place proper-sized (**Adult**) pads for victim's age in correct location
- Clear for analysis
 - Clear rescuers from victim for AED to analyze rhythm (push analyze button if required by device)
 - Communicate clearly to all other rescuers to stop touching victim
- Clear to safely deliver shock
 - Communicate clearly to all other rescuers to stop touching victim
- Deliver a shock
 - Resume chest compressions **immediately** after shock delivery
 - Do NOT turn off AED during CPR

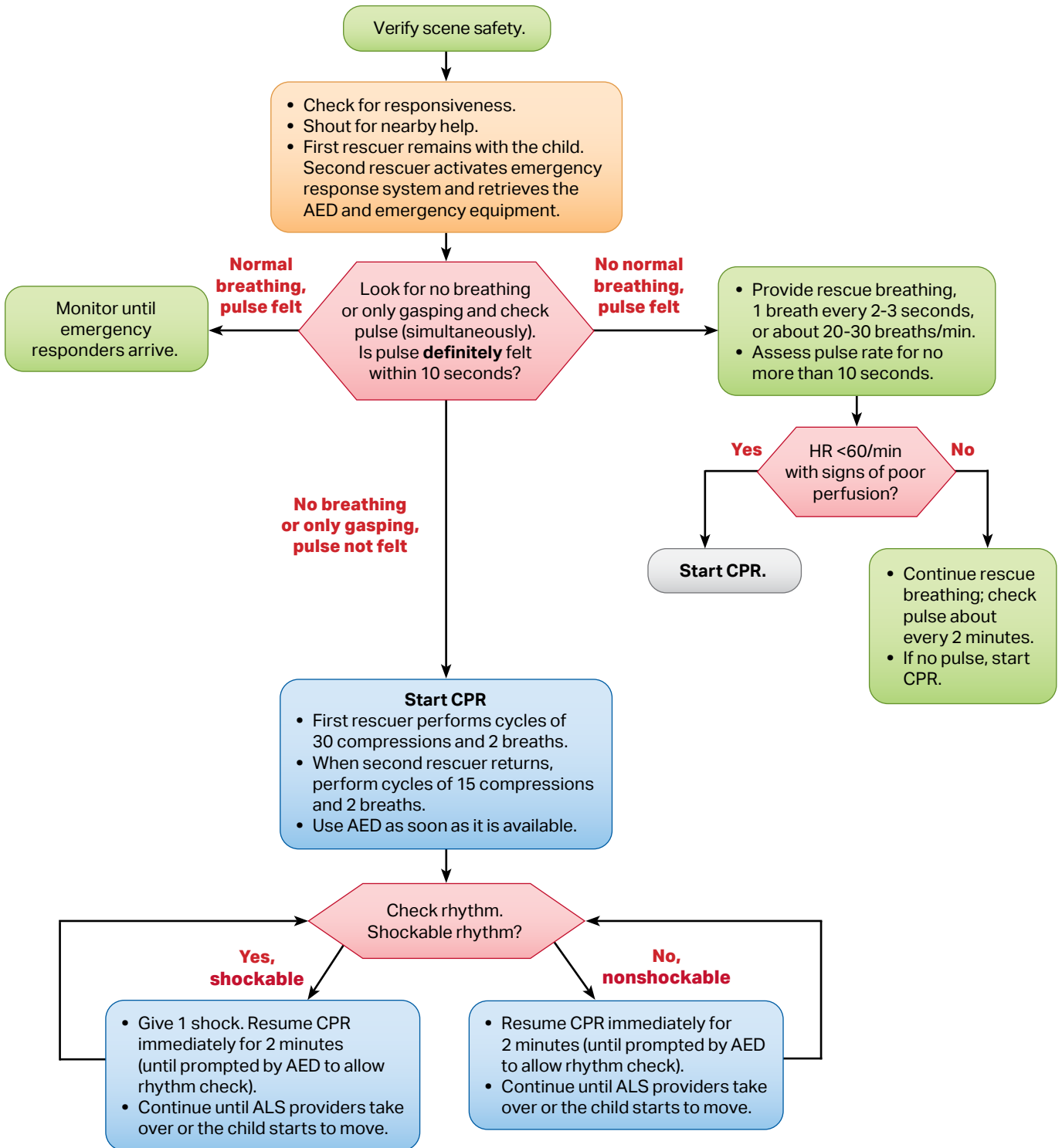
6. **Resume compressions**

- Ensures that high-quality chest compressions are resumed immediately after shock delivery
 - Perform same steps for compressions

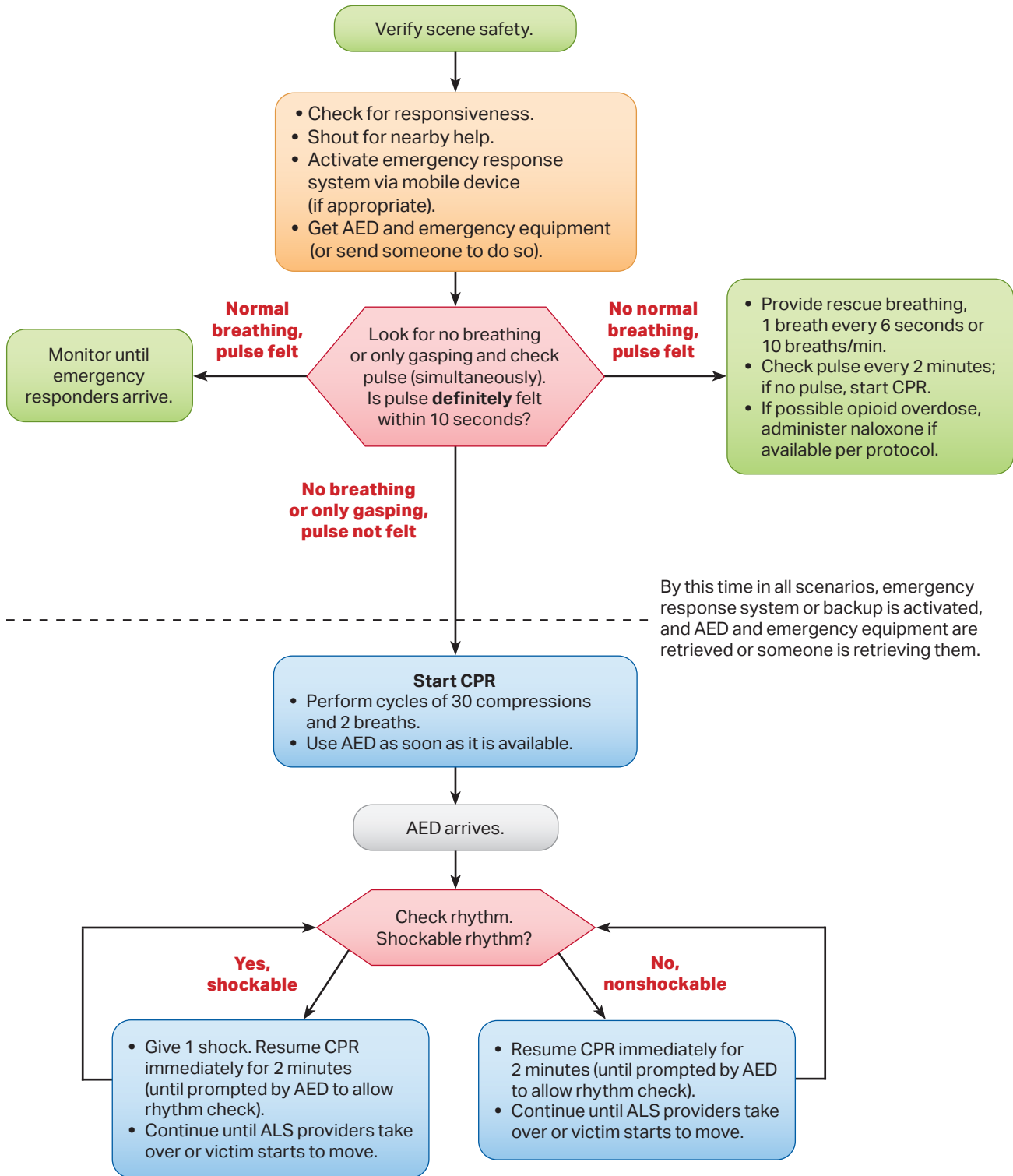
Pediatric Basic Life Support Algorithm for Healthcare Providers—Single Rescuer



Pediatric Basic Life Support Algorithm for Healthcare Providers—2 or More Rescuers



Adult Basic Life Support Algorithm for Healthcare Providers



Heartsaver® Adult CPR AED



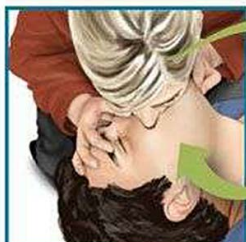
Tap and shout

Yell for help. Send someone to phone 911 and get an AED



Look for no breathing or only gasping

*Push hard and fast.
Give 30 compressions*



*Open the airway and give
2 breaths*

*Repeat sets of 30 compressions
and 2 breaths*



*When the AED arrives, turn it
ON and follow the prompts*

Heartsaver® Child CPR AED



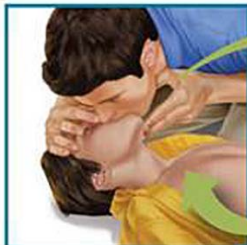
Tap and shout

Yell for help. Send someone to phone 911 and get an AED



Look for no breathing or only gasping

*Push hard and fast.
Give 30 compressions*



*Open the airway and give
2 breaths*

*Repeat sets of 30 compressions
and 2 breaths*



*If you are alone after 5 sets of
30 compressions and 2 breaths,
phone 911, and then resume
sets of 30:2*

*When the AED arrives, turn it
ON and follow the prompts*

Heartsaver® Infant CPR



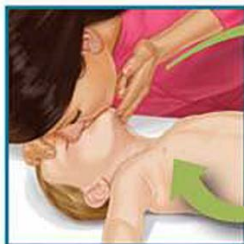
Tap and shout

Yell for help. Send someone to phone 911



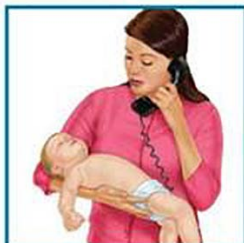
Look for no breathing or only gasping

*Push hard and fast.
Give 30 compressions*



Open the airway and give 2 breaths

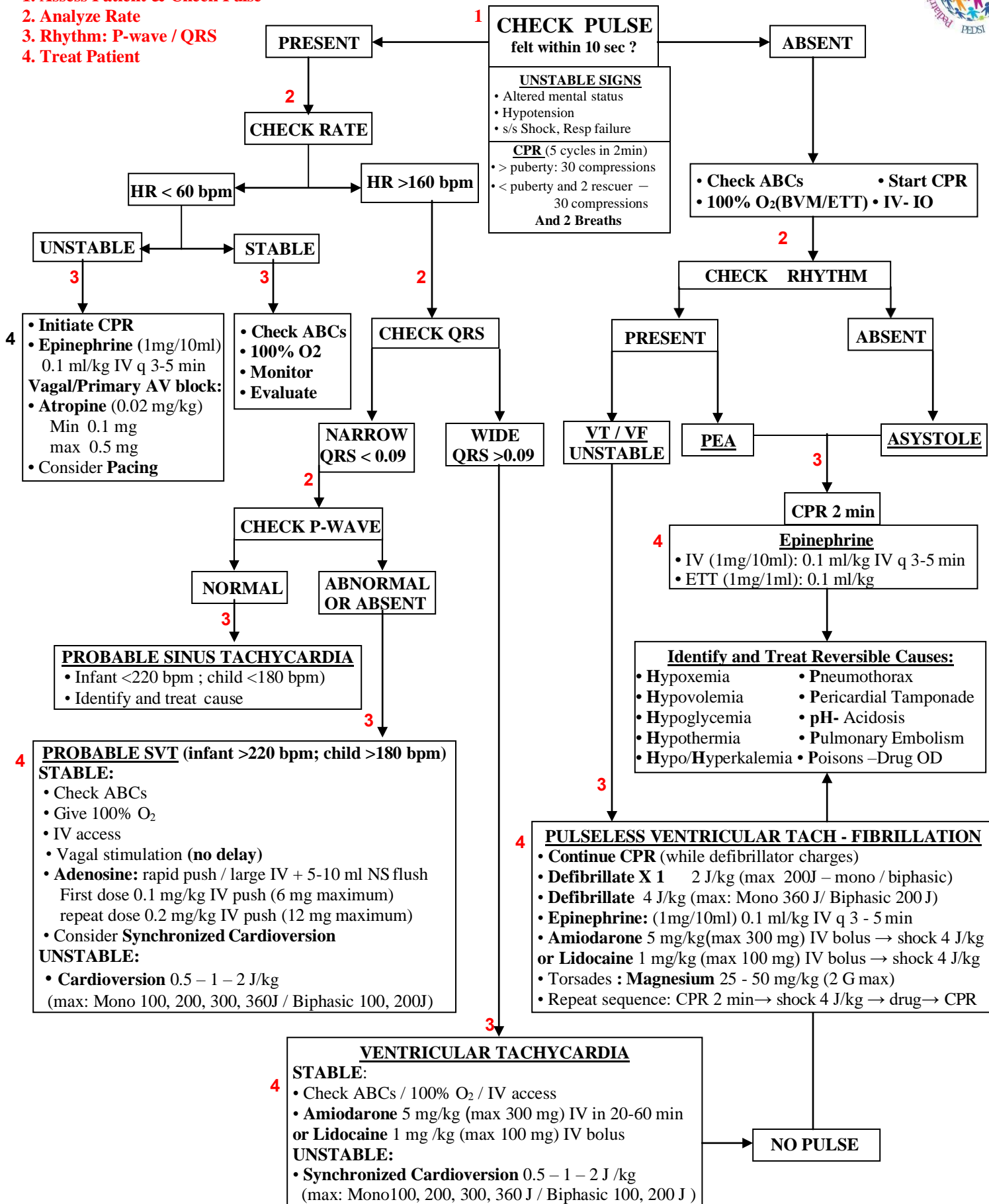
Repeat sets of 30 compressions and 2 breaths



If you are alone after 5 sets of 30 compressions and 2 breaths, phone 911, and then resume sets of 30:2



1. Assess Patient & Check Pulse
2. Analyze Rate
3. Rhythm: P-wave / QRS
4. Treat Patient



Pediatric Cardiac Arrest Algorithm



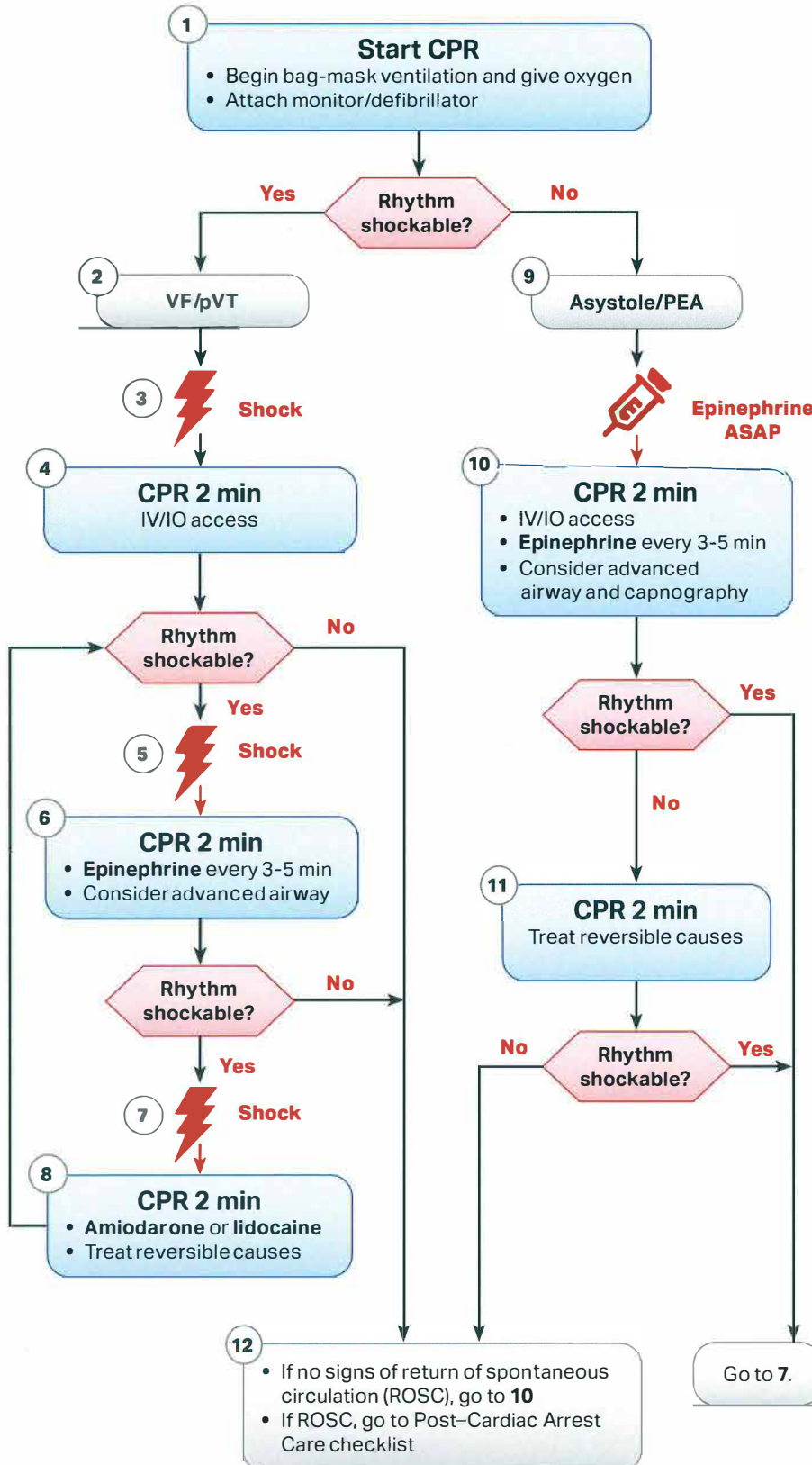
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CPR Quality

- Push hard ($\geq\frac{1}{3}$ of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥ 4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy

- **Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- **Amiodarone IV/IO dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT
- or
- **Lidocaine IV/IO dose:** Initial: 1 mg/kg loading dose

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Pediatric Bradycardia With a Pulse Algorithm



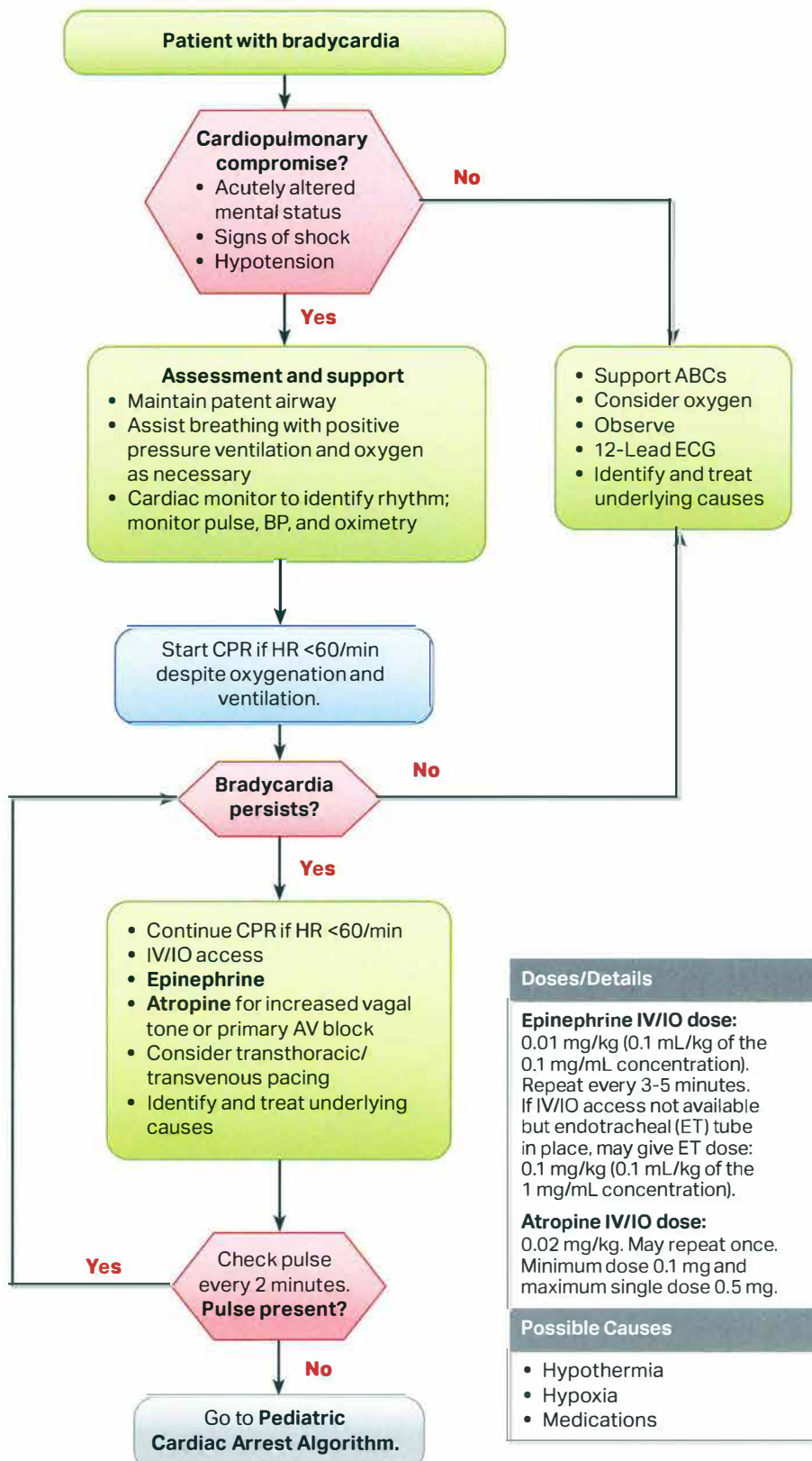
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Doses/Details
Epinephrine IV/IO dose: 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Repeat every 3-5 minutes. If IV/IO access not available but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
Atropine IV/IO dose: 0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose 0.5 mg.
Possible Causes
<ul style="list-style-type: none"> • Hypothermia • Hypoxia • Medications

Pediatric Tachycardia With a Pulse Algorithm



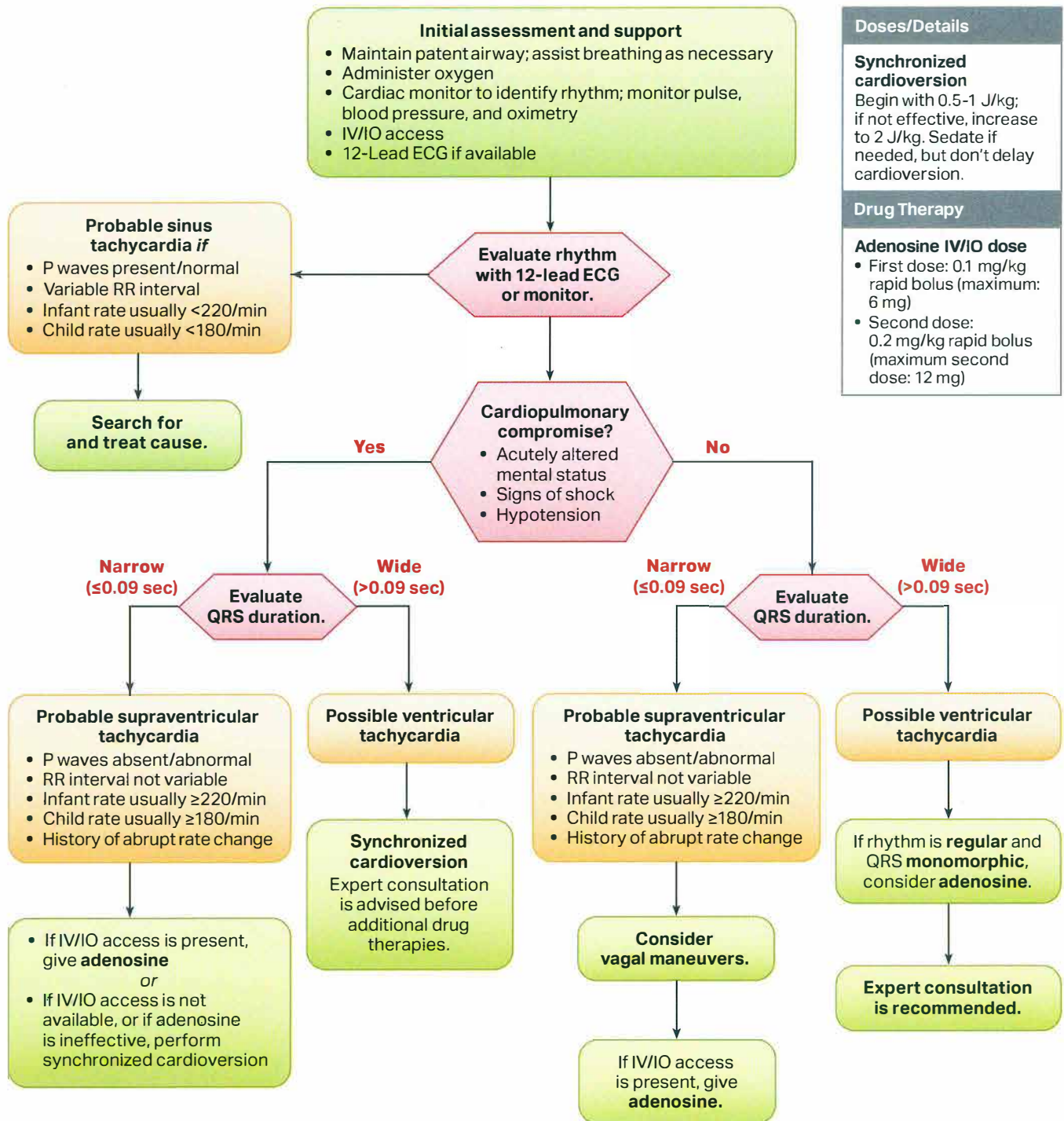
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Identify Signs of Shock

- **A**ppearance: mottled or pallor, **A**ltered Mental Status
- **B**reathing(Respiratory): Tachypnea, Retractions, Hypoxia
- **C**irculation: Tachycardia or Bradycardia, Hypotension, prolonged capillary refill, cool or warm extremities, decreased urine output
- **T**emperature (fever or hypothermia)

Optimize Ventilation and Oxygenation

- Titrate FiO₂ to maintain oxygen saturation **94% -99%**
- Consider advanced airway placement
- Monitor waveform capnography
- Target PCO₂ appropriate for patient's condition (limit exposure to severe hypercapnia and hypocapnia)

Assess for and Support Circulation

- Identify and treat contributing factors
- Monitor circulation - heart rate, blood pressure, cap refill
- Isotonic crystalloid IV/IO bolus – 20ml/kg X 3if needed
- Consider smaller bolus: 5 - 10ml /kg (if suspected poor cardiac function, Neonate, or with severe febrile illness in settings with limited resources)
- Consider inotropic support for fluid-refractory shock
- Correct Hypoglycemia, Hypocalcemia, Hyperkalemia, Metabolic acidosis, severe Anemia

Identify and Treat Reversible Causes

- **H**ypoxia
- **H**ypovolemia
- **H**ypoglycemia
- **H**ypothermia
- **H**ypo/**H**yperkalemia
- **P**neumothorax
- **P**ericardial Tamponade
- **pH**- severe Acidosis
- **PE**-Pulmonary Embolism
- **P**oisons –Drug Overdose

HYPOTENSIVE SHOCK

- | | |
|----------------------|----------------------|
| Low CO-Hi SVR | Hi CO-Low SVR |
| • Epinephrine | • NorEpinephrine |
| • NorEpinephrine | • Vasopressin |
| • Dobutamine | • Epinephrine |

NORMOTENSIVE SHOCK

- Epinephrine - 0.03- 0.05µg/kg/m
- Milinone
- Dobutamine

SEPTIC SHOCK

- Isotonic crystalloid IV/IO bolus – 20ml/kg X 3 in 1st hour if needed & reassess after each bolus
- Antibiotics within 1st hour: broad spectrum
- Fluid refractory & Dopamine– or– Norepinephrine – dependent shock is risk for adrenal insufficiency
*If Adrenal insufficiency is suspected:
Hydrocortisone 1– 2mg/kg IV bolus (Max 100mg)
(Draw baseline cortisol; consider ACTH stimulation test)

Post Resuscitation Monitoring

- Goal: Improve mental status, normalize HR, adequate BP improve organ perfusion, Respiration and Temperature, correct Metabolic derangements
- Monitor & Reassess Airway, Breathing and Circulation
- Monitor for and treat Hypoglycemia
- targeted Temperature management, treat fever aggressively
- Monitor for Myocardial dysfunction & Arrhythmia
- Monitor Neurological functions, treat agitation & seizure
- If patient remains comatose after resuscitation from Cardiac Arrest – evaluate for Therapeutic Hypothermia or ECMO

Pediatric Septic Shock Algorithm



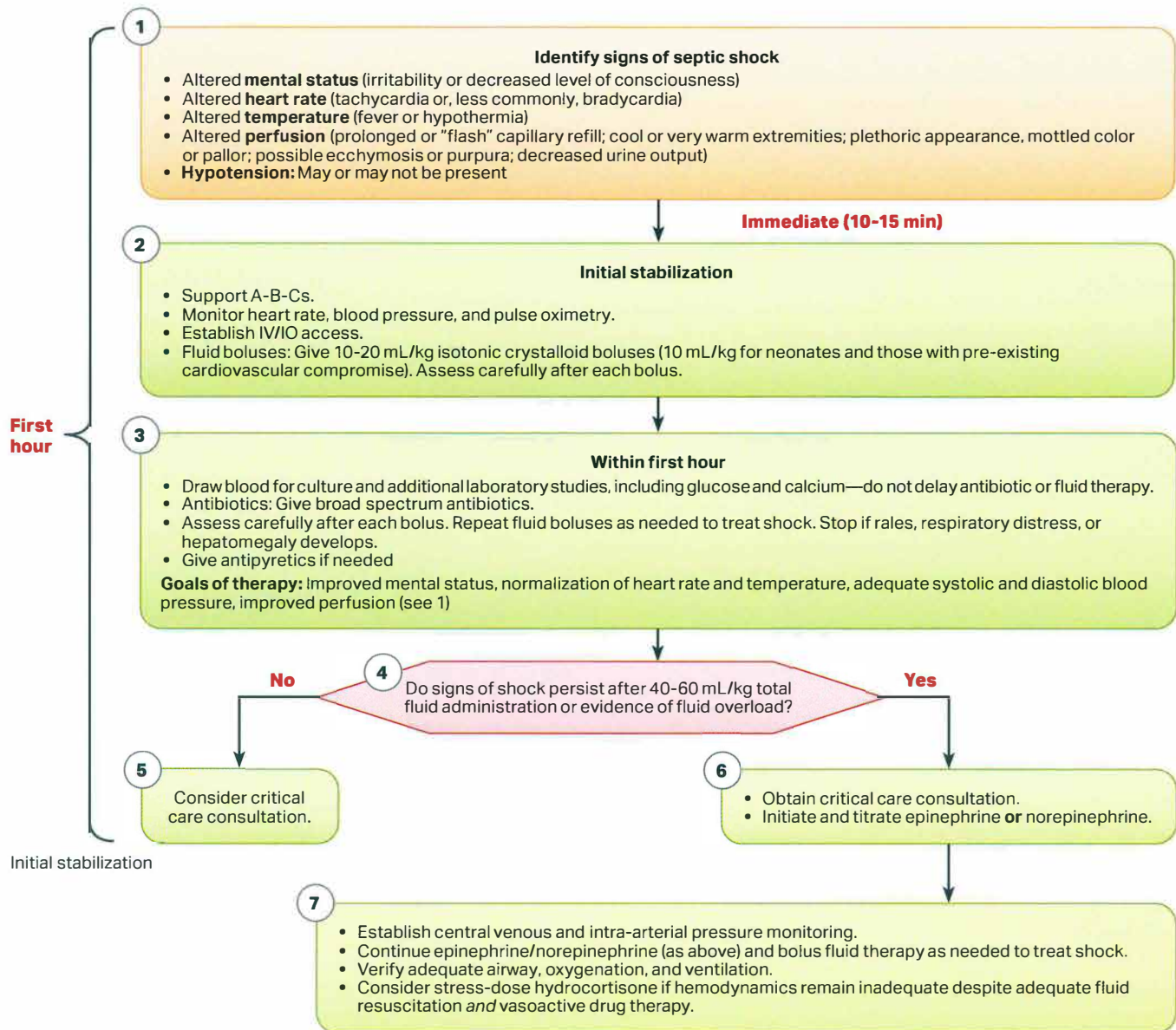
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Brierley J, Carcillo JA, Choong K, et al. Clinical practice parameters for hemodynamic support of pediatric and neonatal septic shock: 2007 update from the American College of Critical Care Medicine. *Crit Care Med*. 2009;37(2):666-688. Kisson N, Orr RA, Carcillo JA. Updated American College of Critical Care Medicine—pediatric advanced life support guidelines for management of pediatric and neonatal septic shock: relevance to the emergency care clinician. *Pediatr Emerg Care*. 2010;26(11):867-869.

Management of Shock After ROSC Algorithm



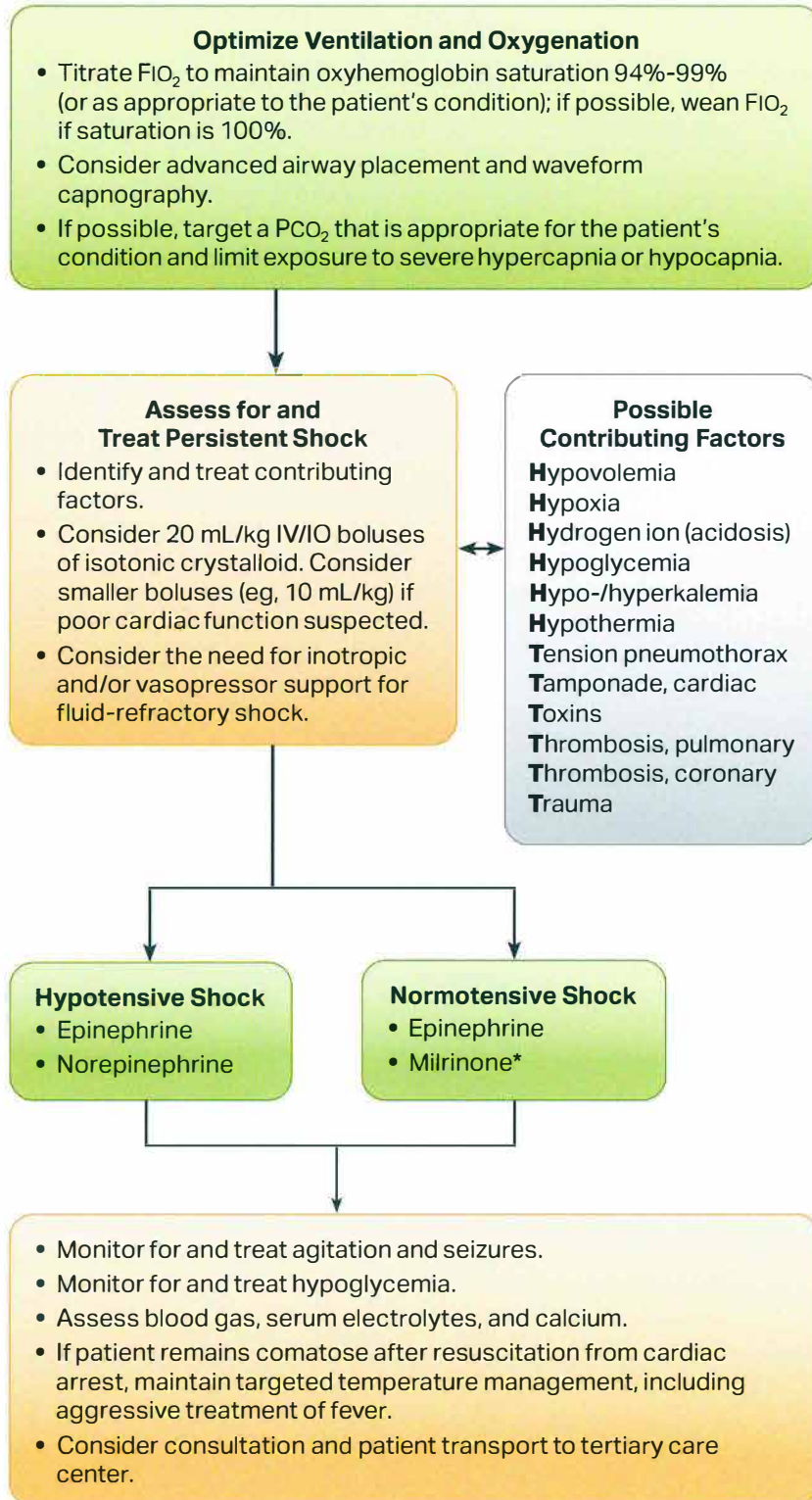
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Estimation of Maintenance Fluid Requirements

- **Infants <10 kg:** 4 mL/kg per hour

Example: For an 8-kg infant, estimated maintenance fluid rate
 = 4 mL/kg per hour × 8 kg
 = 32 mL per hour

- **Children 10-20 kg:** 4 mL/kg per hour for the first 10 kg + 2 mL/kg per hour for each kg above 10 kg

Example: For a 15-kg child, estimated maintenance fluid rate
 = (4 mL/kg per hour × 10 kg)
 + (2 mL/kg per hour × 5 kg)
 = 40 mL/hour + 10 mL/hour
 = 50 mL/hour

- **Children >20 kg:** 4 mL/kg per hour for the first 10 kg + 2 mL/kg per hour for 11-20 kg + 1 mL/kg per hour for each kg above 20 kg.

Example: For a 28-kg child, estimated maintenance fluid rate
 = (4 mL/kg per hour × 10 kg)
 + (2 mL/kg per hour × 10 kg)
 + (1 mL/kg per hour × 8 kg)
 = 40 mL per hour + 20 mL per hour
 + 8 mL per hour
 = 68 mL per hour

After initial stabilization, adjust the rate and composition of intravenous fluids based on the patient's clinical condition and state of hydration. In general, provide a continuous infusion of a dextrose-containing solution for infants. Avoid hypotonic solutions in critically ill children; for most patients use isotonic fluid such as normal saline (0.9% NaCl) or lactated Ringer's solution with or without dextrose, based on the child's clinical status.

*Milrinone can cause hypotension, so use and initiation of it should generally be reserved for those experienced with its use, initiation, and side effects (eg, ICU personnel).

Components of Post-Cardiac Arrest Care



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Oxygenation and ventilation	Check
Measure oxygenation and target normoxemia 94%-99% (or child's normal/appropriate oxygen saturation).	<input type="checkbox"/>
Measure and target $Paco_2$ appropriate to the patient's underlying condition and limit exposure to severe hypercapnia or hypocapnia.	<input type="checkbox"/>
Hemodynamic monitoring	
Set specific hemodynamic goals during post-cardiac arrest care and review daily.	<input type="checkbox"/>
Monitor with cardiac telemetry.	<input type="checkbox"/>
Monitor arterial blood pressure.	<input type="checkbox"/>
Monitor serum lactate, urine output, and central venous oxygen saturation to help guide therapies.	<input type="checkbox"/>
Use parenteral fluid bolus with or without inotropes or vasopressors to maintain a systolic blood pressure greater than the fifth percentile for age and sex.	<input type="checkbox"/>
Targeted temperature management (TTM)	
Measure and continuously monitor core temperature.	<input type="checkbox"/>
Prevent and treat fever immediately after arrest and during rewarming.	<input type="checkbox"/>
If patient is comatose apply TTM (32°C-34°C) followed by (36°C-37.5°C) or only TTM (36°C-37.5°C).	<input type="checkbox"/>
Prevent shivering.	<input type="checkbox"/>
Monitor blood pressure and treat hypotension during rewarming.	<input type="checkbox"/>
Neuromonitoring	
If patient has encephalopathy and resources are available, monitor with continuous electroencephalogram.	<input type="checkbox"/>
Treat seizures.	<input type="checkbox"/>
Consider early brain imaging to diagnose treatable causes of cardiac arrest.	<input type="checkbox"/>
Electrolytes and glucose	
Measure blood glucose and avoid hypoglycemia.	<input type="checkbox"/>
Maintain electrolytes within normal ranges to avoid possible life-threatening arrhythmias.	<input type="checkbox"/>
Sedation	
Treat with sedatives and anxiolytics.	<input type="checkbox"/>
Prognosis	
Always consider multiple modalities (clinical and other) over any single predictive factor.	<input type="checkbox"/>
Remember that assessments may be modified by TTM or induced hypothermia.	<input type="checkbox"/>
Consider electroencephalogram in conjunction with other factors within the first 7 days after cardiac arrest.	<input type="checkbox"/>
Consider neuroimaging such as magnetic resonance imaging during the first 7 days.	<input type="checkbox"/>



Waseem Hafeez, MD

- ✓ The order of the 3 assessment questions has changed to **(1) Term gestation? (2) Good tone? and (3) Breathing or crying?**
- ✓ The Golden Minute (60-second) mark for completing the initial steps, reevaluating, and beginning ventilation (if required) is retained to emphasize the importance of avoiding unnecessary delay in initiation of ventilation
- ✓ **A-B-C sequence** maintained with **compression-to-ventilation ratio (3:1 with 90 compressions and 30 breaths per minute)**. Recommendations about chest compression technique (2 thumb-encircling hands) remain unchanged.
- ✓ Rescuers may consider using higher ratios (e.g., 15:2) if the arrest is believed to be of cardiac origin.
- ✓ **Blood oxygen levels in uncompromised babies generally do not reach extrauterine values until approx 10 mins following birth.** Skin color is poor indicator of oxyhemoglobin saturation during immediate neonatal period.
- ✓ Initiate resuscitation with air or blended oxygen, titrating the oxygen concentration to an SpO₂ in the target range (see Neonatal algorithm) using pulse oximetry with the probe attached to the right upper extremity (i.e., wrist or palm).
- ✓ **During CPR, use 100% oxygen whenever chest compressions are provided. It is reasonable to wean the oxygen concentration as soon as the heart rate recovers.**
- ✓ **Spontaneously breathing preterm infants with respiratory distress may be supported with continuous positive airway pressure (CPAP) initially rather than with routine intubation for administering PPV.**
- ✓ **Resuscitation of preterm newborns of less than 35 weeks of gestation should be initiated with low oxygen (room-air 21% to 30%) and the oxygen titrated to achieve pre-ductal oxygen saturation approximating the range achieved in healthy term infants.**
- ✓ A laryngeal mask may be considered as an alternative to tracheal intubation if face-mask ventilation and tracheal intubation is unsuccessful for resuscitation of newborns 34 weeks or more of gestation.
- ✓ **If the baby is bradycardic (HR <60 per min) after 90 seconds of resuscitation with a lower concentration of oxygen, oxygen concentration should be increased to 100% until recovery of a normal heart rate.**
- ✓ **Neonatal chest compression:**
 - **HR < 60 bpm after 30 secs of adequate ventilation**
 - Two-thumb encircling hands – lower third of sternum / Depth: one-third of AP chest diameter
- ✓ **Neonatal Initial volume of fluid resuscitation – NS 10 ml/kg (not Albumin)**
- ✓ IO only if UV Catheterization not readily available
- ✓ **Epinephrine IV dose 0.1 ml/kg of 1:10,000 / ETT dose 1 ml/kg of 1:10,000 (do not use 1:1,000 in newborn)**
- ✓ **Meconium - Vigorous infants born with meconium-stained fluids do not require Intrapartum oropharyngeal suction** or routine intubation for tracheal suction.
- ✓ **Infant born through meconium-stained amniotic fluid and presents with poor muscle tone and inadequate breathing efforts, the infant should be placed under a radiant warmer, begin initial steps of resuscitation.** Appropriate intervention to support ventilation and oxygenation should be initiated as indicated for each individual infant. This may include intubation and suction if the airway is obstructed. PPV should be initiated if infant is not breathing or HR < 100 bpm. **Routine intubation for tracheal suctioning is not suggested.**
- ✓ **Delayed cord clamping for longer than 30 seconds is reasonable for both term and preterm infants, but not for infants who require resuscitation at birth or for infants born at less than 29 wks gestation.**
- ✓ For nonvigorous term and late preterm newborn infants >34 wks gestation intact cord milking may be reasonable compared with early cord clamping (<30 seconds).
- ✓ For preterm newborn infants <28 weeks' gestation, intact cord milking is not recommended.
- ✓ **Effective positive-pressure ventilation is the priority in newborn infants who need support after birth. Using a T-piece resuscitator to deliver positive-pressure ventilation is preferred to the use of a self-inflating bag.**
- ✓ **Temperature should be recorded as a predictor of outcomes and as a quality indicator.**
- ✓ **Temperature of newly born non-asphyxiated infants should be maintained between 36.5°C and 37.5°C after birth through admission and stabilization.**
- ✓ **Prevent hypothermia in preterm infants** - A variety of strategies (radiant warmers, plastic wrap with a cap, thermal mattress, warmed humidified gases, and increased room temperature).
- ✓ **Hyperthermia (temperature over 38°C) should be avoided because it introduces potential associated risks.**
- ✓ **Assessment of heart rate remains critical during the first minute of resuscitation and the use of a 3-lead ECG may be reasonable, because providers may not assess heart rate accurately by auscultation or palpation, and pulse oximetry may underestimate heart rate. Use of the ECG does not replace the need for pulse oximetry to evaluate the newborn's oxygenation.**
- ✓ **Withholding or withdrawing resuscitation** - An Apgar score of 0 at 10 minutes is a strong predictor of mortality and morbidity in late preterm and term infants, decisions to continue or discontinue resuscitation must be individualized.

Newborn Resuscitation: Functional History: **4 M's**=Maturity(FT-PT)/Multiple Gestation/Meconium/Meds(Narcotics in 4 hrs)

3 Assessment questions: (1) Term gestation? (2) Good tone? (3) Breathing or Crying?

Temp, A, B, C, Drugs: T: Dry, Warm, Position, Suction, Stimulate

A: HR <100 – Oxygen: 100% or Room Air (upto 90 sec → no improvement → 100% O₂)

B: HR <100 – Ventilation: BVM / ETT @ 30/min

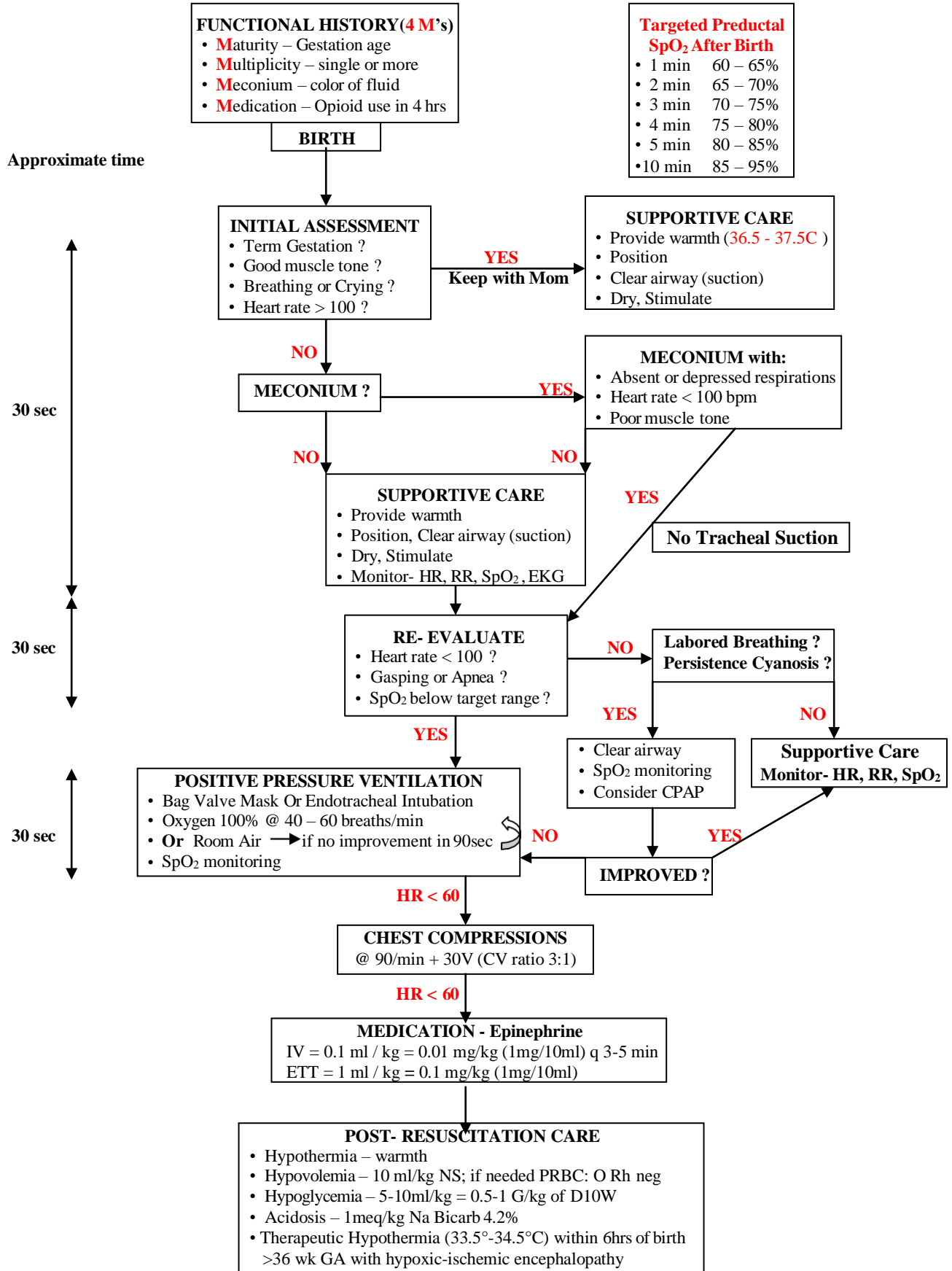
C: HR <60 – Chest Compression @ 90/min

D: HR <60 – Medications - Epi 0.1 ml/kg (0.01mg/Kg) @1mg/10ml

Meconium with (Apnea / Respiratory Distress / HR < 100 / Limp / Blue) = CPR / BVM / ETT / Meds



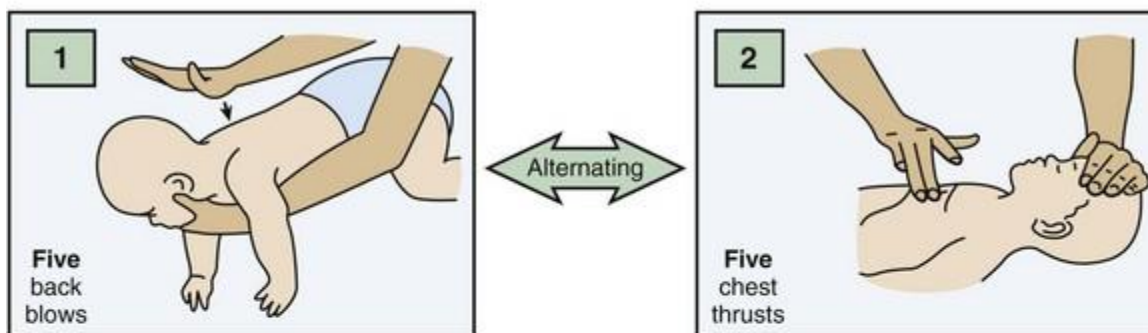
Waseem Hafeez, MD



FOREIGN BODY AIRWAY OBSTRUCTION

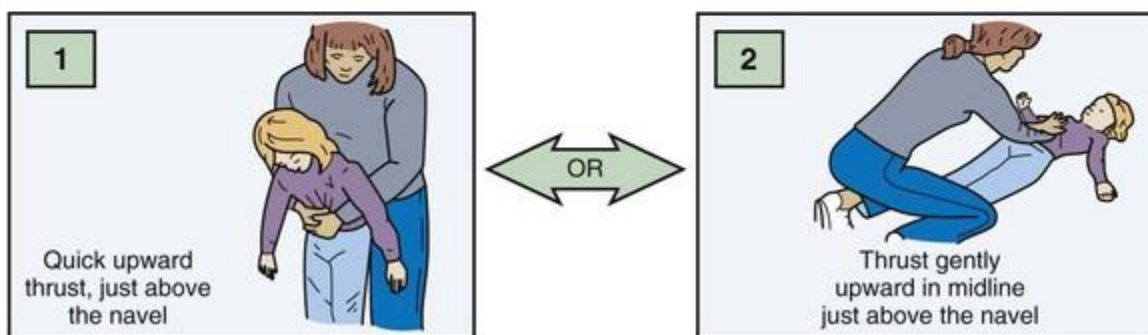
A

INFANT CHOKING

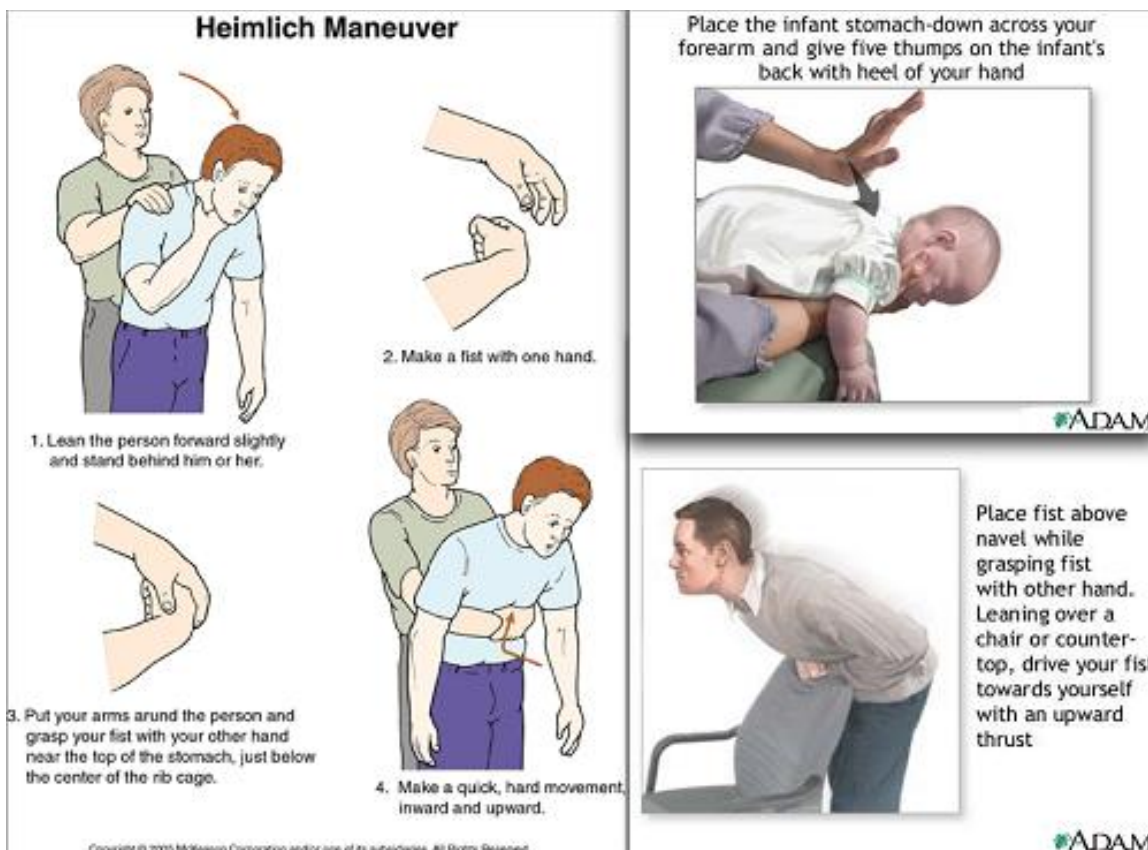


A

CHILD CHOKING



B





RESUSCITATION TEAM ORGANIZATION & CODE ROLES © 2024-01 WH

Waseem Hafeez, MD

AIRWAY & BREATHING: BVM / ETT

RIGHT

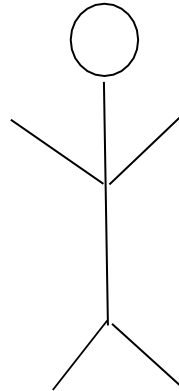
PGY 3 / 2

C–SPINE CONTROL
CHEST COMPRESSION
IV – IO ACCESS
EXPOSE/Log Roll/ GUIAIC
NG TUBE
CHECK LABS & X –RAY

NURSE

ATTACH MONITOR / BP
CHECK TEMPERATURE
CHECK GLUCOSE
FOLEY– CHECK UA & HCG

SENIOR MD



LEFT

PNP & PGY 1 / 2

PRIMARY EVALUATION
R/O PNEUMOTHORAX
BLEEDING CONTROL
IV – IO ACCESS
SECONDARY EVALUATION
HISTORY

NURSE

PLACE OXYGEN
PULSE OXIMETER
DRAW MEDICATIONS
DOCUMENTATION

TEAM LEADER CHECK LIST

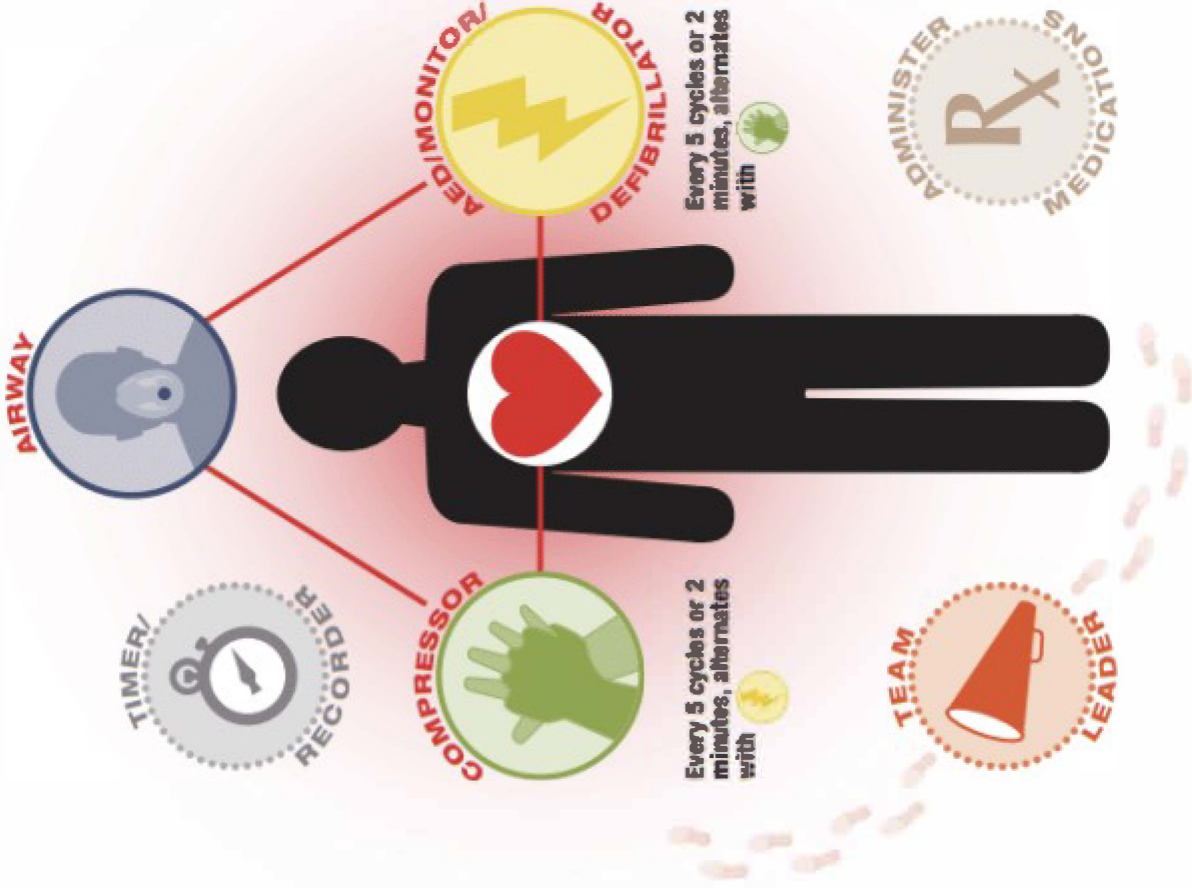
- PREP: IV–IO / Monitors / Suction / O₂ / Airway equip / Meds
- ESTIMATE WEIGHT = 2 X (Age in Yrs + 4) Kg
- ASSESS RESPONSE / BREATHING ? / PULSE CHECK <10sec
- AIRWAY – Head tilt – Chin lift / Jaw thrust – C–Collar / O₂ / Suction
- BREATHING – Rate / Air Entry / Retractions / Pulse O₂
- R/O PNEUMOTHORAX
- CIRCULATION – Heart Rate / BP / Cap Refill / Pulses
- IV / IO access – NS 20 ml/kg X 3 / Pressor / PRBC
- DISABILITY – AVPU, Pupils, Neuro Exam, GCS
- DEXTROSE– 2 ml/kg D₂₅W / < 3mo = 5 ml/kg D₁₀ W
- EXPOSURE – Log Roll, Rectal & Guaiac
- FEVER – Maintain Normal Temperature
- FAST (Trauma): RUQ, LUQ, Suprapubic, Sub–xiphoid, Cardiac
- FOLEY – Not if: High Prostate / Blood in Meatus or Scrotum
- GASTRIC TUBE (NG) – If Midface Injury = Orogastric tube
- GUIAIC – if not done during logroll / Gases
- HISTORY – SAMPLE: Signs-Symptoms / Allergy / Meds / PMH / Last Meal

Positions for 6-Person High-Performance Teams*



Resuscitation Triangle Roles

 <p>Compressor</p> <ul style="list-style-type: none"> Assesses the patient Does 5 cycles of chest compressions Alternates with AED/Monitor/Defibrillator every 5 cycles or 2 minutes (or earlier if signs of fatigue set in) 	 <p>AED/Monitor/Defibrillator</p> <ul style="list-style-type: none"> Brings and operates the AED/monitor/defibrillator Alternates with Compressor every 5 cycles or 2 minutes (or earlier if signs of fatigue set in), ideally during rhythm analysis If a monitor is present, places it in a position where it can be seen by the Team Leader (and most of the team) 	 <p>Airway</p> <ul style="list-style-type: none"> Opens and maintains the airway Provides ventilation <p>The team owns the code. No team member leaves the triangle except to protect his or her safety.</p>
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 <p>Team Leader</p> <ul style="list-style-type: none"> Every resuscitation team must have a defined leader Assigns roles to team members Makes treatment decisions Provides feedback to the rest of the team as needed Assumes responsibility for roles not assigned 	 <p>Administer Medications</p> <ul style="list-style-type: none"> An ALS provider role Administers medications 	 <p>Timer/Recorder</p> <ul style="list-style-type: none"> Records the time of interventions and medications (and announces when these are next due) Records the frequency and duration of interruptions in compressions Communicates these to the Team Leader (and the rest of the team)
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Pediatric Color-Coded Length-Based Resuscitation Tape



American Heart Association.



American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Pediatric Advanced Life Support

Zone	3 kg	4 kg	5 kg	Pink	Red	Purple	Yellow	White	Blue	Orange	Green
ETT uncuffed (mm)	3.5	3.5	3.5	3.5	3.5	4.0	4.5	5.0	5.5	N/A	N/A
ETT cuffed (mm)	3.0	3.0	3.0	3.0	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Lip-tip (cm)	9-9.5	9.5-10	10-10.5	10-10.5	10.5-11	11-12	12.5-13.5	14-15	15.5-16.5	17-18	18.5-19.5
Suction (F)	8	8	8	8	8	8	10	10	10	10	12
L-scope blade	1 straight	1 straight	1 straight	1 straight	1 straight	1-1.5 straight	2 straight/curved	2 straight/curved	2 straight/curved	2-3 straight/curved	2-3 straight/curved
Stylet	6 F	6 F	6 F	6 F	6 F	6 F	10 F	10 F	10 F	14 F	14 F
OPA (mm)	50	50	50	50	50	60	60	60	70	80	80
NPA (F)	14	14	14	14	14	18	20	22	24	26	26
Bag-mask device (minimum mL)	450	450	450	450	450	450	450	450-750	750-1000	750-1000	1000
ETCO ₂ detector	Ped	Ped	Ped	Ped	Ped	Ped	Ped	Adult	Adult	Adult	Adult
LMA	1	1	1	1.5	1.5	2	2	2	2-2.5	2.5	3
Tidal volume (mL)	20-30	24-40	30-50	40-65	50-85	65-105	80-130	100-165	125-210	160-265	200-330
Frequency	20-25/min	20-25/min	20-25/min	20-25/min	20-25/min	15-25/min	15-25/min	15-25/min	12-20/min	12-20/min	12-20/min

Abbreviations: ETT, endotracheal tube; F, French; LMA, laryngeal mask airway; NPA, nasopharyngeal airway; OPA, oropharyngeal airway; Ped, pediatric. The Broselow-Luten System Point of Care Guide is © 2020 Vyair Medical, Inc.; used with permission.

PEDIATRIC EMERGENCY MEDICATIONS, DYSRHYTHMIA ALGORITHM AND CODE CHECKLIST

ANAPHYLAXIS
 Epinephrine (1 mg/1ml) 0.01 ml/kg (max 0.5 ml) IM thigh q 15min X 3
 H₁: Diphenhydramine 1 - 2 mg/kg IV slow / IM (max 50 mg)
 H₂: Famotidine (Peptid) 0.25 mg/kg IV (max 20 mg)
 Methylprednisolone 2 mg/kg IV (max <12y = 60mg); >12 yr = 125 mg
 Bronchospasm: see Status Asthmaticus / Stridor: see Croup
 Hypotension: Epinephrine IV infusn 0.1-1 µg/kg/min (adult 2 - 10 µg/min)

ANTIBIOTIC FOR SEVERE BACTERIAL INFECTION / DOSE
 Ampicillin 100 mg/kg (max 2 G) Clindamycin 10 mg/kg (max 600 mg)
 Acyclovir-nb=20 mg/kg; >3mo=10 mg/kg(max 1 G) Gentamicin 2.5 mg/kg
 Ceftriaxone / Cefepime / Cefazolin / Cefotaxime = 50 mg/kg (max 2 G)
 Cefoxitin 40 mg/kg(max 2G) Unasyn 50 mg/kg - Ampicillin (max 2G)
 Vancomycin 15 mg/kg (max 1G) Zosyn 100 mg/kg - Piperacillin (max 3G)

ASTHMA - STATUS ASTHMATICUS (see CHAM protocol)
 Albuterol Neb < 20kg = 2.5 mg / 4puff; > 20kg = 5 mg / 8puff q 20min X 3
 Albuterol Continuous < 20 kg = 10 mg/hr; > 20 kg = 15 mg/hr
 Ipratropium Neb 0.5 mg q 20 min X 3 + Albuterol
 Prednisone 2 mg/kg (max 60 mg/day) PO then 1 - 2 mg/kg/day
 Or Methylpred 2mg/kg (max 60mg) IV then 1mg/kg q 6h (max 125mg/day)
 Or Dexamethasone 0.3 mg/kg (max 10 mg) PO / IV / IM
 Magnesium sulfate 50 - 75 mg/kg (max 2 G) IV in 20min (+/- NS bolus)
 Epinephrine (1:1000 = 1 mg/ml) 0.01 ml/kg (max 0.4ml) SQ q 15min X 3
 Terbutaline 10 µg/kg IV load in 5 min then infuse 0.2 - 10 µg/kg/min
 Consider: Aminophylline 5 mg/kg IV load over 30 min then infusion @
 1 - 9 yr = 1; 9 - 12 yr = 0.9; > 12 yrs = 0.5 mg/kg/hr
 HFNC < 6 mo 4 - 8 L/min; > 6 mo 6 - 10 L/min; FiO₂ to keep O₂ Sat > 92%
 BiPAP: IPAP = 8 - 12 cm H₂O / EPAP = 5 - 8 cm H₂O

ADRENAL CRISIS
 IV Fluids with Dextrose
 Hydrocortisone: stress dose = 50 mg/m² (2 - 3 mg/kg) IV / IM
 0 - 3 yr = 25 mg; 3 - 12 yr = 50mg; > 12 yr = 100 mg
BURNS - Parkland Formula (2nd & 3rd degree Burn Surface Area)
 NS/R/L = 4 ml/kg/day / BSA burn (½ in 8hr & ½ in next 16hrs)
 Add Maintenance fluids (4+2+1) < 20kg Add D5; No K⁺ for 48hrs

DKA (see CHAM protocol)
 Deficit = NS/R/L 10 ml/kg IV bolus over 1hr, may repeat x 1
 NS or 0.45 NS + Potassium (½ KAc + ½ KPO₄) @ 1½ Maintenance
 (Serum K⁺ < 3 = K 60 mEq/L; 4 - 5 = K 40; 5 - 6 = K 20; > 6 = 0)
 Add Maintenance IVF over 24 hr / D₅W: if Glu < 250 - 300 mg/dl
 After 1hr: Reg Insulin 0.1 U/kg/hr IV (< 5yr / Glu > 800 = 0.05 U/kg/hr)

HYPOGLYCEMIA
 Glucose < 5Yr = 5 ml/kg D₁₀W; > 5Yr = 2 ml/kg D₂₅W
 Glucose IV infusion: D₅ - D_{10.5} @ 6 - 8 mg/kg/min
 Glucon < 20kg = 0.5 mg > 20kg = 1 mg IV/IM/SC q 20min
 Hydrocortisone stress dose: see Adrenal crisis

HYPOCALCEMIA
 Calcium Chloride(10%) 0.2 ml/kg Central IV in 5-10min (max 1G)
 Calcium Gluconate(10%) 0.6ml/kg IV in 5-10min(max 3G)

HYPERKALEMIA
 Albuterol neb < 20kg = 2.5 mg; > 20kg = 5 mg q 20min X 2
 K⁺ 6 - 7mEq/L: Furosemide 1 mg/kg (max 40 m g) IV
 Kayexalate (no sorbitol) 1G/kg (max 15 G) PO or 30 - 50 G PR
 K⁺ > 7mEq/L: Reg Insulin 0.1 U/kg + D₁₀W 5 ml/kg IV in 30min
 EKG changes(wide QRS/no P); Ca Glu IV in 5min(see Hypocalcaemia)

STATUS EPILEPTICUS (see CHAM protocol)
 Lorazepam 0.1 mg/kg (max 4 mg) slow IV - repeat q 5 min X 1
 No IV: Diazepam 0.5-0.2mg/kg PR (max 20mg); Midazolam 0.2mg/kg IM(max 10mg)
 Fosphenytoin 20 mg PE / kg IV over 10 min Or IM
 Phenobarbital 20 mg/kg (max 1 G) IV over 15 - 20 min (1st line in Age < 2 mo)
 Valproate (Deпаan) 40 mg/kg (max 3 G) IV in 5 - 10 min
 Levetiracetam (Keppra) 60 mg/kg (max 4.5 G) IV load

SEDATION - ANALGESIA / DOSE
PO: Acetaminophen 15 mg/kg; Ibuprofen 10 mg/kg; Oxycodone 0.1 mg/kg
 Codeine 0.5 - 1 mg/kg (max 60 mg); Midazolam 0.25 - 0.5 mg/kg (max 20 mg)
IV: Fentanyl 1 - 2 µg/kg (max 100 µg); Midazolam 0.05 - 0.1 mg/kg (max 5 mg)
 Propofol 1mg/kg (max 40 µg) then 0.5 mg/kg (max 20 mg)
 Dexmedetomidine 0.5 - 1 µg/kg IV in 10min; Etomidate 0.1 mg/kg then 0.05mg/kg
IM / IV: Ketamine IV = 0.5 - 1 mg/kg; IM = 2 - 4 mg/kg (max 100 mg)
 Ketorolac 0.5 mg/kg (max 30mg); Pentobarbital IV 1 - 2 / IM 2 - 4 mg/kg (max 100mg)
IntraNasal: Fentanyl 2µg/kg (max 100µg); Midazolam 0.25 - 0.4 mg/kg (max 10 mg)
IM/IV / SQ: Dilaudid 0.015 mg/kg (max 2 mg); Morphine 0.1 mg/kg (max 15 mg)
STRIDOR / CROUP If Epiglottitis suspected consider Intubation
 Racemic Epi (2:25%) 0.05 ml/kg (max 0.5 ml) by nebulizer in 3 ml NS q 20min
 Dexamethasone 0.6 mg/kg (max 10 mg) IM / IV / PO
 Heliox (Helium : Oxygen mixture) 70 : 30 Or 80 : 20

TET SPELLS
 Keep child calm / Knee-Chest position / 100% Oxygen / NS 10- 20 ml/kg IV bolus
 Morphine 0.1 mg/kg (max 10 mg) SQ / IM / IV
 Propranolol or Esmolol 0.1 mg/kg (max 5 mg) IV in 10min q 15min X 1
 Phenylephrine 5 - 20 µg/kg (max 500 µg) IV; infuse 0.1 - 0.5 µg/kg/min
 Sodium Bicarbonate (4.2%) 1 mEq/kg (max 50 mEq) IV in 1 - 2hr

MANAGEMENT OF SHOCK (See Hospital Protocol)
 Identify and treat cause
O₂: Maintain Saturation 94% - 99%
NS bolus 20ml/kg X 3(Septic in 1st Hr) / (5 - 10ml/kg - Cardiac/DKA)
 Monitor Hypoglycemia / Hypocalcemia / Electrolytes / Temperature
 Broad spectrum Antibiotic if Sepsis:
 Toxic Shock: Clindamycin + Zosyn + Vancomycin
 Neutropenia: Cefepime +/- Vancomycin
 Pneumonia CA: Ceftriaxone +/- Vancomycin +/- Azithromycin
 Pneumonia HA: Zosyn + Vancomycin +/- Azithromycin
 NewBorn: Cefotaxime + Ampicillin + Acyclovir
 Transfuse to Hgb > 10 gm/dL

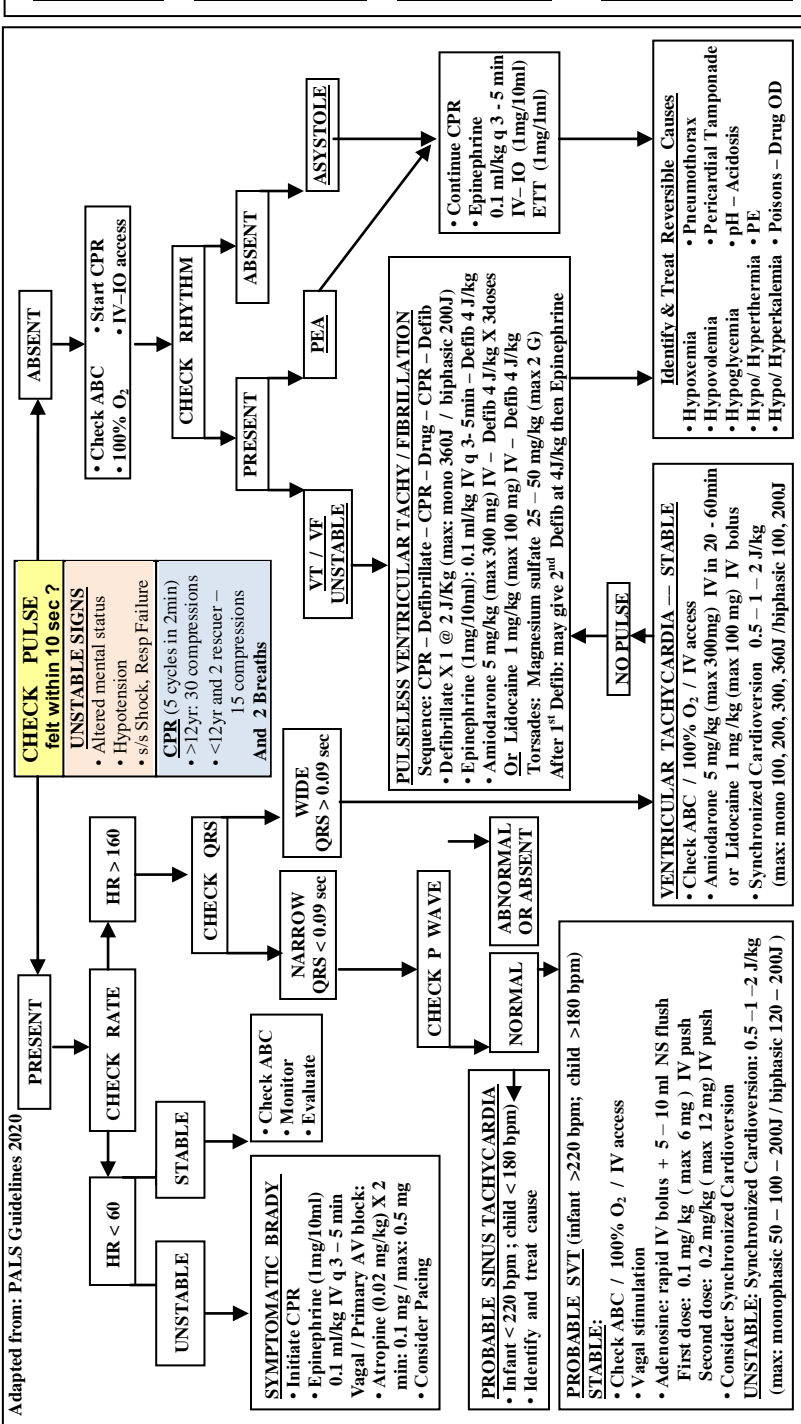
NORMOTENSIVE SHOCK
 Lo CO - Hi SVR
 Epinephrine 0.03-0.05µg/kg/m
 +/-Nor-Epinephrine
 +/-Dobutamine

HYPOVOLEMIC SHOCK
 Hi CO - Lo SVR
 Nor-Epinephrine
 + Vasopressin
 + Epinephrine

SEPTIC SHOCK - Fluid Refractory & Catecholamine Resistant
 If Adrenal failure - Hydrocortisone 2 mg/kg IV (max 100mg)
 Draw baseline Cortisol; consider ACTH stimulation test

NORMAL VITAL SIGNS

AGE	Wt - Kg	Pulse Rate	5% tile BP	95% tile Resp Rate
NB - 3 mo	3 - 5	100 - 180	60 / 40	90 / 55
4 - 11mo	5 - 9	100 - 175	65 - 70 / 45	100 / 55
1 - 2 yr	9 - 12	95 - 155	70 - 74 / 45	105 / 60
2 - 4 yr	12 - 15	90 - 140	74 - 78 / 50	110 / 65
4 - 6 yr	15 - 20	85 - 130	78 - 82 / 53	115 / 70
6 - 8 yr	20 - 25	80 - 120	82 - 86 / 55	115 / 75
8 - 12 yr	25 - 40	75 - 115	86 - 90 / 58	120 / 80
12 - 15 yr	40 - 60	70 - 110	90 / 60	125 / 80
> 16 yr	60 - 70	60 - 100	90 / 60	135 / 85



Adapted from: PALS Guidelines 2020

This code card is to be used only by providers familiar with the current pediatric indications, contraindications, adverse effects and dosages of medications - NOT intended to replace clinical judgement or guide individual patient care in any manner

ETT size = (Age + 16) / 4 ; Cuffed ET = (Age + 14) / 4	AGE	Newborn	2 - 5 Mo	6 - 11 Mo	1 - 2 Yr	3 - 5 Yrs	6 - 8 Yrs	9 - 11 Yrs	12 - 14 Yrs	15 - 16 Yrs	17 - 18 Yrs	> 18 Yrs	AGE	
Preemie ETT = GA wk / 10	WEIGHT	NB: 3 Kg	5 Kg	8 Kg	10 Kg	15 Kg	20 Kg	30 Kg	40 Kg	50 Kg	60 Kg	70Kg / Adult	WEIGHT	
Syst BP min = 70 + (2 x Age) ; max = 110 + (2 x Age)	ETT	3 - 3.5	3.5 - 4	4 - 4.5	4 - 4.5	4.5 - 5	5 - 5.5	6 - 6.5 cuff	6.5 - 7 cuff	7 - 7.5 cuff	7.5 - 8 cuff	7.5 - 8 cuff	ETT	
Osmolality = 2 x Na + Glu / 18 + BUN / 2.8 (N=275 - 295)	Laryngoscope	Miller 0 - 1	Miller 0 - 1	Miller 0 - 1	Miller 0 - 1	Miller 1 - 2	Miller 2	MH/Mac 2 - 3	MH/Mac 3	Mil/Mac 3	Mil / Mac 3	Mil / Mac 3	Laryngoscope	
Anion Gap = Na - (Cl + HCO3) (N = 10 - 14 mEq/L)	LMA (Cuff)	1 (4 ml)	1.5 (7 ml)	1.5 (7 ml)	2 (10 ml)	2 (10 ml)	2 - 2.5(14ml)	3 (20 ml)	4 (30 ml)	4 - 5 (40ml)	5 - 6 (50 ml)	5 - 6 (50ml)	LMA (Cuff)	
PCO2 ↑ 10 mm Hg = pH ↓ 0.08	NG Tube	5 - 8 Fr	5 - 8 Fr	8 - 10 Fr	8 - 10 Fr	10 - 12 Fr	12 - 14 Fr	14 - 16 Fr	14 - 16 Fr	14 - 16 Fr	16 - 18 Fr	16 - 18 Fr	NG Tube	
HCO3 ↓ 10 mm Hg = pH ↓ 0.15	Suction/Foley	6 - 8 Fr	8 - 10 Fr	8 - 10 Fr	10 Fr	10 Fr	10 - 12 Fr	12 Fr	12 Fr	12 Fr	12 - 14 Fr	12 - 14 Fr	Suction/Foley	
PRBC / Platelet / FFP / Cryoprecipitate / Albumin	Chest Tube	10 - 12 Fr	12 - 16 Fr	16 - 20 Fr	16 - 20 Fr	20 - 24 Fr	20 - 24 Fr	24 - 32 Fr	28 - 32 Fr	32 - 36 Fr	36 - 40 Fr	36 - 40 Fr	Chest Tube	
	Femoral	3 Fr - 8 cm	4 Fr - 8 cm	4 Fr - 15 cm	4 Fr - 15 cm	4 Fr - 15 cm	5 Fr - 15 cm	5 Fr - 15 cm	5 Fr - 15 cm	5 Fr - 15 cm	7 Fr - 20 cm	7 Fr - 20 cm	Femoral	
CODE MEDS	ROUTE	NB: 3Kg	2 - 5mo: 5Kg	6 - 11mo: 8Kg	1 - 2yr: 10Kg	3 - 5yr: 15Kg	6 - 8yr: 20Kg	9 - 11 yr: 30Kg	12 - 13yr: 40Kg	14 - 15yr: 50Kg	16 - 17yr: 60Kg	> 18yr: > 70Kg	DRUG	
Atropine	IV / ETT	0.1 mg	0.1 mg	0.16 mg	0.2 mg	0.3 mg	0.4 mg	0.6 mg	0.8 mg	1 mg	1 mg max	1 mg max	Atropine	
Calcium chloride 10%	IV - SLOW	0.6 ml	1 ml	1.6 ml	2 ml	3 ml	4 ml	6 ml	8 ml	10 ml max	10 ml = 1 G max	10 ml = 1 G max	Ca Chloride 10%	
Calcium gluconate 10%	IV	1.8 ml	3 ml	4.8 ml	6 ml	9 ml	12 ml	18 ml	24 ml	30 ml max	30 ml = 3 G max	3 ml = 3 G max	Ca Gluconate 10%	
Epinephrine 1mg/10ml	IV	0.3 ml	0.5 ml	0.8 ml	1 ml	1.5 ml	2 ml	3 ml	4 ml	5 ml	6 ml	7 ml - 10 ml max	Epi 1mg/10ml	
Epinephrine 1mg/1ml	ETT	3ml(1mg/10ml)	0.5 ml ETT	0.8 ml ETT	1 ml ETT	1.5 ml ETT	2 ml ETT	3 ml ETT	4 ml ETT	5 ml ETT	6 ml ETT	7 ml - 10ml ETTmax	Epi 1mg/1ml	
Glucose (D10W)	IV	15 ml	25 ml	40 ml	50 ml	75 ml	100 ml	150 ml	200 ml	250 ml	250 ml max	250 ml = 25 G max	Glucose - D10W	
Lidocaine 1%	IV / ETT	3 mg	5 mg	8 mg	10 mg	15 mg	20 mg	30 mg	40 mg	50 mg	60 mg	70 mg - 100 mg max	Lidocaine	
NaHCO3 (4.2% / 8.4%)	IV	6 ml - 4.2%	10ml-4.2%	8 ml	10 ml	15 ml	20 ml	30ml	40 ml	50 ml	50 ml max	50 ml max	Bicarb 8.4%	
Naloxone (narcan)	IV / ETT	0.3 mg	0.5 mg	0.8 mg	1 mg	1.5 mg	2 mg	2 mg max	2 mg max	2 mg max	2 mg max	2 mg max	Narcan	
CARDIAC / HTN	ROUTE	NB: 3Kg	2 - 5mo: 5Kg	6 - 11mo: 8Kg	1 - 2yr: 10Kg	3 - 5yr: 15Kg	6 - 8yr: 20Kg	9 - 11 yr: 30Kg	12 - 13yr: 40Kg	14 - 15yr: 50Kg	16 - 17yr: 60Kg	> 18yr: > 70Kg	CARDIAC / HTN	
Cardioversion - Sync	Peds Pads	2 J - 3 J	3 J - 5 J	4 - 8 J	5 J - 10 J	8 J - 15 J	10 J - 20 J	15 J - 30 J	20 J - 40 J	25 J - 50 J	30 J - 60 J	35 J - 70 J	Cardioversion	
Defibrillation	< 1yr - 10kg	6 J - 8 J	10 J - 20 J	16 J - 32 J	20 J - 40 J	30 J - 60 J	40 J - 80 J	60 J - 120 J	80 J - 160 J	100 J - 200 J	120 J - 240 J	140 J - 200 J max	Defibrillation	
Adenosine (adenocard)	IV-RAPID	0.3mg - 0.6mg	0.5 mg - 1 mg	0.8mg - 1.6 mg	1 mg - 2 mg	1.5 mg - 3 mg	2 mg - 4 mg	3 mg - 6 mg	4 mg - 8 mg	5 mg - 10 mg	6 mg - 12mg max	6 mg - 12 mg max	Adenosine	
Amiodarone (cordaron)	IV-SLOW	X	25 mg	40 mg	50 mg	75 mg	100 mg	150 mg	200 mg	250 mg	300 mg	300 mg max	Amiodarone	
Furosemide (lasix)	IV	3 mg	5 mg	8 mg	10 mg	15 mg	20 mg	30 mg	40 mg	40 mg max	40 mg max	40 mg max	Lasix	
Hydroalazine(apresoline)	IV-SLOW	X	0.5 mg - 1 mg	0.8mg - 1.6mg	1 mg - 2 mg	1.5 mg - 3 mg	2 mg - 4 mg	3 mg - 6 mg	4 mg - 8 mg	5 mg - 10 mg	6 mg - 12 mg	7mg - 14mg(20 max)	Hydroalazine	
Isradipine (dynamirc)	PO	0.15mg-0.3mg	0.25mg-0.5mg	0.4 mg-0.8mg	0.5 mg- 1mg	0.75mg-1.5mg	1 mg - 2 mg	1.5 mg - 3 mg	2 mg - 4 mg	2.5 mg - 5 mg	3 mg - 5 mg max	4 mg - 5 mg max	Isradipine	
Labetalol (normodyne)	IV	X	1.25mg - 5mg	2 mg - 8 mg	2.5mg-10mg	3.75mg-15mg	5 mg - 20mg	7.5mg - 20mg	10 mg - 20 mg	12.5mg - 20mg	15mg - 20mg max	17.5 mg - 20mg max	Labetalol	
SEDATION / RSI	ROUTE	NB: 3Kg	2 - 5mo: 5Kg	6 - 11mo: 8Kg	1 - 2yr: 10Kg	3 - 5yr: 15Kg	6 - 8yr: 20Kg	9 - 11 yr: 30Kg	12 - 13yr: 40Kg	14 - 15yr: 50Kg	16 - 17yr: 60Kg	> 18yr: > 70Kg	SEDATION / RSI	
Etomidate (amidate)	IV	X	0.5 mg-1.5 mg	0.8mg-2.4 mg	1 mg - 3 mg	1.5mg - 4.5mg	2 mg - 6 mg	3 mg - 9 mg	4 mg - 12 mg	5 mg - 15 mg	6 mg - 18 mg	7 mg - 21 mg	Etomidate	
Fentanyl (sublimaze)	IV - SLOW	3 - 6 µg	5 - 10 µg	8 - 16 µg	10 - 20 µg	15 - 30 µg	20 - 40 µg	30 - 60 µg	40 - 80 µg	50 - 100 µg	60 - 120 µg	70 - 140 µg	Fentanyl	
Ketamine (ketalar)	IV	X	X	X	10mg-20mg	15 mg - 30 mg	20mg-40mg	30 mg - 60 mg	40 mg - 80 mg	50 mg - 100 mg	60 mg - 120 mg	70 mg - 140 mg	Ketamine	
Midazolam (versed)	IV	0.15mg-0.3mg	0.25mg-0.5mg	0.4mg-0.8 mg	0.5mg - 1mg	0.75mg-1.5mg	1 mg - 2 mg	1.5 mg - 3 mg	2 mg - 4 mg	2.5 mg - 5 mg	3 mg - 5 mg max	3.5 mg - 5 mg max	Midazolam	
PARALYZING	ROUTE	NB: 3Kg	2 - 5mo: 5Kg	6 - 11mo: 8Kg	1 - 2yr: 10Kg	3 - 5yr: 15Kg	6 - 8yr: 20Kg	9 - 11 yr: 30Kg	12 - 13yr: 40Kg	14 - 15yr: 50Kg	16 - 17yr: 60Kg	> 18yr: > 70Kg	PARALYZING	
Rocuronium (zemuron)	IV	3 mg	5 mg	8 mg	10 mg	15 mg	20 mg	30 mg	40 mg	50 mg	60 mg	70 mg	Rocuronium	
Succinylcholine(aneectine)	IV	6 mg	10 mg	15 mg	15 mg	22.5 mg	30 mg	45 mg	50 mg	50 mg	60 mg	70 mg (150 mg max)	Succinylcholine	
Vecuronium (norcuron)	IV	0.3 mg	0.5 mg	0.8 mg	1 mg	1.5 mg	2 mg	3 mg	4 mg	5 mg	6 mg	7 mg (10 mg max)	Vecuronium	
NEUROLOGY	ROUTE	NB / 3Kg	2 - 5mo / 5Kg	6 - 11mo / 8Kg	1 - 2yr / 10Kg	3 - 5yr / 15Kg	6 - 8yr/20Kg	9 - 11 yr / 30Kg	12 - 13yr / 40Kg	14 - 15yr / 50Kg	16 - 17yr / 60Kg	> 18yr / > 70Kg	NEUROLOGY	
Lorazepam (ativan)	IV - SLOW	0.3 mg	0.5 mg	0.8 mg	1 mg	1.5 mg	2 mg	3 mg	4 mg	4 mg max	4 mg max	4 mg max	Ativan	
Diazepam (diastat) - PR	Rectal	X	2.5 mg	2.5 mg	5 mg	5 mg - 7.5 mg	5mg - 7.5mg	7.5 mg - 10 mg	7.5 mg - 10 mg	7.5 mg - 10 mg	10 mg - 12.5 mg	15 mg - 20 mg max	Diastat	
Fosphenytoin (cerebyx)	IV in 10 min	X	100 mg	160 mg	200 mg	300 mg	400 mg	600 mg	800 mg	1 G	1.2 G	1.4 G (2 G max)	Fosphenytoin	
Mannitol	IV in 2- 20 min	0.75 - 1.5 G	1.25 - 2.5 G	2 - 4 G	2.5 - 5 G	3.75 - 7.5 G	5 - 10 G	7.5 - 15 G	10 - 20 G	12.5 - 25 G	12.5G-25 G max	12.5G - 25 G max	Mannitol	
Phenobarbital	IV in 20 min	60 mg	100 mg	160 mg	200 mg	300 mg	400 mg	600 mg	800 mg	1G	1 G max	1 G max	Phenobarbital	
PREPARATION OF INFUSIONS (Use Premixed Standard Concentrations When Available)														
INFUSION	MIX In D5W	DOSE RANGE	INITIAL DOSE	Newborn (3 Kg)	6 - 11 mo (8 Kg)	1 - 2 Yr (10 Kg)	3 - 5 Yr (15 Kg)	6 - 8 Yr (20 Kg)	9 - 11 Yr (30 Kg)	12 - 13 Yr (40 Kg)	14 - 15 Yr (50 Kg)	16 - 17 Yr (60 Kg)	> 18 Yr (> 70 Kg)	INFUSION
Dopamine	400 mg in 250 ml (1.6mg/ml)	2 - 20 µg/kg/min	10 µg/kg/min	1.1 ml/hr	3 ml/hr	3.8 ml/hr	5.7 ml/hr	7.5 ml/hr	11.3ml/h	15 ml/hr	18.8 ml/hr	22.5 ml/hr	26.3 ml/hr	Dopamine
Dobutamine	250 mg in 250 ml (1mg/ml)	2 - 20 µg/kg/min	10 µg/kg/min	0.9 ml/hr	2.4 ml/hr	3 ml/hr	4.5 ml/hr	6 ml/hr	9 ml/hr	12 ml/hr	15 ml/hr	18 ml/hr	21 ml/hr	Dobutamine
Epinephrine	2 mg in 100 ml (20 µg/ml)	0.05 - 2 µg/kg/min	0.05 µg/kg/min	0.5 ml/hr	1.2 ml/hr	1.5 ml/hr	2.3 ml/hr	3 ml/hr	4.5 ml/hr	6 ml/hr	7.5 ml/hr	9 ml/hr	10.5 ml/hr	Epinephrine
Norepinephrine	8 mg in 250 ml (32 µg/ml)	0.1 - 2 µg/kg/min	0.1 µg/kg/min	0.6 ml/hr	1.5 ml/hr	1.9 ml/hr	2.8 ml/hr	3.8 ml/hr	5.6 ml/hr	7.5 ml/hr	9.4 ml/hr	11.3 ml/hr	13.1 ml/hr	Norepinephrine
Nicardipine	20mg in 200ml NS(0.1mg/ml)	0.5 - 3 µg/kg/min	0.5 µg/kg/min	0.9 ml/hr	2.4 ml/hr	3 ml/hr	4.5 ml/hr	6 ml/hr	9 ml/hr	12 ml/hr	15 ml/hr	18 ml/hr	21 ml/hr	Nicardipine
Vasopressin	10 Unit in 100 ml (0.1 U/ml)	0.2 - 2 mU/kg/min	0.5 mU/kg/min	0.9 ml/hr	2.4 ml/hr	3 ml/hr	4.5 ml/hr	6 ml/hr	9 ml/hr	12 ml/hr	15 ml/hr	18 ml/hr	21 ml/hr	Vasopressin
Alprostadil	500 µg in 250 ml (2 µg/ml)	0.05 - 0.1 µg/kg/min	0.05 µg/kg/min	0.9 ml/hr	2.4 ml/hr	3 ml/hr	4.5 ml/hr	6 ml/hr	9 ml/hr	12 ml/hr	15 ml/hr	18 ml/hr	21 ml/hr	Alprostadil
1 kg @ 0.6 ml/hr / 2 kg @ 1.2 ml/hr / 3 kg @ 1.8 ml/hr / 4 kg @ 2.4 ml/hr / 5 kg @ 3 ml/hr														

This code card is to be used only by providers familiar with the current pediatric indications, contraindications, adverse effects and dosages of medications - NOT intended to replace clinical judgement or guide individual patient care in any manner