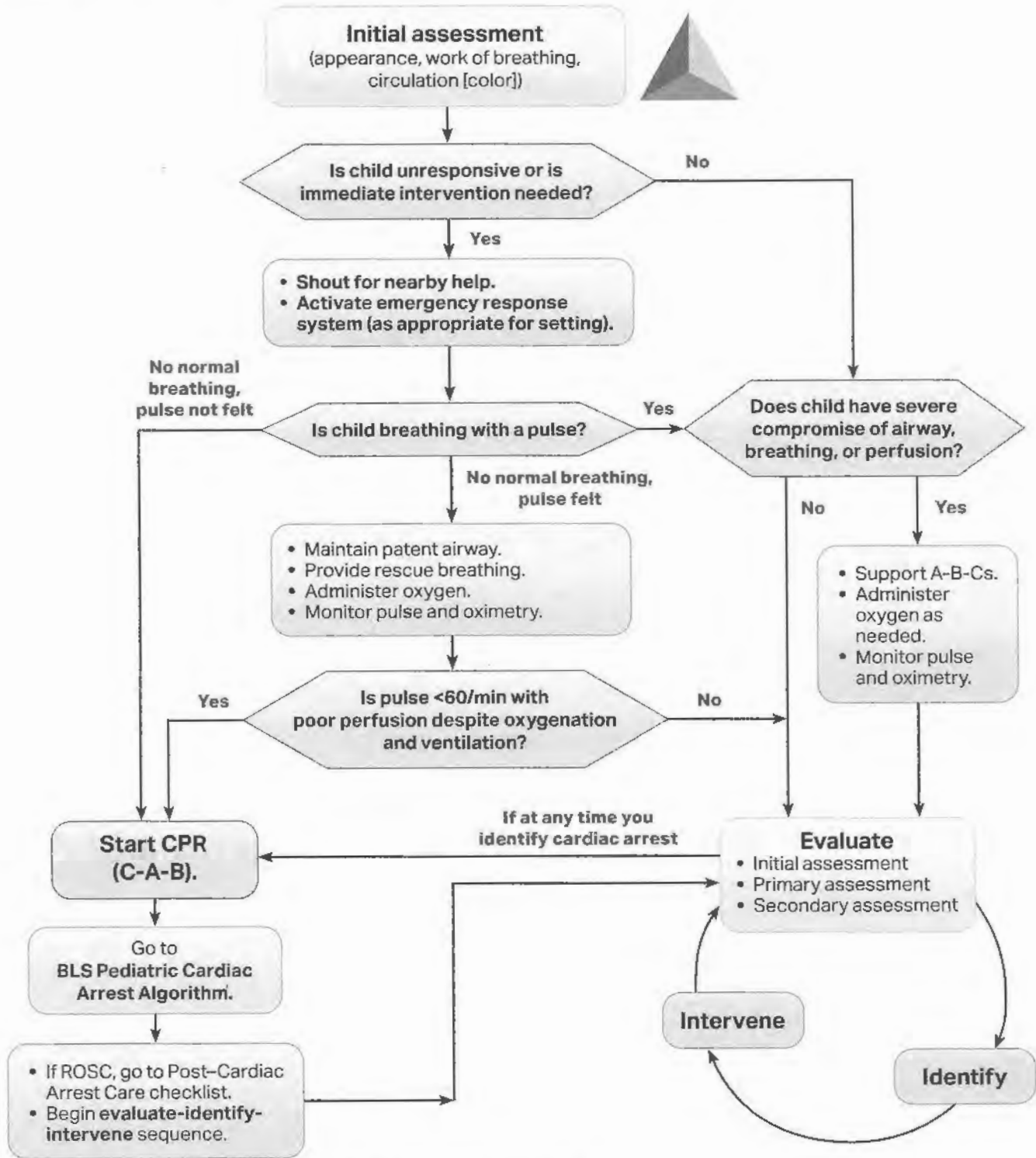
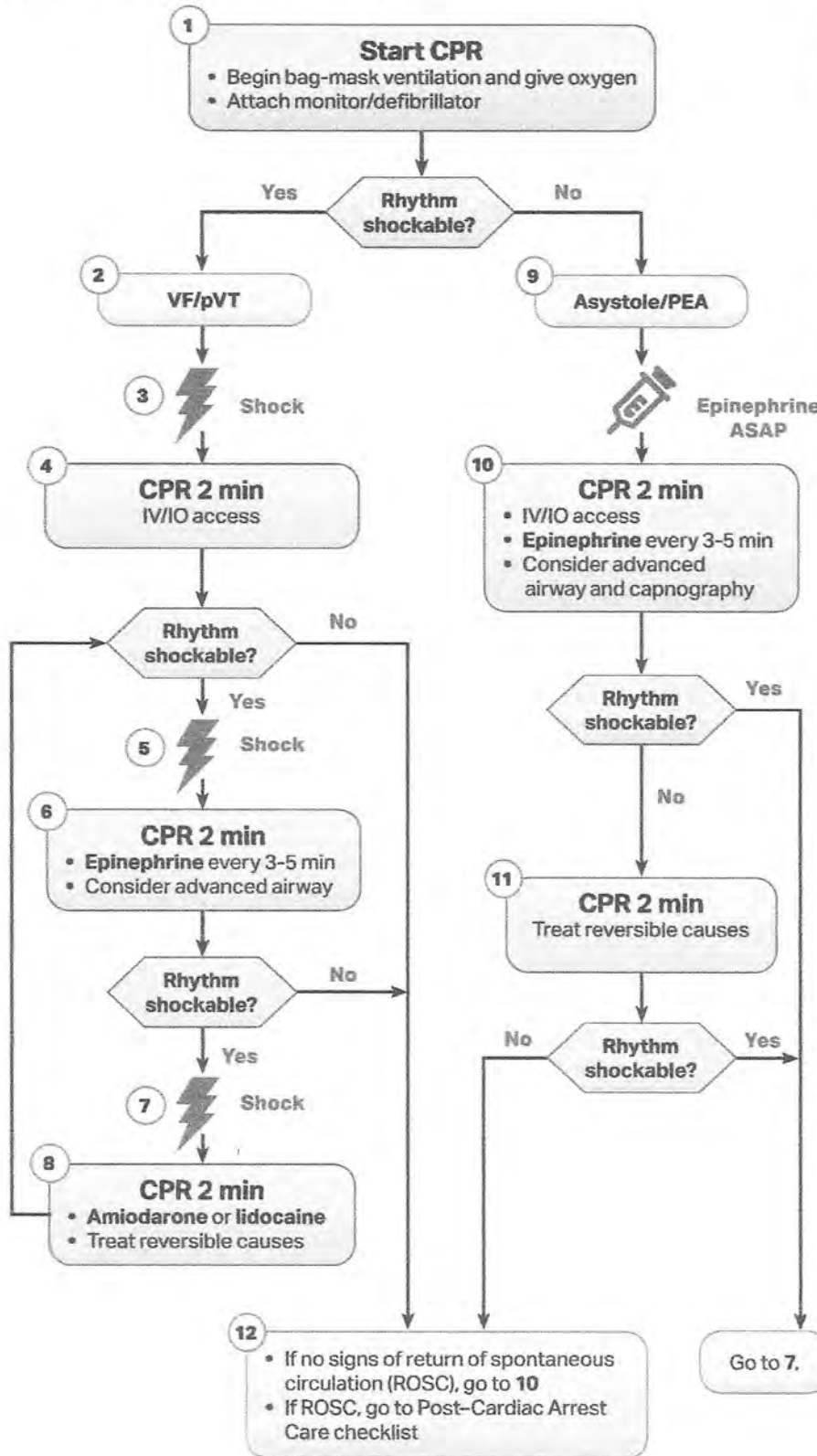


PALS Systematic Approach Algorithm



Pediatric Cardiac Arrest Algorithm



CPR Quality

- Push hard ($\geq 1/3$ 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

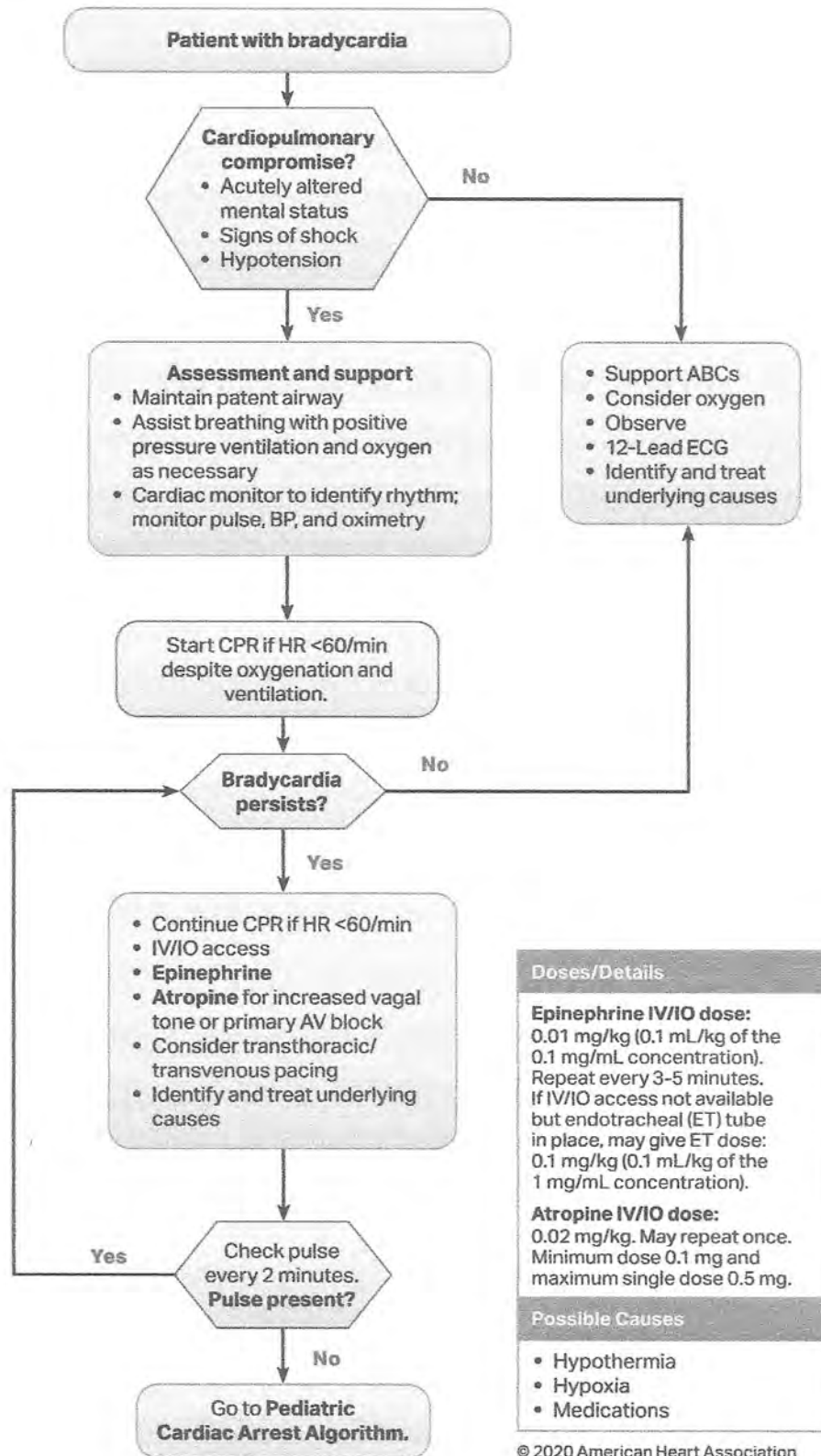
Advanced Airway

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

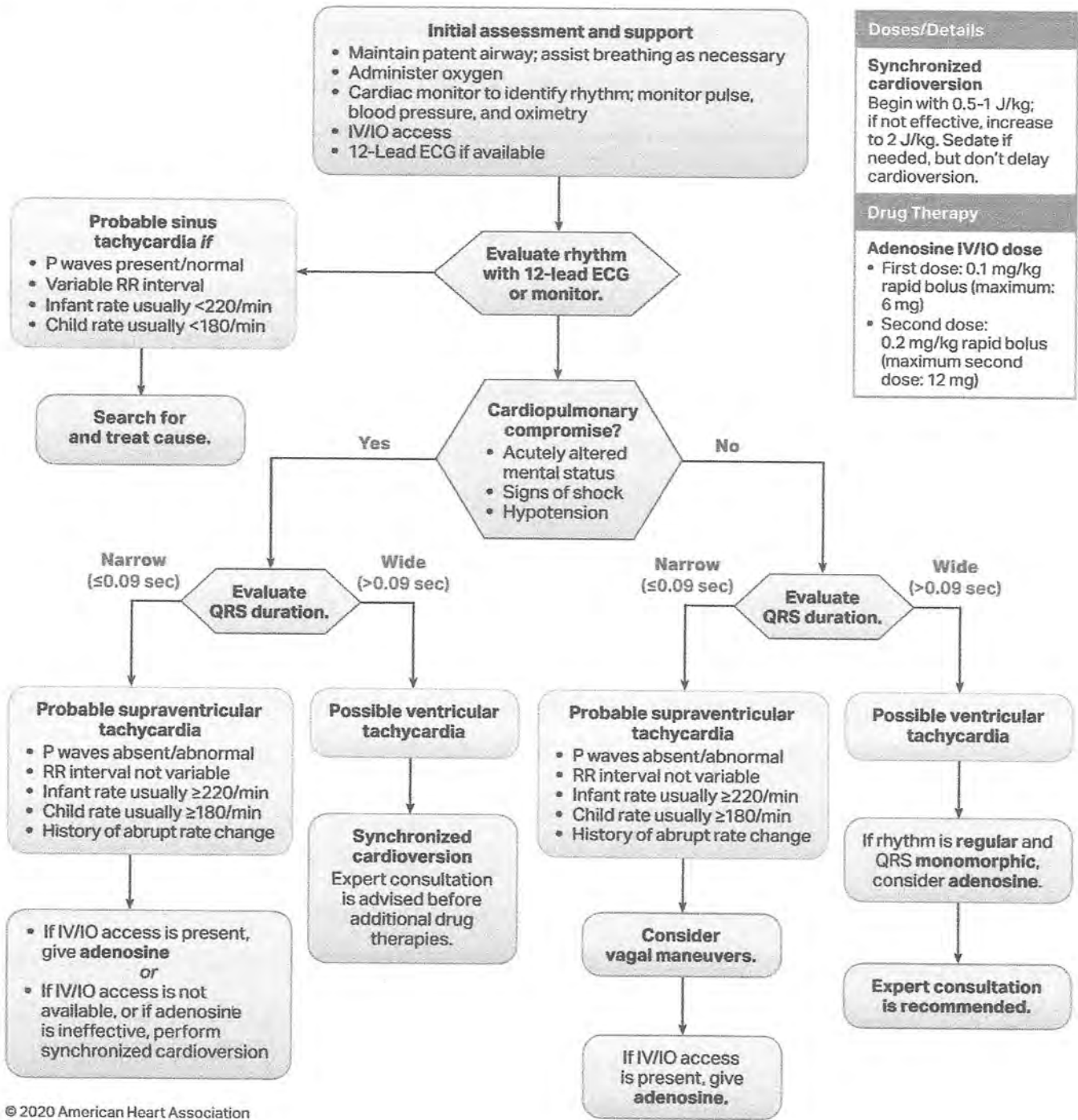
Reversible Causes

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

Pediatric Bradycardia With a Pulse Algorithm



Pediatric Tachycardia With a Pulse Algorithm



Recognizing Respiratory Problems Flowchart

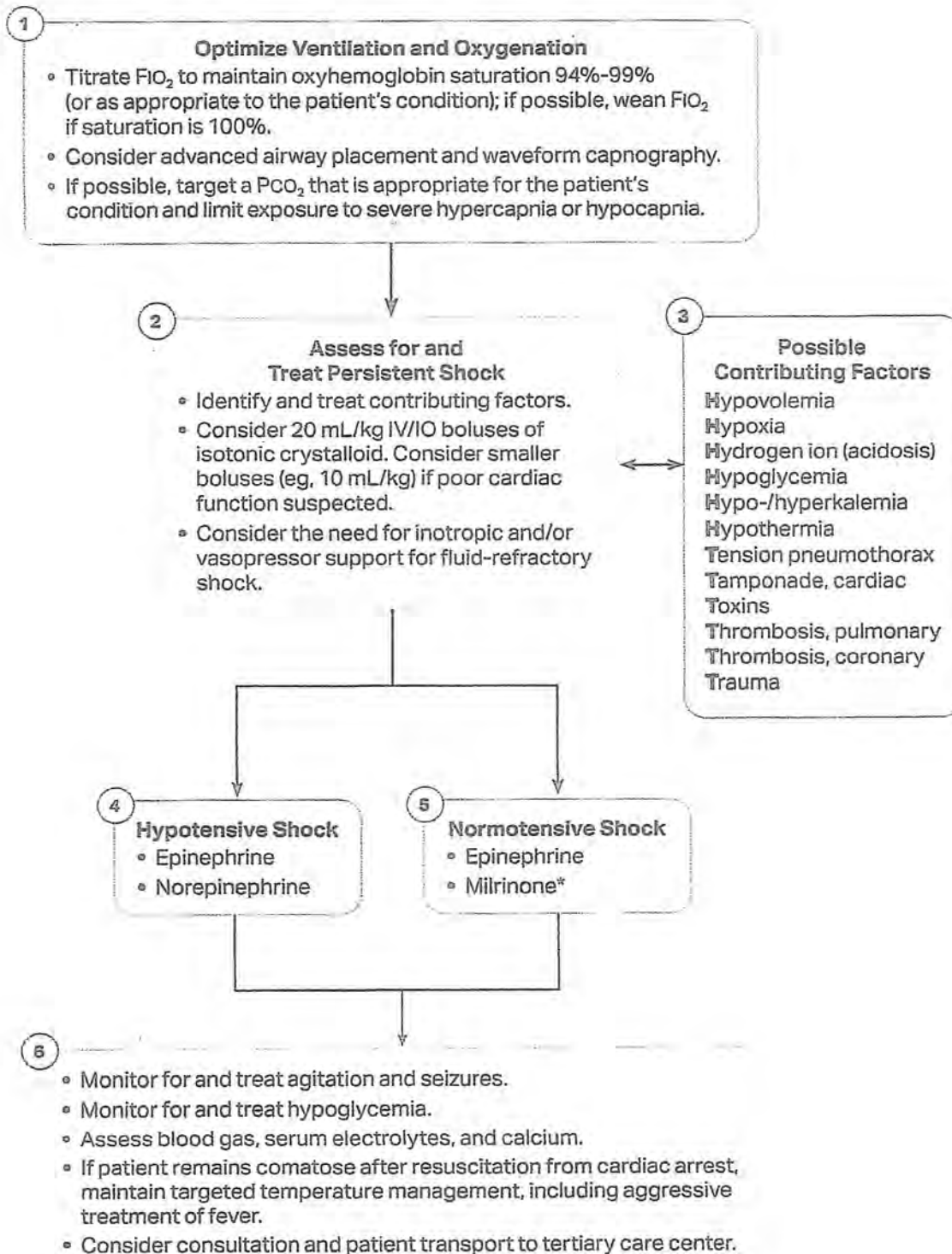
PALS: Signs of respiratory problems					
Clinical signs		Upper airway obstruction	Lower airway obstruction	Lung tissue disease	Disordered control of breathing
Airway	Patency	Airway open and maintainable/not maintainable			
Breathing	Respiratory rate/effort	Increased			Variable
	Breath sounds	Stridor (typically inspiratory)	Barking cough Hoarseness Wheezing (typically expiratory) Prolonged expiratory phase	Grunting Crackles Decreased breath sounds	Normal
	Air movement	Decreased			Variable
Circulation	Heart rate	Tachycardia (early); bradycardia (late)			
	Skin	Pallor, cool skin (early); cyanosis (late)			
Disability	Level of consciousness	Anxiety, agitation (early); lethargy, unresponsiveness (late)			
Exposure	Temperature	Variable			
PALS: Identifying respiratory problems by severity					
Progression of respiratory distress to respiratory failure*					
Airway	Respiratory distress: open and maintainable Respiratory failure: not maintainable				
Breathing	Respiratory distress: tachypnea Respiratory failure: bradypnea to apnea				
	Respiratory distress: work of breathing (nasal flaring/retractions) Respiratory failure: increased effort progresses to decreased effort and then to apnea				
	Respiratory distress: good air movement Respiratory failure: poor to absent air movement				
Circulation	Respiratory distress: tachycardia Respiratory failure: bradycardia				
	Respiratory distress: pallor Respiratory failure: cyanosis				
Disability	Respiratory distress: anxiety, agitation Respiratory failure: lethargy to unresponsiveness				
Exposure	Variable temperature				

*Respiratory failure requires immediate intervention.

Managing Respiratory Emergencies Flowchart

Managing respiratory emergencies flowchart		
<ul style="list-style-type: none"> • Airway positioning • Suction as needed 	<ul style="list-style-type: none"> • Oxygen • Pulse oximetry 	<ul style="list-style-type: none"> • ECG monitor as indicated • BLS as indicated
Upper airway obstruction Specific management for selected conditions		
Croup	Anaphylaxis	Aspiration foreign body
<ul style="list-style-type: none"> • Nebulized epinephrine • Corticosteroids 	<ul style="list-style-type: none"> • IM epinephrine (or autoinjector) • Albuterol • Antihistamines • Corticosteroids 	<ul style="list-style-type: none"> • Allow position of comfort • Specialty consultation
Lower airway obstruction Specific management for selected conditions		
Bronchiolitis	Asthma	
<ul style="list-style-type: none"> • Nasal suctioning • Consider bronchodilator trial 	<ul style="list-style-type: none"> • Albuterol ± ipratropium • Corticosteroids • Magnesium sulfate • IM epinephrine (if severe) • Terbutaline 	
Lung tissue disease Specific management for selected conditions		
Pneumonia/pneumonitis Infectious, chemical, aspiration	Pulmonary edema Cardiogenic or noncardiogenic (ARDS)	
<ul style="list-style-type: none"> • Albuterol • Antibiotics (as indicated) • Consider noninvasive or invasive ventilatory support with PEEP 	<ul style="list-style-type: none"> • Consider noninvasive or invasive ventilatory support with PEEP • Consider vasoactive support • Consider diuretic 	
Disordered control of breathing Specific management for selected conditions		
Increased ICP	Poisoning/overdose	Neuromuscular disease
<ul style="list-style-type: none"> • Avoid hypoxemia • Avoid hypercarbia • Avoid hyperthermia • Avoid hypotension 	<ul style="list-style-type: none"> • Antidote (if available) • Contact poison control 	<ul style="list-style-type: none"> • Consider noninvasive or invasive ventilatory support

Figure 53. PALS Management of Shock After ROSC Algorithm.



*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).

Recognizing Shock Flowchart

Clinical signs		Hypovolemic shock	Distributive shock	Cardiogenic shock	Obstructive shock
Airway	Patency	Airway open and maintainable/not maintainable			
Breathing	Respiratory rate	Increased			
	Respiratory effort	Normal to increased		Labored	
	Breath sounds	Normal	Normal (\pm crackles)	Crackles, grunting	
Circulation	Systolic blood pressure	Compensated shock can progress to hypotensive shock if left untreated			
	Pulse pressure	Narrow	Variable	Narrow	
	Heart rate	Increased			
	Peripheral pulse quality	Weak	Bounding or weak	Weak	
	Skin	Pale, cool	Warm or cool	Pale, cool	
	Capillary refill	Delayed	Variable	Delayed	
	Urine output	Decreased			
Disability	Level of consciousness	Irritable early, lethargic late			
Exposure	Temperature	Variable			

Managing Shock Flowchart

Managing shock flowchart			
<ul style="list-style-type: none"> Oxygen Pulse oximetry ECG monitor 		<ul style="list-style-type: none"> IV/IO access BLS as indicated Point-of-care glucose testing 	
Hypovolemic shock: Specific management for selected conditions			
Nonhemorrhagic		Hemorrhagic	
<ul style="list-style-type: none"> 20 mL/kg NS/LR bolus, repeat as needed Consider colloid 		<ul style="list-style-type: none"> Control external bleeding 20 mL/kg NS/LR bolus, repeat 2 or 3x as needed Transfuse PRBCs as indicated 	
Distributive shock: Specific management for selected conditions			
Septic	Anaphylactic		Neurogenic
Management algorithm: <ul style="list-style-type: none"> Septic Shock 	<ul style="list-style-type: none"> IM epinephrine (or autoinjector) Fluid boluses (10-20 mL/kg NS/LR) Albuterol Antihistamines, corticosteroids Epinephrine infusion 		<ul style="list-style-type: none"> 20 mL/kg NS/LR bolus, repeat PRN Vasopressor
Cardiogenic shock: Specific management for selected conditions			
Bradyarrhythmia/tachyarrhythmia		Other (eg, CHD, myocarditis, cardiomyopathy, poisoning)	
Management algorithms: <ul style="list-style-type: none"> Bradycardia Tachycardia 		<ul style="list-style-type: none"> 5 to 10 mL/kg NS/LR bolus, repeat PRN Inotropic and/or vasoactive infusion Consider expert consultation Antidote for poisoning 	
Obstructive shock: Specific management for selected conditions			
Ductal-dependent (LV outflow obstruction)	Tension pneumothorax	Cardiac tamponade	Pulmonary embolism
<ul style="list-style-type: none"> Prostaglandin E1 Expert consultation 	<ul style="list-style-type: none"> Needle decompression Tube thoracostomy 	<ul style="list-style-type: none"> Pericardiocentesis 20 mL/kg NS/LR bolus 	<ul style="list-style-type: none"> 20 mL/kg NS/LR bolus, repeat PRN Consider thrombolytics, anticoagulants Expert consultation

Table 56. Color-Coded Length-Based Resuscitation Tape

Zone	3 kg	4 kg	5 kg	Pink	Red	Purple	Yellow	White	Blue	Green
ETT uncuffed (mm)	3.5	3.5	3.5	3.5	3.5	4.0	4.5	5.0	5.5	N/A
ETT cuffed (mm)	3.0	3.0	3.0	3.0	3.0	3.5	4.0	4.5	5.0	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
Suction (F)	8	8	8	8	8	8	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
Stylet	6 F	6 F	6 F	6 F	6 F	6 F	10 F	10 F	10 F	14 F
OPA (mm)	50	50	50	50	50	60	60	60	70	80
NPA (F)	14	14	14	14	14	18	20	22	24	26
Bag-mask device (minimum mL)	450	450	450	450	450	450	450	450-750	750-1000	750-1000
ETCO ₂ detector	Ped	Ped	Ped	Ped	Ped	Ped	Ped	Adult	Adult	Adult
LMA	1	1	1	1.5	1.5	2	2	2	2-2.5	2.5
Tidal volume (mL)	20-30	24-40	30-50	40-65	50-85	65-105	80-130	100-165	125-210	160-265
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

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.