PALS Information (for PDA)

Summary of ABCD Maneuvers

1. **Child (1-8 years old)**
    a. **Airway**
        i. **Head tilt-chin lift (if trauma is present, use jaw thrust)**
    b. **Breathing**
        i. **Initial: 2 breaths at 1 to 1.5 sec/breath**
        ii. **Subsequent: ≈20 breaths/min**
        iii. **FBAO: Heimlich maneuver**
    c. **Circulation**
        i. **Pulse check: Carotid**
        ii. **Compression landmarks: Lower half of sternum**
        iii. **Compression method: Heel of one hand**
        iv. **Compression depth: 1 to 1.5 in. or approximately one third to one half depth of chest**
        v. **Compression rate: 100/min**
        vi. **Compression/ventilation ratio: 5:1 (Pause for ventilation until trachea is intubated.)**
2. **Infant (<1 year old)**
    a. **Airway**
        i. **Head tilt-chin lift (if trauma is present, use jaw thrust)**
    b. **Breathing**
        i. **Initial: 2 breaths at 1 to 1.5 sec/breath**
        ii. **Subsequent: ≈20 breaths/min**
        iii. **FBAO: Back blows and chest thrusts**
    c. **Circulation**
        i. **Pulse check: Brachial or femoral**
        ii. **Compression landmarks: 1 finger width below intermammary line**
        iii. **Compression method: <u>2 thumbs-encircled hands</u> or, 2 or 3 fingers**
        iv. **Compression depth: 0.5 to 1 in. or approximately one third to one half depth of chest**
        v. **Compression rate: ≥100/min**
        vi. **Compression/ventilation ratio: 5:1 (Pause for ventilation until trachea is intubated.)**
3. **Newborn (Delivery room or neonatal ICU)**
    a. **Airway-**
        i. **Head tilt-chin lift**
    b. **Breathing**
        i. **Initial: 2 breaths at 1 to 1.5 sec/breath**
        ii. **Subsequent: ≈30-60 breaths/min**
    c. **Circulation**
        i. **Pulse check: Brachial or femoral**
        ii. **Compression landmarks: 1 finger width below intermammary line**
        iii. **Compression method: <u>2 thumbs-encircled hands</u> or, 2 or 3 fingers**
        iv. **Compression depth: 0.5 to 1 in. or approximately one third depth of chest**

v. **Compression rate: 120/min**
vi. **Compression/ventilation ratio: 3:1 for intubated newborns (2 rescuers)**

Newborn Initial Assessment

1. **Assess and support**
    a. **Temperature (warm and dry)**
    b. **Airway (position and suction)**
    c. **Breathing (stimulate to cry)**
    d. **Circulation (heart rate and color)**
2. **Always needed by newborns**
    a. **Assess baby's response to birth**
    b. **Keep baby warm**
    c. **Position, clear airway, stimulate to breathe by drying, and give oxygen (as necessary)**
3. **Needed less frequently**
    a. **Establish effective ventilation**
        i. **Bag and mask**
        ii. **Tracheal intubation**
4. **Rarely needed by newborns**
    a. **Provide chest compressions**
    b. **Administer medications**

Modified Glasgow Coma Scale

Child

1. **Eye Opening**
    a. **Spontaneous- score 4**
    b. **To verbal stimuli- score 3**
    c. **To pain only- score 2**
    d. **No response- score 1**
2. **Verbal Response**
    a. **Oriented, appropriate- score 5**
    b. **Confused- score 4**
    c. **Inappropriate words- score 3**
    d. **Incomprehensible sounds- score 2**
    e. **No response- score 1**
3. **Motor Response***
    a. **Obeys commands- score 6**
    b. **Localizes painful stimuli- score 5**
    c. **Withdraws in response to pain- score 4**
    d. **Flexion in response to pain- score 3**
    e. **Extension in response to pain- score 2**
    f. **No response- score 1**

Infant

1. **Eye Opening**
    a. **Spontaneous- score 4**

   b. To verbal stimuli- score 3
   c. To pain only- score 2
   d. No response- score 1
2. Verbal Response
   a. Coos and babbles- score 5
   b. Irritable cries- score 4
   c. Cries to pain- score 3
   d. Moans to pain- score 2
   e. No response- score 1
3. Motor Response*
   a. Moves spontaneously and purposefully- score 6
   b. Withdraws to touch- score 5
   c. Withdraws in response to pain- score 4
   d. Abnormal flexion posture to pain- score 3
   e. Abnormal extension posture to pain- score 2
   f. No response- score 1

*** If patient is intubated, unconscious, or preverbal, the most important part of this scale is motor response. Motor response should be carefully evaluated.**

Pediatric Trauma Score

1. Weight (kg)
   a. >20 kg- score +2
   b. 10 to 20 kg- score +1
   c. < 10 kg- score –1
2. Airway
   a. Normal- score +2
   b. Maintained- score +1
   c. Unmaintained- score –1
3. Systolic blood pressure (mm Hg)
   a. >90- score +2
   b. 50 –90- score +1
   c. <50- score –1
4. Central nervous system
   a. Awake- score +2
   b. Obtunded- score +1
   c. Coma/decerebrate- score –1
5. Open wound
   a. None- score +2
   b. Minor- score +1
   c. Major/penetrating- score –1
6. Skeletal trauma
   a. None- score +2
   b. Closed fractures- score +1
   c. Open, multiple fractures- score –1

Add the value of each patient characteristic. Highest possible score is +12 and lowest possible score is –6.

Classification of Pediatric Hemorrhagic Shock

Class I- Very Mild Hemorrhage (<15% blood volume loss):

1. **Cardiovascular**
    a. **Heart rate normal or mildly increased**
    b. **Normal pulses**
    c. **Normal blood pressure**
    d. **Normal pH**
2. **Respiratory**
    a. **Rate normal**
3. **Central nervous system**
    a. **Slightly anxious**
4. **Skin**
    a. **Warm, pink mucous membranes and nail beds**
    b. **Capillary refill brisk**
5. **Kidneys**
    a. **Normal urine output**

Class II- Mild Hemorrhage (15% to 25% blood volume loss):

1. **Cardiovascular**
    a. **Tachycardia**
    b. **Peripheral pulses may be diminished**
    c. **Normal blood pressure**
    d. **Normal pH**
2. **Respiratory**
    a. **Tachypnea**
3. **Central nervous system**
    a. **Irritable, confused**
    b. **Combative**
4. **Skin**
    a. **Cool extremities, mottling**
    b. **Delayed capillary refill**
5. **Kidneys**
    a. **Oliguria, increased specific gravity**

Class III- Moderate Hemorrhage (26% to 39% blood volume loss)

1. **Cardiovascular**
    a. **Significant tachycardia**
    b. **Thready peripheral pulses**
    c. **Hypotension**
    d. **Metabolic acidosis**
2. **Respiratory**
    a. **Moderate tachypnea**
3. **Central nervous system**
    a. **Irritable or lethargic**
    b. **Diminished pain response**
4. **Skin**
    a. **Cool extremities, mottling or pallor**
    b. **Prolonged capillary refill**

5. Kidneys
    a. Oliguria
    b. Increased blood urea nitrogen (BUN)

Class IV- Severe Hemorrhage (≥40% blood volume loss)

1. Cardiovascular
    a. Severe tachycardia
    b. Thready central pulses
    c. Significant hypotension
    d. Significant acidosis
2. Respiratory
    a. Severe tachypnea
3. Central nervous system
    a. Lethargic coma
4. Skin
    a. Cool extremities, pallor, or cyanosis
5. Kidneys
    a. Anuria

Drugs Used In PALS

Adenosine

1. 0.1 mg/kg (up to 6 mg)
2. 0.2 mg/kg for second dose
3. Rapid IV push
4. Maximum single dose: 12 mg

Amiodarone: for refractory pulseless VT/VF

1. 5 mg/kg rapid IV/IO
2. Maximum 15 mg/kg/day

Amiodarone: for perfusing tachycardias

1. Loading: 5 mg/kg IV/IO over 20 – 60 minutes
2. Repeat to maximum 15 mg/kg/day IV

Atropine Sulfate

1. 0.02 mg/kg IV/IO/ET
2. Minimum dose 0.1 mg
3. Maximum single dose 0.5 mg child, 1 mg adolescent
4. May double for 2ed dose

Ca+ chloride 10%

1. 20 mg/kg IV/IO
2. Slow IV bolus

Dobutamine

1. 2 – 20 mcg/kg/min
2. Titrate to desired effect

Dopamine

1. Alpha-pressor effects at higher doses > 15 mcg/kg/min

Epinephrine for bradycardia

1. IV/IO: 0.01 mg/kg (1:10,000, 0.1 ml/kg)
2. ET: 0.1 mg/kg (1:1000, 0.1 ml/kg)

Epinephrine for asystolic or pulseless arrest

1. **First dose: IV/IO: 0.01 mg/kg (1:10,000, 0.1 ml/kg)**
2. **First dose: ET: 0.1 mg/kg (1:1,000, 0.1 ml/kg)**
3. **Subsequent doses: Repeat every 3 – 5 minutes during CPR**
4. **Consider a higher dose (0.1 mg/kg, 0.1 ml/kg of 1:1,000) for special conditions**

Epinephrine Infusion

1. **Initial at 0.1 mcg/kg/min**
2. **Titrate to desired effect (0.1 – 1 mcg/kg/min)**

Glucose

1. **0.5 – 1 g/kg IV/IO**
2. **Maximum dose: 2 – 4 ml/kg of 25% solution**
3. **5% = 10 – 20 ml/kg**
4. **10% = 5 – 10 ml/kg**
5. **25% = 2 – 4 ml/kg**
6. **In large vein**

Lidocaine

1. **1 mg/kg**
2. **IV/IO/ET**

Lidocaine Infusion

1. **20 – 50 mcg/kg/min**

Magnesium Sulfate

1. **25 –50 mcg/kg IV/IO over 10 –20 minutes**
2. **Maximum dose: 2 g**

Naloxone (Narcan)

1. **If ≤ 5 years old or ≤ 20 kg: 0.1 mg/kg**
2. **If > 5 years old or > 20 kg: 2 mg**
3. **Titrate to desired effect**

Prostaglandin E

1. **0.05 – 0.1 mcg/kg/min**
2. **Titrate**
3. **Monitor for apnea, hypotension, hypoglycemia, hypocalcemia**

Sodium Bicarbonate

1. **1 mEq/kg dose**
2. **Infuse slowly and only if ventilation is adequate**

Pediatric Resuscitation Supplies

Newborn/Small Infant (3 – 5 kg)

1. **Resuscitation bag: Infant**
2. **O2 Mask: Newborn**
3. **Oral Airway: Infant/small child**
4. **Laryngoscope blade (size): 0 – 1 straight**
5. **Tracheal Tube (mm): Premature infant- 2.5, Term infant- 3.0 – 3.5 uncuffed**
6. **Tracheal Tube Length (cm at lip): 10 – 10.5**
7. **Stylet (F): 6**
8. **Suction Catheter (F): 6 – 8**
9. **BP Cuff: Newborn/Infant**

10. **IV catheter (G): 22 – 24**
11. **Butterfly (G): 23 – 25**
12. **Nasogastric tube (F): 5 – 8**
13. **Urinary Catheter (F): 5 – 8**
14. **Defibrillation/cardioversion external paddles: Infant paddles**
15. **Chest Tube (F): 10 – 12**

Infant (6 – 9 kg)

1. **Resuscitation bag: Child**
2. **O2 Mask: Newborn**
3. **Oral Airway: Infant/small child**
4. **Laryngoscope blade (size): 1 straight**
5. **Tracheal Tube (mm): 3.5 uncuffed**
6. **Tracheal Tube Length (cm at lip): 10 – 10.5**
7. **Stylet (F): 6**
8. **Suction Catheter (F): 8**
9. **BP Cuff: Newborn/Infant**
10. **IV catheter (G): 22 – 24**
11. **Butterfly (G): 23 – 25**
12. **Nasogastric tube (F): 5 – 8**
13. **Urinary Catheter (F): 5 – 8**
14. **Defibrillation/cardioversion external paddles: Infant paddles until 1yr or 10 kg**
15. **Chest Tube (F): 10 – 12**

Toddler (10 – 11 kg)

1. **Resuscitation bag: Child**
2. **O2 Mask: Pediatric**
3. **Oral Airway: Small child**
4. **Laryngoscope blade (size): 1 straight**
5. **Tracheal Tube (mm): 4.0 uncuffed**
6. **Tracheal Tube Length (cm at lip): 11 – 12**
7. **Stylet (F): 6**
8. **Suction Catheter (F): 8 – 10**
9. **BP Cuff: Infant/Child**
10. **IV catheter (G): 20 – 24**
11. **Butterfly (G): 23 – 25**
12. **Nasogastric tube (F): 8 – 10**
13. **Urinary Catheter (F): 8 – 10**
14. **Defibrillation/cardioversion external paddles: Adult paddles when ≥ 1yr or ≥ 10 kg**
15. **Chest Tube (F): 16 – 20**

Small Child (12 – 14 kg)

1. **Resuscitation bag: Child**
2. **O2 Mask: Pediatric**
3. **Oral Airway: Child**
4. **Laryngoscope blade (size): 2 straight**
5. **Tracheal Tube (mm): 4.5 uncuffed**
6. **Tracheal Tube Length (cm at lip): 12.5 – 13.5**
7. **Stylet (F): 6**

8. **Suction Catheter (F): 10**
9. **BP Cuff: Child**
10. **IV catheter (G): 18 – 22**
11. **Butterfly (G): 21 – 23**
12. **Nasogastric tube (F): 10**
13. **Urinary Catheter (F): 10**
14. **Defibrillation/cardioversion external paddles: Adult paddles**
15. **Chest Tube (F): 20 – 24**

Child (15 – 18 kg)

1. **Resuscitation bag: Child**
2. **O2 Mask: Pediatric**
3. **Oral Airway: Child**
4. **Laryngoscope blade (size): 2 straight or curved**
5. **Tracheal Tube (mm): 5.0 uncuffed**
6. **Tracheal Tube Length (cm at lip): 14 – 15**
7. **Stylet (F): 6**
8. **Suction Catheter (F): 10**
9. **BP Cuff: Child**
10. **IV catheter (G): 18 – 22**
11. **Butterfly (G): 21 – 23**
12. **Nasogastric tube (F): 10 – 12**
13. **Urinary Catheter (F): 10 – 12**
14. **Defibrillation/cardioversion external paddles: Adult paddles**
15. **Chest Tube (F): 20 – 24**

Child (19 – 22 kg)

1. **Resuscitation bag: Child**
2. **O2 Mask: Pediatric**
3. **Oral Airway: Child/small adult**
4. **Laryngoscope blade (size): 2 straight or curved**
5. **Tracheal Tube (mm): 5.5 uncuffed**
6. **Tracheal Tube Length (cm at lip): 15.5 – 16.5**
7. **Stylet (F): 14**
8. **Suction Catheter (F): 10**
9. **BP Cuff: Child**
10. **IV catheter (G): 18 – 20**
11. **Butterfly (G): 21 – 23**
12. **Nasogastric tube (F): 12 – 14**
13. **Urinary Catheter (F): 10 – 12**
14. **Defibrillation/cardioversion external paddles: Adult paddles**
15. **Chest Tube (F): 24 – 32**

Large Child (24 – 30 kg)

1. **Resuscitation bag: Child/adult**
2. **O2 Mask: Adult**
3. **Oral Airway: Child/small adult**
4. **Laryngoscope blade (size): 2 – 3 straight or curved**
5. **Tracheal Tube (mm): 6.0 cuffed**

6. **Tracheal Tube Length (cm at lip): 17 – 18**
7. **Stylet (F): 14**
8. **Suction Catheter (F): 10**
9. **BP Cuff: Child/adult**
10. **IV catheter (G): 18 – 20**
11. **Butterfly (G): 21 – 22**
12. **Nasogastric tube (F): 14 – 18**
13. **Urinary Catheter (F): 12**
14. **Defibrillation/cardioversion external paddles: Adult paddles**
15. **Chest Tube (F): 28 – 32**

Adult (≥ 32 kg)

1. **Resuscitation bag: Adult**
2. **O2 Mask: Adult**
3. **Oral Airway: Medium adult**
4. **Laryngoscope blade (size): 3 straight or curved**
5. **Tracheal Tube (mm): 6.5 cuffed**
6. **Tracheal Tube Length (cm at lip): 18.5 – 19.5**
7. **Stylet (F): 14**
8. **Suction Catheter (F): 12**
9. **BP Cuff: Adult**
10. **IV catheter (G): 16 – 20**
11. **Butterfly (G): 18 – 21**
12. **Nasogastric tube (F): 18**
13. **Urinary Catheter (F): 12**
14. **Defibrillation/cardioversion external paddles: Adult paddles**
15. **Chest Tube (F): 32 – 40**

Postarrest Treatment of Shock and Maintenance Fluid Requirements

Postarrest Shock

1. **Fluid Bolus**
    a. **10 – 20 ml/kg NS or RL**
    b. **Monitor response**
2. **Reassess - Signs of Shock Continue >**
3. **What is the Blood Pressure?**
4. **Hypotensive (decompensated) Shock?**
    a. **Consider further fluid boluses**
    b. **Epinephrine (0.1 to 1.0 mcg/kg/min or >**
    c. **Dopamine at higher doses (up to 20 mcg/kg/min) or >**
    d. **Norepinephrine (0.1 to 2 mcg/kg/min)**
5. **Normotensive (compensated) Shock**
    a. **Consider further fluid boluses and/or >**
    b. **Dobutamine (2 to 20 mcg/kg/min) and/or >**
    c. **Dopamine (2 to 20 mcg/kg/min) and/or >**
    d. **Low-dose Epinephrine (0.05 to 0.3 mcg/kg/min) and/or >**
    e. **Inamrinone: Load with 0.75 to 1 mg/kg over 5 minutes, may repeat up to 3 mg/kg. Infusion: 5 to 10 mcg/kg/min and/or >**

f. **Milrinone: Load with 50 to 75 mcg/kg over 5 minutes, may repeat up to 3 mg/kg. Infusion: 0.5 to 0.75 mcg/kg/min**

Estimation of Maintenance Fluid Requirements

1. **Infants < 10 kg: Infusion of 0.2% normal saline in 5% dextrose (D5/0.2% NaCl) at a rate of 4 ml/kg per hour. For example, the maintenance rate for a 8 kg baby is as follows:**
   a. **4 ml/kg/hr x 8 kg = 32 ml/hr**
2. **Children 10 – 20 kg: Infusion of D5/0.2% NaCl at a rate of 40 ml/kg plus 2 ml/kg per hour for each kilogram between 10 and 20 kg. For example, the maintenance rate for a 15 kg child is as follows:**
   a. **40 ml/hr + (2 ml/kg/hr x 5 kg) = 50 ml/hr**
3. **Children > 20 kg: Infusion of D5/0.2% NaCl at a rate of 60 ml/hr plus 1 ml/kg per hour for each kilogram above 20 kg. For example, maintenance rate for a 30 kg child is as follows:**
   a. **60 ml/hr + (1 ml/kg/hr x 10 kg) = 70 ml/hr**

Pediatric Bradycardia Algorithm

1. **BLS Algorithm: Assess and support ABC's as needed**
2. **Provide oxygen**
3. **Attach monitor/defibrillator**
4. **Is bradycardia causing severe cardiorespiratory compromise? (Poor perfusion, hypotension, respiratory difficulty, altered consciousness)**
5. **No >**
   a. **Observe**
   b. **Support ABC's**
   c. **Consider transfer or transport to ALS facility**
6. **Yes >**
   a. **Perform chest compressions if despite oxygenation and ventilation heart rate <60/min in infant or child <u>and</u> poor systemic perfusion**
   b. **Epinephrine***
      i. **IV/IO: 0.01 mg/kg (1:10,000; 0.1 ml/kg)**
      ii. **ET: 0.1 mg/kg (1:1,000; 0.1 ml/kg)**
      iii. **May repeat every 3 to 5 minutes at the same dose**
   c. **Atropine***
      i. **0.02 mg/kg (minimum dose: 0.1 mg)**
      ii. **May be repeated once**
   d. **Consider cardiac pacing**
   e. **If pulseless arrest develops, see Pulseless Arrest Algorithm**

***Give atropine first for bradycardia due to suspected increased vagal tone or primary AV block**

7. **During CPR**
   a. **Attempt/verify: Tracheal intubation and vascular access**
   b. **Check: Electrode position and contact; paddle position and contact; Pacer position and contact**
   c. **Give: Epinephrine every 3 to 5 minutes and consider alternate medications: epinephrine or dopamine infusions**
   d. **Identify and treat possible causes: Hypoxemia; Hypothermia Head injury Heart block Heart transplant (special situation); Toxins/poisons/drugs**

Algorithm for Pediatric Tachycardia with Poor Perfusion

1. **BLS algorithm: Assess, support ABC's**
2. **Pulse Present?**
3. **No >**
    a. **Initiate CPR**
    b. **See Pulseless arrest algorithm**
4. **Yes >**
    a. **Provide oxygen and ventilation as needed**
    b. **Attach monitor/defibrillator**
    c. **12 lead ECG if practical**
    d. **Evaluate QRS duration**

QRS duration normal for age (approximately ≤ 0.08 sec)(narrow complex) >

1. **Evaluate the tachycardia >**

Probable sinus tachycardia

1. **History compatible**
2. **P waves present/normal**
3. **HR often varies with activity**
4. **Variable RR with constant PR**
5. **Infants: rate usually < 220 bpm**
6. **Children: rate usually < 180 bpm**

Probable supraventricular tachycardia

1. **History incompatible**
2. **P waves absent/abnormal**
3. **HR not varible with activity**
4. **Abrupt rate changes**
5. **Infants: rate usually > 220 bpm**
6. **Children: rate usually > 180 bpm**
7. **Consider vagal maneuvers (no delays)**
8. **Immediate cardioversion**
    a. **0.5 to 1 J/kg (may increase to 2 J/kg if initial dose is ineffective)**
    b. **Use sedation if possible; sedation must not delay cardioversion**
9. **Or Immediate IV/IO adenosine**
    a. **Use if IV/IO access is immediately available**
    b. **Dose: 0.1 mg/kg IV/IO (maximum first dose: 6 mg)**
    c. **May double dose and repeat dose once (maximum second dose: 12 mg)**
    d. **Use rapid bolus technique**

QRS duration wide for age (approximately > 0.08 sec)(wide complex) >

1. **Evaluate the tachycardia >**

Probable ventricular tachycardia

1. **Immediate cardioversion**
    a. **0.5 to 1 J/kg (may increase to 2 J/kg if initial dose is ineffective)**
    b. **Use sedation if possible; sedation must not delay cardioversion**
2. **Consider alternative medications**
    a. **Amiodarone: 5 mg/kg IV over 20 to 60 minutes**
    b. **Or Procainamide: 15 mg/kg IV over 30 to 60 minutes (do not routinely administer amiodarone and procainamide together)**

c. Or Lidocaine: 1 mg/kg IV bolus (Wide complex only)
d. Consult pediatric cardiologist
e. 12 lead ECG

During the evaluation >

1. Provide oxygen and ventilation as needed
2. Support ABC's
3. Confirm continuous monitor/pacer attached
4. Consider expert consultation
5. Prepare for cardioversion (consider sedation)
6. Identify and treat possible causes: Hypoxemia; Hypoventilation; Hyperthermia; Hyper/hypokalemia and metabolic disorders; Tamponade; Tension pneuomothorax; Toxins/poisons/drugs; Thromboembolism; Pain

Pediatric Pulseless Arrest Algorithm

1. BLS Aligorithm: Assess and support ABC's
2. Provide oxygen
3. Attach monitor/defibrillator
4. Assess rhythm (ECG) >

Ventricular fibrillation/Ventricular Tachycardia >

1. Attempt defibrillation
    a. Up to 3 times if needed
    b. Initially 2 J/kg, 2 to 4 J/kg, 4 J/kg*
2. Epinephrine
    a. IV/IO: 0.01 mg/kg (1:10,000; 0.1 ml/kg)
    b. ET: 0.1 mg/kg (1:1,000; 0.1 ml/kg)
3. Attempt defibrillation with 4 J/kg* within 30 to 60 seconds after each medication
    a. Pattern should be CPR-drug-(CPR)-shock (repeat) or CPR-drug-(CPR)-shock-shock-shock (repeat)
4. Antiarrhythmic
    a. Amiodarone: 5 mg/kg bolus IV/IO or
    b. Lidocaine 1 mg/kg bolus IV/IO/ET or
    c. Magnesium: 25 to 50 mg/kg IV/IO for torsades de pointes or hypomagnesemia (maximum: 2 g)
5. Attempt defibrillation with 4 J/kg* within 30 to 60 seconds after each medication
    a. Pattern should be CPR-drug-(CPR)-shock (repeat) or CPR-drug-(CPR)-shock-shock-shock (repeat)

*Alternative waveforms and higher doses are class Indeterminate for children

Not Ventricular fibrillation/Ventricular Tachycardia (includes pulseless electrical activity and asystole) >

1. Epinephrine
    a. IV/IO: 0.01 mg/kg (1:10,000; 0.1 ml/kg)
    b. ET: 0.1 mg/kg (1:1,000; 0.1 ml/kg)
2. Continue CPR up to 3 minutes

During CPR >

1. Attempt/verify: Tracheal intubation and vascular access
2. Check: Electrode position and contact, paddle position and contact

3. **Give: Epinephrine every 3 – 5 minutes (consider higher doses for second and subsequent doses)**
4. **Consider alternative medications: vasopressors, antiarrhythmics, buffers**
5. **Identify and treat possible causes: Hypoxemia; Hypovolemia; Hypothermia; Hyper/hypokalemia and metabolic disorders; Tamponade; Tension pneuomothorax; Toxins/poisons/drugs; Thromboembolism;**