Pediatric Advanced Life Support Guide

Assess - Categorize - Decide - Act

This is the cyclic approach used to assess and manage an ill or injured child. It is repeated frequently during evaluation and management.

**Assess:**

Evaluation starts with the general assessment and continues with the primary assessment, the secondary assessment, and the tertiary assessment. If you recognize a life-threatening condition at any time in any assessment, begin interventions.
**Categorize:**

Attempt to categorize the child’s condition by type and Severity.

<table>
<thead>
<tr>
<th><strong>Respiratory</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Severity</strong></td>
</tr>
<tr>
<td>Upper airway obstruction</td>
<td>Respiratory distress</td>
</tr>
<tr>
<td>Lower airway obstruction</td>
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<tr>
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<td></td>
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<tr>
<td>Disordered control of breathing</td>
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<td>Compensated Shock</td>
</tr>
<tr>
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<td>Hypotensive Shock</td>
</tr>
<tr>
<td>Distributive/Septi Shock</td>
<td></td>
</tr>
<tr>
<td>Cardiogenic Shock</td>
<td></td>
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The child’s condition may also be a combination of the two. As their condition deteriorates, one category may lead to others.

**Decide:**

Now you need to decide on appropriate management based on your assessment and categorization of the child’s condition. This is done based on your scope of practice.

**Act:**

Start treatment appropriate for the clinical condition.
Pediatric Assessment Flowchart

General Assessment:
A-appearance
B-work of breathing
C-circulation

Primary Assessment:
A-airway
B-breathing
C-circulation
D-disability
E-exposure

Secondary Assessment:
S-signs and symptoms
A-allergies
M-medications
P-past medical history
L-last meal/liquids consumed
E-events leading up to incident

Also: Focused physical exam

Tertiary Assessment: Labs, X-rays, and other test as needed
Categorize illness by type and severity

**Respiratory**

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**Circulatory**

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**Respiratory + Circulatory = Cardiopulmonary failure**
Management of Respiratory Emergencies

Flowchart

Airway positioning-Oxygen Pulse oximetry-ECG monitoring as needed-BLS as needed

Upper Airway Obstruction
(Specific Management for Selected Conditions)

Croup
- Racemic epinephrine
- Corticosteroids

Anaphylaxis
- IM epinephrine
- Albuterol
- Antihistamines
- Corticosteroids

Aspiration Foreign Body
- Allow position of comfort
- Specialty consultation

Lower Airway Obstruction
(Specific Management for Selected Conditions)

Bronchiolitis
- Nasal suctioning
- Bronchodilator trial

Asthma
- Albuterol &/or ipratropium
- Corticosteroids
- SQ epinephrine
- Magnesium sulfate
- Terbutaline

Lung Tissue (Parenchymal) Disease
(Specific Management for Selected Conditions)

Pneumonia/Pneumonitis
(Infectious Chemical Aspiration)
- Albuterol
- Antibiotics as indicated

Pulmonary Edema
(Cardiogenic or ARDS)
- Consider noninvasive or invasive ventilatory support with PEEP
- Consider vasoactive support
- Consider diuretic

Disordered Control of Breathing
(Specific Management for Selected Conditions)

Increased ICP
- Avoid hypoxemia
- Avoid hypercarbia
- Avoid hyperthermia
- Antidote (if available)

Poisoning/Overdose
- Contact Poison/Control

Neuromuscular Disease
- Consider noninvasive or invasive ventilatory support

*This chart does not include all respiratory emergencies.*
Management of Shock Emergencies Flowchart

Oxygen- Pulse oximetry- ECG monitor- IV/IO access- BLS as needed- Bedside glucose

### Hypovolemic Shock
(Specific Management for Selected Conditions)

#### Nonhemorrhagic
- 20 mL/kg NS/LR bolus, repeat as needed
- Consider colloid after 3rd
- Control external bleeding

#### Hemorrhagic
- 20 mL/kg NS/RL bolus repeat 2 or 3x as needed
- Transfuse PRBC’s as indicated

### Distributive Shock
(Specific Management for Selected Conditions)

#### Septic
Management Algorithm:
- Septic Shock

#### Anaphylactic
- IM epinephrine
- Antihistamines
- Corticosteroids
- Epinephrine infusion
- Albuterol

#### Neurogenic
- 20 mL/kg NS/LR bolus, repeat PRN
- Vasopressor

### Cardiogenic Shock
(Specific Management for Selected Conditions)

#### Brady/Tachyarrhythmia
Management Algorithms:
- Bradycardia
- Tachycardia with poor perfusion

#### CHD, Myocarditis, Cardiomyopathy, Poisoning
- 5-10 mL/kg NS/RL bolus, repeat PRN
- Vasoactive infusion
- Consider expert consultation

### Obstructive Shock
(Specific Management for Selected Conditions)

#### Ductal-Dependent
- Prostaglandin
- Expert consultation

#### Tension Pneumothorax
- Needle decompression
- Tube thoracostomy

#### Cardiac Tamponade
- Pericardiocentesis
- 20 mL/kg NS/RL bolus

#### Pulmonary Embolism
- 20 mL/kg NS/RL bolus, repeat PRN
- Consider thrombolytics, anticoagulants
- Expert consultation
Recognition of Shocks

Clinical Signs: Hypovolemic Shock
A- Airway-open and maintainable/not maintainable
B- Respiratory rate-increased Effort-normal to increased
  Breath sounds-normal, maybe crackles
C- Systolic blood pressure-Compensated to Hypotensive
  Pulse pressure-narrow, Heart rate-increased, Pulse quality-weak
  Skin-pale, cool, Cap refill-delayed, Urine output-decreased
D- Level of consciousness-irritable early, lethargic late
E- variable

Clinical Signs: Distributive Shock
A- Airway-open and maintainable/not maintainable
B- Respiratory rate-increased, Effort-normal to increased
  Breath sounds-normal, maybe crackles
C- Systolic blood pressure-Compensated to Hypotensive
  Pulse pressure-wide, Heart rate-increased, Pulse quality-bounding
  or weak
  Skin-warm or cool, Cap refill-variable, Urine output-decreased
D- Level of consciousness-irritable early, lethargic late
E- variable

Clinical Signs: Cardiogenic Shock
A- Airway-open and maintainable/not maintainable
B- Respiratory rate-increased, Effort-labored,
  Breath sounds-crackles,grunting
C- Systolic blood pressure-Compensated to Hypotensive
  Pulse pressure-narrow, Heart rate-increased, Pulse quality-weak
  Skin-pale, cool, Cap refill-delayed, Urine output-decreased
D- Level of consciousness-irritable early, lethargic late
E- variable

Clinical Signs: Obstructive Shock
A- Airway-open and maintainable/not maintainable
B- Respiratory rate-increased, Effort-labored,
  Breath sounds-crackles,grunting
C- Systolic blood pressure-Compensated to Hypotensive
  Pulse pressure-narrow, Heart rate-increased, Pulse quality-weak
  Skin-pale, cool, Cap refill-delayed, Urine output-decreased
D- Level of consciousness-irritable early, lethargic late
E- variable
**Recognition of Respiratory Problems**

**Clinical Signs: Upper Airway Obstruction**
A-Airway-open and maintainable/not maintainable
B-Respiratory rate/effort-increased, Breath sounds-stridor (typically inspiratory)-seal like coughhoarseness,
Air movement-decreased
C-Heart rate-increased, Skin-pallor, cool skin (early) cyanosis (late)
D-Level of consciousness-anxiety, agitation (early) lethargy, unresponsiveness (late)
E-variable

**Clinical Signs: Lower Airway Obstruction**
A-Airway-open and maintainable/not maintainable
B-Respiratory rate/effort-increased, Breath sounds-wheezing (typically expiratory) prolonged, expiratory phase Air movement- decreased
C-Heart rate-increased, Skin-pallor, cool skin (early) cyanosis (late)
D-Level of consciousness-anxiety, agitation (early) lethargy, unresponsiveness (late)
E-variable

**Clinical Signs: Lung Tissue (Parenchymal) Disease**
A-Airway-open and maintainable/not maintainable
B-Respiratory rate/effort-increased Breath sounds-grunting, crackles decreased breath sounds, Air movement-decreased
C-Heart rate-increased, Skin-pallor, cool skin (early) cyanosis (late)
D-Level of consciousness-anxiety, agitation (early) lethargy, unresponsiveness (late)
E-variable

**Clinical Signs: Disordered Control of Breathing**
A-Airway-open and maintainable/not maintainable
B-Respiratory rate/effort-variable, Breath sounds-normal Air movement-variable
C-Heart rate-increased, Skin-pallor, cool skin (early) cyanosis (late)
D-Level of consciousness-anxiety, agitation (early) lethargy, unresponsiveness (late)
E-variable
# Normal Vital Signs for Pediatric Patients

## Normal Respiratory Rates

<table>
<thead>
<tr>
<th>Age</th>
<th>Breaths/minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (&lt;1 year)</td>
<td>30-60</td>
</tr>
<tr>
<td>Toddler (1-3 years)</td>
<td>24-40</td>
</tr>
<tr>
<td>Preschooler (4-5 years)</td>
<td>22-34</td>
</tr>
<tr>
<td>School Age (6-12 years)</td>
<td>18-30</td>
</tr>
<tr>
<td>Adolescent (13-18 years)</td>
<td>12-18</td>
</tr>
</tbody>
</table>

- A respiratory rate more than 60 per minutes at any age is abnormal and should serve as a “red flag.”

## Normal Heart Rates

<table>
<thead>
<tr>
<th>Age</th>
<th>Awake</th>
<th>Sleeping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn-3 months</td>
<td>85-205</td>
<td>80-160</td>
</tr>
<tr>
<td>3 months-2 years</td>
<td>100-190</td>
<td>75-160</td>
</tr>
<tr>
<td>2 years-10 years</td>
<td>60-140</td>
<td>60-90</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>60-100</td>
<td>50-90</td>
</tr>
</tbody>
</table>

- Heart rate should be appropriate for the child’s age, activity level, and clinical condition. Heart rates vary in a sleeping or athletic child.

## Minimum Systolic Blood Pressure Accepted (5th percentile)

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic Blood Pressure (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term neonate (birth-1 month)</td>
<td>At least 60</td>
</tr>
<tr>
<td>Infant (1 month-1 year)</td>
<td>At least 70</td>
</tr>
<tr>
<td>Child (1 year-10 years)</td>
<td>At least 70 + (age in years x 2)</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>At least 90</td>
</tr>
</tbody>
</table>

- Minimum systolic blood pressure accepted at 5th percentile.
The Algorithm for Pediatric Pulseless Arrest

1. **Pulseless Arrest**
   - BLS Algorithm: Continue CPR
   - Give Oxygen when available
   - Attach Monitor, defibrillator when available

2. **Check Rhythm**
   Is it a Shockable rhythm?

3. **VF/VT**

4. **Give 1 Shock**
   - Manual: 2J/kg
   - AED: >1 year of age (use pediatric system if available for age 1 to 8 years of age)
   - Resume CPR Immediately

5. **Check Rhythm. Is it a Shockable rhythm?**

6. **Continue CPR while defibrillator is charging.**
   **Give 1 Shock**
   - Manual: 4J/kg
   - AED: >1 year of age (use pediatric system if available for age 1 to 8 years of age)
   - Resume CPR Immediately
   - Give Epinephrine
     - IV/IO: 0.01mg/kg (1:10 000:0.1 ml/kg)
     - Endotracheal Tube: 0.1mg/kg (1:1000: 0.1 ml/kg)
   - Repeat every 3 to 5 Minutes

7. **Check Rhythm. Is it a Shockable rhythm?**

8. **Resume CPR Immediately**
   - Give Epinephrine
     - IV/IO: 0.01mg/kg (1:10 000:0.1 ml/kg)
     - Endotracheal Tube: 0.1mg/kg (1:1000: 0.1 ml/kg)
   - Repeat every 3 to 5 Minutes

9. **Asystole/PEA**

10. **Resume CPR Immediately**
    - Give Epinephrine
      - IV/IO: 0.01mg/kg (1:10 000:0.1 ml/kg)
      - Endotracheal Tube: 0.1mg/kg (1:1000: 0.1 ml/kg)
    - Repeat every 3 to 5 Minutes

11. **Check Rhythm**
    Is it a Shockable rhythm?

12. **Check Rhythm. Is it a Shockable rhythm?**
    - If asystole, go to Box 10
    - If electrical activity, check pulse. If no pulse go to Box 10.
    - If pulse is present, begin post resuscitation care.

**During CPR**
- Push hard and fast (100/min)
- Ensure full chest recoil
- Minimize interruptions in chest compressions
  - One cycle of CPR: 15 compressions then 2 breaths: 5 cycles=2 min.
- Avoid hyperventilation
- Secure airway and confirm placement
- After an advanced airway is placed, rescuers no longer deliver “cycles” of CPR.
- Give continuous compressions without pauses for breaths.
- Give 8-10 breaths/min.
- Check Rhythm every 2 minutes
- Rotate compressors every 2 minutes, with rhythm checks.
- Search for and treat possible contributing factors:
  - Hypovolemia, Hypoxia, Hydrogen Ion (acidity) Hypo-/Hyperkalemia, Hypoglycemia, Hypothermia, Toxins
  - Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), Trauma (hypovolemia)
The Algorithm for Pediatric Bradycardia with a Pulse

BRADYCARDIA with a pulse
Causing Cardiorespiratory Compromise

- Support ABCs as needed
- Give oxygen
- Attach Monitor/defibrillator

NO

Bradycardia still causing Cardiopulmonary compromise?

YES

- Perform CPR, if despite Oxygenation and ventilation
  HR<60, with poor perfusion

NO

Persistent symptomatic bradycardia

YES

- Support ABCs as needed
- Give oxygen if needed
- Observe
- Consider Expert Consultation

Reminders
- If Pulseless Arrest Develop, go to Pulseless Arrest Algorithm
- During CPR
  - Push hard and fast (100/min)
  - Ensure full chest recoil
- Support ABCs
- Secure airway if needed and confirm placement
- Minimize interruptions in chest compressions
- Search for and treat Possible Contributing Factors:
  - Hypovolemia
  - Toxins
  - Hypoxia
  - Tamponade, Cardiac
  - Hydrogen Ion (acidosis)
  - Tension Pneumothorax
  - Hypo-/Hyperkalemia
  - Thrombosis (coronary or pulmonary)
  - Hypoglycemia
  - Trauma (hypovolemia, increased ICP)
  - Hypothermia

H & T

- Give Epinephrine
  - IV/IO: 0.01mg/kg (1:10 000:0.1 ml/kg)
  - Endotracheal Tube: 0.1mg/kg (1:1000:0.1 ml/kg)
  - Repeat every 3 to 5 Minutes

- If increased vagal tone or Primary AV Block:
  - Give Atropine, first dose: 0.02mg/kg. May repeat (Minimum dose: 0.1mg; Max dose 1mg)

- Consider cardiac pacing

- If Pulseless arrest develops go to Algorithm for Pulseless Arrest
The Algorithm for Pediatric Tachycardia with Adequate Perfusion

- BLS Algorithm: Assess and support ABCs as needed (assess signs of circulation and pulse; provide oxygen and ventilation)
  - Provide O2
  - Attach monitor/defibrillator
  - Evaluate 12-lead ECG if practical

QRS Normal (≤ 0.08sec)

Evaluate rhythm

What is the QRS duration?

QRS Wide (≥ 0.08sec)

Probable ventricular tachycardia

Consider alternative medications.
- Amiodarone, 5mg/kg IV over 20 to 60 min.
  OR
- Procaïnamide 15mg/kg IV over 30 to 60 min. (Do not routinely administer Amiodarone and Procaïnamide together.)
  OR
- Lidocaine 1mg/kg IV Bolus

Consider sinus Tachycardia.
- History Compatible
- P-waves present and Normal
- HR often varies with activity
- Variable RR with constant PR
- Infants: usually <220bpm
- Children: Usually <180bpm

Probable supraventricular Tachycardia
- History incompatible with ST
- P-waves absent/abnormal
- HR not variable with activity
- Abrupt rate changes
- Infants: usually >220bpm
- Children: Usually >180bpm

Consider Vagal Maneuvers

- Establish vascular access
- Consider Adenosine 0.1mg/kg IV (maximum first dose 6mg).
  May double or repeat one dose (maximum second dose: 12 mg).
  Use Rapid Bolus Technique.

During Evaluation
- Provide Oxygen and ventilation as needed
- Support ABCs
- Confirm continuous monitor/pacer attachment
- Consider expert consultation
- Prepare for cardioversion 0.5 to 1J/kg (Consider sedation)

Identify and treat possible causes:
- Hypovolemia, Hypoxia, Hydrogen Ion (acidosis)
- Hypo-Hyperkalemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), Trauma (hypovolemia), increased ICP

- Consult Pediatric cardiologist
- Attempt cardioversion 0.5 to 1J/kg; may increase to 2J/kg if initial dose is ineffective.
  - Sedate prior to cardioversion
  - Obtain 12-lead ECG
The Algorithm for Pediatric Tachycardia with Pulses and Poor Perfusion

**Tachycardia with pulses and Poor Perfusion**
- Assess and support ABCs as
- Provide O2
- Attach monitor/defibrillator

**QRS Normal (≤ 0.08sec)**
Evaluate rhythm with monitor or 12-lead ECG

**Symptoms Persists**

**QRS Wide (≥ 0.08sec)**

**Probable ventricular tachycardia**

**What is the QRS duration?**

- **Probable Sinus Tachycardia.**
  - History Compatible
  - P-waves present and Normal
  - HR often varies with activity
  - Variable RR with constant PR
  - Infants: usually <220bpm
  - Children: Usually <180bpm

- **Probable Supraventricular Tachycardia**
  - History incompatible with ST
  - P-waves absent/abnormal
  - HR not variable with activity
  - Abrupt rate changes
  - Infants: usually ≥220bpm
  - Children: Usually ≥180bpm

Consider Vagal Maneuvers (no delays)

If vascular access is available:
- **Consider Adenosine** 0.1mg/kg IV (maximum first dose 6mg). May double or repeat one dose (maximum second dose: 12 mg).
  - Use Rapid Bolus Technique.
  - OR
  - Attempt cardioversion 0.5 to 1J/kg; may increase to 2J/kg if initial dose is ineffective.
  - Sedate prior to cardioversion if possible, but

**Hs&Ts**

Identify and treat possible causes:
- Hypovolemia, Hypoxia, Hydrogen Ion (acidosis)
- Hypo-/Hyperkalemia, Hypothermia, Toxins,
- Tamponade (cardiac), Tension Pneumothorax,
- Thrombosis (coronary or pulmonary), Trauma (hypovolemia), increased ICP

**During Evaluation**
- Provide Oxygen and ventilation as needed
- Support ABCs
- Confirm continuous monitor/pacer attachment
- Consider expert consultation
- Prepare for cardioversion 0.5 to 1J/kg (Consider sedation)

- Expert Consultation Advised
- Amiodarone, 5mg/kg IV over 20 to 60 min.
  - OR
  - Procainamide 15mg/kg IV over 30 to 60 min. (Do not routinely administer Amiodarone and Procainamide together.)
AED Treatment Algorithm for Pre-hospital Care of Children >8

For Emergency Cardiovascular Care Pending Arrival of Emergency Medical Personnel

Unresponsive 911-AED:
- Check if Unresponsive
- Phone 911
- Get AED
- Identify and respond to special situations

Unresponsive

Start the ABCDs:
- Airway: open airway
- Breathing: check breathing (look, listen, and feel)

Yes, Breathing

- If breathing is adequate: place in a recovery position
- If breathing is inadequate: start rescue breathing (1 breath every 5 seconds)
- Monitor signs of circulation

Not Breathing

- Provide 2 slow breaths (2 second per breath)
- Circulation: check for signs

Yes, Circulation

- Start rescue breathing (1 breath every 5 seconds)
- Monitor signs of circulation (every 30 to 60 seconds)

No Circulation

Perform CPR (until AED arrives and is ready to attach):
- Start chest compressions (100/min)
- Start rescue breathing (10 to 12 breaths/min)
- Ratio of 15 compressions to 2 breaths

- Attempt Defibrillation (AED on scene):
  - POWER ON the AED first!
  - ATTACH AED electrode pads (stop chest compressions for pad placement)
  - Analyze ("Clear!")
  - Shock ("Clear!") up to 3 times if advised

After 3 shocks or after any "no shock indicated":
- Check for signs of circulation
- If no signs of circulation: perform CPR for 1 minute

Check for signs of circulation, if absent:
- Press ANALYZE
- Attempt defibrillation
- Repeat up to 3 times

Memory aid for "no shock indicated":
- Check for signs of circulation
- If signs of circulation present: check breathing
- If inadequate breathing: start rescue breathing (1 breath every 5 seconds)
- If adequate breathing: place in a recovery position
- If no signs of circulation, analyze rhythm: repeat "shock indicated" or "no shock indicated" sequences

* Note:

Signs of circulation: lay rescuers check for normal breathing, coughing, or movement (typically assessed after 2 rescue breaths delivered to the unresponsive, nonbreathing victim).
**Postarrest Treatment of Shock**

**Postarrest Stabilization**

**Postarrest shock**

**Fluid bolus**

- (10-20 mL/kg NS or RL monitor response)

**Reassess**

- Signs of shock continue

**What is blood pressure?**

**Hypotensive (decompensated) shock?**

- Consider further fluid boluses
  - **Epinephrine** (0.1 to 1 ug/kg per minute)
  - or
  - **Dopamine** at higher doses (up to 20 ug/kg per minute)
  - **Norepinephrine** (0.1 to 2 ug/kg per minute)

**Normotensive (compensated) Shock?**

- Consider further fluid boluses
  - **Dobutamine** (2 to 20 ug/kg per minute) or
  - **Dopamine** (2 to 20 ug/kg per minute)
  - or
  - **Low doses epinephrine** (0.05 to 0.3 ug/kg per minute)
  - **Inamrinone**: Load with 0.75 to 1 mg/kg over 5 minutes, may repeat up to 3 mg/kg. Infusion: 5 to 10 ug/kg per minute.
  - **Milrinone**: Load with 50 to 75 ug/kg. Infusion: 0.5 to 0.75 ug/kg per minute.

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**Estimation of Maintenance Fluid Requirements**

**Infants <10kg**: Infusion of 0.2% normal saline in 5% dextrose (d5/0.2% NaCl) at a rate of 4mL/kg per hour. For example, the maintenance rate for an 8-kg baby is as follows:

\[4 \text{ mL/kg per hour} \times 8 \text{ kg} = 32 \text{ mL/h}\]

**Children 10 to 20 kg**: Infusion of d5/0.2% NaCl at a rate of 40mL/h plus 2mL/kg per hour for each kilogram between 10 and 20 kg. For example, the maintenance rate for a 15-kg child is as follows:

\[40 \text{ mL/h} + (2 \text{ mL/kg per hour} \times 5 \text{ kg}) = 50 \text{ mL/h}\]

**Children >20 kg**: Infusion of d5/0.2% NaCl at a rate of 60 mL/h plus 1mL/kg per hour for each kilogram above 20 kg. For example, the maintenance rate for a 30-kg child is as follows:

\[60 \text{ mL/h} + (1 \text{ mL/kg per hour} \times 10 \text{ kg}) = 70 \text{ mL/h}\]
Overview of Resuscitation in the Delivery Room

Approximate Time

30 Sec

Birth

Clear of meconium?  
Breathing or crying?  
Good muscle tone?  
Color pink?  
Term gestation?

Yes

Routine care
- Provide warmth
- Clear airway
- Dry

No

- Provide warmth
- Position, clear airway (as necessary)
- Dry, stimulate, reposition
- Give O2 (as necessary)

Breathing

- Evaluate respirations, heart rate, and color

Supportive care

HR > 100
And pink

HR < 100

Ventilating

Apnea or

<100

Provide positive pressure ventilation

Ongoing care

HR > 100
And pink

HR < 60

Provide positive-pressure ventilation
Administer chest compressions

HR > 60

Administer epinephrine

30 Sec

30 Sec
# Drugs Used In Pediatric Advanced Life Support

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Dosage (Pediatric)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine</td>
<td>0.1 mg/kg (up to 6mg)</td>
<td>Rapid IV push</td>
</tr>
<tr>
<td></td>
<td>0.2 mg/kg for second dose</td>
<td>Max single dose: 12 mg.</td>
</tr>
<tr>
<td>Amiodarone:</td>
<td>5 mg/kg Bolus IV/IO</td>
<td>Max 15 mg/kg/day.</td>
</tr>
<tr>
<td>For refractory pulseless</td>
<td><em>VT/VF</em> for perfusing tachycardias Loading: 5 mg/kg IV/IO over 20-60 min Repeat to max 15mg /kg/day</td>
<td></td>
</tr>
<tr>
<td>Atropine sulfate</td>
<td>0.02 mg/kg IV/IO/TT</td>
<td>Min dose: 0.1 mg. Max single dose: 0.5mg child, 1mg adolescent. May double 2nd dose.</td>
</tr>
<tr>
<td>Ca2 chloride 10%</td>
<td>20mg/kg IV/IO</td>
<td>Slow IV 10 bolus</td>
</tr>
<tr>
<td>Dobutamine</td>
<td>2-20 ug/kg/min</td>
<td>Titrate to desired effect.</td>
</tr>
<tr>
<td>Dopamine</td>
<td>2-20 ug/kg/min</td>
<td></td>
</tr>
<tr>
<td>Epinephrine for Bradycardia</td>
<td>IV/IO: 0.01 mg/kg (1:10 000, 0.1 mL/kg) Subsequent doses: IV/IO/TT: 0.01-0.1mg/kg (1:1000, 0.1 mL/kg). IV/IO doses as high as 0.2mg/kg of 1:1000 may be effective Repeat q 3-5 min</td>
<td>Epinephrine for Asystolic or pulseless arrest First dose: IV/IO: 0.01 mg/kg (1:10 000, 0.1 mL/kg)</td>
</tr>
<tr>
<td>Epinephrine Infusion</td>
<td>Initial at 0.1 ug/kg/min</td>
<td>Titrate to desired effect (0.1-1ug/kg/min).</td>
</tr>
<tr>
<td>Glucose</td>
<td>0.5-1 g/kg IV/IO Max dose: 2-4 mL/kg Of 25% solution 5%-10% 10%= 5%-10mL/kg, 25%=2-4mL/kg (in large vein)</td>
<td></td>
</tr>
<tr>
<td>Lidocaine</td>
<td>1mg/kg</td>
<td>IV/IO/TT.</td>
</tr>
<tr>
<td>Infusion</td>
<td>20-50ug/kg/min</td>
<td></td>
</tr>
<tr>
<td>Magnesium Sulfate</td>
<td>25-50mg/min over 10-20min</td>
<td>Max dose: 2g</td>
</tr>
<tr>
<td>Milrinone</td>
<td>Loading dose 50-70ug/kg IV/IO over 10-60 min Infusion dose 0.5-0.75ug/kg/min IV/IO Monitor BP, ECG</td>
<td></td>
</tr>
<tr>
<td>Naloxone</td>
<td>1f&lt;5 years old or &lt;20kg: 0.1 mg/kg 1f&gt;5 years old or &gt;20kg: 2 mg</td>
<td>Titrate to desired effect</td>
</tr>
<tr>
<td>Prostaglandin E1</td>
<td>0.05-0.1 ug/kg/min</td>
<td>Titrate, monitor for apnea, Hypotension, hypoglycemia, Hypocalcemia.</td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td>1mEq/kg per dose</td>
<td>Infuse slowly and only if Ventilation is adequate.</td>
</tr>
</tbody>
</table>

For TT administration, dilute medication with NS to a volume of 3-5mL and follow with several positive-pressure ventilations.