# GENERAL PEDIATRIC ASSESSMENT & TREATMENT

**Purpose:** *This protocol provides general guidelines for pediatric patient management. Refer to additional protocols as appropriate for treatment of specific conditions.*

## I. Assessment

**M B S P**

1. Ensure scene safety.
2. Form a general impression of the patient's condition.
3. Observe standard precautions.
4. Establish patient responsiveness. If cervical spine trauma is suspected, manually stabilize the spine.

## II. Management

1. Assess the patient's airway for patency, protective reflexes and the possible need for advanced airway management. Look for signs of airway obstruction.
2. Open the airway using head tilt/chin lift if no spinal trauma is suspected, or modified jaw thrust if spinal trauma is suspected.

**B S P**

3. Suction as necessary.
4. Consider placing an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious.
5. Assess the patient's breathing, including rate, bilateral auscultation, inspection, effort, and adequacy of ventilation as indicated by chest rise. Inspect chest for trauma.
6. If chest rise indicates inadequate ventilation, reposition airway and reassess.
7. If inadequate chest rise is noted after repositioning airway, suspect a foreign body obstruction of the airway. Refer to the appropriate protocol for treatment options.
8. Assess for signs of respiratory distress, failure, or arrest. If present, refer to the appropriate protocol for treatment options.
9. If the child is not breathing or breathing is inadequate, initiate assisted ventilation using a bag-valve-mask device with high-flow, 100% concentration oxygen. Begin with two slow, deep breaths of about 1-1/2 seconds' duration, then ventilate at 20 breaths/minute for all ages.

**S P**

10. If the airway cannot be maintained by other means, including attempts at assisted ventilation, or if prolonged assisted ventilation is anticipated, consider endotracheal intubation. Confirm placement of endotracheal tube using clinical assessment and end-tidal $CO_2$ monitoring as per medical direction.

**B S P**

11. If breathing is adequate, place the child in a position of comfort and administer high-flow, 100% concentration oxygen as necessary. Use a nonrebreather mask or blow-by as tolerated.
12. Control hemorrhage using direct pressure or a pressure dressing.

13. Assess circulation and perfusion by measuring heart rate and observing skin color and temperature, capillary refill time, and the quality of central and peripheral pulses.
14. If pulse absent, initiate cardiopulmonary resuscitation per AHA or ARC accepted standards.

**P** 15. Initiate cardiac monitoring.

**S P** 16. If there is evidence of shock, obtain vascular access using an age-appropriate large-bore catheter. If intravenous access cannot be obtained, proceed with intraosseous access. Administer a fluid bolus of normal saline at 20 ml/kg set to maximum flow rate. Reassess patient after bolus. If signs of shock persist, bolus may be repeated at the same dose up to two times for a maximum total of 60 ml/kg.

**B S P** 17. Evaluate mental status, including papillary reaction, distal function and sensation.
18. If spinal trauma is suspected, continue manual stabilization, place a sized appropriately rigid cervical collar, and immobilize the patient on long backboard or similar device.
19. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
20. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
21. Reassess the patient frequently.
22. Contact medical direction for additional instructions.

# TRAUMA

**Purpose:** *The priorities in pediatric trauma management are to prevent further injury, provide rapid transport, notify the receiving facility, and initiate definitive treatment. On-scene time for a traumatic injury should be no longer than 10 minutes unless there are extenuating circumstances, such as extrication, hazardous conditions, or multiple victims.*

## I. Management

| | | |
|---|---|---|
| **M B S P** | 1. | Refer to General Pediatric Assessment and Treatment Protocol. |
| | 2. | If breathing is adequate, 100% concentration oxygen as necessary. Use a nonrebreather mask or blow-by as tolerated. |
| **P** | 3. | If breath sounds are absent or signs of severe respiratory distress are noted together with a mechanism of injury that could cause a tension pneumothorax, perform needle decompression. Use an 18- or 20-gauge over-the-needle catheter. Insert the needle in the mid-clavicular line at the second intercostal space, just above the third rib. |
| **M B S P** | 4. | Control hemorrhage using direct pressure or a pressure dressing. |
| | 5. | Assess circulation and perfusion. |
| **P** | 6. | Initiate cardiac monitoring. |
| **M B S P** | 7. | Assess mental status. |
| | 8. | Continue manual stabilization while placing an appropriate sized rigid cervical collar. Immobilize the patient on a long backboard or similar device. |
| **B S P** | 9. | Initiate transport to an appropriate facility. |
| **S P** | 10. | Obtain vascular access using an age-appropriate large-bore catheter and administer normal saline at a sufficient rate to keep the vein open. If extenuating circumstances delay transport, obtain vascular access on the scene, but do not delay transport to obtain vascular access. |
| | 11. | If there is evidence of shock, initiate vascular access. If intravenous access cannot be obtained, proceed with intraosseous access. Administer a fluid bolus of normal saline at 20 ml/kg set to maximum flow rate. Reassess patient after bolus. If signs of shock persist, bolus may be repeated at the same dose up to two times for a maximum total of 60 ml/kg. |
| **B S P** | 12. | Splint obvious fractures of long bones. |
| | 13. | Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit. |
| | 14. | Reassess the patient frequently. |
| | 15. | Contact medical direction for additional instructions. |

# BURNS

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.

2. Stop the burning process. If a dry chemical is involved, brush it off, then flush with copious amounts of water. If a caustic liquid is involved, flush with copious amounts of water. Remove all of patient's clothing prior to irrigation. Be prepared to treat hypothermia, which may arise secondary to these interventions. For chemical burns with eye involvement, immediately begin flushing the eye with normal saline. Continue flushing throughout assessment and transport.

3. Establish patient responsiveness. If cervical spine trauma is suspected, manually stabilize the spine. Remove the patient's clothing and jewelry in any affected area.

4. Assess the patient's airway for patency, protective reflexes and the possible need for advanced airway management. Look for signs of airway obstruction.

5. Open the airway using head tilt/chin lift if no spinal trauma is suspected, or modified jaw thrust if spinal trauma is suspected.

**B S P** 6. Suction as necessary.

7. Consider placing an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious.

8. Assess breathing. Refer to the appropriate protocol for management of respiratory distress.

9. If breathing is inadequate, assist ventilation using a bag-valve-mask device with high-flow, 100% concentration oxygen.

**S P** 10. If the airway cannot be maintained by other means, including attempts at assisted ventilation, or if prolonged assisted ventilation is anticipated, consider endotracheal intubation. This step should also be undertaken if inhalation injury is suspected. Confirm placement of endotracheal tube using clinical assessment and end-tidal $CO_2$ monitoring as per medical direction.

**B S P** 11. If breathing is adequate, place the child in a position of comfort and administer high-flow, 100% concentration oxygen as necessary. Use a nonrebreather mask for potential inhalation injury or any serious thermal burn.

12. Assess circulation and perfusion.

**P** 13. For electrical burns, initiate cardiac monitoring and determine rhythm. If a dysrhythmia is present, refer to the appropriate protocol for treatment options.

**S P** 14. If there is evidence of shock in a patient with major thermal burns, obtain vascular access using an age-appropriate large-bore catheter. If intravenous access cannot be obtained, proceed with intraosseous access. Administer a fluid bolus of normal saline at 20 ml/kg set to maximum flow rate. Reassess patient after bolus. If signs of shock persist, bolus

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|---|---|---|
| | | may be repeated at the same dose up to two times for a maximum total of 60 ml/kg. |
| **B S P** | 15. | Assess mental status. |
| | 16. | If spinal trauma is suspected, continue manual stabilization, place an appropriate sized rigid cervical collar, and immobilize the patient on a long backboard or similar device. |
| | 17. | Expose the child only as necessary to perform further assessments. Keep child as warm as possible. |
| | 18. | Apply a clean burn sheet or dry sterile dressings to burned areas. To prevent hypothermia, avoid moist or cool dressings over large surface area and do not leave wounds or skin exposed. |
| | 19. | Initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit. |
| **P** | 20. | Pain management may be indicated. Refer to the appropriate protocol for treatment options. |
| **B S P** | 21. | Reassess the patient frequently. |
| | 22. | Contact medical direction for additional instructions. |

# FOREIGN BODY AIRWAY OBSTRUCTION

## I. Management

| | | |
|---|---|---|
| **M B S P** | 1. | Refer to General Pediatric Assessment and Treatment Protocol. |
| | 2. | Use age-appropriate techniques to dislodge the obstruction (for infants younger than one year, apply back blows with chest thrusts; for children one year and older, use abdominal thrusts), following current AHA or other approved BCLS training guidelines. |
| **S P** | 3. | If unsuccessful, establish a direct view of the object and attempt to remove it with Magill forceps. |
| | 4. | If unsuccessful, attempt endotracheal intubation and ventilate the patient. |
| **B S P** | 5. | Assess circulation and perfusion. |
| | 6. | Assess mental status. |
| | 7. | Expose the child only as necessary to perform further assessments. Keep child as warm as possible. |
| | 8. | Initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit. |
| | 9. | Reassess the patient frequently. |
| | 10. | Contact medical direction for additional instructions. |

# RESPIRATORY DISTRESS, FAILURE, OR ARREST

## I. Assessment

A. Respiratory distress is indicated by the following findings:
- alert, irritable, anxious
- stridor
- audible wheezing
- respiratory rate faster than normal for age
- intercostal retractions
- nasal flaring
- neck muscle use
- central cyanosis that resolves with oxygen administration
- mild tachycardia
- able to maintain sitting position (children older than four months)

B. Respiratory failure involves the findings above with any of the following additions or modifications:
- sleepy, intermittently combative, or agitated
- increased respiratory effort at sternal notch
- marked use of accessory muscles
- retractions, head bobbing, grunting
- central cyanosis
- marked tachycardia
- poor peripheral perfusion
- decreased muscle tone

C. Respiratory arrest involves the findings above with any of the following additions or modifications:
- unresponsive to voice or touch
- absent or shallow chest wall motion
- absent breath sounds
- respiratory rate slower than 10 breaths per minute
- weak to absent pulses
- bradycardia or asystole
- limp muscle tone
- unable to maintain sitting position (children older than four months)

## II. Management

1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Assess the patient's airway for patency, protective reflexes and the possible need for advanced airway management. Look for signs of airway obstruction. Signs include:
   - absent breath sounds

- tachypnea
- intercostal retractions
- stridor or drooling
- choking
- bradycardia
- cyanosis

3. If foreign body obstruction of the airway is suspected, refer to the appropriate protocol for treatment options.
4. Open the airway using head tilt/chin lift if no spinal trauma is suspected, or modified jaw thrust if spinal trauma is suspected.
5. Suction as necessary.
6. Consider placing an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious.
7. Assess the patient's breathing, including rate, auscultation, inspection, effort, and adequacy of ventilation as indicated by chest rise.
8. If chest rise indicates inadequate ventilation, reposition airway and reassess.
9. If inadequate chest rise is noted after repositioning airway, suspect a foreign body obstruction of the airway. Refer to the appropriate protocol for treatment options.
10. Assess for signs of respiratory distress, failure, or arrest. If signs of respiratory failure or arrest are present, assist ventilation using a bag-valve-mask device with high-flow, 100% concentration oxygen.
11. If the airway cannot be maintained by other means, including attempts at assisted ventilation, or if prolonged assisted ventilation is anticipated, consider endotracheal intubation. Confirm placement of endotracheal tube using clinical assessment and end-tidal $CO_2$ monitoring as per medical direction.
12. If breathing is adequate and patient exhibits signs of respiratory distress, administer high-flow, 100% concentration oxygen as necessary. Use a nonrebreather mask or blow-by as tolerated.
13. If wheezing is present, refer to the appropriate protocol for treatment options.
14. Assess circulation and perfusion.
15. Initiate cardiac monitoring.
16. If the patient shows signs of severe respiratory failure or respiratory arrest, consider establishing vascular access and administering normal saline at a sufficient rate to keep the vein open. If intravenous access cannot be obtained, proceed with intraosseous access. Do not delay transport to obtain vascular access.
17. Assess mental status.
18. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
19. Initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
20. Reassess the patient frequently.
21. Contact medical direction for additional instructions.

## III. Special Consideration

A patient who presents with acute respiratory distress of sudden onset accompanied by fever, drooling, hoarseness, stridor, and tripod positioning may have a partial airway obstruction. **Do nothing to upset the child.** Perform critical assessments only. Enlist the parent to administer blow-by oxygen. Place the patient in a position of comfort. Do not attempt vascular access. Transport immediately.

# BRONCHOSPASM

## I. Assessment

A. Bronchospasm is usually accompanied by respiratory distress with the following findings:
- Wheezing
- prolonged expiration
- increased respiratory effort (decreased effort may be noted as patient's condition approaches respiratory failure)
- severe agitation, lethargy
- suprasternal and substernal retractions
- tripod positioning

## II. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.

**B S P** 2. If the patient shows signs of respiratory distress or respiratory failure together with clinical evidence of bronchospasm or a history of asthma, administer 2.5 mg albuterol via nebulizer. If these respiratory findings persist, repeat 2.5 mg albuterol via nebulizer. Do not delay transport to administer medications.

**P** 3. If no response to nebulizer, administer epinephrine 1:1000 at 0.01 mg/kg (maximum individual dose 0.3 mg).

**B S P** 4. Assess circulation and perfusion.

**P** 5. Initiate cardiac monitoring.

**S P** 6. If the patient shows signs of severe respiratory distress, respiratory failure, or respiratory arrest, consider establishing vascular access and administering normal saline at a sufficient rate to keep the vein open. If intravenous access cannot be obtained in a patient with respiratory arrest, proceed with intraosseous access. Do not delay transport to obtain vascular access.

**B S P** 7. Assess mental status.

8. Expose the child only as necessary to perform further assessments. Keep the child as warm as possible.

9. Initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.

10. Reassess the patient frequently.

11. Contact medical direction for additional instructions.

## III. Special Consideration

A silent chest is an ominous sign indicating that respiratory failure or arrest is imminent.

# NEWBORN RESUSCITATION

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Suction the infant's airway using a bulb syringe as soon as the infant's head is delivered and before delivery of the body. Suction the mouth first, then the nose.
3. Once the body is fully delivered, dry the baby, replace wet towels with dry ones, and wrap the baby in a thermal blanket or dry towel. Cover the infant's scalp to preserve warmth.
4. Open and position the airway. Suction the infant's airway again using a bulb syringe. Suction the mouth first, then the nose.

**S P** 5. If thick meconium is present, initiate endotracheal intubation before the infant takes a first breath. Suction the airway using an appropriate suction adapter while withdrawing the endotracheal tube. Repeat this procedure until the endotracheal tube is clear of meconium. If the infant's heart rate slows, discontinue suctioning immediately and provide ventilation until the infant recovers. Note: If the infant is already breathing or crying, this step may be omitted.

**B S P** 6. Assess breathing and adequacy of ventilation.
7. If ventilation is inadequate, stimulate the infant by gently rubbing the back and flicking the soles of the feet.
8. If ventilation is still inadequate after brief stimulation, begin assisted ventilation at
40 to 60 breaths per minute using a bag-valve-mask device with high-flow, 100% concentration oxygen.
9. If ventilation is adequate and the infant displays central cyanosis, administer high-
flow, 100% concentration oxygen via blow-by. Hold the tubing 1 to 1-1/2 inches from the infant's mouth and nose and cup a hand around the end of the tubing to help direct the oxygen flow toward the infant's face.
10. Assess heart rate by auscultation.

**P** 11. If the heart rate is slower than 60 beats per minute after 30 seconds of assisted ventilation with high-flow, 100% concentration oxygen, initiate the following actions:
    - Continue assisted ventilation.
    - Begin chest compressions at a combined rate of 120/minute (three compressions to each ventilation).
    - If there is no improvement in heart rate after 30 seconds, perform endotracheal intubation.
    - If there is no improvement in heart rate after intubation and ventilation, administer 1:10,000 epinephrine solution at 0.01 mg/kg (maximum individual dose 1 mg) via endotracheal tube, or establish vascular access and administer the same dose. In the neonate, vascular access may be obtained intraosseously,or intravenously. Repeat epinephrine at the same dose every 3 to 5 minutes as needed.
    - Initiate transport. Reassess heart rate and respirations en route.

12. If the heart rate is between 60 and 80 beats per minute, initiate the following actions:
    - Continue assisted ventilation with high-flow, 100% concentration oxygen.
    - If there is no improvement in heart rate after 30 seconds, initiate management sequence described in step 11, beginning with chest compressions.
    - Initiate transport. Reassess heart rate and respirations en route.

12. If the heart rate is between 80 and 100 beats per minute, initiate the following actions:
    - Continue assisted ventilation with high-flow, 100% concentration oxygen.
    - Stimulate as previously described.
    - Initiate transport. Reassess heart rate after 15 to 30 seconds.

13. If the heart rate is faster than 100 beats per minute, initiate the following actions:
    - Assess skin color. If central cyanosis is still present, continue blow-by oxygen.
    - Initiate transport. Reassess heart rate and respirations en route.

14. Reassess the patient frequently.
15. Contact medical direction for additional instructions.

# BRADYCARDIA

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.

**P** 2. Initiate cardiac monitoring and determine rhythm.

**B S P** 3. If signs of severe cardiopulmonary compromise are present in an infant or neonate and the heart rate remains slower than 60 beats per minute despite oxygenation and ventilation, initiate chest compressions.

**S P** 4. If the patient shows signs of severe cardiopulmonary compromise, establish vascular access and administering normal saline at a sufficient rate to keep the vein open. If intravenous access cannot be obtained, proceed with intraosseous access. Do not delay transport to obtain vascular access.

**P** 5. If signs of severe cardiopulmonary compromise persist, administer epinephrine using the first available route as follows:

(a) 1:1000 solution at 0.l mg/kg via endotracheal tube; ***or***

(b) 1:10,000 solution at 0.0l mg/kg (maximum individual dose 1 mg) via intravenous or intraosseous route. Repeat the dose every 3 to 5 minutes until either the bradycardia or severe cardiopulmonary compromise resolves.

6. If signs of severe cardiopulmonary compromise and bradycardia persist despite epinephrine, administer atropine at 0.02 mg/kg via intravenous route, intraosseous route, or endotracheal tube. The minimum dose is 0.1 mg; the maximum individual dose is 0.5 mg for a child and 1 mg for an adolescent. Atropine may be repeated once after 3 to 5 minutes.

**B S P** 7. Assess mental status.

8. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.

9. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.

10. Reassess the patient frequently.

**P** 11. Contact medical direction for additional instructions, including:

- initiation of external pacing
- repeated administration of epinephrine
- repeated administration of atropine

## II. Special Consideration

Bradycardia generally arises due to hypoxia. Therefore, airway, ventilation, and oxygenation are the highest management priorities. The cause of the hypoxia should be identified and corrected.

# TACHYCARDIA

## I. Assessment

A. Severe cardiopulmonary compromise is indicated by:
- poor perfusion as evidenced by delayed capillary refill, weak or absent peripheral pulses, or altered mental status
- hypotension
- respiratory difficulty

B. The three types of tachycardia may be distinguished by the following signs:
1. Sinus tachycardia is usually present when
   - An infants heart rate is less than 220 beats per minute
   - A childs heart rate is less than 180 beats per minute
2. Supraventricular tachycardia is usually present when
   - An infants heart rate is faster than 220 beats per minute
   - A childs heart rate is faster than 180 beats per minute
3. Presumptive ventricular tachycardia is present when
   - The QRS duration is greater than 0.08 seconds

## II. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.

**P** 2. Initiate cardiac monitoring and determine rhythm.

**S P** 3. Establish vascular access and administer normal saline at a sufficient rate to keep the vein open. If intravenous access cannot be obtained and the patient shows signs of severe cardiopulmonary compromise, proceed with intraosseous access. Do not delay transport to obtain vascular access.

**P** 4. For probable sinus tachycardia, identify and treat possible causes, such as hypovolemia, shock, hypoxia, or pneumothorax.

5. For probable supraventricular tachycardia with signs of severe cardiopulmonary compromise, the following steps should be taken:
   - If intravenous access is readily available, administer adenosine at 0.1 mg/kg (maximum firstl dose 6 mg) via rapid IV bolus at the port closest to IV hub. Adenosine may be repeated twice at 0.2 mg/kg (maximum second dose 12 mg) as needed.
   - Perform synchronized cardioversion at 0.5 to 1 J/kg. If the patient remains in supraventricular tachycardia, repeat cardioversion at double the energy. Sedate the patient before cardioversion as permitted by regional medical direction. Sedation may be accomplished by administering midazolam at 0.1 mg/kg (maximum individual dose 2 mg) or diazepam at 0.2 mg/kg (maximum individual dose 5 mg) via intravenous route.

6. For probable ventricular tachycardia with a pulse, the following steps should be taken:
   - If intravenous access is readily available and the patient has adequate perfusion, administer lidocaine at 1 mg/kg via intravenous route. This dose may be repeated twice as necessary to a maximum total dose of 3 mg/kg. Note: If intravenous access is not readily available and patient is poorly perfused, go directly to cardioversion.
   - If adequate perfusion, perform synchronized cardioversion at 0.5 to 1 J/kg. If the patient remains in ventricular tachycardia, repeat cardioversion at double the energy. Sedate the patient before cardioversion as permitted by regional medical direction. Sedation may be accomplished by administering midazolam at 0.1 mg/kg (maximum individual dose 2 mg) or diazepam at 0.2 mg/kg (maximum individual dose 5 mg) via intravenous route.

**B S P**

7. Assess mental status.
8. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
9. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
10. Reassess the patient frequently.
11. Contact medical direction for additional instructions

# NON-TRAUMATIC CARDIAC ARREST

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.

2. Confirm absent pulse and begin chest compressions at age-appropriate rate and ratio.

**S P** 3. Attempt endotracheal intubation.

4. Obtain vascular access. If intravenous access cannot be obtained, proceed with intraosseous access.

**P** 5. Initiate cardiac monitoring and determine rhythm.

6. Refer to appropriate protocol for further management actions:
   - Ventricular Fibrillation/Pulseless Ventricular Tachycardia
   - Asystole
   - Pulseless Electrical Activity

# VENTRICULAR FIBRILLATION OR PULSELESS VENTRICULAR TACHYCARDIA

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Defibrillate at 2 J/kg (maximum 200 joules).
3. Defibrillate at 4 J/kg (maximum 360 joules).
4. Defibrillate at 4 J/kg (maximum 360 joules).

**P** 5. Using the most readily available route, administer:
(a) epinephrine 1:1000 solution at 0.1 mg/kg via endotracheal tube; ***or***
(b) epinephrine 1:10,000 solution at 0.01 mg/kg (maximum individual dose 1 mg) via intravenous or intraosseous route.
Subsequent doses of epinephrine 1:1000 solution may be administered every 3 to 5 minutes at 0.1 mg/kg via ET, IV, or IO for the duration of resuscitation.

6. Flush the medication port with 10 to 20 ml of intravenous fluid after each dose of IV medication to aid entry of drugs into central circulation.
7. Defibrillate at 4 J/kg (maximum 360 joules) 30 to 60 seconds after each medication bolus.
8. Consider lidocaine at 1 mg/kg via intravenous route. This step is necessary even if a perfusing rhythm has been reestablished. If defibrillation is unsuccessful, the same dose of lidocaine may be repeated in 5 minutes to a maximum total dose of 3 mg/kg.
9. Defibrillate at 4 J/kg (maximum 360 joules).
10. If VF or pulseless VT recurs after successful defibrillation, repeat defibrillation using the last energy level that restored perfusing rhythm.
11. Contact medical direction for additional instructions.
12. Initiate transport.
13. Assess mental status.
14. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
15. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
16. Reassess the patient frequently.

# ASYSTOLE

***Purpose:*** *Potentially treatable causes of asystole include severe hypoxemia, severe acidosis, severe hypovolemia, tension pneumothorax, cardiac tamponade, profound hypothermia, toxic ingestion, severe bradycardia, and hyperkalemia (renal failure).*

## I. Management

**M B S P**
**P**

1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Confirm the presence of asystole in two leads.
3. Using the most readily available route, administer:
   (a) epinephrine 1:1000 solution at 0.1 mg/kg via endotracheal tube; ***or***
   (b) epinephrine 1:10,000 solution at 0.01 mg/kg (maximum individual dose 1 mg) via intravenous or intraosseous route.
4. Repeat epinephrine 1:1000 solution every 3 to 5 minutes at 0.1 mg/kg via ET, IV, or IO.
5. Flush the medication port with 10 to 20 ml of intravenous fluid after each dose of IV medication to aid entry of drugs into central circulation.
6. Contact medical direction for additional instructions.
7. Initiate transport.
8. Assess mental status.
9. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
10. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
11. Reassess the patient frequently.
12. Asystole that does not respond to the above treatment sequence may be considered refractory. It may be appropriate to discontinue resuscitative efforts in refractory asystole as permitted by regional medical direction.

# PULSELESS ELECTRICAL ACTIVITY

**Purpose:** *Potentially treatable causes of PEA include severe hypoxemia, severe acidosis, severe hypovolemia, tension pneumothorax, cardiac tamponade, profound hypothermia, toxic ingestion, severe bradycardia, and hyperkalemia (renal failure).*

## I. Assessment

A. Pulseless electrical activity (PEA) appears upon cardiac monitoring as absent pulses with organized QRS complexes. The following dysrhythmias may present as PEA:

- electromechanical dissociation (EMD)
- pseudo-EMD
- idioventricular rhythms
- ventricular escape rhythms
- bradyasystolic rhythms
- post-defibrillation idioventricular rhythms

## II. Management

**M B S P**
1. Refer to General Pediatric Assessment and Treatment Protocol.

**P**
2. Using the most readily available route, administer:
   (a) epinephrine 1:1000 solution at 0.1 mg/kg via endotracheal tube; ***or***
   (b) epinephrine 1:10,000 solution at 0.01 mg/kg (maximum individual dose 1 mg) via intravenous or intraosseous route.
3. Repeat epinephrine 1:1000 solution every 3 to 5 minutes at 0.1 mg/kg via ET, IV, or IO.
4. Flush the medication port with 10 to 20 ml of intravenous fluid after each dose of IV medication to aid entry of drugs into central circulation.
5. Initiate transport.
6. Contact medical direction for additional instructions.
7. Assess mental status.
8. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
9. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
10. Reassess the patient frequently.

# ALTERED MENTAL STATUS

**Purpose***: This protocol is intended for patients with an altered mental status of unknown etiology.*

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Consider placing an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious.
3. Assess breathing.
4. If breathing is inadequate, assist ventilation using a bag-valve-mask device with high-flow, 100% concentration oxygen.

**S P** 5. If the airway cannot be maintained by other means, including attempts at assisted ventilation, or if prolonged assisted ventilation is anticipated, consider endotracheal intubation. Confirm placement of endotracheal tube using clinical assessment and end-tidal $CO_2$ monitoring as per medical direction.

**B S P** 6. If breathing is adequate, place the child in a position of comfort and administer high-flow, 100% concentration oxygen as necessary. Use a nonrebreather mask or blow-by as tolerated.
7. If signs of respiratory distress, respiratory failure, or respiratory arrest are present, refer to the appropriate protocol for treatment options.
8. Assess circulation and perfusion.

**P** 9. Initiate cardiac monitoring.

**S P** 10. Obtain vascular access. If intravenous access cannot be obtained, proceed with intraosseous access.

**P** 11. If hypoglycemia suspected, administer Dextrose:
- 0.5 mg/kg of D25

If vascular access is unavailable, administer 1 mg glucagon via intramuscular injection.

12. Dextrose may be repeated at same dosage if hypoglycemia is still suspected and no change in patient's mental status.
13. Administer naloxone at 0.1 mg/kg (maximum individual dose 2 mg) via intravenous or intraosseous route. Naloxone may be given via endotracheal tube or intramuscular injection at the same dose if vascular access is not available.

**S P** 14. If there is evidence of shock or suspected dehydration, administer a fluid bolus of normal saline at 20 ml/kg set to maximum flow rate. Reassess patient after bolus. If signs of shock persist, bolus may be repeated at the same dose up to two times for a maximum total of 60 ml/kg.

**B S P** 15. Re-assess mental status.
16. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
17. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
18. Reassess the patient frequently.
19. Contact medical direction for additional instructions.

# SEIZURES

**Purpose:** *This protocol is intended for patients who are experiencing status epilepticus. To manage seizures in patients who are not experiencing status epilepticus, contact on-line medical control for instructions.*

## I. Assessment

Status epilepticus:

- a single episode of seizure activity lasting longer than 5 minutes, or
- two or more episodes of seizure activity between which the patient does not regain consciousness

## II. Management

| | | |
|---|---|---|
| **M B S P** | 1. | Refer to General Pediatric Pediatric Assessment and Treatment Protocol. |
| | 2. | Protect the patient from injury during involuntary muscular movements. |
| | 3. | Assess the patient's airway for patency, protective reflexes and the possible need for advanced airway management. Look for signs of airway obstruction. |
| | 4. | Open the airway using head tilt/chin lift if no spinal trauma is suspected, or modified jaw thrust if spinal trauma is suspected. |
| | 5. | Suction as necessary. |
| | 6. | Consider placing an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious. |
| | 7. | Assess breathing. |
| | 8. | If breathing is inadequate, assist ventilation using a bag-valve-mask device with high-flow, 100% concentration oxygen. |
| **S P** | 9. | If the airway cannot be maintained by other means, including attempts at assisted ventilation, or if prolonged assisted ventilation is anticipated, consider endotracheal intubation. Confirm placement of endotracheal tube using clinical assessment and end-tidal $CO_2$ monitoring as per regional medical direction. |
| **B S P** | 10. | If breathing is adequate, place the child in a position of comfort and administer high-flow, 100% concentration oxygen as necessary. Use a nonrebreather mask or blow-by as tolerated. |
| | 11. | Assess circulation and perfusion. |
| **P** | 12. | Initiate cardiac monitoring. |
| **S P** | 13. | Establish vascular access. Administer normal saline at a sufficient rate to keep the vein open. |
| **P** | 14. | If hypoglycemia is suspected, administer intravenous dextrose as follows:<br>• 0.5 mg/kg of D25<br>If vascular access is unavailable, administer 1 mg glucagon via intramuscular injection. |
| | 15. | Dextrose may be repeated at same dosage if hypoglycemia is still |

suspected and patient is still in status epilepticus.

16. Intravenous anticonvulsants should be given slowly (over 1-2 minutes) to avoid apnea. Administer one of the following anticonvulsants:
    - Diazepam 0.2 mg/kg (maximum individual dose 10 mg) via intravenous route ***or*** 0.5 mg/kg (maximum individual dose 10 mg) via rectal route
    - Midazolam 0.15 mg/kg (maximum individual dose 5 mg) via intravenous or intramuscular route
17. If seizures persist, repeat Diazepam or Midazolam at the same dose or contact medical control for further instructions.

**B S P**

18. Assess mental status.
19. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
20. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
21. Reassess the patient frequently.
22. Contact medical direction for additional instructions.

# NON-TRAUMATIC SHOCK

## I. Assessment

Shock may be categorized as hypovolemic, distributive, or cardiogenic. Manifestations of shock include:

- altered mental status
- tachypnea
- tachycardia
- absent peripheral pulses
- cool, clammy, mottled skin
- capillary refill time longer than 2 seconds
- hypotension and/or bradycardia (late findings)

## II. Management

| | | |
|---|---|---|
| **M B S P** | 1. | Refer to General Pediatric Assessment and Treatment Protocol. |
| **P** | 2. | Initiate cardiac monitoring. |
| **S P** | 3. | Establish vascular access using an age-appropriate large-bore catheter. If intravenous access cannot be obtained, proceed with intraosseous access. Do not delay transport to obtain vascular access. |
| | 4. | If evidence of shock, administer a fluid bolus of normal saline at 20 ml/kg set to maximum flow rate. Reassess patient after bolus. If signs of shock persist, bolus may be repeated at the same dose up to two times for a maximum total of 60 ml/kg. |
| **B S P** | 5. | Assess mental status. |
| | 6. | Expose the child only as necessary to perform further assessments. Keep child as warm as possible. |
| | 7. | Initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit. |
| | 8. | Reassess the patient frequently. |
| | 9. | Contact medical direction for additional instructions. |

# ANAPHYLAXIS /ALLERGIC REACTION

## I. Assessment

The patient with an allergic reaction will have:
- generalized allergic manifestations, such as urticaria (hives)
- a history of allergic exposure

To meet the criteria for anaphylactic shock, the patient must have the findings listed above *plus* one of the following:
- partial or complete airway obstruction
- signs of shock, such as altered mental status, respiratory distress, weak or absent peripheral pulses, cyanosis

## II. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.

**P** 2. If patient meets criteria for anaphylactic shock, administer epinephrine 1:1000 solution at 0.0l mg/kg (maximum individual dose 0.3 mg) via subcutaneous injection. Massage the injection site vigorously for 30 to 60 seconds.

**B S P** 3. Assess breathing.

4. If breathing is inadequate, assist ventilation using a bag-valve-mask device with high-flow, 100% concentration oxygen.

**S P** 5. If the airway cannot be maintained by other means, including attempts at assisted ventilation, or if prolonged assisted ventilation is anticipated, consider endotracheal intubation. Confirm placement of endotracheal tube using clinical assessment and end-tidal $CO_2$ monitoring as per regional medical direction.

**B S P** 6. If breathing is adequate, place the child in a position of comfort and administer high-flow, 100% concentration oxygen as necessary. Use a nonrebreather mask or blow-by as tolerated.

7. If wheezing is present in a patient with adequate ventilation, administer 2.5 mg albuterol via nebulizer. If wheezing persists, repeat 2.5 mg albuterol via nebulizer.

8. Assess circulation and perfusion.

**P** 9. Reassess patient for signs of anaphylactic shock. If criteria are still present, repeat epinephrine 1:1000 solution at 0.0l mg/kg (maximum individual dose 0.3 mg) via subcutaneous injection.

10. Initiate cardiac monitoring.

**S P** 11. If the patient meets criteria for anaphylactic shock, establish vascular access using an age-appropriate large-bore catheter. If intravenous access cannot be obtained, proceed with intraosseous access. Do not delay transport to obtain vascular access.

12. If evidence of shock persists, administer a fluid bolus of normal saline at 20 ml/kg set to maximum flow rate. Reassess patient after bolus. If signs of shock persist, bolus may be repeated at the same dose up to two times for a maximum total of 60 ml/kg.

**P** 13. Administer diphenhydramine at 1 mg/kg (maximum individual dose 50 mg) via intravenous route or deep intramuscular injection if no vascular access.

**B S P** 14. Assess mental status.

15. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.

16. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.

17. Reassess the patient frequently.

18. Contact medical direction for additional instructions.

# TOXIC EXPOSURE

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Look for the source of the toxic exposure. Collect any containers or medication bottles to transport with the patient to the hospital.
**P** 3. Initiate cardiac monitoring.
**S P** 4. Obtain vascular access as indicated.
**P** 5. If respiratory depression is present and a narcotic overdose is suspected, administer naloxone at 0.1 mg/kg (maximum individual dose 2 mg) via intravenous, intraosseous, or intramuscular route.
**B S P** 6. Contact medical control for other toxic exposures.
7. Assess mental status.
8. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
9. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
10. Reassess the patient frequently.
11. Contact medical direction for additional instructions.

## II. Special Considerations

Treatment for other toxic exposures may be instituted as permitted by medical control. Other treatments include the following and if medical control chooses to implement treatments, must identify dosages:

- High-dose atropine for organophosphates
- Sodium bicarbonate for tricyclic antidepressants
- Glucagon for calcium channel blockers or beta-blockers
- Diphenhydramine for dystonic reactions
- Dextrose for insulin overdose

# NEAR-DROWNING

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
**P** 2. Initiate cardiac monitoring and determine rhythm. Consult the appropriate protocol for treatment of specific dysrhythmias.
**S P** 3. Obtain vascular access. Administer normal saline at a sufficient rate to keep the vein open.
**B S P** 4. Assess mental status.
5. If spinal trauma is suspected, continue manual stabilization, apply an appropriate sized rigid cervical collar, and immobilize the patient on a long backboard or similar device.
6. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
7. If the child's condition is critical or unstable, initiate transport as quickly as possible. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
8. Reassess patient frequently.
9. Contact medical direction for additional instructions.

# PAIN MANAGEMENT

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
**S P** 2. Obtain vascular access. Administer normal saline at a sufficient rate to keep the vein open.
**B S P** 3. Assess mental status.
**P** 4. Contact medical control for altered mental status prior to administering pain management.
**B S P** 5. Expose the child only as necessary to perform further assessments. Keep child as warm as possible.
6. If the child's condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
**P** 7. Assess the patient's pain using a numerical scale or visual analogue scale as appropriate to child's abilities.
8. Administer Morphine: 0.1 mg/kg (maximum individual dose 10 mg) via intravenous or subcutaneous route
9. After drug administration, assess the patient's response. Note adequacy of ventilation and perfusion.
10. Reassess the patient frequently.
11. Contact medical direction for further instructions.

# DEATH OF A CHILD

**Purpose:** *There is no normal parental reaction to the death of a child. Individual responses may range from emotional outbursts to apparent withdrawal.* ***Rescuers should not make any assumptions or judgments.*** *Maintain a professional demeanor at all times. Perform the initial assessment, environmental assessment, and focused history as part of the clinical process. Observe, assess, and document accurately and objectively.*

## I. Management

**M B S P** 1. Refer to General Pediatric Assessment and Treatment Protocol.
2. Assess airway and breathing. Confirm apnea.
3. Assess circulation and perfusion.
**P** 4. Initiate cardiac monitoring. Confirm absent pulse.
**B S P** 5. Determine whether to resuscitate:
- If patient does not exhibit lividity or rigor, proceed with cardiopulmonary resuscitation, following the protocol for non-traumatic cardiac arrest. Initiate transport.
- If patient exhibits lividity and rigor, shows no signs of life, contact medical control and appropriate law enforcement and refer to dead on scene protocol. Note: Lividity can be mistaken for bruising and evidence of abuse.

## II. Special Considerations (as appropriate)

A. Provide supportive measures for parents and siblings:
- Explain the resuscitation process, transport decision, and further actions to be taken by hospital personnel or the medical examiner.
- Reassure parents that there was nothing they could have done to prevent death.
- Allow the parents to see the child and say goodbye.
- Maintain a supportive, professional attitude no matter how the parents react.
- Whenever possible, be responsive to parental requests. Be sensitive to ethnic and religious needs or responses and make allowances for them.

B. Obtain patient history using a nonjudgmental approach. Ask open-ended questions as follows:
- Has the child been sick?
- Can you describe what happened?
- Who found the child? Where?
- What actions were taken after the child was discovered?
- Has the child been moved?
- When was the child last seen before this occurred, and by whom?
- How did the child seem when last seen?
- When was the last feeding provided?

C. Reassess the environment. Document findings, noting the following:
- Where the child was located upon arrival
- Description of objects located near the child upon arrival
- Unusual environmental conditions, such as a high temperature in the room, abnormal odors, or other significant findings

D. If the parents interfere with treatment or attempt to alter the scene, initiate the following actions:
- Remain supportive, sympathetic, and professional
- Avoid arguing with the parents or exhibiting anger
- Do not restrain the parents or request that they be restrained unless scene safety is clearly threatened

E. Document the emergency call, including the following information:
- Time of arrival
- Initial assessment findings and basis for resuscitation decision
- Time of resuscitation decision
- Time of arrival at hospital if resuscitation and transport were initiated
- Parental support measures provided if resuscitation was not initiated
- History obtained (note who provided the information)
- Environmental conditions
- Time law enforcement personnel arrived on scene
- Time that scene responsibility was turned over to law enforcement personnel

AUTHENTICATION AND APPROVAL

Marquette County EMS Medical Director — Date

Original Approval: 09/02/03