Pediatric Medication Emergency Dosing and Intervention Cards

Purpose: Instructions for using the Michigan Medication Emergency Dosing and Intervention Cards (MI-MEDIC). Pediatric patients (≤ 14 years) utilize MI MEDIC cards for appropriate medication dosage. When unavailable utilize pediatric dosing listed within protocol

1. Obtain correct weight of the child
    a. If patient's actual weight is known, use MI MEDIC card for that weight. (DO NOT CONFUSE POUNDS and KILOGRAMS)
    b. If patient's weight is not known, use length-based resuscitation tape to determine the proper color zone.
    c. If a length-based resuscitation tape not available, use patient's age to determine color of card to use. DO NOT GUESS THE WEIGHT OF THE CHILD.
2. Select appropriate weight-based medication for intervention.
3. Select the corresponding colored card
4. Select desired medication from Cardiac Resuscitation or Medical Conditions
5. ASSURE medication CONCENTRATION on hand is as specified on card
6. Some medications should be diluted as instructed on card
7. If dilution is required, follow steps to dilute entire vial of medication prior to drawing up final ml volume to administer.
8. Confirm medication dose and volume to be delivered.
9. Administer volume of medication as desired.
10.
Contact Medical Control for questions or concerns.

NOTE: Some medication doses have been rounded for safety and ease of use for the prevention of medication errors. These doses may not exactly correspond with the mg/kg dose in the pediatric treatment protocols. The use of these rounded doses has been approved for use and administration will be acceptable as long as the dose was referenced from the MI MEDIC cards.

Newborn & Neonatal Assessment and Resuscitation

Aliases: newborn assessment, newborn treatment, newborn resuscitation, neonatal resuscitation.

Purpose: Infants less than 30 days old are considered neonates. This protocol is intended for assessment of newly born infants, and/or the resuscitation of newly born infants less than 30 days old.

ASSESSMENT OF NEWLY BORN INFANTS

1. History
   A. Date and time of birth
   B. Onset of symptoms
   C. Prenatal history (prenatal care, substance abuse, multiple gestation, maternal illness)
   D. Birth history (maternal fever, meconium, prolapsed or nuchal cord, bleeding)
   E. Estimated gestational age (may be based on last menstrual period)

2. Immediate Assessment & Procedures
   A. **Respiratory (R of APGAR)**
      i. Assess rate and effort (strong, weak, or absent; regular or irregular)
      ii. Absent
         a. If the baby does not breathe spontaneously, stimulate by gently rubbing its back or slapping the soles of its feet.
      iii. Respiratory distress (grunting, nasal flaring, retractions, gasping, apnea **OR** no return of spontaneous breathing after stimulation.
         a. position airway (sniffing position) and clear airway as needed
         b. If thick meconium or secretions present suction mouth then nose
         c. Initiate ventilation with appropriately sized equipment and 21% oxygen (room air)
   B. **Heart rate/pulse (P of APGAR)**(fast, slow, or absent), auscultation of chest is the preferred method
      i. If heart rate >100 beats per minute
         a. Monitor for central cyanosis, provide blow-by oxygen as needed
         b. Monitor for signs of respiratory distress. If apneic or significant distress:
            1) Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute
      ii. If heart rate < 100 beats per minute
         a. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute
         b. Primary indicator of improvement is increased heart rate
         c. Only use minimum necessary volume to achieve chest rise
         d. If no improvement after 90 seconds, provide ventilations with supplemental oxygen (100%) until heart rate normalizes (100 or above)
      iii. If heart rate < 60 beats per minute

a. Ensure effective ventilations with supplementary **oxyge**n and adequate chest rise
b. If no improvements after 30 seconds, initiate chest compressions
   1) Two-thumb-encircling-hands technique is preferred
c. Coordinate chest compressions with positive pressure ventilation (3:1 ratio, 90 compressions and 30 breaths per minute)
d. Per MCA selection, consider intubation per **Airway Management-Procedure Protocol**

C. **Color/Appearance (first A of APGAR)** (central cyanosis, peripheral cyanosis, pallor, normal)
   a. Administer blow-by oxygen for a few minutes until baby's core color is pink.

D. **Grimace (G of APGAR)**

E. **Muscle tone/activity (second A of APGAR)**(poor or strong)

3. APGAR score for witnessed deliveries, based on above assessment should be noted at one minute and five minutes after delivery.
   i. A – appearance (color)
   ii. P – pulse (heart rate)
   iii. G – grimace (reflex irritability to slap on sole of foot)
   iv. A – activity (muscle tone)
   v. R – respiration (respiratory effort)
   vi. Each parameter gets a score of 0 to 2.

APGAR SCORING

Sign	0	1	2
Appearance – skin color	Bluish or paleness	Pink or ruddy; hands or feet are blue	Pink or ruddy; entire body
Pulse – heart rate	Absent	Below 100	Over 100
Grimace – reflex irritability to foot slap	No response	Crying; some motion	Crying; vigorous
Activity – muscle tone	Limp	Some flexion of extremities	Active; good motion in extremities
Respiratory effort	Absent	Slow and Irregular	Normal; crying

4. Prevent heat lost
   A. Maintain warm environment
   B. Keep infant dry and covered with dry blankets
   C. Keep infant's head covered with infant cap
   D. Swaddle infant to mother skin to skin if infant is stable until transport
5. For patient transport, refer to **Safe Transportation of Children in Ambulances-Treatment Protocol**.

Childbirth and Related Obstetrical Emergencies

Purpose: To provide the process for the assessment and management of the mother for childbirth and childbirth related emergencies. Assessment and care of newborns and infants under 30 days old, see **Newborn/Neonatal Assessment and Resuscitation-Treatment Protocol**.

1. Follow **General Pre-hospital Care-Treatment Protocol**

2. Assessment Information
   A. Past Medical History: previous births, previous complications, history of preeclampsia/eclampsia.
   B. Current History: duration of gestation (weeks), whether single or multiple births are expected, or any prior pregnancy complications.
   C. Specific Objective Findings: vital signs, assess contractions (duration, frequency).
   D. In the presence of licensed health care providers (e.g., physician, licensed midwife), contact Medical Control for care not consistent with protocols.
   E. Determine whether to transport or remain at scene due to imminent delivery. Indications of impending, imminent delivery may include:
      a. Multiple pregnancy, strong regular contractions, every 2 minutes or less, ruptured membrane, bloody show, need to push or bear down, crowning
   F. Obtain vascular access if time permits per **Vascular Access and IV Fluid Therapy-Procedure Protocol**

3. Management of Normal Delivery
   A. If signs of newborn delivery are imminent, and there is no time to transport, prepare for delivery.
   B. Have oxygen and suction readily available for care of the newborn.
   C. Try to find a place for maximum privacy, cleanliness, and warmth.
   D. Allow safe birth position of choice.
   E. Monitor patient for signs of hypotension. If signs develop, position patient so weight of uterus is to patient's left side.
   F. Drape if possible, using clean sheets.
   G. Encourage mother to relax and take slow deep breaths through her mouth.
   H. Reassure her throughout process.
   I. As baby's head begins to emerge from vagina, support it gently with hand and towel to assist in delivery.
      a. Do not pull baby's head or neck once head is delivered.
   J. After head is delivered look and feel to see if cord is wrapped around baby's neck (see Nuchal Cord management below).
   K. As the shoulders deliver, carefully hold, and support the head and shoulders as the body delivers, may be suddenly – and the baby is very slippery! Use a sterile towel if available to help support the baby.
   L. Note the time of delivery.

M. Begin newborn assessment per **Newborn/Neonatal Assessment and Resuscitation-Treatment Protocol.**
N. After 1 minute, clamp cord about 5–6 inches from the abdomen with two clamps; cut the cord between the clamps.
   a. While cord is attached, take care to ensure the baby is not significantly higher positioned than the mother to prevent blood from flowing backwards from baby to placenta.
   b. If resuscitation is needed baby can still benefit from a 1- minute delay in cord clamping but start resuscitation immediately see **Newborn/Neonatal Assessment and Resuscitation-Treatment Protocol**
O. Place the baby skin to skin on the mother's abdomen on its side with head lower than the body. (Suction with a bulb syringe should be reserved for infants with obvious obstruction)
P. Prevent heat loss
   a. Gently dry baby off and remove all wet linen
   b. Ensure the environment is warm.
   c. Place infant cap on baby
Q. For near/at term vigorous newborns, with conscious stable mothers, allow infant to remain on mother's chest during assessment and cover both baby and the mother with warm dry blankets until transport. Refer to **Safe Transport of Children in Ambulances-Treatment Protocol.**

4. <u>Management of mother post-delivery</u>.
   A. Obtain vital signs.
   B. Assess for signs of preeclampsia/eclampsia.
   C. Assess for signs of postpartum hemorrhage.
   (S) a. If blood loss is significant, place IV and administer **NS** or **LR** fluid bolus of 1 liter wide open.
      i. Monitor for pulmonary edema.
      ii. If pulmonary edema presents, stop fluids and contact Medical Control for direction.
   b. Administer oxygen NRB at 15 LPMN (if not already)
   c. Contact Medical Control for severe hemorrhage for consideration of **TXA** per **Hemorrhagic Shock-Treatment Protocol**
      i. Fundal massage should take place concurrently.
   D. Placenta delivery
      a. Generally, takes place within 20 minutes of delivery.
      b. Place placenta in basin or plastic bag and transport with mother.
      c. Following placental delivery, massage the uterus to aid in contraction of the uterus.
      d. Continue to assess the mother's uterus and bleeding in route to the hospital to assure the uterus is contracted and blood loss is minimal. Report blood loss upon arrival at the hospital.

5. Management of Abnormal Deliveries
   A. Apply high flow oxygen to mother.
   B. Contact Medical Control as soon as appropriate.
   C. **Nuchal Cord** (cord wrapped around neck)
      a. If the cord is around the neck and loose, slide gently – over the head DO NOT TUG.
      b. If the loop is too tight to slip over the head, attempt to slip the cord over the shoulders and deliver the body through the loop.
      c. If the cord is around neck and snug, clamp the cord with 2 clamps and cut between the clamps.
      d. Wait for the next contraction for completion of delivery of the body. DO NOT PULL on the baby.
   D. **Shoulder Dystocia**
      a. If delivery fails to progress after head delivers, quickly attempt the following:
         i. Hyperflex mother's hips to severe supine knee-chest position (i.e., McRoberts' maneuver).
         ii. Apply firm suprapubic pressure to attempt to dislodge shoulder. This often requires two EMS clinicians to perform and allows for delivery in up to 75% of cases.
         iii. Attempt to angle baby's head as posteriorly as possible but NEVER pull.
         iv. Continue with delivery as normal once the anterior shoulder is delivered.
   D. **Breech position**
      a. Place mother supine, allow the buttocks, feet, and trunk to deliver spontaneously, then support the body while the head is delivered.
      b. When delivering breech, you may need to rotate the baby's trunk clockwise; or sweep the legs from the vagina.
      c. Once the legs are delivered support the body to avoid hyperextension of the head; keep the fetus elevated off the umbilical cord.
      d. If needed, put the mother in a prone kneeling position which may assist in the delivery of the newborn
      e. Assess for presence of prolapsed cord and treat as below.
      f. If head fails to deliver, place gloved hand into vagina with fingers between infant's face and uterine wall to create an open airway. Place your index and ring fingers on the baby's cheeks forming a "V" taking care not to block the mouth and allowing the chin to be tilted toward the chest flexing the neck.
      g. NEVER pull on the body, especially a preterm or previable baby. Support the baby's body while mother pushes when she feels the urge.
   E. **Prolapsed Cord**
      a. Place mother in a supine position with hips supported on a pillow.
      b. Place gloved hand into vagina and gently lift head/body off the cord.
      c. Assess for pulsations in cord, if no pulses are felt, lift the presenting part off the cord
      d. Wrap the prolapsed cord in moist sterile gauze.

e. Maintain until relieved by hospital staff.
f. If previous techniques are not successful, mother should be placed in prone knee chest position or extreme Trendelenburg with hips elevated.
g. DO NOT ATTEMPT TO PUSH CORD BACK INTO THE PATIENT!

F. **Arm or limb presentation** – Life threatening condition.
a. Immediate transportation in prone knee chest position or extreme Trendelenburg with hips elevated.
b. Delivery should not be attempted outside the hospital.

G. **Multiple births**
a. Immediate transportation
b. Multiple birth infants are typically small birth weight and will need careful management to maintain body heat.
c. For imminent delivery proceed with procedures of normal delivery as above including clamping of cord and skin to skin.
d. Prepare additional supplies for subsequent births.
e. There may be time to transport between births.

6. Management of Preeclampsia or Eclampsia

A. Management of Preeclampsia or Eclampsia include women 20 weeks gestation up to 6 weeks post childbirth.
a. **Magnesium sulfate** can be administered prior, during, or post childbirth.
b. Be prepared to support respirations for infants born post **magnesium sulfate** administration.

B. Signs of eclampsia
a. Seizure **-** Any pregnant patient who is seizing should be assumed to have eclampsia and treated as such until arrival at the hospital.

C. Treatment of eclampsia – (actively seizing)
a. High flow oxygen
b. Establish IV access per **Vascular Access and IV Therapy-Procedure Protocol**
i. Administer **magnesium sulfate** 4 gm over 10 minutes IV/IO until seizure stops**.** Administration of **magnesium sulfate** is best accomplished by adding **magnesium sulfate** 4gm to 100 or 250 ml of **NS** and infusing over approximately 10 minutes.
ii. If eclamptic seizure does not stop after **magnesium sulfate**, then refer to **Seizure-Treatment Protocol**

D. Signs of severe preeclampsia
a. BP systolic greater than 160 mmHG or diastolic greater than 110 mmHG with one or more of the associated symptoms below
i. Headache
ii. Confusion/altered mental status
iii. Vision changes including blurred vision, spots/floaters, loss of vision these symptoms are often a precursor to seizure)
iv. Right upper quadrant or epigastric pain
v. Shortness of breath/Pulmonary edema
vi. Ecchymosis suggestive of low platelets (bruising, petechiae)
vii. Vaginal bleeding suggestive of placental abruption

viii. Focal neurologic deficits suggesting hemorrhagic or thromboembolic stroke
ix. Marked peripheral edema

b. Prophylaxis treatment for severe preeclampsia
i. High flow oxygen
ii. IV access per **Vascular Access and IV Therapy-Procedure Protocol**
iii. Administer magnesium sulfate (per MCA selection)

Pre radio **magnesium sulfate** administration (without Medical Control contact)

Post radio **magnesium sulfate** administration (contact Medical Control) prior to administration.

iv. Administer **magnesium sulfate** 4gm IV/IO. Administration of **magnesium sulfate** is best accomplished by adding **magnesium sulfate** 4gm to 100 or 250 ml of **NS** and infusing over approximately 10 minutes.

c. Immediate transport

NOTES:

1. Hyperextension means head back,
2. Hyperflexion means head to chest.
3. There are two patients to assess, manage, and transport during childbirth – request resources as appropriate.

Medication Protocols
Magnesium Sulfate

Safe Transportation of Children in Ambulances

Safe transportation of children in ambulances is very important. This protocol will serve as a guideline to the safe transportation of children in an ambulance. These are a limited set of circumstances that may not fit every situation.

Definitions:

1. Child Restraint System (CRS) is a device that is designed for child safety in any mode of transportation (e.g., vehicle, airplane, ambulance, etc.). This includes:
2. Vehicle CRS such as car seats that are used in personal vehicles (e.g., forward and rearward facing and booster seats
3. Ambulance Child Restraints (ACR) are a subset of CRS and are a specific type of child restraint system that is designed to be used in ambulances and on ambulance stretchers. ACR is not a brand name and devices that meet the definition of ACR and are approved by the MCA may be utilized.
    a. An ACR does NOT include car seats that were designed for use in personal vehicles.

Criteria for Transport

1. This protocol applies pediatric patients who are of a height/weight that require the use of a CRS.
2. Any pediatric patient that requires a CRS that is transported in an ambulance **must be in an ACR.**
    a. When not transported in an ACR, this must be documented as such and reported to the MCA.
3. This protocol is based on recommendations, as published by the National Highway Traffic Safety Administration (NHTSA), for the transportation of children in five possible situations:
    a. The transport of a non-patient pediatric passenger, accompanying an injured or ill patient
    b. The transport of a pediatric patient whose condition does *not* require continuous and/or intensive medical monitoring or intervention.
    c. The transport of a pediatric patient who *does* require continuous and/or intensive monitoring or intervention.
    d. The transport of a pediatric patient whose condition requires spinal motion restriction and/or lying flat, refer to **Spinal Precautions-Procedure Protocol**
    e. The transport of a pediatric patient who require transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)

Procedure

1. **Transport patient on ambulance stretcher secured with an ACR.**
2. The child's height and weight will be considered when determining an appropriate ACR, following manufacturers recommendations.
3. When use of ACR is unavailable, unachievable or is detrimental see situational guidelines below, document as such and report to the MCA.

Situation Guidelines: Alternatives for consideration during catastrophic situations when ACR use is unavailable or unachievable (must be documented as such and reported to the MCA). Follow in order of operation until an achievable transport method is arrived at.

1. Transport of an uninjured/not ill child accompanying an injured or ill patient (in this order)
    a. Arrange for transport in a vehicle other than an emergency ground ambulance in a size-appropriate, properly installed, undamaged CRS.
    b. Request an ACR equipped transporting vehicle.
    c. Transport in an ambulance in the front passenger seat in a size-appropriate, properly installed, undamaged CRS. Airbags must off and seat moved to the furthest back position.
    d. Transport in an ambulance in a forward-facing EMS provider's seat/ captain's chair, in a size-appropriate, properly installed, undamaged CRS.
    e. Transport in an ambulance in rear-facing EMS provider's seat in a size-appropriate, properly installed, undamaged CRS.

2. Transport of an ill/injured child that does *not* require continuous intensive medical monitoring or interventions (in this order)
    a. Request an ACR equipped transporting vehicle if patient's condition allows.
    b. Transport the child in a size-appropriate undamaged CRS secured appropriately on ambulance stretcher.
    c. Transport in the forward-facing EMS provider's seat/ captain's chair, in a size-appropriate, properly installed, undamaged CRS.
    d. Transport in the rear-facing EMS provider's seat in a size-appropriate, properly installed, undamaged CRS.
    e. Secure the child to the ambulance stretcher, using three horizontal restraints across the child's chest, pelvis, and lower extremities and one vertical restraint across each of the child's shoulders. The ambulance stretcher should be positioned (subject to the manufacturer's specifications) to provide for the child's comfort based upon the child's injuries and/or illness and to allow for appropriate medical care.

3. Transport of an ill/injured child who *does* require continuous intensive monitoring or intervention.
    a. Request an ACR equipped transporting vehicle if patient's condition allows.
    b. Secure the child to the ambulance stretcher, using three horizontal restraints across the child's chest, pelvis, and lower extremities and one vertical restraint across each of the child's shoulders. The ambulance stretcher should be positioned (subject to the manufacturer's specifications) to provide for the child's comfort based upon the child's injuries and/or illness and to allow for appropriate medical care.

4. Transport of an ill/injured child who requires spinal motion restriction or lying flat.
    a. Request an ACR equipped transporting vehicle and follow **Spinal Precautions-Procedure Protocol**
    b. If the child is already secured to a spine board and it is detrimental to remove the child from the device, ensure padding is added as needed and secure to the ambulance stretcher (i.e., extrication prior to arrival of transporting ambulance). See **Spinal Precautions-Procedure Protocol.**

5. Transport of a child or children requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)
    a. Transport each as a single patient according to the guidance provided for situations 1 through 4. Use additional units to accomplish safe transport.
    b. For mother and newborn, both are considered patients.
        i. Prevent hypothermia of the newborn immediately and continuously.
        ii. Where the mother does not have complications arising from delivery, transport the newborn in an ACR on the ambulance stretcher and the mother in the rear-facing EMS provider seat.
        iii. Where the mother has complications resulting from delivery and is in need of positioning on the ambulance stretcher, transport the newborn in an approved size-appropriate car seat in the rear-facing EMS provider seat with a belt-path that prevents both lateral and forward movement under continuous monitoring, securing the mother to the ambulance stretcher.

Protocol Source/References: National Highway Traffic Safety Administration. (2012). Working group best-practice recommendations for the safe transportation of children in emergency ground ambulances. https://www.nasemso.org/Committees/STC/documents/NHTSA-Safe-Transportation-of-Children-in-Ambulances-2012.pdf

Pediatric Seizures

1. Follow **General Pre-Hospital Care – Treatment Protocol**
2. For focal seizures, contact Medical Control
3. **IF PATIENT IS ACTIVELY SEIZING (GENERALIZED TONIC-CLONIC):**
   - A. Protect patient from injury
   - B. Maintain airway and provide supplemental oxygen
   - C. Administer **midazolam** according to the **MI-MEDIC** Cards
     - i. If **MI-MEDIC** is unavailable, administer **midazolam** 0.1 mg/kg IM, maximum single dose 10 mg
     - ii. If IV established prior to seizure activity, administer midazolam 0.05 mg/kg IV/IO, maximum single dose of 5 mg
     - iii. Monitor Spo2, EKG, and waveform capnography (**per End Tidal Carbon Dioxide Monitoring – Procedure Protocol**) after midazolam administration
   - D. Consider trauma; If evidence or suspicion of trauma, treat according to applicable protocol in addition to treating seizures
   - E. Check blood glucose (may be MFR skill, see **Blood Glucose Testing – Procedure Protocol**)
     - i. Start IV/IO if needed
     - ii. Administer **dextrose** according to **MI-MEDIC** when blood glucose is <60 mg/dL
       1. If **MI-MEDIC** is unavailable, utilize the table below

Color	Age	Weight	Dose	Concentration	Volume		Concentration	Volume
Grey	0-2 months	3-5 kg (6-11 lbs.)	2.5g	Dextrose 12.5%	20 mL	**OR**	Dextrose 10%	25 mL
Pink	3-6 months	6-7 kg (13-16 lbs.)	3.25g	Dextrose 25%	13 mL	**OR**	Dextrose 10%	33 mL
Red	7-10 months	8-9 kg (17-20 lbs.)	4.25g	Dextrose 25%	17 mL	**OR**	Dextrose 10%	43 mL
Purple	11-18 months	10-11 kg (21-25 lbs.)	5g	Dextrose 25%	20 mL	**OR**	Dextrose 10%	50 mL
Yellow	19-35 months	12-14 kg (26-31 lbs.)	6.25g	Dextrose 25%	25 mL	**OR**	Dextrose 10%	63 mL
White	3-4 years	15-18 kg (32-40 lbs.)	8g	Dextrose 25%	32 mL	**OR**	Dextrose 10%	80 mL
Blue	5-6 years	19-23 kg (41-50 lbs.)	10g	Dextrose 25%	40 mL	**OR**	Dextrose 10%	100 mL
Orange	7-9 years	24-29 kg (52-64 lbs.)	12.5g	Dextrose 50%	25 mL	**OR**	Dextrose 10%	125 mL
Green	10-14 Years	30-36 kg (65-79 lbs.)	15g	Dextrose 50%	40 mL	**OR**	Dextrose 10%	150 mL

iii. If unable to start IV, administer **glucagon** IM/IN (if available per MCA selection), (may be EMT skill per MCA selection)

1. If **MI-MEDIC** is unavailable, utilize the table below

Glucagon administration per MCA Selection

☐ Not included

	Glucagon IM *Injectable formulation ONLY* A. Patients < 5 years of age administer **glucagon** 0.5 mg IM B. Patients ≥ 5 years of age administer **glucagon** 1 mg IM	**Glucagon** IN *Intranasal formulation ONLY* **A.** Patients < 5 years of age **Do NOT Administer** B. Patients ≥ 5 years of age administer **glucagon** 3 mg IN
EMT	☐	☐
Specialist	X	☐
Paramedic	X	☐

*INTRANASAL GLUCAGON ADMINISTRATION: Only glucagon that is FDA-approved for nasal administration (e.g., Baqsimi(R)) may be given by IN route. Injectable glucagon is not to be administered via IN route. EMS clinicians may assist family/patient care givers in administering glucagon that is FDA-approved for IN use, if prescribed for the patient (regardless of age).

F. If seizure persists 10 minutes after initial dose of **midazolam** and correction of low blood glucose, repeat **midazolam** one time (per MCA selection)

◉ Pre-radio **midazolam** administration (without Medical Control contact)

○ Post-radio **midazolam** administration (contact Medical Control prior to administration)

i. 0.1 mg/kg IM, maximum single dose of 10 mg
OR
ii. If IV available, 0.05 mg/kg IV/IO, maximum single dose of 5 mg

G. If seizures persist after second dose, consider underlying causes and contact Medical Control for further instructions

4. **IF PATIENT IS NOT ACTIVELY SEIZING**, monitor and treat known underlying causes, if possible

A. Check blood glucose (may be MFR skill, see **Blood Glucose Testing – Procedure Protocol**) and treat as outlined above (3. E.)

i. If blood glucose <60 mg/dL:

1. Altered, able to swallow, AND 3 months old or older – Administer oral glucose
2. Not Alert – administer dextrose according to **MI-MEDIC** or table above

B. Check temperature and refer to **Pediatric Fever – Treatment Protocol**, if applicable
C. Monitor oxygenation and mental status, administer oxygen to maintain 94% SpO2, including ventilatory support as needed according to the **Airway Management – Procedure Protocol**
    i. For patients with respiratory depression and high suspicion o opioid involvement, administer **naloxone** per **Opioid Overdose Treatment and Prevention – Treatment Protocol**
D. Consider trauma; if evidence or suspicion of trauma, treat according to applicable protocol
E. Keep environment safe for the patient, padding around the patient if possible

NOTES:

1. Instructions for diluting **dextrose**:
    A. To obtain **dextrose** 10%, discard 40 ml out of one p of D50, then draw up 40 ml of NS into the D50 ampule
    B. To obtain **dextrose** 12.5%, discard 37.5 ml out of one amp of D50, then draw 37.5 ml of NS into the D50 ampule
    C. To obtain **dextrose** 25%, discard 25 ml out of one amp of D50, then draw 25 ml of NS into the D50 ampule
    D. May utilize 10% for all ages 5 ml/kg (0.5 gm/kg) up to 250 ml, according to **Dextrose-Medication Protocol**
2. To avoid extravasation, a patent IV must be available for IV administration of **dextrose**. **Dextrose** should always be pushed slowly (e.g., over 1-2 minutes)

Medication Protocols
Dextrose
Glucagon
Midazolam
Naloxone

Pediatric Fever

This protocol is intended to assist EMS providers in reducing fever in the pediatric patients prior to arrival to the emergency department**. Fever is defined as a temperature of 100.4 degrees Fahrenheit (38 degrees Celsius) or greater.** Emergency management of the febrile child involves an assessment to determine if any associated problems are present which may require emergency treatment.

1. Follow **General Pre-hospital Care-Treatment Protocol**.
2. Pediatric patients (≤ 14 years) utilize MI MEDIC cards for appropriate medication dosage. When unavailable utilize pediatric dosing listed within protocol.
3. Obtain baseline temperature and document method used.
    a. Children less 60 days old require a documented rectal temperature (including time temperature obtained) prior to antipyretic administration.
4. Administer antipyretic according to MCA selection

MCA Antipyretic Selection (Must select at least one)
☑ **Ibuprofen (children > 6 months of age)**
☑ **Acetaminophen**

5. Administer i**buprofen** if child is over 6 months old, has not been given **ibuprofen** (e.g., Motrin/Advil) or any medication containing ibuprofen (i.e., cold medication) in the last 6 hours and is alert.
    i. If patient's weight is known, utilize that weight and MI-MEDIC for dosing.
    ii. If patient's weight is not available, utilize length-based tape and MI-MEDIC for dosing.
    iii. If MI-MEDIC is not available, use dosing chart below.

OR

6. Administer **acetaminophen** if the child has not been given **acetaminophen** (e.g., Tylenol) or any medication containing acetaminophen (i.e., cold medication) in last four (4) hours and is alert, and:
    i. If patient's weight is known, utilize that weight and MI-MEDIC for dosing.
    ii. If patient's weight is not available, utilize length-based tape and MI-MEDIC for dosing
    iii. If MI-Medic is not available, use dosing chart below.
7. If any question concerning alertness or ability to swallow, **DO NOT ADMINISTER.**
8. Dosing questions should be directed to online medical control.

Children's Elixir Dosing Table			
Child's Weight	Child's Age	**Acetaminophen** 160 mg/5mL	**Ibuprofen** 100 mg/5mL
3-5 kg (6-12 lbs.)	0-2 mos.	1.25 mL (40 mg)	DO NOT GIVE
6-7 kg (13-16 lbs.)	3-6 mos.	3 mL (96 mg)	DO NOT GIVE
8-9 kg (17-20 lbs.)	7-10 mos.	4 mL (128 mg)	4 mL (80 mg)
10-11 kg (21-25 lbs.)	11-18 mos.	5 mL (160 mg)	5 mL (100 mg)
12-14 kg (26-31 lbs.)	19 mos.-35 mos.	6 mL (192 mg)	6 mL (120 mg)
15-18 kg (32-40 lbs.)	3-4 yrs.	7 mL (224 mg)	7.5 mL (150 mg)
19-23 kg (41-51 lbs.)	5-6 yrs.	9 mL (288 mg)	9.5 mL (190 mg)
24-29 kg (52-64 lbs.)	7-9 yrs.	12 mL (384 mg)	13 mL (260 mg)
30-36 kg (65-79 lbs.)	10-14 yrs.	15 mL (480 mg)	15 mL (300 mg)

Medication Protocols
Acetaminophen
Ibuprofen

Protocol Source/References: http://assets.babycenter.com/ims/Content/first-year-health-guide_acetaminophen_chart_pdf.pdf

Pediatric Respiratory Distress

1. Follow **General Pre-hospital Care-Treatment Protocol.**
2. Pediatric patients (≤ 14 years) utilize MI MEDIC cards for appropriate medication dosage. When unavailable, utilize pediatric dosing listed within protocol.
3. Assess the patient's airway.
   a. If unable to ventilate patient after airway repositioning, refer to **Foreign Body Airway Obstruction-Treatment Protocol** and/or **Airway Management-Procedure Protocol.**
   b. Respiratory Failure or Respiratory Arrest, refer to **Pediatric Crashing Patient/Impending Arrest-Treatment Protocol.**
   c. Consider anaphylaxis. Refer to **Allergic Reaction/Anaphylaxis-Treatment Protocol.**
4. Allow the patient a position of comfort that also maintains an open airway.
5. Titrate SpO2 to 94%. Have a parent assist with oxygen via blow-by or mask support if needed.
6. Airway should be managed by least invasive method possible.
7. Suction secretions if needed.
8. Consider CPAP if appropriate size available. Follow **CPAP-Procedure Protocol.**
9. Do not delay transport for interventions.
10. Attempt vascular access only if necessary for patient treatment.

<u>Suspected Bronchospasm (Wheezing):</u>

1. Assist the patient in using their own **albuterol** Inhaler, if available, prescribed to the patient, and not expired.
2. Administer **albuterol 2.5 mg/3ml** NS nebulized (Per MCA selection may be EMT skill) per **Medication Administration-Medication Protocol.**

Nebulized **albuterol** administration per MCA selection
☑ EMT

3. Consider CPAP if appropriate size available. Follow **CPAP- Procedure Protocol.**
4. In cases of respiratory failure administer **epinephrine auto-injector.**

<u>MCA Approval of **epinephrine** auto-injector IM</u>
☐ MFR

MCAs will be responsible for maintaining a roster of the agencies choosing to participate and will submit roster to MDHHS.

a. If child appears to weigh less than 10 kg (approximately 20 lbs.), contact medical control prior to administering epinephrine, if possible.
b. If child weighs between 10-30 kg (approximately 20-60 lbs.), administer **pediatric epinephrine auto-injector** IM.
c. If child weighs greater than 30 kg (approximately 60 lbs.), administer **epinephrine auto-injector** IM.

5. In cases of respiratory failure, administer **epinephrine** 1 mg/ml IM (per MCA selection, may be BLS or MFR skill).

NOTE: BLS not carrying epinephrine auto-injector MUST participate in draw up epinephrine.

MCA Approval of draw up **epinephrine.**
☑ MFR
☑ BLS
Personnel must complete MCA approved training prior to participating in draw up **epinephrine.**

MCAs will be responsible for maintaining a roster of the agencies choosing to participate and will submit roster to MDHHS.

a. If child appears to weigh less than 10 kg (approximately 20 lbs.), contact medical control prior to epinephrine if possible.
b. If child weighs between 10-30 kg (approximately 60 lbs.), administer **epinephrine** (concentration of 1mg/1mL) 0.15 mg (0.15mL) IM
c. If child weighs 30 kg or greater; administer **epinephrine** (concentration of 1mg/1mL) 0.3 mg (0.3 mL) IM

6. If available per MCA selection, administer **prednisone** 50 mg PO to children > 6 years of age.

Additional Medication Option:
☑ **Prednisone** 50 mg tablet PO
(Children > 6 y/o)

a. If prednisone is not available, patient is ≤ 6 years of age, or patient is unable to receive medication PO, administer **methylprednisolone** 2 mg/kg IV/IO/IM.

Stridor/Suspected Croup:

1. Croup is most common in children 6 months to 6 years of age.
2. Commonly associated with recent upper airway infection or fever.

3. If foreign body is suspected and unable to be removed, contact Medical Control prior to administration of nebulized **racepinephrine/epinephrine.** See **Foreign Body Airway Obstruction-Treatment Protocol.**
4. Consider humidified oxygen.
5. If patient presents with stridor at rest without suspected airway obstruction, administer nebulized **racepinephrine/epinephrine** per MCA selection (Medical Control contact not required):

MCA Selection
☐ **Racepinephrine** 2.25% inhalation solution via nebulizer Administer by placing 0.5 mL of **Racepinephrine** 2.25% inhalation solution in nebulizer and dilute with 3 mL of normal saline.
☑ **Epinephrine** 5 mg (1mg/1ml) nebulized

6. Do not delay transport.

Respiratory Failure or Arrest:

1. Ventilate the patient using an appropriately sized BVM with supplemental oxygen.
   a. Chest rise is the best indicator of successful ventilation.
   b. Ventilate at a rate appropriate for the patient:
      i. Infant: 30 breaths per minute
      ii. Child: 20 breaths per minute
   c. Utilize capnography per **End Tidal Carbon Dioxide Monitoring-Procedure Protocol** to maintain end tidal CO2 35-45 mmHg.
2. BVM is the preferred method of ventilation for patients under 8 years old.
   a. When unable to ventilate with BVM and basic airway adjuncts, consider advanced airway. See **Airway Management-Procedure Protocol.**
3. If opioid overdose is suspected, administer **naloxone** according to MI-MEDIC cards. If MI-MEDIC is unavailable, administer **naloxone** per **Opioid Overdose Treatment and Prevention-Treatment Protocol**.
4. Monitor EKG and refer to **Pediatric Crashing Patient/Impending Arrest-Treatment Protocol** or appropriate cardiac protocol as required.

Medication Protocols

Albuterol, Epinephrine, Methylprednisolone, Prednisone, Racepinephrine

Pediatric Altered Mental Status

The purpose of this protocol is to provide for the assessment and treatment of pediatric patients with altered mental status of unknown etiology such as alcohol, trauma, poisonings, seizures, behavioral problems, stroke, environmental causes, infection, etc.

- For pediatrics less than < 24 hours old – refer to **Newborn/Neonatal Assessment and Resuscitation-Treatment Protocol**
- For critically ill patients refer **to Pediatric Crashing Patient/Impending Arrest-Treatment Protocol**

1. Follow **General Pre-hospital Care-Treatment Protocol**.
2. Pediatric patients (≤ 14 years) utilize **MI MEDIC** for appropriate medication. dosage. When unavailable utilize pediatric dosing listed within protocol.
3. Restrain patient, if necessary, refer to **Patient Restraint-Procedure Protocol**.
4. Ensure adequate oxygenation, ventilation, and work of breathing.
   - A. Monitor SpO2
   - S B. Consider use of capnography
5. Check blood glucose (may be MFR skill, see **Blood Glucose Testing-Procedure Protocol**
6. Check temperature if febrile go to **Pediatric Fever-Treatment Protocol**
7. S Start IV/IO if needed per **Vascular Access & IV Therapy-Procedure Protocol**
8. If blood glucose < 60 mg/dl:
   - A. Altered, able to swallow AND 3 months old or older– administer **oral glucose**.
   - S B. Not alert – administer **dextrose** according to **MI MEDIC** or table below

Color	Age	Weight	Dose	Concentration	Volume		Concentration	Volume
Grey	0-2 months	3-5 kg (6-11 lbs.)	2.5g	Dextrose 12.5%	20 mL	**OR**	Dextrose 10%	25 mL
Pink	3-6 months	6-7 kg (13-16 lbs.)	3.25g	Dextrose 25%	13 mL	**OR**	Dextrose 10%	33 mL
Red	7-10 months	8-9 kg (17-20 lbs.)	4.25g	Dextrose 25%	17 mL	**OR**	Dextrose 10%	43 mL
Purple	11-18 months	10-11 kg (21-25 lbs.)	5g	Dextrose 25%	20 mL	**OR**	Dextrose 10%	50 mL
Yellow	19-35 months	12-14 kg (26-31 lbs.)	6.25g	Dextrose 25%	25 mL	**OR**	Dextrose 10%	63 mL
White	3-4 years	15-18 kg (32-40 lbs.)	8g	Dextrose 25%	32 mL	**OR**	Dextrose 10%	80 mL
Blue	5-6 years	19-23 kg (41-50 lbs.)	10g	Dextrose 25%	40 mL	**OR**	Dextrose 10%	100 mL
Orange	7-9 years	24-29 kg (52-64 lbs.)	12.5g	Dextrose 50%	25 mL	**OR**	Dextrose 10%	125 mL
Green	10-14 Years	30-36 kg (65-79 lbs.)	15g	Dextrose 50%	40 mL	**OR**	Dextrose 10%	150 mL

Ⓢ 9. Per MCA selection, if unable to start IV, administer **glucagon** IM/IN (if available per MCA selection) according to MI-MEDIC, (may be EMT skill per MCA selection). If **MI MEDIC** is unavailable follow dosing as below.

Glucagon administration per MCA Selection

☐ Not included

	Glucagon IM *Injectable formulation ONLY* A. Patients < 5 years of age administer **glucagon** 0.5 mg IM B. Patients ≥ 5 years of age administer **glucagon** 1 mg IM	**Glucagon** IN *Intranasal formulation ONLY* **A.** Patients < 5 years of age **Do NOT Administer** B. Patients ≥ 5 years of age administer **glucagon** 3 mg IN
EMT	☐	☐
Specialist	X	☐
Paramedic	X	☐

*INTRANASAL GLUCAGON ADMINISTRATION: Only glucagon that is FDA-approved for nasal administration (e.g., Baqsimi(R)) may be given by IN route. Injectable glucagon is not to be administered via IN route. EMS clinicians may assist family/patient care givers in administering glucagon that is FDA-approved for IN use, if prescribed for the patient (regardless of age).

10. If patient respiratory depression persists and/or patient has not regained consciousness despite adequate oxygenation and ventilatory support administer **naloxone** per **Opioid Overdose Treatment and Prevention-Treatment Protocol**

11. Contact Medical Control for repeat **dextrose**.

12. Contact Medical Control for repeat **naloxone**.

NOTE:

1. Instructions for diluting **dextrose**
   - A. To obtain **dextrose 10%**, discard 40 ml out of one amp of D50, then draw up 40 ml of **NS** into the D50 ampule
   - B. To obtain **dextrose 12.5%,** discard 37.5 ml out of one amp of D50, then draw 37.5 ml of **NS** into the D50 ampule.
   - C. To obtain **dextrose 25%,** discard 25 ml out of one amp of D50, then draw 25 ml of **NS** into the D50 ampule.
   - D. May utilize **dextrose 10%** for all ages 5 ml/kg (0.5 gm/kg) up to 250 ml, according to **Dextrose-Medication Protocol**.
2. To avoid extravasation, a patent IV must be available for IV administration of

dextrose. **Dextrose** should always be pushed slowly (e.g., over 1-2 minutes).

Medication Protocols
Dextrose
Glucagon
Naloxone

Purpose: EMS frequently encounters patients that are critically ill and quickly deteriorating to the point of cardiac or respiratory arrest. Deterioration can often occur while packaging and loading these patients. It is important to rapidly recognize the deteriorating patient and taking immediate action to stabilize the condition prior to loading and transporting. The following timeline provides a prioritization of the goal-directed treatments to stabilize the patient and prevent deterioration.

1. **Criteria: Patient ≤ 14 years of age**
   a. Inclusion:
      i. Patient in whom cardiac or respiratory arrest appears imminent
      ii. Patient with provider impression of critical illness, including new onset altered mental status, airway compromise or severe respiratory distress/failure,(cyanosis, severe retractions, head bobbing,grunting, respiratory rate extremes per age-adjusted normal MI-MEDIC), and/or signs and symptoms of shock/poor perfusion. (capillary refill greater than 3 seconds, tachycardia or hypotension per age-adjusted normal on MI-MEDIC).
   b. Exclusion:
      i. Life-threatening trauma that has not been corrected (i.e., exsanguination, pneumothorax, etc.)
2. **Critical Actions (within First 5 Minutes)**
   a. Airway
      i. Open airway manually. For child <2 years old, place padding under shoulders (align auditory meatus with sternal notch).
      ii. Insert nasopharyngeal or oropharyngeal Airway as indicated/tolerated if not following commands (GCS motor <6), as indicated/tolerated if GCS <9, or no response to verbal stimuli per the **Airway Management-Procedure Protocol**.
   b. Breathing
      i. If respiratory failure or distress, sit patient up if tolerated and not contraindicated by suspected spine injury. keep the patient calm and allow them to maintain a position of comfort, if possible.
      ii. Provide high-flow oxygen per the **Oxygen Administration-Procedure Protocol.**
         A. If respirations are <10 per minute, ventilate by BVM at 15LPM. Two-person, two-handed technique is most effective and is highly recommended if the number of providers allows.
         B. If respirations are inadequate, ventilate by BVM at 15LPM. Administer ventilations guided by chest rise. Two-person, two-

handed technique is most effective and is highly recommended if the number of providers allows.

iii. If respirations are >10 but inadequate, apply CPAP for respiratory distress/hypoxia if appropriate size CPAP available. Refer to **CPAP-Procedure Protocol** for age/size requirements.

iv. Respirations may be assisted with BVM in sitting position if patient tolerates.

v. Consider PPV by BVM if not following commands or SpO2 <90%

vi. If respirations appear adequate, but the patient is not following commands or SpO2 persistently less than 90%, consider ventilation by BVM with 15LPM oxygen

vii. Administer ventilations guided by chest rise. Two-person, two-handed technique is most effective and is highly recommended if the number of providers allows.

S vii. Consider waveform capnography if appropriate per **End Tidal Carbon Dioxide Monitoring-Procedure Protocol**

c. Circulation

i. Reference MI-MEDIC cards for age-adjusted expected blood pressure and heart rate ranges.

ii. If bradycardic (HR <60), optimize ventilation/oxygenation. Refer to the **Pediatric Bradycardia-Treatment Protocol.**

S iii. Emergent IV/IO access - Limit IV attempts to 2 total. For unresponsive or severely compromised pediatrics, IO can be the initial attempt.

d. Monitoring

i. NIBP (cycle every 3 minutes)

ii. SpO2

S iii. Continuous capnography per **End Tidal Carbon Dioxide-Procedure Protocol**.

iv. EKG

3. Immediate actions within First 10 Minutes

a. Circulation

S i. If evidence of poor perfusion, administer **NS** or **LR** 20 mL/kg bolus (unless cardiogenic shock suspected i.e., JVD, hepatomegaly, abdominal distension, crackles, etc.).

S A. If suspected cardiogenic shock, administer 5-10 mL/kg **NS** bolus instead and contact Medical Control.

ii. If dysrhythmia is thought to be primary cause of shock, contact Medical Control to discuss further interventions (electrical therapy with cardioversion or pacing, etc.).

4. **Actions within First 15 Minutes**
    a. Re-assess response to treatments, including capillary refill with vital signs
        i. Recheck vitals and listen to lungs following fluid bolus.
        A. If decreasing oxygen saturations, crackles, or worsening respiratory distress —STOP fluid bolus and contact Medical Control immediately.
            i. Consider starting vasopressors per **Shock-Treatment Protocol**.
    b. Circulation
        i. Repeat **NS** or **LR** 20 ml/kg bolus if indicated, maximum total dose 40 ml/kg.
        ii. If bradycardia (HR <60), optimize ventilation/oxygenation and refer to the **Pediatric Bradycardia-Treatment Protocol**
        iii. If no response to fluids, follow **Shock-Treatment Protocol**
5. **Actions within First 20 Minutes**
    a. Re-assess response to treatments
    b. Circulation
        i. Continue fluids as indicated by **Shock-Treatment Protocol** or contact Medical Control
        ii. Continue vasopressors (push-dose) as indicated by **Shock-Treatment Protocol** or contact Medical Control
    c. Airway
        i. Insert advanced airway, if indicated and appropriate size available, per **Airway Management-Procedure Protocol.**
6. Once critical and immediate actions have been completed: move the patient to ambulance for transport. Transport may be initiated earlier per provider discretion.

Notes:

1. The specific lengths of time listed are approximate to provide a sense of urgency and to prioritize actions. Provider safety is of utmost importance. Care for these patients should be given as quickly as possible, but safety considerations and the scene environment may lead to times that are longer than these stated goals. When conditions make it impossible to meet these goals, the reasons should be documented.

2. Actions listed should be simultaneous and not in any specific order. As critical actions are performed, transport may be initiated. However, transport should not supersede initiation of life saving intervention.

3. The concepts/actions listed can also be used in conjunction with the **Pediatric Return of Spontaneous Circulation (ROSC)-Treatment Protocol** to prioritize key interventions prior to transport of cardiac arrest patients with ROSC.

MCA Quality Improvement Performance Parameters:

1. Review all cases of cardiac arrest witnessed by (in presence of) EMS providers for compliance with this protocol.

2. Ensure that specific treatments also follow other appropriate protocols, e.g., Airway Management, Shock, Tachycardia, Bradycardia, etc.