Minnesota Pre-hospital Pediatric BLS Guidelines

Emergency Medical Services for Children
Resource Center of Minnesota

Working Together to Save Children's Lives
2545 Chicago Avenue South
MS 17-104
Minneapolis, MN 55404
EMSC Office: 800-660-7022
www.emscmn.org

Minnesota State EMS Pediatric Guidelines

These pediatric guidelines are provided as a service of the Minnesota Emergency Medical Services for Children Program. They reflect the current state of pediatric pre-hospital care.

These guidelines have been developed to assist the local medical directors with creation of pediatric protocols for their service(s). As guidelines, they are designed to comprehensively cover the potential spectrum of scope of practice for BLS providers. Ambulance Medical Directors have the responsibility to develop and determine service pediatric protocols based on skills and knowledge for their service(s).

Editors: Paula Fink Kocken, MD, Medical Director, EMSC
E-mail: paula.kocken@childrensmn.org

Kjelsey Polzin, Program Coordinator, EMSC
E-mail: kjelsey.polzin@childrensmn.org

The Minnesota Emergency Medical Services for Children Program wishes to acknowledge contributing authors and reviewers:

Dan DeSmet, NREMT-P, Regional Manager, North Memorial Ambulance

James Levi, BSHCAD, NREMT-P, Emergency Response & Trauma Outreach Education Specialist, Children's Hospitals and Clinics of MN

Kirk Hughes, RN, EMT-B, CSPI, Education Director, Minnesota Poison Control System / Hennepin Regional Poison Center

Kristi Moline, Program Manager, EMSC

Mark Mannenbach, MD, Division Head of Pediatric Emergency Medicine, Assistant Professor of Pediatric and Adolescent Medicine, Mayo Clinic Rochester

Members of the MN EMSC Advisory Committee

Members of the MN EMSRB Medical Standing Advisory Committee

Mitchell Peterka, EMT-B, Injury Prevention Coordinator, Children's Hospitals and Clinics of Minnesota

Thomas Hellmich, MD, Department of Emergency Medicine, Division of Pediatric and Adolescent Emergency Medicine, Mayo Clinic Rochester

We invite comments and continued review and contributions from interested parties. Please contact the Minnesota EMSC Program. Thank you.

I. General Guidelines

A. Pediatric Definition, Normal Weights and Vital Signs

1. Age limits for pediatric and adult medical protocols must be flexible
2. It is recognized that the exact age of a patient is not always known
3. Neonatal: 0 – 4 weeks of age
4. Infant: 1 month – 1 year of age
5. For 8 years of age and younger, pediatric orders should always apply
6. Ages 8 – 18 years, judgment should be used, although pediatric orders will usually apply

Average For Age	***Lbs.***	***(kg)***	***Pulse***	***Blood Pressure (systolic)***	***Resp.***
Premature	3	(1.5)	100 – 180	50 – 60	40 – 60
Newborn	7.5	(3.5)	100 – 160	60 – 90	40 – 60
1 Year	22	(10)	110 – 170	70 – 110	20 – 30
3 Years	33	(15)	80 – 160	80 – 110	20 – 30
6 Years	44	(20)	60 – 130	90 – 115	20 – 30
8 Years	55	(25)	60 – 120	90 – 115	12 – 25
12 Years	88	(40)	60 – 120	95 – 120	12 – 25
15 Years	125	(55)	60 – 120	100 – 130	12 – 20

CONSIDER LENGTH BASED CALCULATION SYSTEMS FOR PEDIATRIC PATIENTS

B. General Pediatric Assessment and Care

This provides general guidelines for initial assessment and care of the pediatric patient. Use of a length-based resuscitation tape is recommended to assist in determination of appropriate equipment size, vital signs and drug dosages.

1. Perform scene survey
    a) Assess for hazardous conditions
    b) Ensure scene safety
    c) Call for additional assistance if needed (this includes ALS response or intercept)

2. Observe standard universal precautions and assure scene safety

3. Form a first impression of the patient's condition
    a) Pediatric Assessment Triangle (PAT)
        Three Components:
        (1) Appearance
        (2) Work of Breathing
        (3) Circulation/Skin Color

If patient is unresponsive and not having effective breathing or not breathing, start compressions and please refer to General Pediatric Trauma Assessment & Care.

4. Determine patients level of consciousness (LOC)
    a) **AVPU**
        *(1) **A**lert*
        *(2) **V**oice*
        *(3) **P**ain*
        *(4) **U**nresponsive*

5. Spine injury consideration
    a) If significant mode of injury, decreased level of consciousness or loss of consciousness, distracting injury, or cervical spine trauma is suspected, manually stabilize the cervical spine
    b) See General Pediatric Trauma Assessment & Care for more information on caring for the injured patient

6. Assess airway - patency, protective reflexes and possible need for advanced airway management
    a) Look, listen and feel for signs of airway obstruction
    b) Open the airway – head tilt/chin lift (if no suspected spinal trauma) or modified jaw thrust if spinal trauma is suspected
        (1) Suction airway if necessary
        (2) Consider placing an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious
        (3) Consider placing pad under infant/child's shoulder to aid in airway positioning

7. Assess breathing
    a) Rate, work of breathing, adequacy of ventilations, auscultation and inspection

b) Inspect skin, lips and nail beds for cyanosis
c) Obtain pulse oximeter reading
d) If inadequate ventilations, reposition airway and reassess
e) If inadequate ventilation after repositioning airway, suspect foreign body obstruction and refer to Foreign Body Obstruction – Conscious Patient
f) Assess for signs of respiratory distress, failure, or arrest - refer to appropriate protocol for treatment options
g) If child is not breathing or breathing is inadequate
   (1) Assist ventilations using a Bag Valve Mask (BVM), high-flow (100%) oxygen and nasal or oral airway
h) If child is breathing, with low oxygen saturation and/or signs of hypoxia
   (1) If pulse oximeter reading is < 90%, administer high-flow oxygen via non-rebreather mask or blow-by as tolerated
i) If child is breathing adequately
   (1) Consider high-flow oxygen with non-rebreather mask or blow-by as tolerated

8. Assess circulation and perfusion
   a) Determine heart rate
   b) Skin color and temperature
   c) Capillary refill time and quality of central and peripheral pulses
   d) If no pulse or perfusion or evidence of poor perfusion and heart rate (HR) is < 60/minute begin CPR (see Cardiac Emergencies)
   e) With adequate perfusion and HR > 60/min administer high flow (100%) oxygen via non-rebreather or blow-by
   f) Assess and treat for shock
   g) Control bleeding
   h) Keep the patient warm and consider Trendelenburg position (elevation of the long board when spinal injury is suspected)
   i) Anticipate vomiting and prepare to suction airway as needed

9. Make transport decision – (if not already done)
   a) Notify receiving hospital according to Hospital Destination Guidelines
   b) Do not delay transport for further assessment or treatment
   c) Parents should be allowed to stay with child during evaluation and transport if appropriate for the situation

10. Focused history and physical exam
    a) Head-to-toe assessment (toe-to-head)
    b) SSAMPLE History
        (1) Signs
        (2) Symptoms
        (3) Allergies
        (4) Medications
        (5) Past medical history
        (6) Last meal
        (7) Events
    c) Consider all potential non-traumatic causes
        (1) Hypothermia
        (2) Overdose
        (3) Underlying medical conditions
        (4) Check blood glucose levels

11. Continuous monitor and assessment
    a) Vital signs
    b) Neurological status
        (1) AVPU
        (2) Pupillary response
        (3) Distal function and sensation (Circulation, Movement and Sensation CMS)

12. Treat all life threatening conditions as they become identified
13. Follow specific treatment guidelines as appropriate
14. ALS intercept requested and transport to meet ALS

C. Hospital Destination Guidelines

1. Children with life-threatening emergencies should be transported to the nearest hospital with appropriate pediatric and/or trauma capabilities
    a) Pediatric capabilities include 24-hour in-house pediatric emergency and intensive care physicians
    b) Pediatric trauma capabilities include verified Level I and Level II trauma centers prepared for children
    c) In areas of the state where pediatric center or trauma capabilities are greater than 30 minutes away, ambulance services with their medical directors should plan <u>in advance</u> for the destination determination of critically ill or injured children
    d) Children with acutely unstable airways or in cardiac arrest require transport to the closest hospital

2. Medical control may divert certain categories of pediatric trauma or critical pediatric patients to Level I trauma facilities or pediatric centers
3. Early contact with medical control and with accurate triage information is important in the seriously ill or injured pediatric patient
4. Consider direct transport of a critically ill child to a pediatric center or a critically injured child to a trauma center if the child meets **any** of these physiological criteria:
    a) Neurological
        (1) The child has decreased mental status – responsive to verbal stimulation or less on the AVPU scale (Alert – Verbally responsive – Pain response – Unresponsive)
        (2) Seizures not responsive to therapy
    b) Respiratory distress
        (1) Respiratory Rate
            (a) < 20 or > 60 breaths/minute in infancy (under 6 months)
            (b) < 16 or > 50 breaths/minute in a toddler (6 – 24 months)
            (c) < 10 or > 40 breaths/minute in a preschooler (2 – 5 years)
            (d) < 10 or > 30 breaths/minute in a school age child
        (2) Increased work of breathing
        (3) Worsening or not improving respiratory distress despite therapeutic interventions
        (4) High flow oxygen needed to maintain oxygen saturations ≥ 94%
    c) Circulatory Compromise
        (1) HR bradycardia or tachycardia:
            (a) < 80 or > 200 in infancy (under 6 months)
            (b) < 65 or > 180 in a toddler (6 – 24 months)
            (c) < 60 or > 160 in a preschooler (2 – 5 years)
            (d) < 60 or > 120 in a school age child
        (2) Shock or diminished perfusion
            (a) Capillary refill ≥ 2 seconds
            (b) Systolic blood pressures:
                (i) < 60 mm Hg in infancy (under 6 months)
                (ii) < 70 mm Hg in a toddler (6 – 24 months)
                (iii) < 75 mm Hg in a preschooler (2– 5 years)
                (iv) < 80 mm Hg in a school age child
        (3) Dysrhythmia

II. Newborn Resuscitation

Resuscitation efforts should focus on improving respiratory status and maintaining body temperature.

A. Evaluation and Treatment Priorities

1. During delivery, suction mouth then nose before delivery of body
    a) This is especially important if there is meconium in the amniotic fluid
2. Dry infant and maintain warm environment
    a) Wrap the baby in a thermal blanket
    b) Cover the infant's head to preserve warmth

3. Assess airway
    a) Open and position the airway in the "sniffing" position
    b) Suction airway again using bulb syringe, mouth first then nasopharynx
    c) Avoid hyperextension of the neck
    d) If thick meconium is present in apneic and/or hypotonic infant:
        (1) Initiate endotracheal intubation before the infant takes first breath
        (2) Suction the airway while withdrawing the endotracheal tube
        (3) Repeat intubation/suction only once, then if infant remains apneic and hypotonic assist ventilation with BVM or complete intubation
    e) If infant becomes bradycardic (< 60), discontinue suctioning, provide ventilation and start compressions

4. Assess breathing and adequacy of ventilation
    a) Stimulate the infant by rubbing the back or flicking the soles of the feet
    b) If evidence of central cyanosis
        (1) Oxygen 100% via blow-by administration
    c) If infant is apneic
        (1) BVM at 40 - 60 breaths/minute with 100% oxygen

5. Assess heart rate – auscultation or palpation of brachial artery or umbilical cord stump
    a) If heart rate is < 60 and signs of poor perfusion are persistent after 30 seconds of assisted ventilation with 100% oxygen initiate the following:
        (1) Continue ventilation
        (2) Begin chest compressions and CPR - rate of 100 compressions per minute (hard and fast)
        (3) Stop CPR when heart rate > 60 with signs of improved perfusion
    b) If heart rate is 60 – 100/minute
        (1) Continue ventilation
        (2) Assess skin color – if cyanosis use blow-by oxygen
    c) If heart rate is > 100/minute
        (1) Continue assisted ventilation until patient is breathing adequately on own and is vigorous

6. Reassess the infant frequently
    a) Pulse, respiratory rate, tone, color and response

7. Contact direct medical control for additional instructions and do the following:
    a) Continue care of mother
    b) Place two clamps 6 and 8 inches from baby then cut umbilical cord between clamps
    c) Transport delivered placenta to hospital with the baby

8. ALS intercept requested and transport to meet ALS

B. Apgar Scoring

SCORE	*0*	*1*	*2*
Heart Rate	Absent	< 100	> 100
Respiratory Effort	Absent	Slow, Irregular	Good, Crying
Muscle Tone	Limp/Flaccid	Some Flexion	Active Motion of Extremities
Reflex, Irritability	No Response	Grimace or Some Motion	Coughs, Sneezes, Active Cry
Color	Blue/Pale	Pink Body, Extremities Blue	Completely Pink

III. Respiratory / Airway Compromise

A. Foreign Body Obstruction – Conscious Patient

1. Do not intervene on patients with a partial obstruction and good air exchange
    a) Avoid any agitation
    b) Position comfortably
    c) Consider alternate methods of oxygen delivery (i.e., blow-by oxygen)
    d) DO NOT attempt invasive airway maneuvers

2. If patient's airway remains obstructed and patient has poor air exchange and cannot talk, cough or cry with or without cyanosis:
    a) Infant (less than 1 year old)
        (1) Administer 5 back blows followed by 5 chest thrusts until obstruction is dislodged or infant becomes unconscious
        (2) If the infant becomes unconscious, position to open airway; perform head-tilt / chin–lift or jaw thrust if trauma is suspected
        (3) Remove foreign object if visible - DO NOT perform blind sweep
        (4) Begin sequence for Foreign Body Obstruction – Unconscious Patient
    b) Child (greater than 1 year old)
        (1) Administer abdominal thrusts until object is dislodged or child becomes unconscious
        (2) If the child becomes unconscious, position to open airway; perform head-tilt / chin–lift or jaw thrust if trauma is suspected
        (3) Remove foreign object if visible: DO NOT perform blind sweep
        (4) Begin sequence for Foreign Body Obstruction – Unconscious Patient

3. Do not delay transport to the closest hospital and request ALS intercept if available

B. Foreign Body Obstruction – Unconscious Patient

1. Assess ABC's and open airway using a head-tilt / chin-lift
2. Remove obstruction if visible - DO NOT perform blind sweep
3. Attempt to ventilate patient using a BVM device with high-flow, 100% oxygen
4. If unsuccessful, reposition airway and attempt BVM assisted ventilation again
5. If patient is not breathing and you are unable to ventilate
    a) Begin CPR (see Cardiac Emergencies)
6. Each time the airway is opened for ventilations, check the pharynx for the foreign body
7. Continue CPR sequence until the object is removed, ventilations are successful or child/infant recovers
8. If you successfully remove the airway obstruction:
    a) Look, listen and feel for air movement, at least 5 seconds and no longer than 10 seconds
    b) If no air exchange, attempt two ventilations and confirm chest rise
    c) If no chest rise and/or breaths do not go in, reposition and try again
    d) If ventilations are successful, check for pulse, at least 5 seconds and no longer than 10 seconds
    e) If child has a pulse but is not breathing or not breathing effectively, ventilate (child or infant 1:3-5 seconds) using a BVM device with high-flow oxygen

    If child is not breathing and has no pulse, begin CPR (see Cardiac Emergencies)
9. Do not delay transport to closest hospital

C. Upper Airway Compromise (Croup / Non-foreign Body)

1. Calm patient and keep patient in a position of comfort, often upright on parent's lap
2. Be alert for tracheal or esophageal obstruction
3. Assess rate and quality of respirations - note if retractions present
4. For cyanosis and severe stridor
    a) High-flow oxygen, if mask agitates patient use blow-by oxygen technique
5. Do not try to visualize pharynx
6. For respiratory arrest or cyanosis with decreased LOC - assist with BVM
7. Do not delay transport to closest hospital and request ALS intercept if available

D. Asthma – Breathing Patient

1. High-flow oxygen and expedite transport:
    a) Goal is to **improve air exchange** and maintain adequate oxygenation (> 90%)
    b) The patient may not achieve 100% oxygen sats
2. Inhalation Therapy:
    a) 2.5 mg Albuterol via nebulizer
    b) May assist patient with his or her own prescribed metered dose inhaler (MDI), under medical direction
3. If no improvement with patient in moderate to severe distress:
    a) Administer nebulized Albuterol 2.5 mg
    b) May repeat once
4. Do not delay transport to closest hospital and request ALS intercept if available

E. Asthma – Non Breathing Patient or Agonal Patient

1. Oral airway with BVM at 12-20 per minute
2. DO NOT HYPERVENTILATE
3. ALLOW ADEQUATE TIME FOR LUNG DEFLATION
4. Do not delay transport to closest hospital and request ALS intercept if available

F. Anaphylaxis

1. Establish and maintain airway, high flow oxygen
2. If severe S/S (hives, airway constriction, vomiting, and/or known allergic response)
    a) Administer the following:
        (1) Patient > 30 kg (66 lbs) – ***EpiPen*** *(0.3mg Epinephrine Autoinjector)*
        (2) Patient 15 kg to 30 kg (33 - 66 lbs) – ***EpiPen JR IM*** *(0.15 mg Epinephrine Autoinjector)*
        (3) Patient < 15 kg - contact medical control
3. If patient's systolic pressure drops below minimum for age (General Guidelines) or decreased LOC
4. Treat for shock as indicated in Assess circulation and perfusion
5. If after 5 minutes there is no improvement
    a) Repeat administration of one of the following:
        (1) Patient > 30 kg (66 lbs) – ***EpiPen*** *(0.3 mg Epinephrine Autoinjector)*
        (2) Patient 15 kg to 30 kg (33-66 lbs) – ***EpiPen JR IM*** *(0.15 mg Epinephrine Autoinjector)*
        (3) Patient < 10 kg – contact medical control
6. If patient's anaphylaxis includes lower airway (wheezing) consider Albuterol 2.5 mg neb
7. If sting or poisonous bite, immobilize the limb and cool with an ice pack
8. Do not delay transport to closest hospital and request ALS intercept if available

IV. Cardiac Emergencies

These are general guidelines for all cardiac arrests that are not directly related to respiratory failure or airway obstruction.

A. General Guidelines for All Cardiac Emergencies - CPR

1. If a patient is unresponsive and not breathing or not effectively breathing and there is evidence of poor perfusion, perform chest compressions at a rate of 100/minute (hard/fast)
2. Hands only compressions can be performed if the rescuer is unable to perform ventilations
3. Infant (1 month to 1 year)
    a) The CPR two thumbs on the sternum technique with the hands encircling the chest is the preferred method but the two fingers below nipple line on the sternum can be used
    b) The ratio of compressions to ventilations is 30:2 for one rescuer and 15:2 for two rescuers
    c) Compression depth is one third to one half the AP diameter of the chest (about 1 ½ inches)
4. Child (1 year to the onset of puberty)
    a) CPR with one or two hands
    b) The ratio of compressions to ventilations is 30:2 for one rescuer and 15:2 for two rescuers
    c) Compression depth is at least one third the AP diameter of the chest (about 2 inches)
5. As soon as AED or defibrillator is available, attach it to the patient
6. Try to limit the interruption of compressions
7. If pediatric pads are not available, use adult pads and energy levels
8. Ensure pads do not overlap or touch, pads may be placed with one on front/one on back of chest in smaller children
9. If **unwitnessed arrest**, perform 5 cycles / 2 minutes of CPR then use AED or defibrillator
10. If **witnessed arrest**/collapse, use AED or defibrillator immediately
11. If you are using an **AED,** give shock - the device will tell you whether the rhythm is "shockable"
12. If using a **manual defibrillator**, determine if the rhythm is "shockable"
13. If using a **manual defibrillator**, energy should start at 2 J/kg followed by 4 J/kg and may escalate to a maximum of 10 J/kg
14. Continue CPR for 5 cycles / 2 minutes before checking for a pulse
15. Airway adjuncts if needed to obtain adequate ventilations and oxygenation
16. Attach ECG monitor
17. Treat possible causes and specific arrhythmia per guidelines
18. Do not delay transport to closest hospital

B. Use of Automatic External Defibrillators (AED's)

Bystander, First Responders & BLS services:

1. Ages < 1 year old
    a) AED's are not recommended
        (1) Emphasis is placed on adequate ventilation of infant and CPR if indicated
2. Ages 1-8 years old:
    a) Use pediatric pads/paddles and appropriate energy selection
    b) If pediatric pads are not available, use adult pads and energy levels
    c) Ensure pads do not overlap or touch
    d) Pads may be placed with one on front/one on back of chest in smaller children
3. Ages > 8 years old
    a) Use adult pads and energy levels on AED
4. Do not delay transport to closest hospital and request ALS intercept if available
5. If AED advises no shock:
    a) Transport to the hospital
    b) Ensure airway control
    c) Continue high quality CPR
    d) Allow AED to reanalyze every 2 minutes

ILCOR Recommendations

- Currently, there is insufficient evidence to support a recommendation for or against the use of AEDs in children < 1 year of age.
- For a lone rescuer responding to a child without signs of circulation, the task force continues to recommend provision of 2 minutes or 5 cycles of CPR before any other action, such as activating the emergency medical services (EMS) system or attaching the AED.
- Defibrillation is recommended for documented ventricular fibrillation (VF)/pulseless ventricular tachycardia (VT) (Class I).

V. Medical

A. Unconscious - Altered Mental Status

1. Establish and maintain airway, high-flow oxygen, assist ventilations as needed
2. If perfusion is inadequate, or HR drops < 60/minute; begin Cardiac Emergencies
3. Protect cervical spine if trauma possible
4. Place patient on cardiac monitor
5. Obtain history
6. Check blood glucose
7. Follow steps for Hypoglycemia (and/or Known Diabetic Patient) for levels < 50
8. Do not delay transport to closest hospital and request ALS intercept if available

B. Hypotension (Shock)

1. Signs of shock: decreased peripheral perfusion, mottled skin, poor capillary refill (> 2 seconds), poor peripheral pulses, decreased LOC, low blood pressure
2. If no pulse or evidence of poor perfusion and HR < 60/minute, begin Cardiac Emergencies
3. With adequate perfusion and HR > 60/minute administer high flow 100% oxygen via non-rebreather or blow-by
4. If patient is not improving, do not delay transport to closest hospital and request ALS intercept if available
5. Consider possible causes of hypotension
    a) Toxic shock, sepsis, dehydration or toxic ingestion
6. Identify if patient could be at risk of adrenal insufficiency by Medical Alert Bracelet, designation in medical records, or family or medical confirmation
7. Medical conditions can include
    a) Congenital Adrenal Hyperplasia (CAH), Addison's disease or chronic steroid use
8. If confirmed adrenal insufficiency and shock is present, emergent treatment with steroids is life-saving:
    a) Parents or caregivers may give an IM shot of steroids for treatment of illness
    b) These patients should be transported to the hospital emergently
    c) If no steroids are available, alert emergency department/medical control that a patient with probable adrenal crisis is en route and ask that hydrocortisone is ready to administer on arrival
9. Keep patient warm and consider Trendelenburg position
10. Anticipate vomiting and prepare to suction airway as needed
11. Do not delay transport to closest hospital and request ALS intercept if available

C. Hypoglycemia (and/or Known Diabetic Patient)

1. Check blood glucose
2. If you are unable to check the blood glucose and the patient is symptomatic, proceed with the following steps
3. If patient is conscious, symptomatic and able to swallow effectively:
    a) Administer oral glucose or other form of sugar:
        (1) Patients 4 months of age and greater with BG < 50, administer oral glucose up to 20 g
        (2) Newborn to 4 months with BG < 50, administer oral glucose up to 15 g or allow breast or bottle feeding
    b) If patient's condition is improving, wait 5-15 minutes then re-check glucose level
    c) If patient is unconscious, do not delay transport to closest hospital and request ALS intercept if available

D. Seizures

1. Establish and maintain airway, high-flow oxygen
2. Check blood glucose, treat accordingly
    a) If low blood glucose, follow steps indicated in the Hypoglycemia (and/or Known Diabetic Patient)section above
3. Do not delay transport to closest hospital and request ALS intercept if available

E. Sudden Infant Death Syndrome

1. General
    a) Infants usually less than six months of age
2. Treatment guidelines:
    a) Initiate CPR unless there are obvious signs of death; rigor mortis (stiff limbs), livor mortis (blood settling in the lower portions of the body)
    b) Follow protocol for Cardiac Emergencies
    c) Support the parents and avoid questions or comments suggesting blame, remain non-judgmental
    d) Observe carefully and note:
        (1) Location and position of child
        (2) Ambient temperature
        (3) Objects immediately surrounding the child: including type of mattress and bedding; DO NOT REMOVE OR MOVE OBJECTS
        (4) Behavior of all people present and the explanations provided
        (5) Vomitus in mouth or foreign body present
    e) Document all observations and report them to receiving hospital
    f) Contact local law enforcement if not already done so

F. Hypothermia

1. Assess ABC's
    a) Check pulse for 30-60 seconds to adequately confirm pulselessness or severe bradycardia in the hypothermic patient
    b) Monitor EKG
    c) Perform CPR as indicated:
        *(1) Defibrillate **once** if indicated by AED or if in VF/VT*
        (2) Ventilate with warmed, humidified oxygen
        (3) Determine core temperature
            (a) > 30 degrees C (86 degrees F)
                (i) Continue CPR
                (ii) Repeat defibrillation if indicated by AED or if in VF/VT as core temperature rises
                (iii) Active rewarming procedures
            (b) < 30 degrees C (86 degrees F)
                (i) Continue CPR
                (ii) Do not repeat defibrillation until core temperature is greater than 30 degrees
                (iii) Active rewarming procedures
                (iv) Rapid transport
    d) Protect from further heat loss
        (1) Remove wet garments
        (2) Insulate around with blankets to prevent further heat loss
    e) Avoid rough handling of the patient

G. Hyperthermia

1. Do not delay transport to closest hospital and request ALS intercept if available
2. Ensure adequate airway
3. Oral rehydration (if able to maintain airway)
    a) Water or electrolyte solution (examples: Gatorade or Pedialyte)
4. Attempt cooling techniques:
    a) Remove from heat source
    b) Remove clothing and cover with wet sheets
    c) Sponge or splash with cool water
    d) Fan to increase evaporation and subsequent heat loss
    e) If vitals are stable, cold packs to axilla and groin
5. Monitor EKG
6. Do not administer Acetaminophen
7. Treat associated symptoms
8. Do not delay transport for cooling in the field
9. ALS intercept requested and transport to meet ALS

VI. Trauma

A. General Pediatric Trauma Assessment & Care

This provides general guidelines for initial assessment and care of the injured pediatric patient. Use of a length-based resuscitation tape is recommended to assist in determination of appropriate equipment size, vital signs and drug dosages.

1. Perform scene survey
    a) Assess for hazardous conditions
    b) Mechanics of injury (MOI)
    c) Ensure scene safety
    d) Call for additional assistance if needed (this includes ALS response or intercept)
    e) Triage multiple patients as appropriate

2. Observe standard universal precautions

3. Form a first impression of the patient's condition
    a) Pediatric Assessment Triangle (PAT)
        Three Components:
        (1) Appearance
        (2) Work of Breathing
        (3) Circulation / Skin Color

If patient is unresponsive and not having effective breathing or not breathing, start compressions, please refer to Cardiac Emergencies.

4. Determine patients LOC
    a) AVPU
        *(1) **A**lert*
        *(2) **V**oice*
        *(3) **P**ain*
        *(4) **U**nresponsive*
5. Spine injury consideration
    a) If significant MOI, decreased level of consciousness or loss of consciousness, distracting injury, or cervical spine trauma is suspected, manually stabilize the cervical spine
6. Assess airway - patency, protective reflexes and possible need for advanced airway management
    a) Look for signs of airway obstruction
    b) Open the airway – head tilt/chin lift (if no suspected spinal trauma) or modified jaw thrust if spinal trauma is suspected
    c) If jaw thrust does not open the airway, use the head tilt/chin lift method
    d) Opening the airway is a priority
    e) Suction airway if necessary
        (1) Consider placing an oropharyngeal airway adjunct if the airway cannot be maintained with positioning and the patient is unconscious
        (2) Consider placing pad under infant/child's shoulder to aid in airway positioning

7. Assess breathing
    a) Rate, work of breathing, adequacy of ventilations, auscultation and inspection
    b) Inspect skin, lips and nail beds for cyanosis
    c) Obtain pulse oximeter reading
    d) If inadequate ventilations, reposition airway and reassess
    e) If inadequate ventilation after repositioning airway, suspect foreign body obstruction
    f) Assess for signs of respiratory distress, failure, or arrest and refer to appropriate protocol for treatment options
    g) If child is not breathing or breathing is inadequate
        (1) Assist ventilations using a BVM, high-flow (100%) oxygen and nasal or oral airway
    h) If child is breathing, with low oxygen saturation of < 90% and/or signs of hypoxia
        (1) Administer high-flow oxygen via non-rebreather mask or blow-by as tolerated
    i) If child is breathing adequately
        (1) Consider high-flow oxygen with non-rebreather mask or blow-by as tolerated

8. Assess circulation and perfusion
    a) Determine heart rate
    b) Skin color and temperature
    c) Capillary refill and quality of central and peripheral pulses
    d) Control hemorrhage – direct pressure, elevation, pressure point or pressure dressing as needed
    e) If no pulse or perfusion and/or HR is < 60/minute with evidence of poor perfusion
        (1) Initiate chest compression and ventilations
    f) Assess and treat for shock as indicated in I.B.8

9. Transport
    a) Notify receiving hospital according to _Trauma guidelines
    b) Do not delay transport for further assessment or treatment
    c) Immobilize the patient on a pediatric backboard or age/size appropriate device to immobilize the head, neck and spine

10. ALS intercept requested and transport to meet ALS
11. Focused history and physical exam
    a) Head-to-toe assessment (toe-to-head)
    b) SSAMPLE History:
        (1) Signs
        (2) Symptoms
        (3) Allergies
        (4) Medications
        (5) Past medical history
        (6) Last meal
        (7) Events
    c) Consider all potential non-traumatic causes:
        (1) Hypothermia
        (2) Overdose
        (3) Underlying medical conditions

12. Continuous monitor and assessment
    a) Vital signs
    b) Neurologic status:
        (1) AVPU
        (2) Pupillary response
        (3) Distal function and sensation (Circulation, Movement and Sensation - CMS)

13. Treat life threatening conditions as they become identified
14. Follow specific treatment guidelines as appropriate

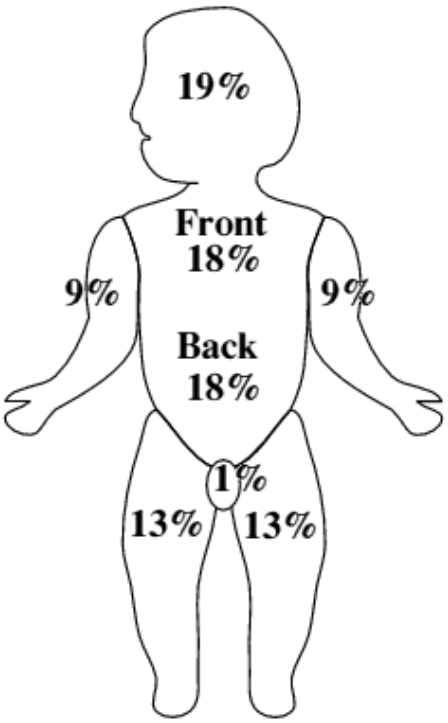
B. Burns

1. General burn care

   Transport of all burn patients is recommended unless cleared by medical control

   a) Ensure scene safety; perform scene survey and general pediatric assessment
   b) Stop burning process
      (1) Thermal burns – use water
      (2) Dry chemical – brush off and then flush with copious amounts of water
      (3) Caustic liquid – flush with copious amounts of water
      (4) Electrical – remove from source
   c) Prevent Hypothermia secondary to burn care
   d) Determine burn severity:
      (1) Superficial partial-thickness (1st degree) ex. sunburn red
      (2) Deep partial-thickness (2nd degree) ex. blisters
      (3) Full thickness (3rd degree) ex. charred and non-tender
   e) Estimate % burned (below)
   f) Transport all burn patients with:
      (1) Burns to face, hands, feet or genital area
      (2) 20-30% total body surface area burn partial-thickness
      (3) All full thickness of any size
   g) Remove jewelry on affected areas
   h) Watch for signs of inhalation injury
   i) 100% oxygen administration
   j) Burn sheets applied to burned area or dry sterile dressings

2. Burn Chart (Pediatric)
   a) Refer to adult burn chart > 10 years old
3. Palmar Method
   a) The palm of the <u>patient's</u> hand (including fingers) can be used to estimate 1% of total body surface area (TBSA) for infants and children
   b) Approximately 0.5% for children > 15 years old

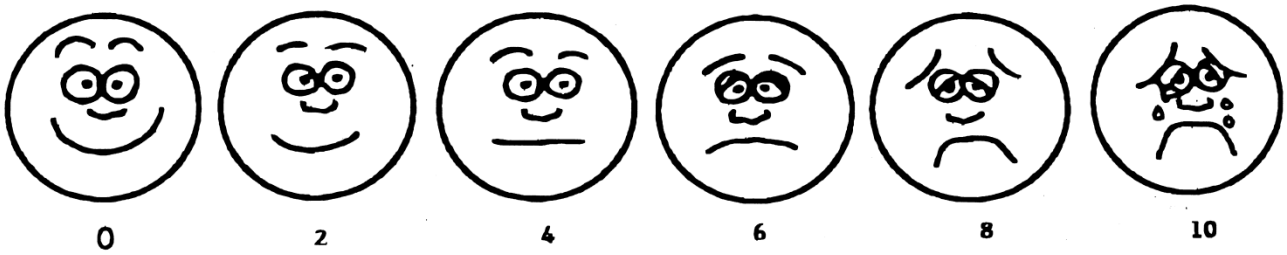


1%

C. Pediatric Pain Rating Scale

1. Use the Wong-Backer scale to rate pain in a cooperative, communicative child
2. Use the FLACC scale to rate pain in a non-cooperative, non-communicative child
3. Use the Visual Analog scale to rate pain in a cooperative, communicative child who is older than 7 years old

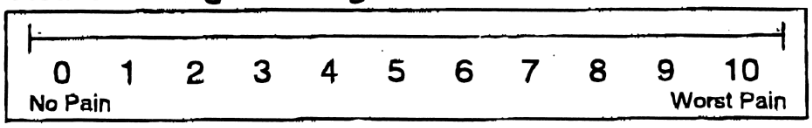
Wong-Baker Faces Pain Rating Scale



FLACC Scale

Categories	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractable	Difficult to console or comfort
Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between zero and ten.			

Visual Analog Scale *ages 7 and above*



D. Drowning and Near Drowning

1. Protect and immobilize possible cervical spine injuries
2. Establish and maintain airway
3. Cardiac monitor
4. Evaluate, protect against and/or treat Hypothermia per guidelines
5. All near-drowning patients who require rescue breathing (mouth-to-mouth or BVM ventilation) or have any change in LOC should be transported
6. Near-drowning patients not being transported should be cleared by medical control
7. Do not terminate resuscitation of a drowning patient in the field without contacting medical control
8. Do not delay transport to closest hospital and request ALS intercept if available

E. Child Abuse - Neglect

1. Consider child abuse:
    a) Any injury without a consistent history or explanation
    b) Injury in a non-mobile child
    c) Significant injury reportedly resulting from a household fall
    d) Unconscious child with no history or a history of an insignificant fall
    e) Severity of injury is inconsistent with the history

2. Initiate appropriate medical treatments
3. Obtain and document detailed history – use quotes if possible
4. Avoid questions or comments suggesting blame or mechanism of injury
5. Observe carefully and note:
    a) Location and position of child
    b) Surroundings, scene, and situation
    c) Who is/was present at the time of injury

6. If concern for child abuse, notify law enforcement and/or social services per protocol as soon as possible

VII. Children with Special Health Care Needs (CSHCN)

A. Guidelines

Available from the EMSC National Resource Center
http://www.childrensnational.org/files/PDF/EMSC/PubRes/Prehospital_Protocols_for_CSHCN__EP000987_2002.pdf

This document is 10 years old but is still one of the best sources for treatment of children with special health care needs. Providers need to ask the caregivers of children for their personal care plans and for advice on how to help the specific child with special health care needs.

1. General care:
    a) Tracheostomy
    b) Ventilators
    c) Apnea monitors
    d) Central lines
    e) CSF shunts
    f) Feeding tubes
    g) Internal pacemakers/defibrillators
    h) Vagus nerve stimulator
    i) Colostomy

VIII. Poisons and Overdoses

For specific information contact the Poison Control Center at 1-800-222-1222

A. General Care

1. External contamination only:
    a) Protect medical and rescue personnel
    b) Remove contaminated clothing
    c) Brush off any solid material from skin
    d) Flush contaminated skin or eyes with copious amounts of water
    e) Contact medical control before transport to allow adequate preparation time

2. Internal ingestion: major overdose, altered LOC or depressed CNS:
    a) Establish and maintain airway, administer high-flow (100% oxygen)
    b) If patient shows signs of poor perfusion or HR < 60/minute, begin Cardiac Emergencies
    c) Check blood glucose if hypoglycemic and treat according to Hypoglycemia (and/or Known Diabetic Patient)
    d) If unconscious/unresponsive, attach AED and use as directed
    e) Request ALS intercept if available

B. Cholinergic agents

Carbamates, Parathion, Diazinon, Malathion, nerve agents, certain mushrooms and organophosphate insecticides

1. "SLUDGE" – Salivation, Lacrimation, Urination, Defecation, Gastric upset, Emesis

   OR

   "DUMBBELS" – Diarrhea, Urination, Miosis, Bronchorrea, Bradycardia, Emesis, Lacrimation, Salivation/Sweating
2. Evaluate and treat per Poisons and Overdoses
3. ALS intercept requested and transport to meet ALS

C. Unknown and/or Poly Drug Ingestion

1. Evaluate and treat per poisons and overdose general guidelines
2. DO NOT induce vomiting, anticipate nausea and vomiting and prepare suction
3. Bring empty bottles or containers to the hospital to aid identification
4. DO NOT bring hazardous materials or open/unsealed containers

D. Beta Blocker Overdose with Bradycardia

Propranolol, Atenolol, Cervedilol, Lobetolol, Metoprolol

1. Evaluate and treat per poisons and overdose general guidelines
   a) Hypotension: Treat for shock as indicated in the section Assess circulation and perfusion
2. Bradycardia
3. Hypoglycemia
   a) Check blood glucose
   b) If low blood glucose, administer oral glucose slowly if patient is conscious with the ability to swallow and refer to the Hypoglycemia (and/or Known Diabetic Patient) section

E. Carbon Monoxide Poisoning

Carbon monoxide reduces blood oxygenation by displacing oxygen from hemoglobin. The responder must exercise caution, and not expose themselves to fumes. Carbon monoxide is heavier than air and settles to the ground and lower levels, making children more vulnerable to its effects.

1. Evaluate and treat following poisoning and overdose general guidelines for internal ingestion
2. Administer high flow oxygen to all suspected victims of carbon monoxide poisoning
   a) Via non-rebreather or BVM, with nasal/oral adjunct for the unresponsive patient
   b) Blow-by is not recommended for suspected carbon monoxide poisoning
   c) Anticipate nausea and vomiting and prepare suction
   d) Request ALS intercept if available

F. Children Found at Methamphetamine Lab Sites

Any child found in an environment where methamphetamine is made or used is at risk for toxicity. Children found in these settings may also be at risk for various types of abuse or neglect, which should be addressed in a medical as well as social services evaluation. The ongoing safety of the child must be considered when making a judgment about the need for an acute assessment.

Decontamination is necessary to prevent cross-contamination of toxic substances found at Meth lab sites. Decontamination simply means thoroughly washing in order to remove any potentially harmful residue from persons removed from a hazardous site. Decontamination is necessary to protect the individual from continued exposure, as well as to prevent possible secondary contamination of other persons, equipment and facilities with which a contaminated individual might come in contact.

All persons removed from a clandestine lab should be properly decontaminated at the scene and dressed in clean clothing prior to any additional questioning or evaluation.

Decontamination is necessary regardless of the age of the person removed from the lab and whether or not the lab was in use at the time of removal.

The best recommendation for a child is to have a facility such as a tent or camper available at the scene in which the child can be given a warm shower and then dressed in age and gender appropriate clothing to minimize the psychological impact of the decontamination process.

All of the child's clothing should be removed and the child should be thoroughly washed with soap and water in a warm shower as soon as possible. Care should be taken with a child's personal possessions, which may contain chemical/drug contamination. In cases of gross chemical/drug contamination it is necessary to remove a child's clothing and provide clean attire prior to removing the child from scene (grossly soiled clothing must remain at the scene and should be handled as evidence by law enforcement.) Also the child should not come into your care with any personal items from their homes including, but not limited to:

- Blankets
- Toys
- Bottles and/or formula
- Diapers
- Contact lenses

Only items provided by responders on scene or by medical professionals at evaluation should come with the child to the hospital. There may be an exception for certain personal items such as eyeglasses, which will have to be cleaned by professionals at the scene.

Decisions regarding specifics of decontamination are most appropriately made by trained HAZMAT personnel at the scene.

1. All children found at methamphetamine lab sites should be transported as soon as possible for a medical screening exam at an appropriate emergency department
2. For children with obvious injury or illness or toxin exposure, begin treatment and transport to the nearest appropriate hospital

3. For all children who are not obviously injured or ill:
    a) Perform a basic assessment
    b) Check vital signs (temperature, blood pressure, pulse, and respiration)
4. Child welfare personnel should evaluate placement options and implement short-term shelter for the child

IX. Appendix

A. Pre-hospital Pediatric Destination Guideline Development

Advanced planning by the medical director of each service or the regional medical direction consortium should inventory the capabilities of receiving hospitals for each service or region and consider the service needs (and mutual aid) for the primary service area. This worksheet is designed to assist in this assessment.

Pediatric trauma patients should be transported according to trauma triage protocols. Considerations for transporting pediatric trauma patients are included below. All critical pediatric patients should be taken to the nearest hospital with pediatric capabilities. Centers with pediatric capabilities will vary in different regions of the state.

In general, patients in **cardiac arrest** or with an **unmanageable airway** should be taken to the nearest facility. Longer transport (up to 30 minutes travel time) to reach a pediatric center should be considered in the transport of a critically ill child. The length of time to reach a pediatric center should be considered in the choice of where to transport the pediatric patient. The hospital capabilities to consider should include:

- Airway
    - Is someone always available who is able and willing to intubate children?
    - Does the emergency department have a triage protocol for identifying children in severe respiratory distress?
    - Do they have a pediatric rapid sequence induction training (including PALS / CALS training)?
    - Are these always available?
- Vascular access
    - Does the department regularly start IV's on children?
    - Down to what age are they comfortable?
    - Are personnel trained in the use of IO?
- Protocols
    - Does the department have a pediatric transfer protocol?
        - Criteria to transfer based on vital signs and specific injury pattern
        - Mechanisms to contact referring hospitals and transport services (ground or helicopter)
    - Does the department have pediatric treatment protocols?
- Trauma capability per American College of Surgeons and the MN proposed trauma plan – MDH
    - Are surgeons readily available?
        - In house or on call?
        - Are they experienced at and comfortable with treating children?
    - Are operating rooms staffed and available?
    - Are there additional surgical specialists available (i.e., orthopedic specialists or neurosurgeons)
- Does this hospital have a Pediatric emergency department?
    - Staffed 24 hours/day?
- Does this hospital have a PICU?
    - Staffed by intensivist 24 hours/day?
- Backup
    - Is anesthesia backup available?
        - In house or on call?
    - Is pediatric backup available?
        - In house or on call?