



Southwest General

Partnering with



University Hospitals

EMS Services

PRE-HOSPITAL CARE

MEDICAL CONTROL

PROTOCOLS AND PROCEDURES

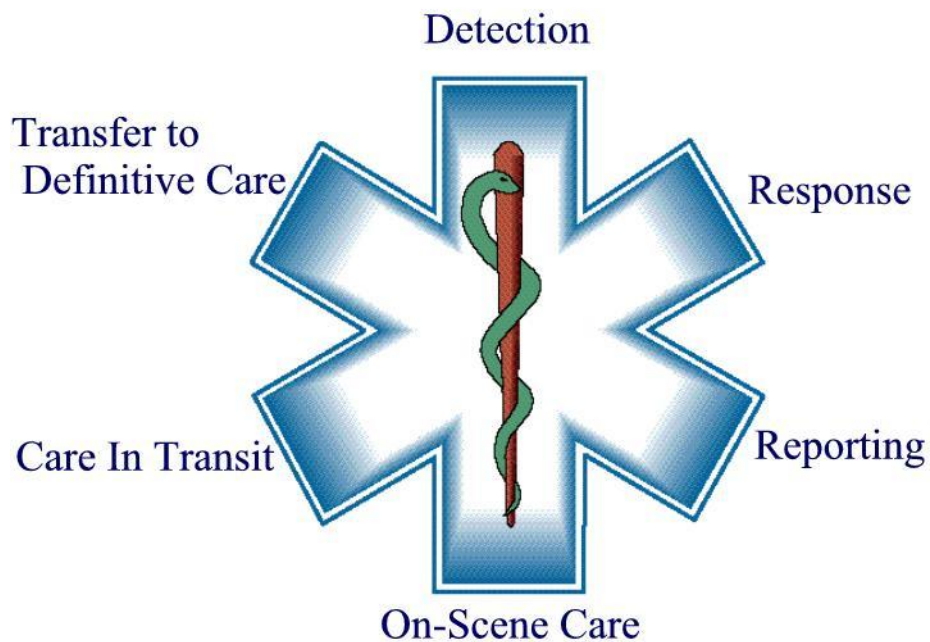


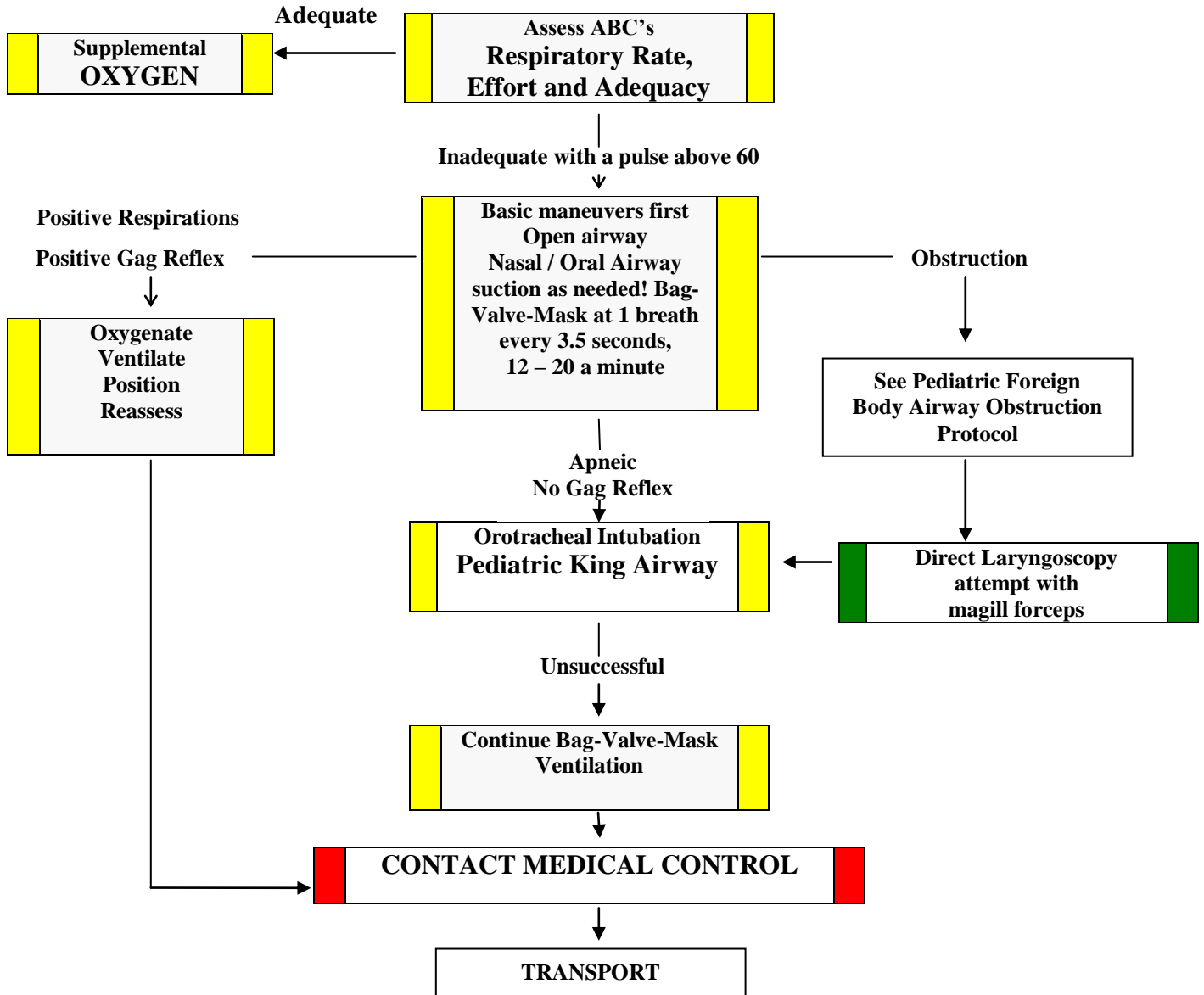
TABLE OF CONTENTS		
7. PEDIATRIC PROTOCOLS		pages
EMS and Children with Special Healthcare Needs		1
AIRWAY / BREATHING		
Pediatric Airway		2
Pediatric Foreign Body Airway Obstruction (FBAO)		4-4A
Pediatric Respiratory Distress – Upper Airway – Croup		5-5A
Pediatric Respiratory Distress – Lower Airway		6-6A
ARRYTHMIAS / ACLS		
Pediatric Sinus Bradycardia		7-7A
Pediatric Narrow – Complex Tachycardia		8-8A
Pediatric Wide – Complex Tachycardia		9-9A
CARDIAC ARREST / ACLS		
Pediatric Asystole / Pulseless Electrical Activity (PEA)		10-10A
Pediatric Ventricular Fibrillation (V-FIB) And Pulseless Ventricular Tachycardia		11-11A
MEDICAL		
Pediatric Altered Level of Consciousness		12-12A
Pediatric Diabetic Emergencies		13-13A
Pediatric Heat Illness		14-14A
Pediatric Hypothermia / Frostbite		15-15A
Pediatric Neonatal Resuscitation		16-16A
Pediatric Esophageal Foreign Body Obstruction		17-17A
Pediatric Seizure		18-18B
Pediatric Shock (Non – Traumatic)		19-19A
Pediatric Toxic Ingestion / Exposure / Overdose		20-20A
TRAUMA		
Pediatric Trauma Emergencies		21-23
Pediatric Abdominal Trauma		24-24A
Pediatric Burns		25-25B
Pediatric Chest Trauma		26-26A
Pediatric Drowning / Near Drowning		27-27A
Pediatric Extremity / Amputation Trauma		28-28A
Pediatric Head Trauma		29-29A
Pediatric Multiple Trauma		30-30A
Pediatric Trauma Arrest		31
PEDIATRIC ASSESSMENT CHARTS		
Glasgow Coma Scale / Normal Vital Signs		32
Pediatric Pharmacology Review		33-34
Common Medications used in Pediatric Emergency Care		35-41

**PEDIATRIC
EMERGENCIES IN CHILDREN WITH SPECIAL HEALTH CARE NEEDS****GENERAL CONSIDERATIONS:**

1. Treat the ABC's first. Treat the child, not the equipment. If the emergency is due to an equipment malfunction, manage the child appropriately using your own equipment.
2. Children formerly cared for in hospitals or chronic care facilities are often cared for in homes by parents or other caretakers. These children may have self-limiting or chronic diseases. There are multitudes of underlying medical conditions that may categorize children as having special needs. Many are often unstable and may frequently involve the EMS system for evaluation, stabilization, and transport. Special needs children include technology-assisted children such as those with tracheostomy tubes with or without assisted ventilation, children with gastrostomy tubes, and children with indwelling central lines. The most serious complications are related to tracheostomy problems.
3. Children with Special Healthcare Needs (CSHCN) have many allergies. Children with spina bifida are often allergic to latex. Before treating a patient, ask the caregivers if the children are allergic to latex or have any other allergies. Stock latex-free equipment (some regularly used equipment that contains latex includes gloves, oxygen masks, IV tubing, BVM, blood pressure cuff, IV catheters, etc.).
4. Knowing which children in a given area have special needs and keeping a logbook is encouraged.
5. Parents and caretakers are usually trained in emergency management and can be of assistance to EMS personnel. Listen carefully to the caregiver and follow his/her guidance regarding the child's treatment.
6. Children with chronic illnesses often have different physical development from well children. Therefore, their baseline vital signs may differ from normal standards. The size and developmental level may be different from age-based norms and length based tapes used to calculate drug dosages. Ask the caregiver if the child normally has abnormal vital signs (i.e., fast heart rate or a low pulse oximeter reading).
7. Some CSHCN may have sensory deficits (i.e., they may be hearing impaired or blind), yet may have age-appropriate cognitive abilities. Follow the caregivers' lead in talking to and comforting a child during treatment and transport. Do not assume that a CSHCN is developmentally delayed.
8. When moving a special needs child, a slow careful transfer with two or more people is preferable. Do not try to straighten or unnecessarily manipulate contracted extremities as it may cause injury or pain to the child. Certain medical conditions will require special care. Again, consult the child's caregiver.
9. Caregivers of CSHCN often carry "go bags" or diaper bags that contain supplies to use with the child's medical technologies and additional equipment such as extra tracheostomy tubes, adapters for feeding tubes, suction catheters, etc. Before leaving the scene, ask the caregivers if they have a "go bag" and carry it with you.
10. Caregivers may also carry a brief medical information form or card. The child may be enrolled in medical alert program whereby emergency personnel can get quick access to the child's medical history. Ask the caregivers if they have an emergency information form or some other form of medical information for their child.
11. Caregivers of CSHCN often prefer that their child be transported to the hospital where the child is regularly followed or the "home" hospital. When making the decision as to where to transport a CSHCN, take into account, local protocols, the child's condition, capabilities of the local hospital, caregivers' request and the ability to transport to certain locations.

**PEDIATRIC
AIRWAY**

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



General Considerations

- **Capnography is mandatory with all methods of intubation. Document results of ETCO₂**
- **Limit intubation attempts to 2 per patient.**
- If unable to intubate, continue BVM ventilation's, transport rapidly, and **notify receiving hospital early.**
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic - use oxygen, not a paper bag.
- Consider Sellick's maneuver should be used to assist with difficult intubations.
- Continuous pulse oximetry should be utilized in all patients with an inadequate respirations.
- Consider C-collar to help maintain ETT or King Airway placement for intubated patients.

**This page has been left blank
INTENTIONALLY**

AIRWAY / BREATHING
PEDIATRIC
FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)

Infant (0 – 12 months)

Head Tilt / Chin Lift / Jaw Thrust / Airway Maneuvers

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

Mild FBAO

Severe FBAO
Responsive

Severe FBAO
Unresponsive

Do not interfere. Allow victim to cough while you observe for signs of severe FBAO

5 Back Slaps /
5 Chest Compressions
Repeat until effective or victim becomes unresponsive.

1. **Confirm severe airway obstruction.**
Check for sudden onset of severe breathing difficulty, ineffective or silent cough, weak or silent cry.
2. **Give up to 5 back slaps and up to 5 chest compressions.**
3. **Repeat step 2.**

OXYGEN
10 – 15 L Pediatric Mask,
as tolerated

Before you deliver breaths, look into mouth. If you see a foreign body that can be easily removed, remove it. Continue CPR for 5 cycles or about 2 minutes. If you are alone, activate EMS System. Return and continue CPR until more skilled rescuers arrive.

Child (1 – 8 years)

Head Tilt / Chin Lift / Jaw Thrust / Airway Maneuvers

Mild FBAO

Severe FBAO
Responsive

Severe FBAO
Unresponsive

Encourage patient to cough

- Heimlich Maneuvers**
1. Ask "Are you choking?"
 2. Give abdominal thrusts/Heimlich maneuver.
 3. Repeat abdominal compressions until effective or victim becomes unresponsive.

1. Lower victim to floor. If victim is unresponsive with no breathing or no normal breathing (ie, agonal gasps), begin CPR (no pulse check).
2. Before you deliver breaths, look into mouth. If you see a foreign body that can be easily removed, remove it. Continue CPR for 5 cycles or about 2 minutes. If you are alone, activate EMS System. Return and continue CPR until more skilled rescuers arrive.

OXYGEN
10 – 15 L Pediatric Mask,
as tolerated

CONTACT MEDICAL CONTROL

TRANSPORT

AIRWAY / BREATHING		
PEDIATRIC FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)		
History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Coughing • Choking • Inability to speak • Unresponsive 	<ul style="list-style-type: none"> • Witnessed aspiration • A sudden onset of respiratory distress with coughing, gagging, stridor, or wheezing. • Sudden onset of a respiratory distress in the absence of fever other respiratory symptoms (eg, antecedent cough, congestion) suggests FBAO rather than an infectious cause of respiratory distress, such as croup. • Change in skin color • Decreased LOC • Increased / Decreased respiratory rate • Labored breathing • Unproductive cough 	<ul style="list-style-type: none"> • Cardiac arrest • Respiratory arrest • Anaphylaxis

GENERAL CONSIDERATIONS:

- Infants 0-12 months DO NOT receive abdominal thrusts. Use chest compressions.
- NEVER perform blind finger sweeps in infants or children.
- Attempt to clear the airway should only be made if foreign body aspiration is witnessed or very strongly suspected and there is a severe airway obstruction.
- **Foreign-Body Airway Obstruction (Choking) *Epidemiology and Recognition:*** More than 90% of childhood deaths from foreign-body aspiration occur in children < 5 years of age; 65% of the victims are infants. Liquids are the most common cause of choking in infants whereas balloons, small objects, and foods (eg, hot dogs, round candies, nuts, and grapes) are the most common causes of foreign-body airway obstruction (FBAO) in children.

AIRWAY / BREATHING
PEDIATRIC
RESPIRATORY DISTRESS UPPER AIRWAY - CROUP

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL

Calm Patient
 Sit Patient on Parent's Lap
 Position Patient Sitting Upright
 Do Not Lay Patient Down
 Do Not Perform Visual Airway Exam

Check Pulse Oximetry

Mild – Moderate Distress

Aerosol
 Cool Mist with Normal Saline

Severe Distress

Evaluate Level of Distress / Pulse Oximetry
 SPO₂ less than 87%
 or
 SPO₂ greater than 87% with retraction
 Accessory Muscle Use
 With Severe Respiratory Distress/Impending arrest

**EPINEPHRINE 0.01 mg / kg subcut.
 1:1000 Solution Max. dose 0.5 mg**

CONTACT MEDICAL CONTROL

TRANSPORT

AIRWAY / BREATHING		
PEDIATRIC RESPIRATORY DISTRESS UPPER AIRWAY - CROUP		
History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time of onset • Possibility of foreign body • Medical history • Medications • Fever or respiratory infection • Other sick siblings • History of trauma 	<ul style="list-style-type: none"> • Anxious appearance • Barking cough • Stridor • Gagging • Drooling • Inability to swallow • Increased respiratory effort 	<ul style="list-style-type: none"> • Asthma • Aspiration • Foreign body • Infection • Pneumonia • Epiglottitis • Congenital heart disease • Medication or Toxin • Trauma

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- **Croup** typically affects children less than 2 years of age. It is viral, possible fever, gradual onset, usually not drooling.
- **Epiglottitis** typically affects children greater than 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, and drooling is common. Airway manipulation may worsen the condition.
- **Stridor**, gagging or choking in the breathing patient with respiratory distress may indicate upper airway obstruction.
- **Wheezing** in the breathing patient with respiratory distress usually indicates lower airway disease, which may come from a variety of causes. The patient with severe lower airway disease may have altered LOC, and be unable to talk, may have absent or markedly decreased breath sounds and severe retractions with accessory muscle use.

AIRWAY / BREATHING
PEDIATRIC
RESPIRATORY DISTRESS LOWER AIRWAY

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

Signs of increased work of breathing?
 (Abnormal RR, retractions, accessory muscle use, inability to speak full sentences, grunting or nasal flaring.)

Yes

Adequate / patent airway?

No

Pediatric Airway Protocol

Yes

Position to patient comfort

Wheezing or decreased lung sounds?

Yes

Assist patient with personal inhaler

(Lower Airway Symptom Classification chart)

Mild

Administer O₂ to maintain pulse ox ≥ 94%

ALBUTEROL via nebulizer 1 unit dose

Moderate

ALBUTEROL 1 unit dose x1

Then with ATROVENT 1 unit dose (age < 8) administer simultaneously with ALBUTEROL via nebulizer

Severe

ALBUTEROL 1 unit dose x1

Then with ATROVENT 1 unit dose (age < 8) administer simultaneously with ALBUTEROL via nebulizer

Epi 0.01 mg/kg 1:1000 solution
 If signs and symptoms are severe, or moderate and not improving with ALBUTEROL/ATROVENT

IV PROTOCOL
 If signs and symptoms are severe

Reassess Vital Signs, Lung Sounds and work of breathing

May repeat ALBUTEROL AEROSOL x 2 enroute as need to achieve adequate relief of symptoms

CONTACT MEDICAL CONTROL

TRANSPORT

**PEDIATRIC
RESPIRATORY DISTRESS LOWER AIRWAY**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time of onset • Possibility of foreign body • Medical history • Medications • Fever or respiratory infection • Other sick siblings • History of trauma 	<ul style="list-style-type: none"> • Wheezing or stridor • Retractions work of breathing. • Increased heart rate • Altered level of consciousness • Anxious appearance 	<ul style="list-style-type: none"> • Asthma • Aspiration • Foreign body • Infection • Pneumonia • Croup • Epiglottitis • Congenital heart disease • Medication or Toxin • Trauma

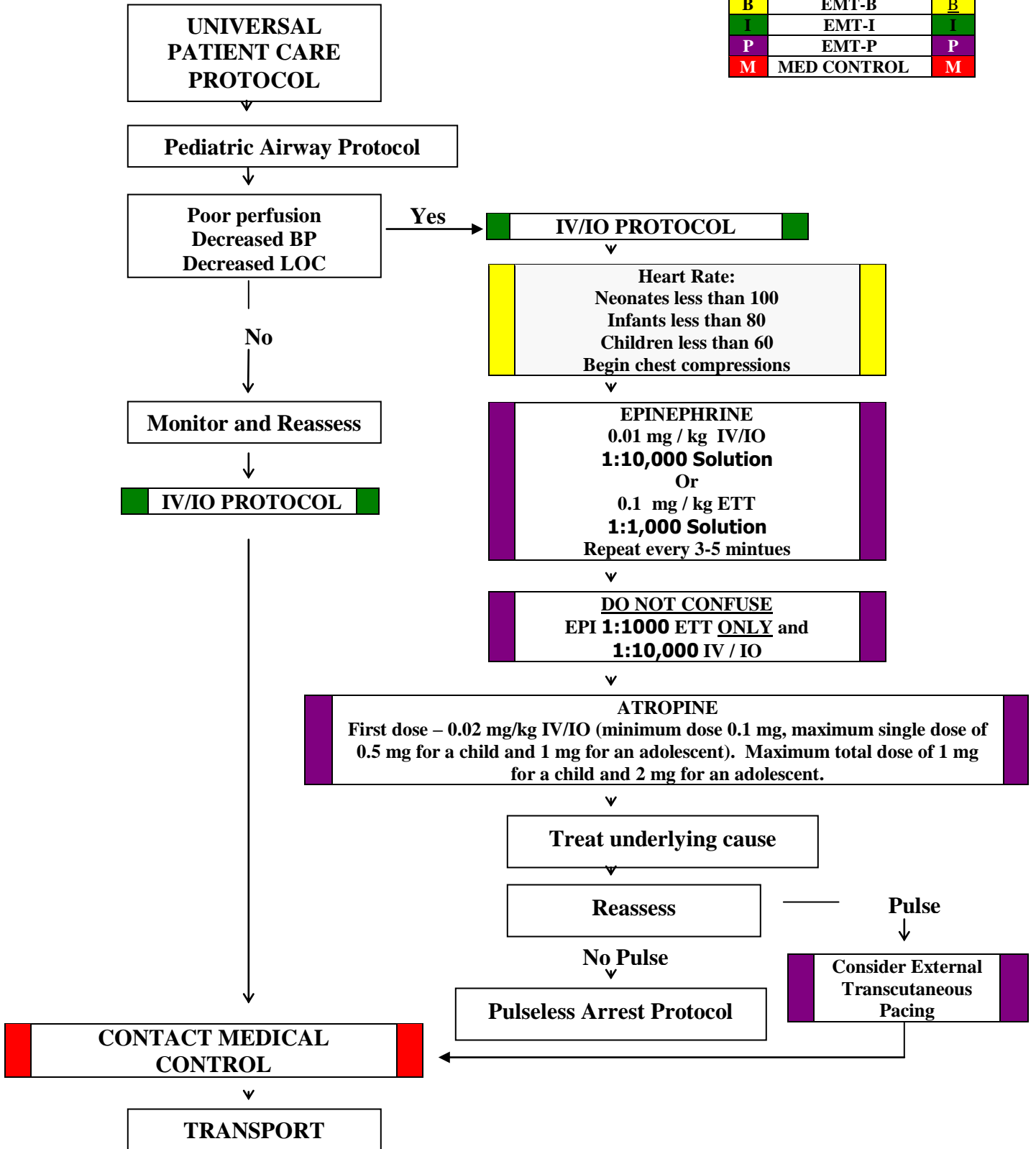
GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- DO NOT attempt an invasive airway procedure unless absolutely necessary.
- For some patients in severe respiratory distress, wheezing may not be heard. Consider Albuterol for the known asthmatic in severe respiratory distress.
- Stridor, gagging or choking in the breathing patient with respiratory distress may indicate upper airway obstruction.
- Wheezing in the breathing patient with respiratory distress usually indicates lower airway disease, which may come from a variety of causes. The patient with severe lower airway disease may have altered LOC, be unable to talk, may have absent or markedly decreased breath sounds and severe retractions with accessory muscle use.
- If the patient has signs of respiratory failure, begin to assist ventilations with BVM, even when they are breathing.
- Contact Medical Control for patients with a cardiac history.

Lower Airway Symptom Classification			
	Mild	Moderate	Severe
Wheeze	None or end expiratory	Inspiratory and expiratory	Breath sounds becoming inaudible or decreased with faint wheezes
Air Exchange	Equal all lobes	Decreased some lobes	Decreased all lobes
Accessory Muscles	None	Intercostal retractions; infants with nasal flaring or grunting	Intercostal retractions plus any other acc. muscle use (abdominal, suprasternal, use of neck muscles)
Other	Able to speak in complete sentences, Alert with age appropriate behavior	Able to speak only few words at a time, alert, age appropriate behavior	Difficulty speaking, may appear sleepy or tired, high risk patient (previous hospital admissions for same)

**PEDIATRIC
SINUS BRADYCARDIA**

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



**PEDIATRIC
SINUS BRADYCARDIA**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Past medical history • Foreign body exposure • Respiratory distress or arrest • Apnea • Possible toxic or poison exposure • Congenital disease • Medication (maternal or infant) 	<ul style="list-style-type: none"> • Hypoxia • Decreased heart rate • Delayed capillary refill or cyanosis • Mottled, cool skin • Hypotension or arrest • Altered level of consciousness • Poor Perfusion • Shock • Short of breath • Pulmonary fluid 	<ul style="list-style-type: none"> • Respiratory effort • Respiratory obstruction • Foreign body / secretions • Croup / Epiglottitis • Hypovolemia • Hypothermia • Infection / Sepsis • Medication or Toxin • Hypoglycemia • Trauma

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Heart Rate less than 100 (Neonates = after birth)
- Heart Rate less than 80 (Infants = below one year of age)
- Heart Rate less than 60 (Children greater than 1 year up to puberty)
- Most maternal medications pass through breast milk to the infant.
- The majority of pediatric arrests are due to airway problems.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturer’s guidelines.
- Identify and treat possible causes for pediatric bradycardia:
 1. Hypoxia
 6. Acidosis
 2. Hypothermia
 7. Hypovolemia
 3. Head injury
 8. Tension Pneumothorax
 4. Heart block
 9. Tamponade, Cardiac
 5. Toxic ingestion / exposure
 10. Thrombosis, Pulmonary and Coronary
- Refer to Broselow Pediatric Tape when unsure about patient weight, age and/or drug dosage.
- The minimum dose of Atropine that should be administered to a pediatric patient is 0.1 mg. Total maximum dose for a child is 1 mg, for an adolescent a total maximum dose is 3 mg.
- If the rhythm changes, follow the appropriate protocol.

PEDIATRIC TACHYCARDIA WITH A PULSE AND POOR PERFUSION ALGORITHM

UNIVERSAL PATIENT CARE PROTOCOL

Identify and treat underlying cause

- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
 - 12-Lead ECG if available; don't delay therapy
- Continuous Cardiac Monitor / If Sinus Tachycardia, First Attempt to Identify Treatable Causes: Assess for hypothermia, hypovolemia, fever, hypoxia, hypoglycemia and treat.

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

Doses/Details

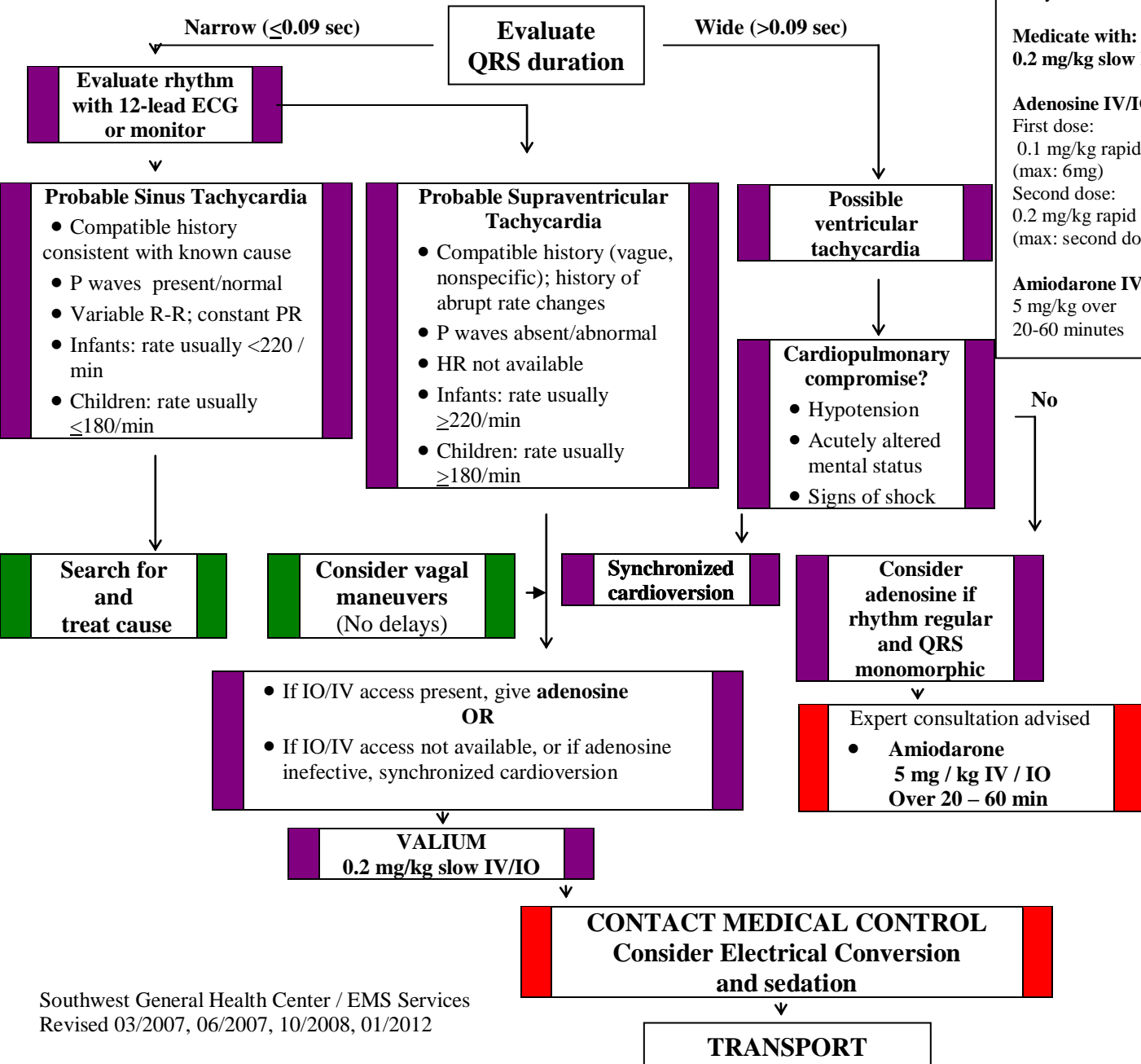
Synchronized Cardioversion:
Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg.
Sedate if needed, but don't delay cardioversion.

Medicate with: VALIUM 0.2 mg/kg slow IV/IO

Adenosine IV/IO Dose:
First dose: 0.1 mg/kg rapid bolus (max: 6mg)
Second dose: 0.2 mg/kg rapid bolus (max: second dose: 12 mg).

Amiodarone IV/IO Dose:
5 mg/kg over 20-60 minutes

IV/IO PROTOCOL



**PEDIATRIC TACHYCARDIA WITH A PULSE
AND POOR PERFUSION ALGORITHM**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Past medical history • Medications or toxic ingestion (Aminophylline, diet pills, thyroid supplements, decongestants, Digoxin) • Drugs (nicotine, cocaine) • Congenital Heart Disease • Respiratory Distress • Syncope or near syncope 	<ul style="list-style-type: none"> • HR: Child greater than 180/bpm Infant greater than 220/bpm • Pale or Cyanosis • Diaphoresis • Tachypnea • Vomiting • Hypotension • Altered Level of Consciousness • Pulmonary congestion • Syncope 	<ul style="list-style-type: none"> • Heart disease (Congenital) • Hypo / Hyperthermia • Hypovolemia or Anemia • Electrolyte imbalance • Anxiety / Pain / Emotional Stress • Fever / Infection / Sepsis • Hypoxia • Hypoglycemia • Medication / Toxin / Drugs (see HX) • Pulmonary embolus • Trauma • Tension Pneumothorax

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Carefully evaluate the rhythm to distinguish Sinus Tachycardia, Supraventricular Tachycardia, and Ventricular Tachycardia.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children less than 10 kg or Broselow Tape color Purple.
- Monitor for respiratory depression and hypotension associated if Diazepam is used.
- Continuous pulse oximetry is required for all SVT patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Assess and treat possible causes of tachycardia; hypoxia, hypovolemia, fear, and pain.
- A complete medical history must be obtained.
- Do not delay cardioversion to gain vascular access for the unstable patient.
- If you are unable to get the monitor to select low enough joules, then rapid transport to the nearest appropriate facility is indicated.
- Record 3-Lead EKG strips during Adenosine administration.
- Perform a 12-Lead EKG prior to and after Adenosine conversion or cardioversion of SVT if time allows.
- If the rhythm changes, follow the appropriate protocol.

PEDIATRIC TACHYCARDIA WITH A PULSE AND ADEQUATE PERFUSION ALGORITHM

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL
 Continuous Cardiac Monitor / In All Tachycardia, First Attempt to Identify Treatable Causes: Assess for hypothermia, hypovolemia, fever, hypoxia, hypoglycemia and treat

Identify and treat underlying cause

- Maintain patient airway; assist breathing as necessary
- Oxygen
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- 12-Lead ECG if available; don't delay therapy

IV/IO PROTOCOL

QRS normal (≤ 0.09 sec)

QRS wide (> 0.09 sec)

Evaluate rhythm

Evaluate QRS duration

Evaluate rhythm

Probable Sinus Tachycardia

- Compatible history consistent with known cause
- P waves present/normal
- Variable R-R; constant PR
- Infants: rate usually < 220 / min
- Children: rate usually ≤ 180 / min

Search for and treat cause

Probable Supraventricular Tachycardia

- Compatible history (vague, nonspecific); history of abrupt rate changes
- P waves absent/abnormal
- HR not available
- Infants: rate usually ≥ 220 / min
- Children: rate usually ≥ 180 / min

Consider vagal maneuvers

- Establish vascular access
- Consider **adenosine** 0.1 mg/kg IV (maximum first dose 6 mg) May give second dose of 0.2 mg/kg IV (maximum second dose 12 mg) Use rapid bolus technique.

CONTACT MEDICAL CONTROL

- **Amiodarone** 5 mg/kg IV over 20 to 60 minutes

TRANSPORT

Possible Supraventricular Tachycardia (with QRS aberrancy)

- RR interval regular
- Uniform QRS morphology

Probable ventricular tachycardia

- Expert consultation strongly recommended
- Search for and treat reversible causes
- Obtain 12-lead ECG
- Consider pharmacologic conversion
- Or
- Consider electrical conversion
 - Consult pediatric cardiologist
 - Attempt **cardioversion** with 0.5 to 1 J/kg (may increase to 2 J/kg if initial dose ineffective)
 - Sedate if needed, but do not delay cardioversion, medicate with VALIUM 0.2 mg/kg slow IV/IO.

**PEDIATRIC TACHYCARDIA WITH A PULSE
AND ADEQUATE PERFUSION ALGORITHM**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Past medical history / medications, diet, drugs / toxins • Acute hypoxemia • Acidosis • Electrolyte imbalance 	<ul style="list-style-type: none"> • Ventricular tachycardia on ECG (runs or sustained) • Conscious, rapid pulse • Chest pain, shortness of breath • Dizziness / hypotension • Rate usually near normal to 200 bpm for sustained V-Tach • Diminished peripheral perfusion • Increased work of breathing 	<ul style="list-style-type: none"> • Artifact / device failure • Cardiac • Endocrine / metabolic • Drugs • Pulmonary

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- If the patient relapses back into wide complex tachycardia / ventricular tachycardia, initiate Synchronized cardioversion with the joules setting that previously cardioverted the patient.
- Record EKG strips during Amiodarone administration.
- Perform a 12- Lead EKG prior to and after Amiodarone conversion or synchronized cardioversion of wide complex tachycardia / ventricular tachycardia.
- Perform a Code Summary and attach it to the patient run report.
- Be sure to treat the patient and not the monitor.
- ***For Perfusing Supraventricular and Ventricular Arrhythmias*** : Amiodarone loading dose: 5 mg/kg IV/IO over 20 to 60 minutes (maximum single dose: 300 mg). Can repeat to maximum of 15 mg/kg per day (24 hrs.).
- Amiodarone is only compatible with D5W.
- Polymorphic V-Tach (Torsades de Pointes) may benefit from the administration of Magnesium Sulfate.
- Magnesium Sulfate 25 to 50 mg/kg IV/IO over 10 to 20 minutes (max. dose 2 g) for Torsades de Pointes.
- Magnesium Sulfate and can be mixed with NS or D5W.
- Synchronized Cardioversion (mono and biphasic monitors) 0.5 to 1 J/kg; if not effective, increase to 2 J/kg.

**PEDIATRIC
ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)**

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

CPR

- Push hard ($\geq 1/3$ of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compressions for 1 rescuer. If advanced airway, 8-10 breaths per minute continuous chest compressions.

See Pediatric Airway Protocol

Apply Cardiac Monitor

Confirm Asystole
in 2 Leads

Confirm Asystole / PEA

Identify and Treat Possible Causes:
Hypoxemia
Acidosis
Hypovolemia
Tension Pneumo.
Hypothermia
Hypoglycemia
Toxins

IV/IO PROTOCOL

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO POST RESUSCITATION PROTOCOL

EPINEPHRINE
0.01mg / kg IV/IO
1:10,000 Solution
Or
0.1 mg / kg ETT
1:1,000 Solution
Repeat every 3-5 minutes

NORMAL SALINE IV BOLUS
20 mL/kg
Repeat as needed

Blood Glucose Analysis

Glucose less than 80

CPR

DEXTROSE
(Give age appropriate dosage)

- Organized rhythm → check pulse
- Pulse present (ROSC) → post-cardiac arrest care

CONTACT MEDICAL CONTROL

TRANSPORT

**PEDIATRIC
ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time of arrest • Medical history • Medications • Possibility of foreign body • Hypothermia 	<ul style="list-style-type: none"> • Pulseless • Apneic or agonal respirations • Cyanosis 	<ul style="list-style-type: none"> • Ventricular Fibrillation • Pulseless Ventricular Tachycardia
CONSIDER TREATABLE CAUSES		
<ul style="list-style-type: none"> • Hypovolemia • Tension Pneumothorax • Myocardial Infarction • Drug Overdose 	<ul style="list-style-type: none"> • Hypothermia • Acidosis • Cardiac Tamponade • Pulmonary Embolism 	<ul style="list-style-type: none"> • Tricyclic Overdose • Hypoxia • Hypoglycemia • Hyperkalemia

GENERAL CONSIDERATIONS:

- Exam: Mental Status
- Always confirm asystole in more than one lead.
- Cardiac arrest in children is primarily due to lack of an adequate airway, resulting in hypoxia.
- If the patient converts to another rhythm or has a return of circulation, refer to the appropriate protocol and treat accordingly.
- When assessing for a pulse, palpate the brachial or femoral arteries for infants and the carotid or femoral artery for children.
- Continue BLS procedures throughout the resuscitation.
- If the patient is intubated, be sure to routinely reassess tube placement.
- If the patient has an IO, routinely reassess for patency.
- When there is an established ETT, DO NOT delay administration of medications for IV/IO attempts.
- Administer the appropriate medications down the tube.

During CPR Remember:

Push hard and fast	After an advanced airway is placed, rescuers no longer deliver “cycles” of CPR. Give continuous chest compressions without pauses for breaths. Give 8 -10 breaths / min. Check rhythm every 2 min.	<i>Search for and treat possible contributing factors:</i> Hypoxia, Hypovolemia, Hydrogen Ion (acidosis), Hypo-Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), Trauma
Ensure full chest recoil		
Minimize interruptions in chest compressions		
One cycle of CPR: 30 compressions then 2 breaths 5 cycles = 1-2 min.		
Avoid hyperventilation		
Secure airway and confirm placement	Rotate EMT’s compressions every 2 min. with rhythm checks	

ET Guidelines - Adult and Peds

1. Lidocaine, Epi, Atropine, and Narcan can be given down the ET Tube.
2. The optimal dose of most drugs given by ET is unknown.
3. ET drugs deliver low blood levels. All drugs except Epi are given 2-3x’s normal dose.
4. Instill the drug while briefly holding compressions, follow with 5 mL (smaller with neonates) of NS flush, followed by 5 positive-pressure ventilations.
5. IV / IO can be administered. **Dextrose administration:** **Neonate: D10 solution** = (250 mL bag of NS withdraw and discard 50 mL and then add 50 mL of D50 to the 200 mL NS to make D10 solution, give: 5-10 mL/kg).
Infants and children: 2-4 mL/kg IV of a D25 solution. May be repeated x1 after 5 minutes D25 solution – (Mix D50 with 50 mL NS).

**PEDIATRIC
VENTRICULAR FIBRILLATION (V-FIB)
PULSELESS VENTRICULAR TACHYCARDIA**

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

CPR

- Push hard ($\geq 1/3$ of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compressions for one rescuer. If advanced airway, 8-10 breaths per minute continuous chest compressions.

Confirm V-Fib /
Pulseless V-Tach

Apply Cardiac Monitor / AED

Defibrillate 2 J/kg

See Pediatric Airway Protocol

CPR x 5 cycles / 2 minutes

IV / IO PROTOCOL

EPINEPHRINE
0.01 mg/kg IV/IO 1:10,000 Solution
0.1 mg/kg ETT
1:1,000 Solution
Repeat every 3-5 minutes
** When IV/IO available during CPR
(before and after shock)

CPR x 5 cycles / 2 minutes

Defibrillate 4 J/kg

Give Antiarrhythmic during CPR

CPR x 5 cycles / 2 minutes

Defibrillate 4 J/kg
May go up to 10 J/kg

CONTACT MEDICAL CONTROL

TRANSPORT

AMIODARONE
5 mg/kg IV/IO
May repeat x 2 up
to 15 mg/kg
Maximum single
dose 300 mg

LIDOCAINE
1mg/kg IV/IO
2-3 mg/kg ET

**CONSIDER:
MAGNESIUM
SULFATE**
25-50 mg/kg IV/IO
(Torsades, ONLY)
Maximum dose 2g

**Shock Energy for
Defibrillation**
First shock 2 J/kg,
Second shock 4 J/kg,
Subsequent shocks ≥ 4 J/kg,
Maximum 10 J/kg or adult dose

AT ANY TIME

Return of
Spontaneous
Circulation
(ROSC)

GO TO POST
RESUSCITATION
PROTOCOL

**PEDIATRIC
VENTRICULAR FIBRILLATION (V-FIB)
PULSELESS VENTRICULAR TACHYCARDIA**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time of Onset • Medical history • Medications • Possibility of foreign body • Hypothermia 	<ul style="list-style-type: none"> • Unresponsive • Cardiac arrest 	<ul style="list-style-type: none"> • Respiratory failure • Foreign body • Secretions • Infection (croup, epiglottitis) • Hypovolemia (dehydration) • Congenital heart disease • Trauma • Tension pneumothorax • Hypothermia • Toxin or medication • Hypoglycemia • Acidosis

GENERAL CONSIDERATIONS:

- Exam: Mental Status
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Airway is the most important intervention. This should be accomplished immediately. Patient survival is often dependent on airway management success.
- If the patient converts to another rhythm, follow the appropriate protocol and treat accordingly.
- If the patient converts back to ventricular fibrillation or pulseless ventricular tachycardia, defibrillate at the previously used setting.
- Defibrillation is the definitive therapy for ventricular fibrillation and pulseless ventricular tachycardia.
- Defibrillate 30-60 seconds after each medication administration.
- Monophasic and Biphasic waveform defibrillators should use the same energy levels noted:
(2 J/kg, 4 J/kg, 4 J/kg)
- The proper administration sequence is shock, drug, shock, and drug.
- For refractory VF, Pulseless VT: Amiodarone 5 mg/kg IV/IO bolus can repeat 5 mg/kg IV/IO bolus up to total dose of 15 mg/kg. (max single dose 300 mg).

**PEDIATRIC
ALTERED LEVEL OF CONSCIOUSNESS**

UNIVERSAL PATIENT CARE PROTOCOL



See Pediatric Airway Protocol



Spinal Immobilization Protocol



IV / IO PROTOCOL



Blood Glucose Analysis



Glucose < 60



ORAL GLUCOSE
5-10g (1/2 Tube)
(If gag reflex with no IV
Access and no airway
compromise)

OR

DEXTROSE 25% (D25)
2-4 mL/kg IV/IO
(Give age appropriate dosage)

IV/IO can be administered:

Dextrose administration: Neonate: D10 solution =
(250 mL bag NS withdraw and discard 50 mL and then
add 50 mL of D50 to the 200 mL NS to make D10
solution, give: 5-10 mL/kg).

Infants and children: 2-4 mL/kg IV of a D25 solution.
May be repeated x1 after 5 minutes

D25 solution= (Mix D50 with 50 mL NS).

GLUCAGON (GLUCAGEN)

0.1 mg / kg IM / IN

- If under 20 kg, give ½ mg IM
- If over 20 kg, give 1 mg IM
Maximum 1 mg



IF ALTERED MENTAL STATUS AND RESPIRATORY DEPRESSION
NALOXONE (NARCAN)

0.1 mg / kg / IV / IO / IN Atomized

Max Dose 2 mg



Monitor and Reassess



CONTACT MEDICAL CONTROL

TRANSPORT

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

**PEDIATRIC
ALTERED LEVEL OF CONSCIOUSNESS**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Known diabetic, medic alert tag • Drugs, drug paraphernalia • Report of illicit drug use or toxic ingestion • Past medical history • Medications • History of trauma 	<ul style="list-style-type: none"> • Unresponsive • Decreased responsiveness • Inadequate respirations • Confusion • Agitation • Decreased mental status • Change in baseline mental status • Hypoglycemia (cool, diaphoretic skin) 	<ul style="list-style-type: none"> • Head trauma • CNS (stroke, tumor, seizure) • Infection • Shock (septic, metabolic, traumatic) • Diabetes (hyper / hypoglycemia) • Toxicologic • Acidosis / Alkalosis • Environmental exposure • Pulmonary (Hypoxia) • Electrolyte abnormality • Psychiatric disorder

GENERAL CONSIDERATIONS:

- Protect the patient airway and support ABCs.
- Document the patient's initial Glasgow Coma Score.
- Naloxone (Narcan) administration may cause acute opiate withdraw, which includes vomiting, agitation, or combative behavior. Be prepared for the possibility of combative behavior to ensure crew safety.
- Naloxone (Narcan) may wear off in as little as 20 minutes causing the patient to become more sedate and possibly hypoventilate. All patients receiving Naloxone (Narcan) MUST be transported.

ONLY A FEW CAUSES CAN BE TREATED IN THE FIELD. CARE SHOULD FOCUS ON MAINTAINING AIRWAY AND RAPID TRANSPORT.

MEDICAL PROTOCOLS
PEDIATRIC
DIABETIC EMERGENCIES

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

IV / IO PROTOCOL

Blood Glucose Analysis

Glucose < 60

ORAL GLUCOSE
5-10g (1/2 Tube)
(If alert with no IV Access
and no airway compromise)

Glucose > 250

Check for Hypotension,
Tachycardia, Poor Cap Refill

DEXTROSE 25% (D25)
2-4 mL/kg IV/IO
(Give age appropriate dosage)
IV/IO can be administered:
Dextrose administration: Neonate: D10 solution =
(250 mL bag NS withdraw and discard 50 mL and then
add 50 mL of D50 to the 200 mL NS to make D10
solution, give: 5-10 mL/kg).
Infants and children: 2-4 mL/kg IV of a D25 solution.
May be repeated x1 after 5 minutes
D25 solution= (Mix D50 with 50 mL NS).

NORMAL SALINE
IV BOLUS 20 ml / kg

GLUCAGON (GLUCAGEN)
0.1 mg / kg IM / IN

- If under 20 kg, give ½ mg IM
- If over 20 kg, give 1 mg IM
Maximum 1 mg

Recheck Blood Glucose

CONTACT MEDICAL CONTROL

TRANSPORT

MEDICAL PROTOCOLS

PEDIATRIC DIABETIC EMERGENCIES

HYPOGLYCEMIA

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Known diabetic, medic alert tag • Past medical history • Medications • Recent Blood Sugar 	<ul style="list-style-type: none"> • Altered Level of Consciousness • Dizziness • Irritability • Diaphoresis • Convulsions • Hunger • Confusion 	<ul style="list-style-type: none"> • ETOH • Toxic Overdose • Trauma • Seizure • Syncope • CNS Disorder • Stroke • Tumor • Pre-existing condition

HYPERGLYCEMIA

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Known diabetic, medic alert tag • Past medical history • Medications • Recent Blood Sugar 	<ul style="list-style-type: none"> • Altered Level of Consciousness • Coma • Abdominal Pain • Nausea / Vomiting • Dehydration • Frequent Thirst and Urination • General Weakness Malaise • Hypovolemic Shock • Hyperventilation • Deep / Rapid Respirations 	<ul style="list-style-type: none"> • ETOH • Toxic Overdose • Trauma • Seizure • Syncope • CNS Disorder • Stroke • Diabetic Ketoacidosis

GENERAL CONSIDERATIONS:

Hyperglycemia:

- Diabetic Ketoacidosis (DKA) is a complication of diabetes mellitus. It can occur when insulin levels become inadequate to meet the metabolic demands of the body for a prolonged amount of time (onset can be within 12-24 hours). Without enough insulin, the blood glucose increases and cellular glucose depletes. The body removes excess blood glucose by dumping it into the urine. Pediatric patients in DKA should be treated as hyperglycemic under the Pediatric Diabetic Emergency Protocol.
- Patients can have Hyperglycemia without having DKA.

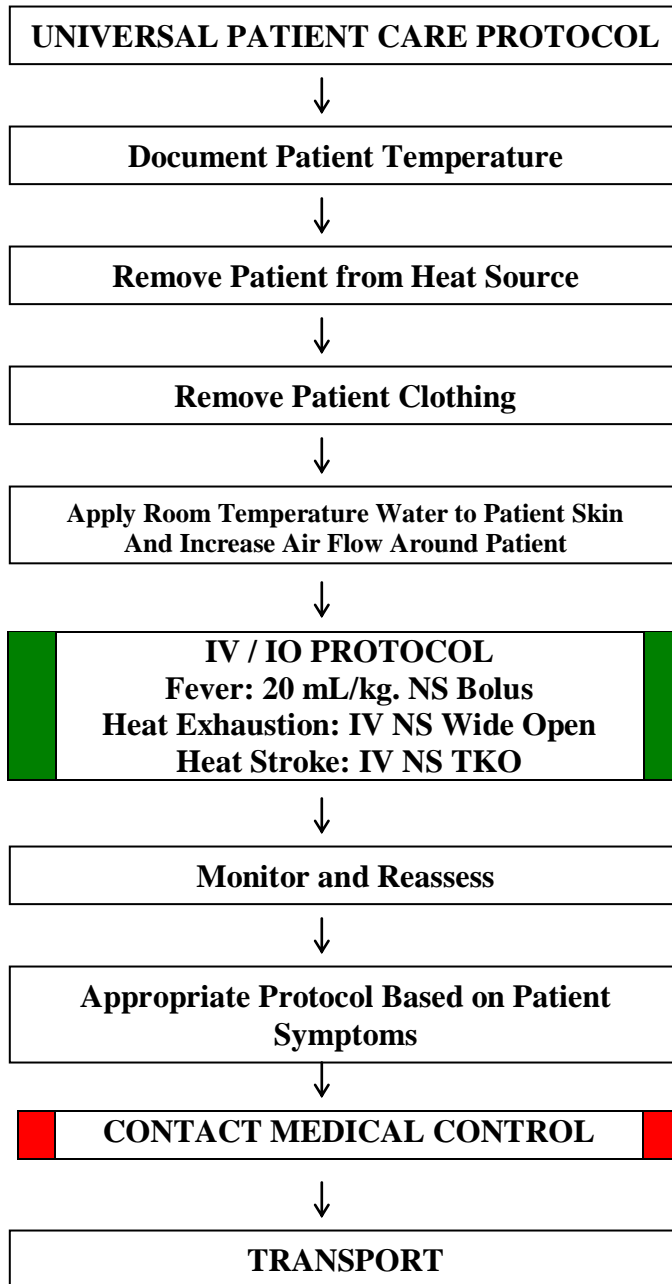
Hypoglycemia:

- Always suspect Hypoglycemia in patients with an altered mental status.
- If a blood glucose analysis is not available, a patient with altered mental status and signs and symptoms consistent with hypoglycemia should receive Dextrose or Glucagon.** Dextrose is used to elevate blood sugar but it will not maintain it. The patient will need to follow up with a meal, if not transported to a hospital.
- If the patient is alert and has the ability to swallow; consider administering oral glucose, have patient drink orange juice with sugar or a sugar – containing beverage, or have the patient eat a candy bar or meal.
- Check the patient's blood sugar after the administration of Dextrose, Glucagon, or after any attempt to raise the patient's blood sugar.

Miscellaneous:

- If IV access is successful after Glucagon IM and the patient is still symptomatic, Dextrose 25% 2 mL/kg.
 - IV/IO can be administered.
- Dextrose administration: Neonate: *D10 solution* = (250 mL bag of NS withdraw and discard 50 mL and then add 50 mL of D50 to the 200 mL NS to make D10 solution, give: 5-10 mL/kg).**
- Infants and children: 2 – 4 mL/kg IV of a D25 solution. May be repeated x1 after 5 minutes *D25 solution* = (Mix D50 with 50 mL NS).**

**PEDIATRIC
HEAT ILLNESS**



B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

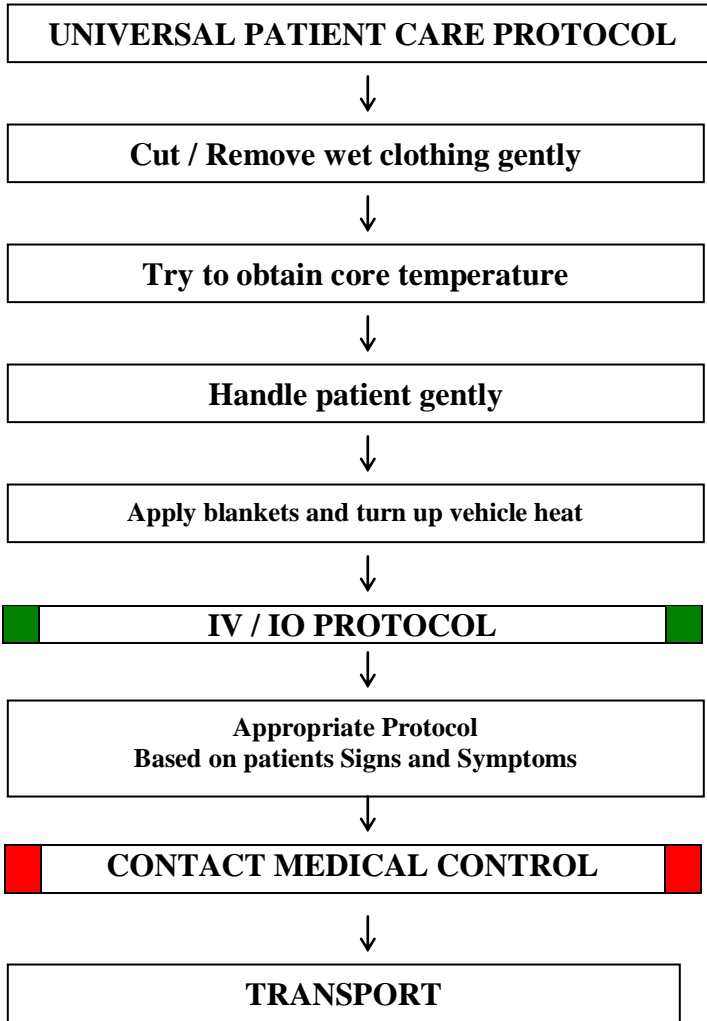
**PEDIATRIC
HEAT ILLNESS**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Age • Exposure to increased temperatures and humidity • Past medical history / medications • Extreme exertion • Time and length of exposure • Poor PO intake • Fatigue and/or muscle cramping 	<ul style="list-style-type: none"> • Altered mental status or unconsciousness • Hot, dry or sweaty skin • Hypotension or shock • Seizures • Nausea 	<ul style="list-style-type: none"> • Fever (infection) • Dehydration • Medications • Hyperthyroidism (Storm) • Delirium tremens (DT's) • Heat cramps • Heat exhaustion • Heat stroke • CNS lesions or tumors
Heat Exhaustion: Dehydration		Heat Stroke: Cerebral Edema
<ul style="list-style-type: none"> • Muscular/abdominal cramping • General weakness • Diaphoresis • Febrile • Confusion • Dry mouth / thirsty • Tachycardia • BP normal or orthostatic 	<ul style="list-style-type: none"> • Confusion • Bizarre behavior • Skin hot, dry, febrile • Tachycardia • Hypotensive • Seizure • Coma 	

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro
- Extremes of age are more prone to heat emergencies (i.e. young and old).
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Sweating generally disappears as body temperature rises above 104 degrees F (40 degrees C).
- Intensive shivering may occur as patient is cooled.
- **Heat Cramps** consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, temperature greater than 104 degrees F (40 degrees C), and altered mental status.
- Patients at risk for heat emergencies include neonates, infants, geriatric patients, and patients with mental illness. Other contributory factors may include heart medications, diuretics, cold medications and/or psychiatric medications.
- Heat exposure can occur either due to increased environmental temperatures or prolonged exercise or a combination of both. Environments with temperature greater than 90 degrees F and humidity greater than 60% present the most risk.
- Heat stroke occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and/or electrolyte imbalances. Be alert for cardiac dysrhythmias for the patient with heat stroke.

**PEDIATRIC
HYPOTHERMIA / FROSTBITE**



B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

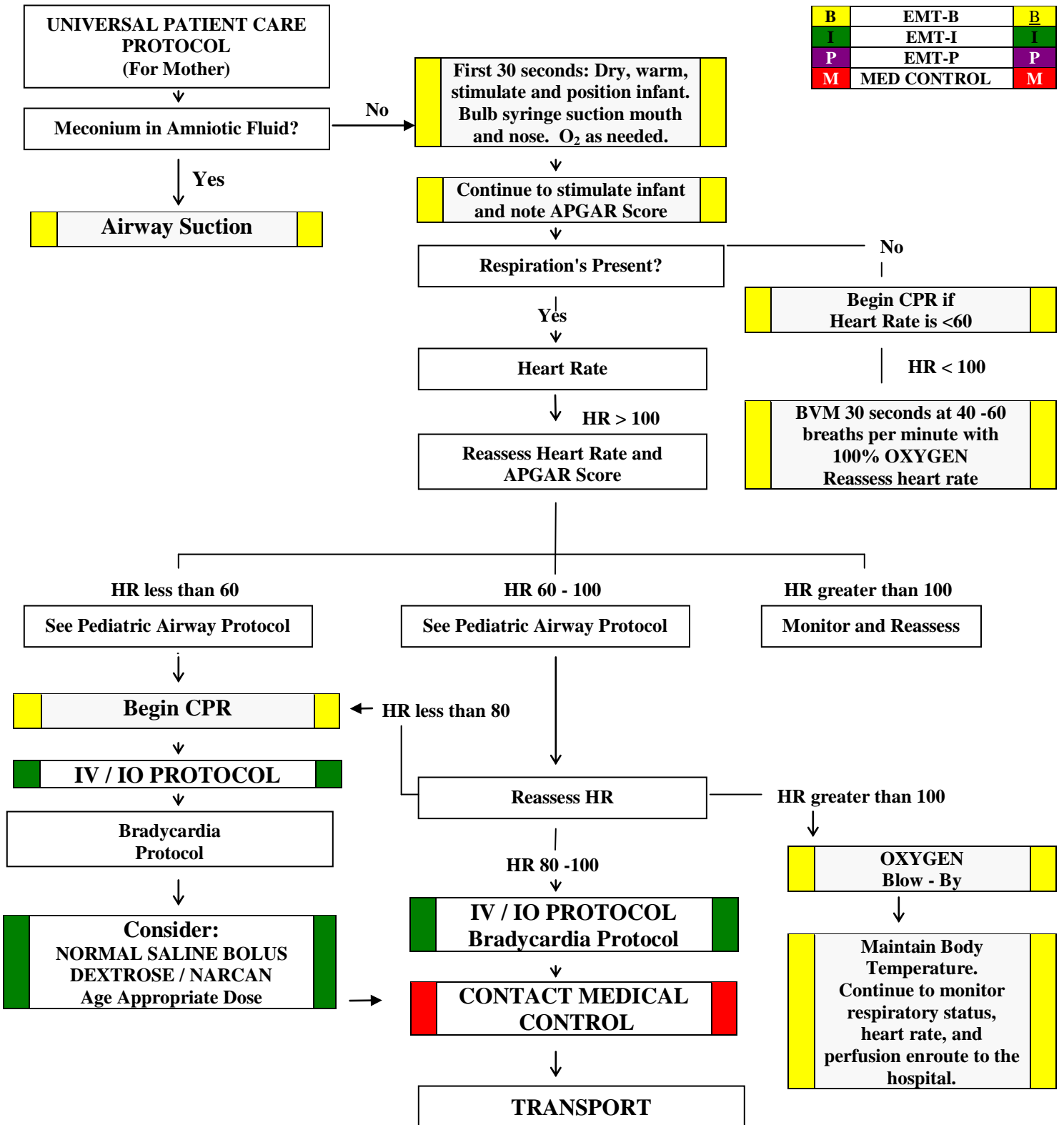
**PEDIATRIC
HYPOTHERMIA / FROSTBITE**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Past medical history • Medications • Exposure to environment even in normal temperatures • Exposure to extreme cold • Extremes of age • Drug use: Alcohol, Barbituates • Infections / Sepsis • Length of exposure / Wetness 	<ul style="list-style-type: none"> • Cold, clammy • Shivering • Mental status changes • Extremity pain or sensory abnormality • Bradycardia • Hypotension or shock 	<ul style="list-style-type: none"> • Sepsis • Environmental exposure • Hypoglycemia • CNS dysfunction • Stroke • Head injury • Spinal cord injury

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro
- Hypothermic / drowning / near drowning patients that appear cold and dead are NOT dead until they are warm and dead, or have other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Defined as core temperature less than 35° C (95° F).
- Extremes of age are more susceptible (i.e. young and old).
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedure and supportive care. Warming procedures include: removing wet clothing, limiting exposure, and covering the patient with warm blankets if available.
- Do not allow patients with frozen extremities to ambulate.
- Superficial frostbite can be treated by using the patient's own body heat.
- Do not attempt to rewarm deep frostbite unless there is an extreme delay in transport, and there is no risk that the affected body part will be refrozen. Contact Medical Control prior to rewarming a deep frostbite injury.
- With temperature less than 31° C (88° F) ventricular fibrillation is common cause of death. Handling patients gently may prevent this (rarely responds to defibrillation).
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 32° C (90° F).
- Hot packs can be activated and placed in the armpit and groin area if available.
- Care should be taken not to place the packs directly against the patient's skin.
- Consider withholding CPR if patient has organized rhythm. Discuss with Medical Control.
- All hypothermic patients should have resuscitation performed until care is transferred, or if there are other signs of obvious death (putrification, traumatic injury unsustainable to life).
- The most common mechanism of death in hypothermia is ventricular fibrillation. If the hypothermia victim is in ventricular fibrillation, CPR should be initiated. If V fib is not present, then all treatment and transport decisions should be tempered by the fact that V fib can be caused by rough handling, noxious stimuli or even minor mechanical disturbances, this means that respiratory support with 100% oxygen should be done gently, including intubation, avoiding hyperventilation.
- The heart is most likely to fibrillate between 85-88 degrees F (29-31 degrees C.) Defibrillate VF / VT at 2J/kg, 4J/kg, 4J/kg with affective CPR intervals. (May give a total of 3 shocks).

**PEDIATRIC
NEONATAL RESUSCITATION**



B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

**PEDIATRIC
NEONATAL RESUSCITATION**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Due date and gestational age • Multiple gestation (twins, etc.) • Meconium • Delivery difficulties • Congenital disease • Medications (maternal) • Maternal risk factors substance abuse smoking 	<ul style="list-style-type: none"> • Respiratory distress • Peripheral cyanosis or mottling (normal) • Central cyanosis (abnormal) • Altered level of responsiveness • Bradycardia 	<ul style="list-style-type: none"> • Airway failure • Secretions • Infection • Maternal medication effect • Hypovolemia • Hypoglycemia • Congenital heart disease • Hypothermia

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro
- Maternal sedation or narcotics will sedate infant (Naloxone effective).
- Consider hypoglycemia in infant.
- Document 1 and 5 minute APGAR scores (see Appendix).
- If the patient is in distress, consider causes such as, hypovolemia. Administer a 20 mL/kg fluid bolus of normal saline.
- If the BGL less than 60 mg/dL go to the Pediatric Diabetic Protocol.
- IV/IO can be administered.
Dextrose administration: Neonate: D10 solution = (250 mL bag of NS withdraw and discard 50 mL and then add 50 mL of D50 to the 200 mL NS to make D10 solution, give: 5-10 mL/kg).
Infants and children: 2 – 4 mL/kg IV of a D25 solution. May be repeated x1 after 5 minutes **D25 solution** = (Mix D50 with 50 mL NS).
- Hypothermia is a common complication of home and field deliveries. Keep the baby warm and dry.
- If there is a history of recent maternal narcotic use, consider Naloxone (Narcan) 0.1 mg/kg every 5 minutes until patient responds.
- Meconium may need to be suctioned several times to clear airway. It may also be necessary to visualize the trachea and suction the lower airway. Lower airway suction is achieved by intubating the infant and using the aspirator each time suctioning is done. This lower airway suction is only done when the infant is NOT vigorous.
- If drying and suction has not provided enough stimulation, try rubbing the infant’s back or flicking their feet. If the infant still has poor respiratory effort, poor tone, or central cyanosis, consider them to be distressed. Most distressed infants will respond quickly to BVM.
- Use caution not to allow newborns to slip from grasp.

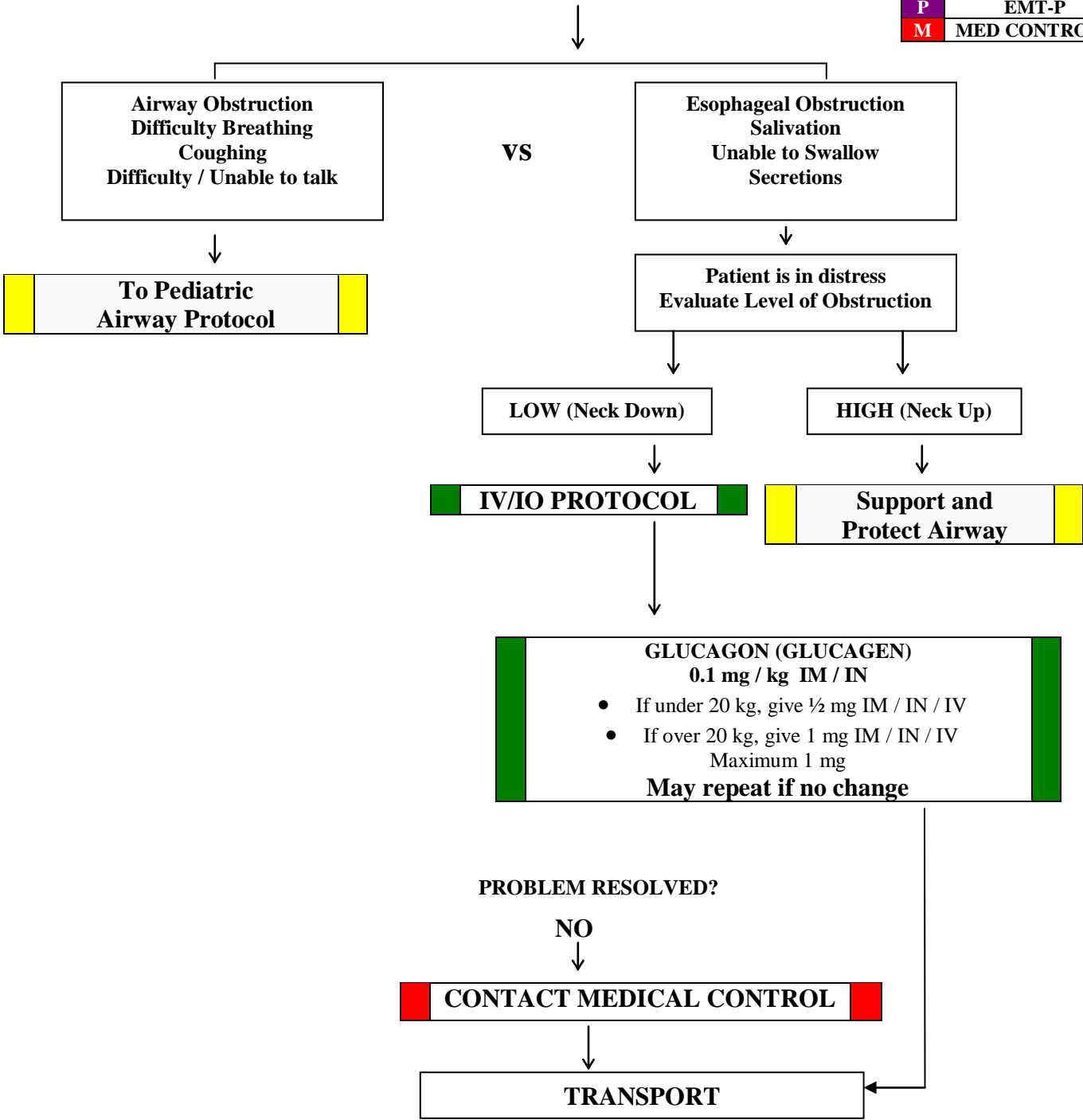
APGAR SCORING

SIGN	0	1	2
Color	Blue / Pale	Pink Body, Blue Extremities	Completely Pink
Heart Rate	Absent	Below 100	Above 100
IRRITABILITY (Response to Stimulation)	No Response	Grimace	Cries
Muscle Tone	Limp	Flexion of Extremities	Active Motion
Respiratory Effort	Absent	Slow and Regular	Strong Cry

**PEDIATRIC
ESOPHAGEAL FOREIGN BODY OBSTRUCTION**

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



**PEDIATRIC
ESOPHAGEAL FOREIGN BODY OBSTRUCTION**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Onset during eating or swallowing pills, etc. 	<ul style="list-style-type: none"> • Salivation • Unable to swallow secretions • Distressed patient • Able to breathe but may feel impaired 	<ul style="list-style-type: none"> • Airway obstruction, coughing, unable to speak, difficulty breathing

GENERAL CONSIDERATIONS:

- Rule out airway obstruction first.
- Patient may be helpful in identifying location of bolus obstruction as they can feel it, point to it.
- If bolus is located in neck area, glucagon will not work, just monitor and transport.
- If bolus located from neck down, proceed with glucagon treatment.

MEDICAL PROTOCOLS
PEDIATRIC SEIZURE

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

Position on side to prevent aspiration

Febrile?

Yes
↓
Cooling Measures

No

Blood Glucose Analysis

IV / IO PROTOCOL

Evidence of Shock or Trauma?

See
Appropriate
Protocol

Glucose less than
60

Active Seizure?

ORAL GLUCOSE
5-10 g (1/2 Tube)
(If intact gag reflex with
no IV access)
If no airway compromise

GLUCAGON (GLUCAGEN)
0.1 mg / kg IM / IN

- If under 20 kg, give ½ mg IM
- If over 20 kg, give 1 mg IM
Maximum 1 mg

DEXTROSE 25% (D25)
2 mL / kg IV/IO
(Give age appropriate dosage)
IV/IO can be administered:
Dextrose administration: Neonate: D10 solution = (250 mL bag NS withdraw and discard 50 mL and then add 50 mL of D50 to the 200 mL NS to make D10 solution, give: 5-10 mL/kg).
Infants and children: 2-4 mL/kg IV of a D25 solution. May be repeated x1 after 5 minutes
D25 solution= (Mix D50 with 50 mL NS).

DIAZEPAM (VALIUM) IV 0.2 mg /kg slow or administered rectally
Maximum dose 10 mg
OR
MIDAZOLAM (VERSED) IV 0.1 mg / kg slow
(2 mg / 2 ml concentration)
Max dose 4 mg
OR
MIDAZOLAM (VERSED)
Atomized IN 0.1 mg / kg
Use: (5 mg / 1 ml concentration)
Max dose 5 mg
Administer half of the total volume in each nostril

Do Not Confuse MIDAZOLAM (VERSED) Concentrations

CONTACT MEDICAL CONTROL

TRANSPORT

PEDIATRIC SEIZURE

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Fever • Prior history of seizures • Seizure medications • Reported seizure activity • History of recent head trauma • Congenital anomaly 	<ul style="list-style-type: none"> • Observed seizure activity • Altered mental status • Hot, dry skin or elevated body temperature 	<ul style="list-style-type: none"> • Fever • Infection • Head trauma • Medication or Toxin • Hypoxia or Respiratory failure • Hypoglycemia • Metabolic abnormality / acidosis • Tumor

Categories of Seizures

Complex – Unconscious	Focal – Partial, Localized
Simple – Conscious	Generalized – All Body
Complex Focal	Simple Focal
Complex Generalized	Simple Generalized

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro
- Status Epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Partial seizures** involve only a part of the brain and therefore only a part of the body:
 - **Simple partial (Jacksonian) seizures** have a motor (movement) component that is located in one portion of the body. Children with these seizures remain awake and alert. Movement abnormalities can “march” to other parts of the body as the seizure progresses.
 - **Complex partial seizures** are similar, except that the child is not aware of what is going on. Frequently, children with this type of seizure repeat an activity, such as clapping, throughout the seizure. They have no memory of this activity. After the seizure ends, the child is often disoriented in a state known as the postictal period.
- **Generalized seizures** involve a much larger portion of the brain. They are grouped into 2 types: convulsive (muscle jerking) and nonconvulsive with several subgroups:
 - **Convulsive seizures** are noted by uncontrollable muscle jerking lasting for a few minutes- usually less than 5- followed by a period of drowsiness that is called the postictal period. The child should return to his or her normal self except for fatigue within around 15 minutes. Often the child may have incontinence (lose urine or stool), and it is normal for the child not to remember the seizure. Sometimes the jerking can cause injury, which may range from a small bite on the tongue to a broken bone.
 - **Tonic seizures** result in continuous muscle contraction and rigidity, while tonic-clonic seizures involve alternating tonic activity with rhythmic jerking of muscle groups.
 - **Infantile spasms** commonly occur in children younger than 18 months. They are often associated with mental retardation and consist of sudden spasms of muscle groups, causing the child to assume a flexed stature. They are frequent upon awakening.

**PEDIATRIC
SEIZURE Continued**

- **Absence seizures**, also known as **petit mal seizures**, are short episodes during which the child stares or eye blinks, with no apparent awareness of their surroundings. These episodes usually do not last longer than a few seconds and start and stop abruptly; however, the child does not remember the event at all. These are sometimes discovered after the child's teacher reports daydreaming, if the child loses his or her place while reading or misses instructions for assignments.
- **Status epilepticus** is either a seizure lasting **longer than 30 minutes** or repeated seizures without a return to normal in between them. It is most common in children younger than 2 years, and most of these children have generalized tonic-clonic seizures. Status epilepticus is very serious. With any suspicion of long seizure, you should call 911.
- Be prepared to assist ventilations especially if a Benzodiazepine such as valium or versed is used.
- If evidence or suspicion of trauma, spine should be immobilized.
- If febrile, remove clothing and sponge with room temperature water.
- **In an infant, a seizure may be the only evidence of a closed head injury.**

MEDICAL PROTOCOLS
PEDIATRIC SHOCK (NON-TRAUMATIC)

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

Evidence or history of trauma
 Yes → **Pediatric Trauma Protocol**

No

IV / IO PROTOCOL

Anaphylaxis

Hypovolemic / Septic / Neurogenic

ASSIST PATIENT WITH PERSONAL EPI PEN

NORMAL SALINE BOLUS 20 ml / kg

Respiratory Distress

Allergic Reaction Hives

Monitor and Reassess

EPINEPHRINE
 0.1 mg / kg subcut. / IM
 1:1000 Solution
 Maximum Dose 0.5 mg

EPINEPHRINE
 0.1 mg / kg subcut. / IM
 1:1000 Solution
 Maximum Dose 0.5 mg

Blood Glucose Analysis

BENADRYL
 1 mg/kg slow
 IV / IM / IO

BENADRYL
 1 mg/kg slow
 IV / IM / IO

Glucose less than 60

Wheezes

Impending Full Arrest & Hypotensive

ORAL GLUCOSE
 5-10 g (1/2 Tube)
 (If intact gag reflex with no IV access)
 If no airway compromise

ALBUTEROL (if wheezing)
 2.5 mg Nebulized @ 6 L O₂ Give
 1/2 dose if less than 10 kg. wt.

EPINEPHRINE
 0.01 mg / kg IV/IO
 1:10,000 Solution

GLUCAGON (GLUCAGEN)
 0.1 mg / kg IM / IV / IN
 • If under 20 kg, give 1/2 mg IM
 • If over 20 kg, give 1 mg IM
 Maximum 1 mg
May repeat if no change.

DOPAMINE
 2-20 mcg /kg

DEXTROSE 25% (D25)
 2-4 mL / kg IV/IO
 (Give age appropriate dosage)

FLUID BOLUS
 For Perfusion if needed

Consider titrate to effect for neurogenic, cardiogenic, septic, or anaphylactic

CONTACT MEDICAL CONTROL

IV/IO can be administered:
Dextrose administration: Neonate: D10 solution = (250 mL bag NS withdraw and discard 50 mL and then add 50 mL of D50 to the 200 mL NS to make D10 solution, give: 5-10 mL/kg).
Infants and children: 2-4 mL/kg IV of a D25 solution. May be repeated x1 after 5 minutes
D25 solution= (Mix D50 with 50 mL NS).

TRANSPORT

**PEDIATRIC
SHOCK (NON-TRAUMATIC)**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Blood loss • Fluid loss • Vomiting • Diarrhea • Fever • Infection 	<ul style="list-style-type: none"> • Restlessness, confusion, weakness • Dizziness • Increased HR, rapid pulse • Decreased BP • Pale, cool, clammy skin • Delayed capillary refill 	<ul style="list-style-type: none"> • Trauma • Infection • Dehydration • Vomiting • Diarrhea • Fever • Congenital heart disease • Medication or Toxin

ALLERGIC REACTION / ANAPHYLAXIS

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Onset and location • Insect sting or bite • Food allergy / exposure • Medication allergy / exposure • New clothing, soap, detergent • Past history of reactions • Past medical history • Medication history 	<ul style="list-style-type: none"> • Warm, burning feeling • Itching • Rhinorrhea • Hoarseness • Stridor • Wheezing • Respiratory distress • Altered LOC / Coma • Cyanosis • Pulmonary Edema • Facial / Airway Edema • Urticaria / Hives • Dyspnea 	<ul style="list-style-type: none"> • Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock (vascular effect) • Angioedema (drug induced) • Aspiration / Airway obstruction • Vasovagal event • Asthma

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro
- Consider all possible causes of shock and treat per appropriate protocol.
- Decreasing heart rate is a sign of impending collapse.
- Most maternal medications pass through breast milk to the infant. Examples: Narcotics, Benzodiazepines.
- Be sure to use the appropriate sized BP cuff.
- Findings in the primary assessment should alert you that the patient is in shock. Pay particular attention to the patient's mental status, tachycardia, skin color, and capillary refill.
- Shock is not only caused by blood loss. The EMT must evaluate for fluid loss from other causes such as excessive vomiting and/or diarrhea, heat exposure and malnutrition.
- Do not use only the patient's blood pressure in evaluating shock; also look for lower body temperature, poor capillary refill, decreased LOC, increased heart rate and/or poor skin color or turgor.
- Routinely reassess the patient and provide supportive care.
- Use caution when using Epinephrine for patients with a cardiac history.
- Use caution when using Epinephrine for patients with a heart rate greater than 150 bpm.

MEDICAL PROTOCOLS
PEDIATRIC
TOXIC INGESTION / EXPOSURE / OVERDOSE

UNIVERSAL PATIENT CARE

↓
 See Pediatric Airway Protocol

IV / IO PROTOCOL

↓
Check Blood Glucose Level

↓
Cardiac Monitor

↓
CAUSE?

↓
Respiratory Depression
NARCAN
0.1 mg / kg IV / IM / IO / IN

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

**Hypotension,
 Seizures,
 Dysrhythmias,
 Mental Status Change
 Respiratory Depression**

**TREAT PER
 APPROPRIATE
 PROTOCOL**

**Beta Blocker or Calcium
 Channel Blocker Overdose
 (Bradycardic)**

**Immediate Transcutaneous
 Pacing for Severe Cases
 Hypotension / AMS**

**GLUCAGON (GLUCAGEN)
 0.1 mg / kg IV / IN / IM
 For Mild / Moderate
 Beta Blocker Bradycardia
 Cases Only
 Max Dose 3 mg**

**NORMAL SALINE
 Bolus to Maintain SBP 90**

**DOPAMINE (INTROPIN)
 2-20 mcg /kg / min IV Drip
 For Severe Cases or Not
 Responding to Treatment**

**Tricyclic Ingestion
 (Wide QRS)**

**Patient noted to be on any TRICYCLIC
 listed below and QRS complex wider than
 .12 msec**

Brand Name	Generic Name
Adapin	doxepin
Anafranil	clomipramine
Elavil	amitriptyline
Endep	amitriptyline
Ludiomil	maprotiline
Norpramin	desipramine
Pamelor	nortriptyline
Pertofrane	desipramine
Sinequan	doxepin
Surmontil	trimipramine
Tofranil	imipramine
Vivactil	protriptyline

**SODIUM BICARBONATE 1 mEq / kg
 IV/IO
 Diluted 1:1 in Normal Saline
 (until the QRS complex narrows to less
 than .12 msec and the patient condition
 improves)**

**Tricyclic Ingestion
 (Wide QRS)**

**ATROPINE
 0.02 mg / kg IV / IO
 Repeat every 3-5 minutes**

Atropine is Given to:

- Dry Secretions
- Improve respirations

**NO MAX DOSE – Give
 As Needed to Maintain
 Airway and Breathing**

CONTACT MEDICAL CONTROL

TRANSPORT

**PEDIATRIC
TOXIC INGESTION / EXPOSURE / OVERDOSE**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> ● Ingestion or suspected ingestion of a potentially toxic substance ● Substance ingested, route, quantity ● Time of ingestion ● Reason (suicidal, accidental, criminal) ● Available medications in home ● Past medical history, medications 	<ul style="list-style-type: none"> ● Mental status changes ● Hypo / Hypertension ● Decreased respiratory rate ● Tachycardia, dysrhythmias ● Seizures 	<ul style="list-style-type: none"> ● Tricyclic antidepressants (TCAs) ● Acetaminophen (Tylenol) ● Depressants ● Stimulants ● Anticholinergic ● Cardiac medications ● Solvents, Alcohols, cleaning agents ● Insecticides (organophosphates) ● Respiratory depression ● Other Organophosphates ● Carbamates

COMMON BETA BLOCKERS			
Acebutolol	Carvedilol	Labetolol	Propranolol
Atenolol	Coreg	Levator	Sectral
Betapace	Corgard	Lopressor	Sotalol
Betoxolol	Esmolol	Metoprolol	Tenormin
Bisoprolol	Inderal	Nadolol	Timolol
Brevibloc	Innopran XL	Nebivolol	Trandate
Bystolic	Kerlone	Pindolol	Zabeta
COMMON CALICUM CHANNEL BLOCKERS			
Acalas	Cardene	Lacidpine	Nitrepin
Adalat	Cardif	Lacipil	Nivadil
Amlodipine	Cardizem	Landel	Norvasc
Arandipine	Cilindipine	Lercanipine	Plendil
Atelec	Cinalong	Madipine	Pranidipine
Azelmidipine	Clevidipine	Manidipine	Procardia
Barnidipine	Cleviprex	Motens	Procorum
Baylotensin	Coniel	Nicardipine	Sapresta
Baymycard	Diltiazem	Nifedipine	Siscard
Benidipine	Efonidipine	Nilvadipine	Sular
Calan	Felodipine	Nimodipine	Syscor
Calblock	Gallopamil	Nimotop	Verapamil
Calslot	HypoCa	Nisoldipine	Zanidip
Carden SR	Isoptin	Nitrendipine	

Reference: Greater Cleveland Poison Control Center 1-800-222-1222

KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, and emesis to ED.
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea / vomiting. If not detected and treated, causes irreversible liver failure.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, and seizures
- **Anticholinergics:** increased HR, increased temperature, dilated pupils, and mental status changes.
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- If it can be done safely, take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport.
- If applicable, DO NOT transport a patient to the hospital until proper decontaminated.
- Medical Direction may order antidotes for specific ingestions.
- **DO NOT** use syrup of ipecac.

**PEDIATRIC
TRAUMA EMERGENCIES****The Golden Hour**

**THE GOLDEN HOUR FOR THE PATIENT BEGINS WHEN THE TRAUMA HAPPENS.
DO NOT WASTE VALUABLE TIME ON SCENE.**

International Trauma Life Support (ITLS)**GUIDELINES FOR LOAD AND GO TRAUMA TRANSPORTS:****Initial Assessment reveals:**

- Altered mental status
- Abnormal respirations
- Abnormal circulation

Signs discovered during the Rapid Trauma Survey of conditions that rapidly lead to shock:

- Abnormal chest exam (flail, open, tension, pneumothorax)
- Tender, distended abdomen
- Pelvic instability
- Bilateral femur fractures
- Significant mechanism of injury and/or poor general health of patient.

GENERAL CONSIDERATIONS:

- A trauma victim is considered to be a pediatric patient if they are 15 years old or younger.
- Once the patient is determined to be an actual or potential major trauma / multiple system patient, personnel on scene and/or Medical Control must quickly determine the appropriate course of action including:
 1. Requesting aeromedical evacuation from scene. See: Aeromedical Transport Procedure.
 2. Ground transportation directly to an appropriate facility.
- Major Trauma patients are to be transported to the closest Trauma Center.
- Contact the receiving hospital for all major trauma or critical patients.
- Cover open wounds, burns, and eviscerations.
- With the exception of airway control, initiate ALS enroute when transporting major trauma patients.
- If the EMT is unable to establish an airway and ventilate, transport to the closest facility for airway stabilization.
- The on scene time for major trauma patients should not exceed 10 minutes without a documented, acceptable reason for the delay.
- All major trauma patients should receive oxygen administration; large bore IV(s), cardiac monitoring and capnography.
- Provide a documented reason if an intervention could not be performed.

Mass Casualty Incidents (MCI)

- Upon arrival at a MCI, the first arriving unit should notify their dispatch of the need to implement the Mass Casualty Plan, call for additional resources, establish a safe staging area, and estimate the total number of victims.
- If nerve agent / terrorist incident is suspected, consider use of the DuoDote®.
- Each EMS service has a pre-defined coordinating hospital based on their county's mass casualty plan. It is the responsibility of the responding jurisdiction to notify their appropriate coordinating hospital as soon as possible, giving a brief description of the incident and the estimated number of victims. The coordinating hospital will then notify the receiving hospitals of the MCI. The transportation officer should maintain a constant contact with the coordinating hospital until the scene has been cleared of salvageable victims.

PEDIATRIC TRAUMA GUIDELINES

Emergency medical service personnel shall use the following criteria, consistent with their certification, to evaluate whether an injured person qualifies as an adult trauma victim or pediatric trauma victim, in conjunction with the definition of trauma according to the State of Ohio Trauma Triage Guidelines.

An Adult Trauma Victim is a person 16 years of age or older exhibiting one or more of the following physiologic or anatomic conditions:

<u>Physiologic conditions</u>	<u>Anatomic conditions</u>
<ul style="list-style-type: none"> ● Glasgow Coma Scale less than 13 ● Loss of consciousness greater than 5 minutes ● Deterioration in level of consciousness at the scene or during transport ● Failure to localize to pain ● Respiratory rate less than 10 or greater than 29 ● Requires endotracheal intubation ● Requires relief of tension pneumothorax ● Pulse greater than 120 in combination with evidence of hemorrhagic shock ● Systolic blood pressure less than 90, or absent radial pulse with carotid pulse present 	<ul style="list-style-type: none"> ● Penetrating trauma to the head, neck, or torso ● Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise ● Injuries to the head, neck, or torso where the following physical findings are present: <ul style="list-style-type: none"> ● Visible crush injury ● Abdominal tenderness, distention, or seatbelt sign ● Pelvic fracture ● Flail chest ● Injuries to the extremities where the following physical findings are present: <ul style="list-style-type: none"> ● Amputations proximal to the wrist or ankle ● Visible crush injury ● Fractures of proximal long bones ● Evidence of neurovascular compromise <ul style="list-style-type: none"> ● Signs or symptoms of spinal cord injury ● 2nd or 3rd degree greater than 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway ● Injury sustained in two or more body regions

Field Trauma Triage Criteria: Mechanism of Injury (MOI) & Special Considerations

<u>Co-Morbid Diseases and Special Considerations:</u>	<u>Mechanisms of Injury (MOI)</u>
<ul style="list-style-type: none"> ● Age less than 5 or greater than 55 ● Cardiac disease ● Respiratory disease ● Diabetes ● Immunosuppression ● Morbid obesity ● Pregnancy ● Substance abuse / intoxication ● Liver disease ● Renal disease ● Bleeding disorder / anticoagulation 	<ul style="list-style-type: none"> ● High speed MVC ● Ejection from vehicle ● Vehicle rollover ● Death in same passenger compartment ● Extrication time greater than 20 minutes ● Falls greater than 20 feet ● Vehicle versus bicycle / pedestrian ● Pedestrian struck, thrown or run over ● Motorcycle crash greater than 20 mph with separation of rider from bike ● Fall from any height, including standing with signs of traumatic brain injury

PEDIATRIC TRAUMA GUIDELINES

GENERAL CONSIDERATIONS:

Exceptions to Mandatory Transport to a Trauma Center:

Emergency medical service personnel shall transport a trauma victim directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:

1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center.
2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time.
3. Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources.
4. No appropriate adult or pediatric trauma center is able to receive and provide adult or pediatric trauma care to the trauma victim without undue delay.
5. Before transport of a patient begins, the patient requests to be taken to a particular hospital that is not a trauma center or, if the patient is less than eighteen years of age or is not able to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

TRAUMA ALERT PROCEDURE

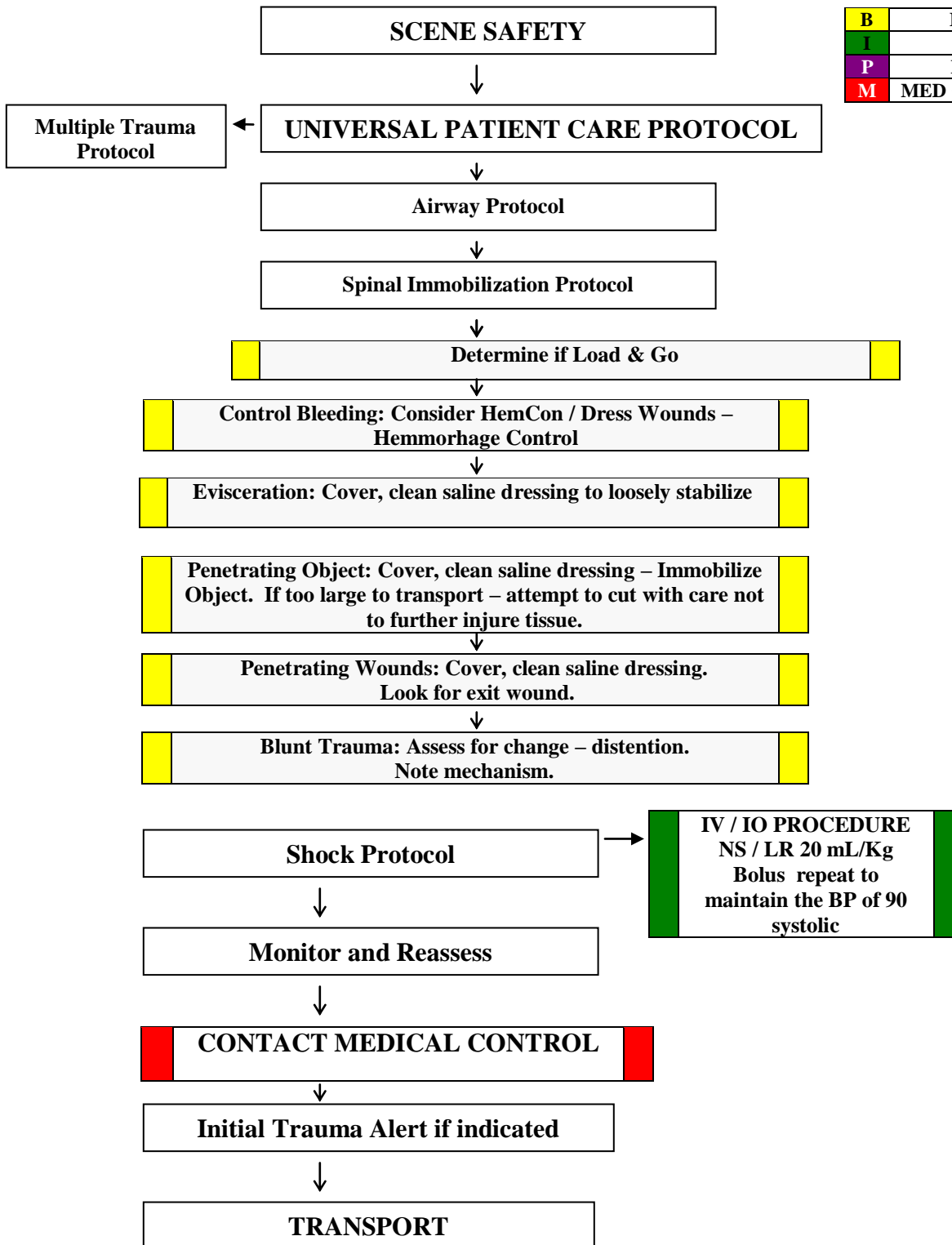
1. EMS Pre-hospital response – verbalize “trauma” initially when placing call
2. EMS Notifies ED of Potential Trauma Victim(s)
3. EMS Notifies ED - Trauma patient(s) Report / GCS given / destination decided
4. ED Charge Nurse notifies ED Doctor activates “Trauma Alert”
5. Patient Enroute to Hospital - ETA given
6. Arrival of patient(s)
7. Team Care / treatment

Glascow Coma Scale				
INFANT <i>Birth to age 4</i>			ADULT <i>Age 4 to Adult</i>	
4	Spontaneously	<u>Eye Opening</u>	Spontaneously	4
3	To speech		To command	3
2	To pain		To pain	2
_____ 1	No response		No Response	1 _____
5	Coos, babbles	<u>Best Verbal Response</u>	Oriented	5
4	Irritable cries		Confused	4
3	Cries to pain		Inappropriate words	3
2	Moans, grunts		Incomprehensible	2
_____ 1	No response		No response	1 _____
6	Spontaneous	<u>Best Motor Response</u>	Obeys commands	6
5	Localizes pain		Localizes pain	5
4	Withdraws from pain		Withdraws from pain	4
3	Flexion (decorticate)		Flexion (decorticate)	3
2	Extension (decerebrate)		Extension (decerebrate)	2
_____ 1	No response		No response	1 _____
_____ =	TOTAL	GCS less than 8? Intubate!	TOTAL =	_____

TRAUMA

PEDIATRIC ABDOMINAL TRAUMA

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



TRAUMA
PEDIATRIC BURNS

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL

↓
See Airway Protocol

↓
Consider Spinal Immobilization

↓
Remove rings, bracelets, and other constricting items

Thermal

Chemical

↓
**If burn less than 10% body surface area (using rule of nines)
Cool down wound with NORMAL SALINE**

↓
Flush areas with NORMAL SALINE for 10 – 15 minutes

↓
Cover burn with dry sterile sheet dressings

↓
Flush eyes with NORMAL SALINE for 10 – 15 minutes

↓
**IV / IO PROTOCOL
NORMAL SALINE IV BOLUS**

↓
Eye Injury, Tetracaine eye drops then continuous flushing with Normal Saline.

↓
Pain Control Protocol

↓
Remove clothing and/or expose area

↓
CONTACT MEDICAL CONTROL

↓
TRANSPORT

PEDIATRIC BURNS

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Type of exposure (heat, gas, chemical) • Inhalation injury • Time of injury • Past medical history • Medications • Other trauma • Loss of consciousness • Tetanus / Immunization status 	<ul style="list-style-type: none"> • Burns, pain, swelling • Dizziness • Loss of consciousness • Hypotension / shock • Airway compromise / distress • Singed facial or nasal hair • Hoarseness / wheezing 	<ul style="list-style-type: none"> • Superficial (1°) red and painful • Partial thickness (2°) superficial partial thickness, deep partial thickness, blistering • Full thickness (3°) painless and charred or leathery skin • Chemical • Thermal • Electrical • Radiation

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- Critical Burns: greater than 25% body surface area (BSA), full thickness burns greater than 10% BSA, partial thickness superficial partial thickness, deep partial thickness and full thickness burns to face, eyes, hand or feet, genitals, joints, electrical burns, respiratory burns, deep chemical burns, burns with extremes of age or chronic disease, and burns with associated major traumatic injury. These burns may require hospital admission or transfer to a burn center.
- **Early intubation is required in significant inhalation injuries; also apply cardiac monitor and treat arrhythmia, especially with electrical burns.**
 - Potential CO exposure should be treated with 100% oxygen. Provide endotracheal intubation per procedure protocol.
 - Circumferential burns to extremities are dangerous due to potential vascular compromise.
 - Burn patients are prone to hypothermia – Never apply ice or cool burns that involve greater than 10% body surface area.
 - Do not overlook the possibility of multiple system trauma.
 - Do not overlook the possibility of child abuse with children and burn injuries.
 - Pediatric Dose: Morphine 0.1mg/Kg every 5 minutes until pain relieved. (Maximum dose of 10mg in the field.) See appendix for rule of nines.
 - Administer IV fluids per the Parkland Burn Formula: Fluid for first 24 hours (mL) = 4x patient's weight in kg x %BSA.

1. Thermal (dry and moist):

- Stop burning process: i.e., remove patient from heat source, cool skin, remove clothing
- If patient starts to shiver or skin is cool, stop cooling process
- Estimate extent (%) and depth of burn (see chart). Determine seriousness (see chart) of burn. Contact Medical Control, transport accordingly. Cover burn areas with sterile dressing.

2. Radiation Burns:

- Treat as thermal burns except when burn is contaminated with radioactive source, then treat as chemical burn.
- Wear appropriate protective clothing when dealing with contamination.
- Contact HAZ MAT TEAM for assistance in contamination cases.

3. Chemical Burns:

- Wear appropriate protective clothing and respirators.
- Remove patient from contaminated area to decontamination site (NOT SQUAD).
- Determine chemicals involved; contact appropriate agency for chemical information.
- Remove patient's clothing and flush skin.
- Leave contaminated clothes at scene. Cover patient over and under before loading into squad.
- Patient should be transported by personnel not involved in decontamination process.
- Determine severity (see chart), contact Medical Control and transport accordingly.
- Relay type of substance involved to Medical Control.

4. Electrical Burns:

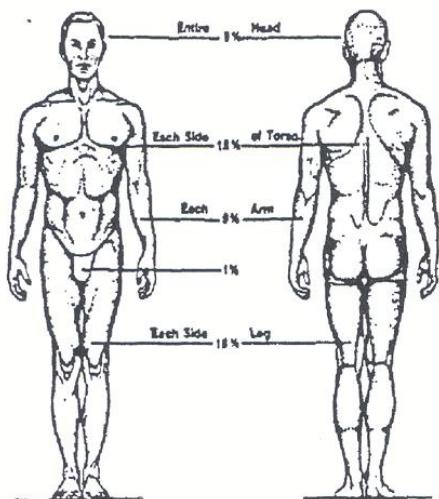
- Shut down electrical source; do not attempt to remove patient until electricity is CONFIRMED to be shut off.
- Assess for visible entrance and exit wounds and treat as thermal burns.
- Assess for internal injury, i.e., vascular damage, tissue damage, fractures, and treat accordingly.
- Determine severity of burn, contact Medical Control and transport accordingly.

5. Inhalation Burns:

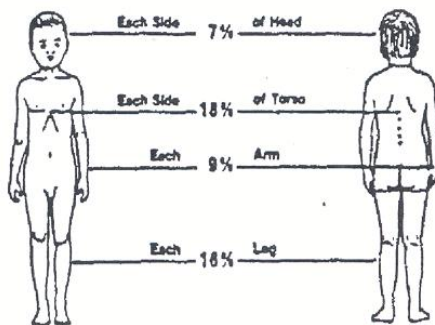
- Always suspect inhalation burns when the patient is found in closed smokey environment and/or exhibits any of the following: burns to face/neck, singed nasal hairs, cough and/or stridor, soot in sputum.
- Provide oxygen therapy, contact Medical Control and transport.
 - Handle patient gently to avoid further damage of the patient's skin.
 - If the patient is exposed to a chemical, whenever possible, get the name of the chemical, and document it on the patient run report. **DO NOT** transport any hazardous materials with the patient.
 - Look for signs of dehydration and shock.
 - Initiate early intubation for symptomatic patients with inhalation burns.
 - Patients with major burns should be transported to the MetroHealth Medical Regional Burn Center.
 - Patients with unstable airway or who are rapidly deteriorating should be transported to the closest appropriate facility.
 - Patients with large surface burns lose the ability to regulate their body temperature. Avoid heat loss by covering the patient.

RULE OF NINES

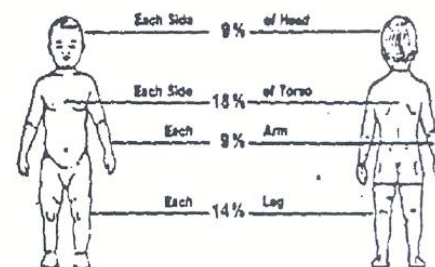
RULE OF NINES



Percentage of Adult Body Surface



Percentage of Child Body Surface



Percentage of Infant Body Surface

1% is equal to the surface of the palm of the patient's hand. If unsure of %, describe injured area.

SERIOUSNESS OF BURNS

MINOR

1st degree < 70%
 2nd degree < 10%
 +3rd degree < 2%

MODERATE

1st degree > 70%
 +2nd degree 10-30%

CRITICAL

2nd degree > 30%
 3rd degree > 2%
 Any burns with trauma.
 Any burns with head, face,
 feet, genitalia involved.

+ Only if hands, face, feet or genitalia are NOT involved

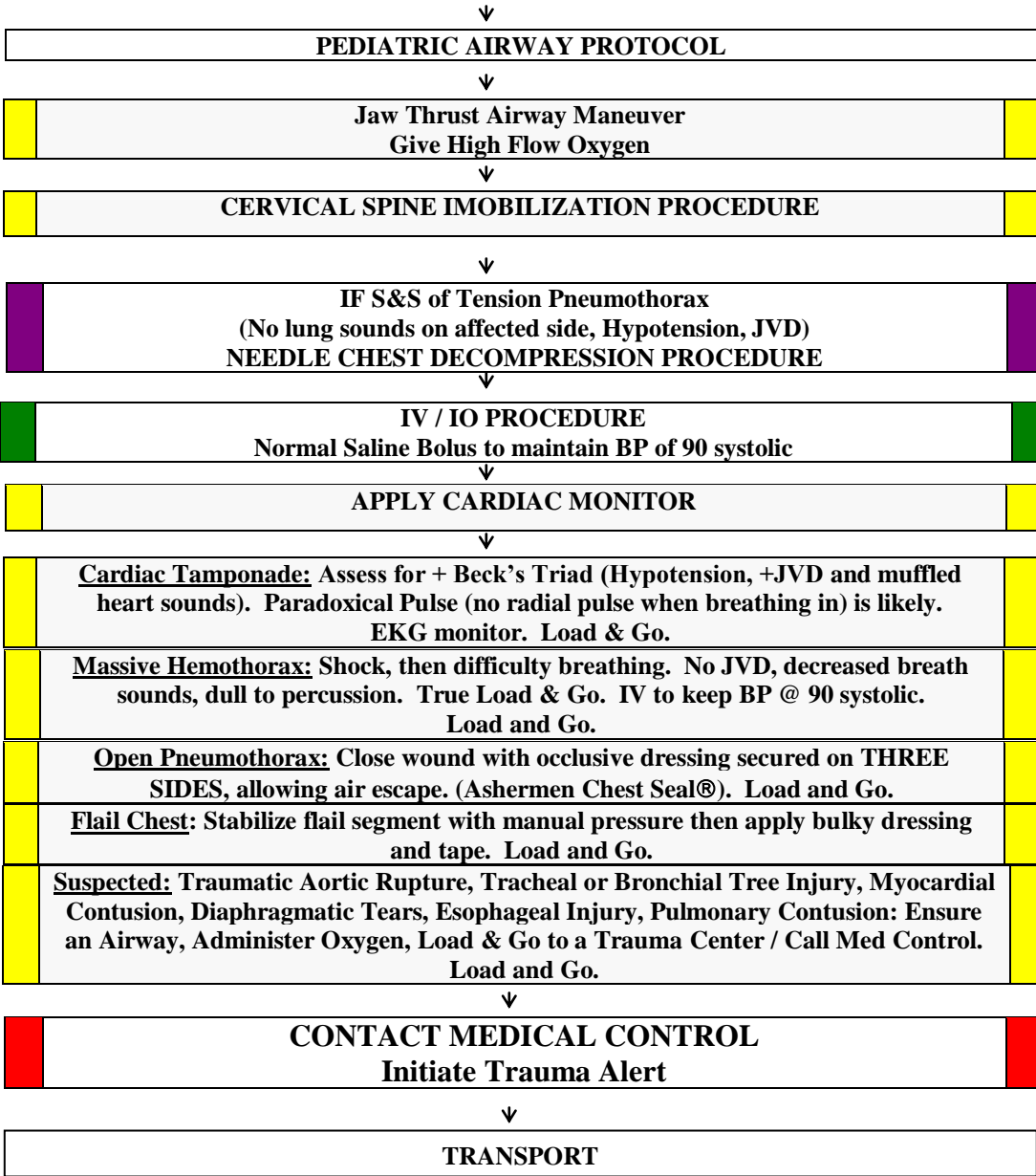
MAJOR BURN CRITERIA

- 2° and 3° burns more than 10% surface area
- burns of the face, hands feet genitalia
- electrical shock with burn injury
- burn with inhalation injury any burn with potential functional or cosmetic impairment

TRAUMA
PEDIATRIC CHEST TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL
C-Spine Immobilization
Evidence of Trauma – Blunt or Penetrating
Abnormal breath sounds, inadequate respiratory rate, Unequal symmetry.
Diminished chest excursion. Cyanosis.

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



PEDIATRIC CHEST TRAUMA

Signs and Symptoms

Simple Pneumothorax	Open Pneumothorax	Tension Pneumothorax	Hemothorax
<ul style="list-style-type: none"> • Shortness of Breath • Dyspnea • Tachypnea • Cyanosis • Chest Pain • Absent / diminished lung sounds on the affected side 	<ul style="list-style-type: none"> • Shortness of Breath • Dyspnea • Cyanosis • Sucking Chest Wound • Shock • Absent / diminished lung sounds on affected side 	<ul style="list-style-type: none"> • Shortness of Breath • Cyanosis • Shock • Absent / diminished lung sounds • Tracheal deviation • Hypotension • JVD • Tachycardia • Dyspnea (late sign) 	<ul style="list-style-type: none"> • Shortness of Breath • Dyspnea • Cyanosis • Dullness to percussion sounds • Flat Neck Veins • Hypotension • Shock • Absent / diminished breath sounds • Tachycardia
CARDIAC TAMPONADE	TRAUMATIC ASPHYXIA	FLAIL CHEST	
<ul style="list-style-type: none"> • Hypotension • Decreasing Pulse Pressure • Elevated Neck Veins • Muffled Heart Tones • Bruising over the Sternum • Tachycardia 	<ul style="list-style-type: none"> • Bloodshot, Bulging Eyes • Blue, Bulging Tongue • JVD • Cyanotic Upper Body 	<ul style="list-style-type: none"> • Paradoxical Chest Wall movement • Asymmetric Chest Movement upon Inspiration • Dyspnea • Unstable Chest Segment • Significant Chest Wall Pain 	

GENERAL CONSIDERATIONS:

Thoracic injuries have been called the deadly dozen. The first six are obvious at the primary assessment:

- | | |
|-----------------------|-------------------------|
| 1. Airway Obstruction | 4. Massive Hemothorax |
| 2. Flail Chest | 5. Open Pneumothorax |
| 3. Cardiac Tamponade | 6. Tension Pneumothorax |

The second six injuries may be more subtle and not easily found in the field:

- | | |
|-----------------------------|--------------------------------------|
| 7. Traumatic Aortic Rupture | 10. Diaphragmatic Tears |
| 8. Esophageal Injury | 11. Tracheal / Bronchial Tree Injury |
| 9. Myocardial Contusion | 12. Pulmonary Contusion |

- **A sucking chest wound** is when the thorax is open to the outside. The occlusive dressing may be anything built in such as, petroleum gauze, plastic, or a defibrillator pad. Asherman Chest Seal ®. May help respirations to place patient on the injured side, allowing unaffected lung to expand easier.
- **A flail chest** is when there are extensive rib fractures present, causing a loose segment of the chest wall resulting in paradoxical and ineffective air movement. This movement must be stopped by applying a bulky pad to inhibit the outward excursion of the segment. Positive pressure breathing via BVM will help push the segment and the normal chest wall out with inhalation and to move inward together with exhalation, getting them working together again. Do not use too much pressure to prevent additional damage or pneumothorax.
- **A Penetrating Object** must be immobilized by any means possible. If it is very large, cutting may be possible, with care taken not to move it about when making the cut. Place an occlusive and bulky dressing over the entry wound.
- **A Tension Pneumothorax** is life threatening, look for hypotension and unequal breath sounds, JVD, increasing respiratory distress, decrease mental status, and lastly, tracheal displacement. The pleura must be decompressed with a needle to provide relief. * Use #18 gauge decompression needle for under 50 kg / 100 lbs. Use either the mid-clavicular (2nd or 3rd intercostals space) or the midaxillary (5th or 6th space) landmarks, going in on the top side of the rib. Once the catheter is placed, watch closely for reocclusion. Repeat if needed.

PEDIATRIC DROWNING / NEAR DROWNING

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

Airway Protocol – Initiate ventilation while patient is still in water if not breathing. Provide high flow oxygen ASAP.

**Spinal Immobilization Protocol
Place backboard while still in water if able.**

IV / IO PROTOCOL

**Apply Cardiac Monitor
If V-Fib – defibrillate per ACLS (AED)**

**IF HYPOTHERMIC – Refer to Protocol
If Cardiac Arrest – May attempt Defib.
BLS only for all else.**

**DECOMPRESSION – give oxygen – no positive pressure unless NOT breathing.
Position on L side with head down.**

Monitor and Reassess

CONTACT MEDICAL CONTROL

**TRANSPORT
To appropriate facility**

PEDIATRIC DROWNING / NEAR DROWNING

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Submersion in water regardless of depth • Possible trauma i.e., fall, diving board • Duration of immersion • Temperature of water • Salt or fresh water 	<ul style="list-style-type: none"> • Period of unconsciousness • Unresponsive • Mental status changes • Decreased or absent vital signs • Vomiting • Coughing 	<ul style="list-style-type: none"> • Trauma • Pre-existing medical problem • Barotrauma (diving) • Decompression sickness

GENERAL CONSIDERATIONS:

- Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro
- Drowning due to suffocation from submersion in water.
- 2 causes – breath holding which leads to aspiration of water, and laryngospasm which closes the glottis.
- Both causes lead to profound hypoxia and death.
- Fresh water drowning ventricular fibrillation may be likely.
- Salt water drowning may cause pulmonary edema in time.
- Pulmonary edema can develop within 24-48 hours after submersion.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- Drowning is a leading cause of death among would-be rescuers.
- Allow appropriately trained and certified rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), consider transport for availability of a hyperbaric chamber.
- All hypothermic / near-drowning patients should have resuscitation performed until care is transferred, or if there are other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Consider a c-spine injury in all drowning cases. Always immobilize a drowning patient.
- In the absence of hypothermia, ACLS protocols are to be followed for drowning patients in cardiac arrest after the submersion.
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedure and supportive care.
- DO NOT perform the Heimlich maneuver to remove water from the lungs prior to resuscitation.

PEDIATRIC EXTREMITY / AMPUTATION TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL

Wound Care / Control Bleeding with Hemmorage Control bandage and direct pressure.

Life or Limb Threatening Event?

Multiple Trauma Pediatric Protocol

Wound Care / Bleeding Control / Splinting
Risk of Exsanguination?
Internally or Externally?
Apply tourniquet around the injured appendage above the level of bleeding. *LABEL/DATE/TIME/direct verbal report to receiving hospitals physician as to: TIME/LOCATION of tourniquet application.

IV / IO PROTOCOL

Pain Management Protocol

Nitrous Oxide per protocol
Self-administered with mask

Morphine Sulfate 0.1 mg/Kg every 4-5 min IVP Titrated to response and resp. rate

Amputation?
Clean amputated part with NS or sterile water. Wrap part in Sterile Dressing and place in plastic bag if able. Place on Ice if available – no direct contact to tissue

CONTACT MEDICAL CONTROL

TRANSPORT

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

PEDIATRIC EXTREMITY / AMPUTATION TRAUMA

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Type of injury • Mechanism: crush / penetrating / amputation • Time of injury • Open vs closed wound / fracture • Wound contamination • Medical history • Medications 	<ul style="list-style-type: none"> • Pain, swelling • Deformity • Altered sensation / motor function • Diminished pulse / capillary refill • Decreased extremity temperature 	<ul style="list-style-type: none"> • Abrasion • Contusion • Laceration • Sprain • Dislocation • Fracture • Amputation

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Extremity, Neuro
- In amputations, time is critical. Transport and notify Medical Control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- If a tourniquet is applied, give a direct verbal report to receiving hospital as to time and location of tourniquet application and document.

Extremity Trauma:

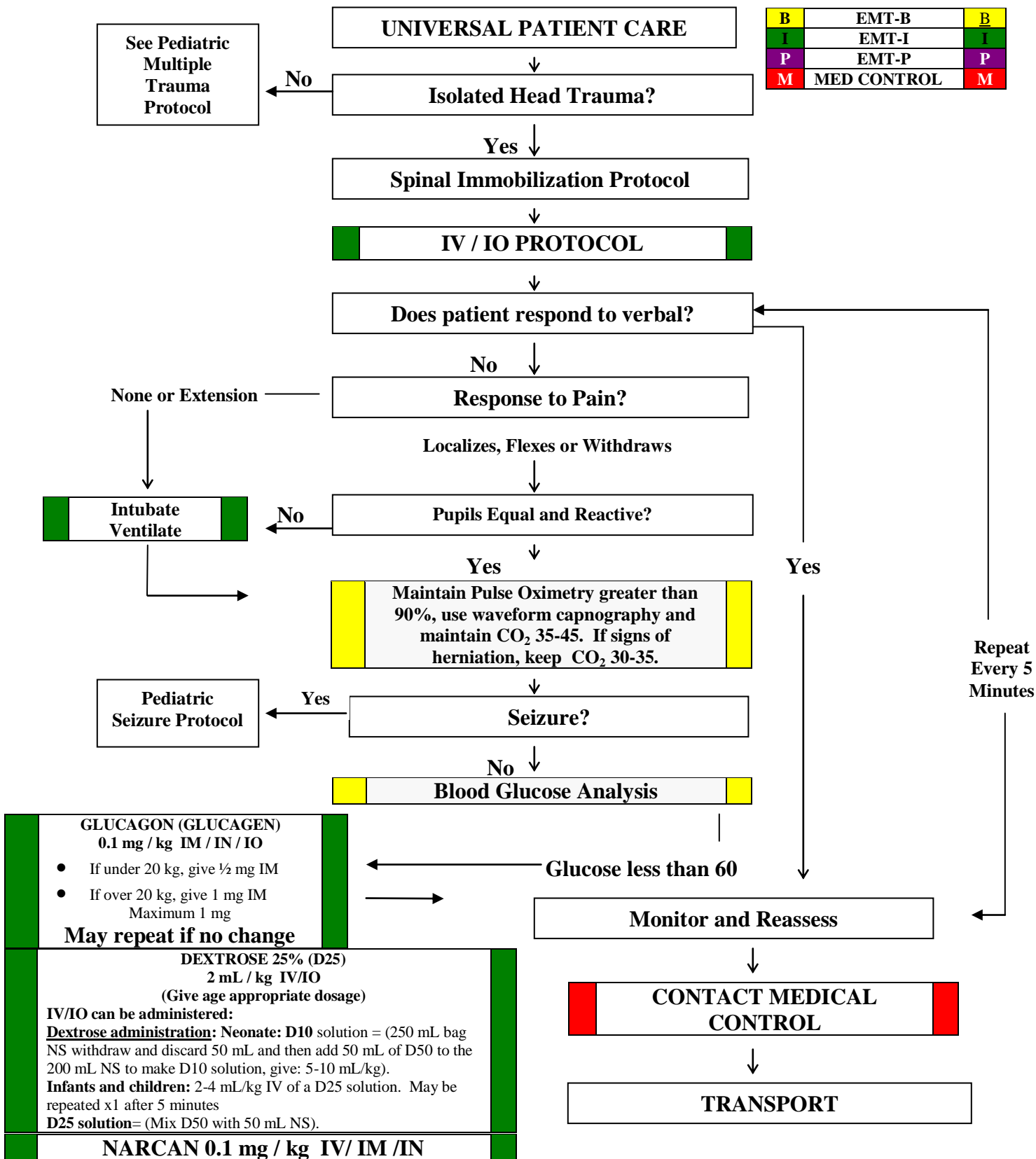
- In cases of major trauma, the backboard can work as a whole body splint.
- DO NOT take the time to splint injured extremities in major trauma patients unless it does not delay the scene time or prevents you from performing more pertinent patient care.
- Splint the extremity if the patient has signs and symptoms of a fracture or dislocation.
- Treat all suspected sprains or strains as fractures until proven otherwise.
- Splint the joint above and below for all suspected fractures.
- Splint the bone above and below for all suspected joint injuries.
- Check and document the patient's MPS before and after splinting.
- A traction splint with a backboard is the preferred splint to use for femur fractures.

Traumatic Amputation:

- Care of the amputated extremity include:
 1. Cleanse an amputated extremity with normal saline.
 2. DO NOT place any amputated tissue directly on ice or cold pack. Instead, wrap amputated limb in moistened sterile dressing with normal saline and place in plastic bag. Put the bag into a container of cool water / ice.
- Contact the receiving hospital with the patient information, and include the status of the amputated limb.
- Focus on patient care and not on the amputated extremity.
- Tourniquets are a last resort.
- Remember to calm and reassure the patient. Do not give the patient or their family members false hope of re-attachment of the affected limb. A medical team at the receiving hospital makes this decision.
- Delegate someone to do an on scene search for the amputated part when it cannot be readily found and continue with patient care.

PEDIATRIC HEAD TRAUMA

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



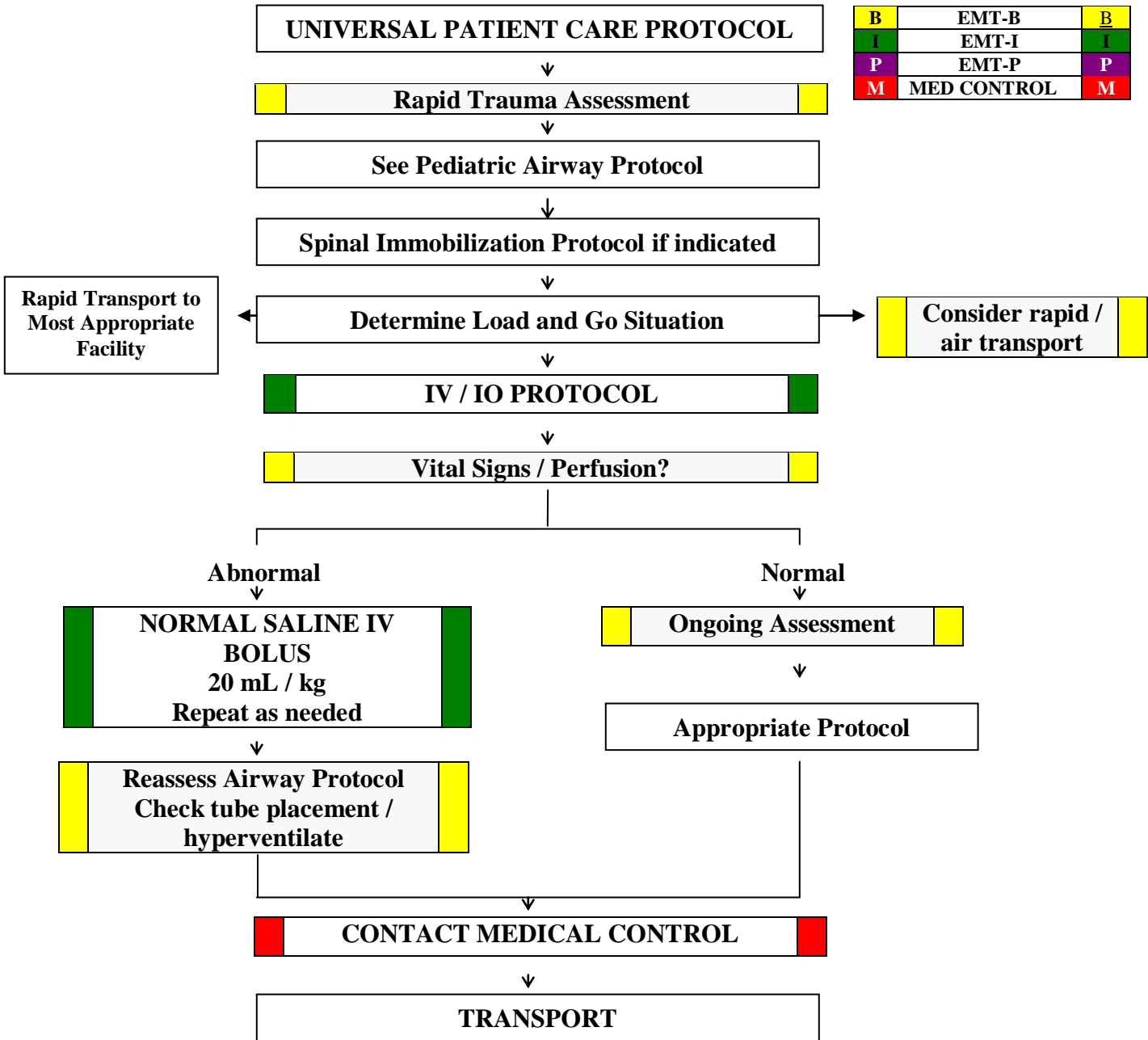
**PEDIATRIC
HEAD TRAUMA**

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time of injury • Mechanism (blunt vs. penetrating) • Loss of consciousness • Bleeding • Past medical history • Medications • Evidence for multi-trauma 	<ul style="list-style-type: none"> • Pain, swelling, bleeding • Altered mental status • Unconscious • Respiratory distress / failure • Vomiting • Major traumatic mechanism of injury • Seizure 	<ul style="list-style-type: none"> • Skull fracture • Brain injury (Concussion, Contusion, Hemorrhage or Laceration) • Epidural hematoma • Subdural hematoma • Subarachnoid hemorrhage • Spinal injury • Abuse

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- If GCS less than 13 consider air / rapid transport and if GCS less than 8, intubation should be anticipated.
- Hyperventilate the patient only if evidence of herniation (blown pupil, decorticate / decerebrate posturing, bradycardia).
- If hyperventilation is needed maintain ETCO₂ = 30-35
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury.
- The most important item to monitor and document is a change in the level of consciousness.
- Concussions are periods of confusion or LOC associated with trauma, which may have resolved by the time EMS arrives. A physician should evaluate ASAP any prolonged confusion or mental status abnormality, which does not return to normal within 15 minutes or any documented loss of consciousness.

TRAUMA PROTOCOLS
PEDIATRIC
MULTIPLE TRAUMA



TRAUMA PROTOCOLS

PEDIATRIC MULTIPLE TRAUMA

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> ● Time and mechanism of injury ● Damage to structure or vehicle ● Location in structure or vehicle ● Others injured or dead ● Speed and details of MVC ● Restraints/Protective equipment, carseat ● Helmet ● Pads ● Ejection ● Past medical history ● Medications 	<ul style="list-style-type: none"> ● Pain, swelling ● Deformity, lesions, bleeding ● Altered mental status ● Unconscious ● Hypotension or shock ● Arrest 	<p><u>Life Threatening:</u></p> <ul style="list-style-type: none"> ● Chest Tension pneumothorax ● Flail chest ● Pericardial tamponade ● Open chest wound ● Hemothorax ● Intra-abdominal bleeding ● Pelvis / Femur fracture ● Spine fracture / Cord injury ● Head injury (see Head Trauma) ● Extremity fracture / dislocation ● HEENT (Airway obstruction) ● Hypothermia

A Pediatric Trauma Victim is a person less than 16 years of age exhibiting one or more of the following physiologic or anatomic conditions:

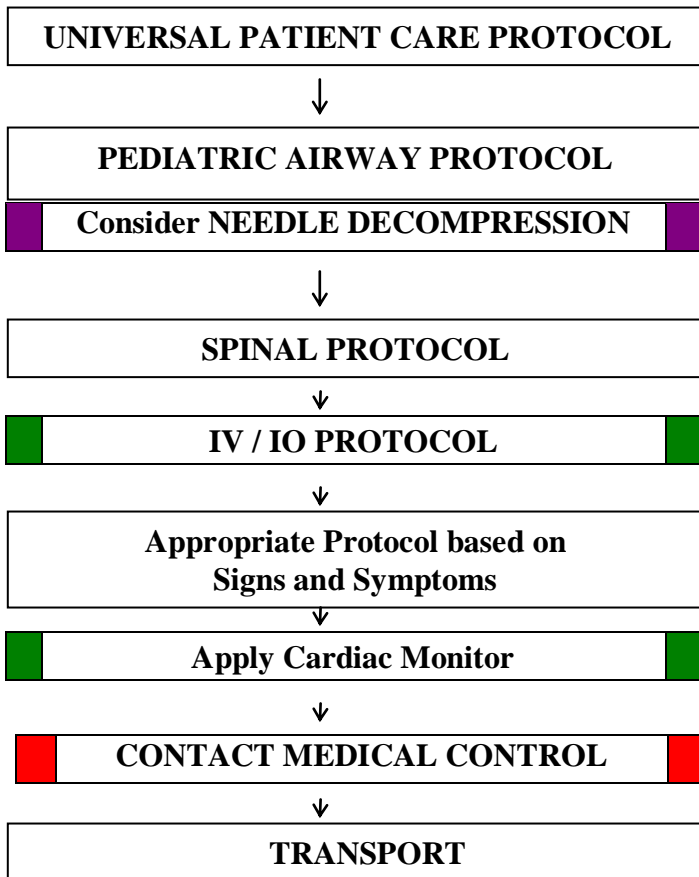
<p><u>Physiologic conditions:</u></p> <ul style="list-style-type: none"> ● Glasgow Coma Scale less than 13 ● Loss of consciousness greater than 5 minutes; ● Deterioration in level of consciousness at the scene or during transport; ● Failure to localize to pain; ● Evidence of poor perfusion, or evidence of respiratory distress or failure. 	<p><u>Anatomic conditions:</u></p> <ul style="list-style-type: none"> ● Penetrating trauma to the head, neck, or torso; ● Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise; ● Injuries to head, neck, or torso where the following physical findings are present; ● Visible crush injury; ● Abdominal tenderness, distention, or seatbelt sign: <ul style="list-style-type: none"> * Pelvic fracture; * Flail chest; ● Injuries to the extremities where the following physical findings are present: <ul style="list-style-type: none"> * Amputations proximal to the wrist or ankle; * Visible crush injury; * Fractures of two or more proximal long bones; * Evidence of neurovascular compromise; ● Signs or symptoms of spinal cord injury; 2nd or 3rd Degree burns greater than 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway.
---	---

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro
- Mechanism is the most reliable indicator of serious injury. Examine all restraints / protective equipment for damage.
- In prolonged extrications or serious trauma consider air transportation for transport times and the ability to give blood.
- Do not overlook the possibility for child abuse.
- A trauma victim is considered to be a pediatric patient if they are 15 years old or younger.
- The Proper size equipment is very important to resuscitation care. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE OR SIMILAR GUIDE) when unsure about patient weight, age and/or drug dosage and when choosing equipment size.
- With the exception of airway control, initiate ALS enroute when transporting major trauma patients.
- If unable to access patient airway and ventilate, then transport to the closest facility for airway stabilization.
- The on scene time for major trauma patients should not exceed 10 minutes without documented, acceptable reason for the delay.
- All major trauma patients should receive oxygen administration, an IV(s), and cardiac monitoring.
- Provide a documented reason if an intervention could not be performed.
- Contact Medical Control as the recommendation might be to transport major trauma pediatric patients to the closest Pediatric Trauma Center (Pediatric Level I Trauma Centers are: Rainbow Babies and Children's, Akron Children's Hospital; MetroHealth Medical Center is a Pediatric Level II Trauma Center).

PEDIATRIC TRAUMA ARREST

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> • Time of injury • Mechanism: blunt / penetrating • Loss of consciousness • Bleeding • Medications • Evidence of multi-trauma 	<ul style="list-style-type: none"> • Excessive bleeding • Unresponsive; not breathing • Cardiac Arrest • Significant mechanism of injury 	<ul style="list-style-type: none"> • Obvious DOA • Death



B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

General Considerations

- Immediately transport traumatic cardiac arrest patients.
- With the exception of endotracheal intubation, traumatic cardiac arrests are “load and go” situations.
- Resuscitation should not be attempted in cardiac arrest patients with hemicorporectomy, decapitation, or total burns, nor in patients with obvious, severe blunt trauma that are without vital signs, pupillary response, or an organized or shockable cardiac rhythm at the scene. Patients in cardiac arrest with deep penetrating cranial injuries and patients with penetrating cranial or truncal wounds associated with asystole and a transport time of more than 15 minutes to a definitive care facility are unlikely to benefit from resuscitative efforts.
- Extensive, time-consuming care of trauma victims in the field is usually not warranted. Unless the patient is trapped, they should be enroute to a Medical Facility within 10 minutes after arrival of the ambulance on the scene.

PEDIATRIC ASSESSMENT CHARTS

**PEDIATRIC
GLASCOW COMA SCALE**

EYE OPENING	CHILD (Age 4 and up)	Infant (Birth to Age 4)	
	Spontaneous	Spontaneous	4
To voice	To voice	3	
To pain	To pain	2	
None	None	1	
VERBAL RESPONSE			
	Oriented	Coos, babbles	5
	Confused	Irritable cry, inconsolable	4
	Inappropriate	Cries to pain	3
	Garbled speech	Moans to pain	2
	None	None	1
MOTOR RESPONSE			
	Obeys commands	Normal movements	6
	Localizes pain	Withdraws to touch	5
	Withdraws to pain	Withdraws to pain	4
	Flexion	Flexion	3
	Extension	Extension	2
Flaccid	Flaccid	1	

- **NOTE: MOTOR RESPONSE IS MOST INDICATIVE OF LEVEL OF INJURY**

PEDIATRIC ASSESSMENT CHARTS

PEDIATRIC

AGE	HEART RATE	RESPIRATIONS	SYSTOLIC BLOOD PRESSURE
Preterm, 1 kg	120-160	30-60	36-66
Preterm 2 kg	120-160	30-60	50-72
Newborn	126-160	30-60	60-70
Up to 1 yr	100-140	30-60	70-80
1-3 yr	100-140	20-40	76-90
4-6 yr	80-120	20-30	80-100
7-9 yr	80-120	16-24	84-110
10-12 yr	60-100	16-20	90-120
13-14 yr	60-90	16-20	90-120
15 + yr	60-90	14-20	90-130

Blood pressure is a late and unreliable indicator of shock in children.

PEDIATRIC			
PHARMACOLOGY REVIEW			
MEDICATION	DOSE	ROUTE	REMARKS
Acetaminophen (Tylenol)	10 mg/kg	PO	Useful for musculoskeletal pain and fever control
Adenosine	0.1 mg/kg 1st dose 0.2 mg/kg 2nd dose	IV, IO	Indicated for SVT. First dose up to 6mg, second dose up to 12 mg. Max dose 12mg
Albuterol	2.5 mg	Aerosol	Indicated for wheezing as per protocol. ½ dose if weight <10kg
Amiodarone	5mg/kg	IV, IO	Over 20-60 minutes, maximum 15 mg/kg per day. For shock-refractory pulseless VT/VF: 5 mg/kg rapid IV/IO
Atropine	0.02 mg/kg	IV, IO, ET	First dose - 0.02 mg/kg IV/IO (minimum dose 0.1 mg, maximum single dose of 0.5 mg for a child and 1 mg for an adolescent). May repeat dose every 3 – 5 minutes. (maximum total dose of 1 mg for a child and 2 mg. for an adolescent). Can be mixed with Atrovent
Atrovent (Ipratropium)	0.5 mg in 2.5 mL	Aerosol	Indicated for respiratory distress, lower airway, wheezing. Can be mixed with Albuterol
Dextrose 25%	2 mL/kg 2-4 mL/kg	IV, IO	Try to obtain bedside glucose level before administering. Administer if blood glucose less than 60; dilute 50% 1:1 with sterile water; consult Medical Control if infant less than 1 month as solution may need to be further diluted.
Diazepam (Valium)	0.2-0.3 mg/kg	IV	Indicated for uncontrolled seizure mg/kg activity; anticipate respiratory depression. Max. dose 10 mg
Diazepam (Valium)	0.5 mg/kg	Rectal	Indicated for uncontrolled seizure activity; anticipate respiratory depression. Max. dose 10 mg
Diphenhydramine (Benadryl)	1 mg/kg	IV	Useful in allergic reactions and anaphylaxis. Max. dose 50 mg
Epinephrine (1:10,000) (0.1 mg/mL solution)	0.01 mg/kg (<u>0.01mL/kg</u>)	IV, IO	<i>Use for: VF/VT, Asystole, PEA, Symptomatic Bradycardia</i> Every 3-5 minutes
Epinephrine (1:1,000) (1 mg/mL solution)	0.1 mg/kg (<u>0.1 mL/kg</u>)	ET	*The <i>ET route</i> has limited absorption, use IV/IO route whenever possible
Epinephrine (1:1,000) (1 mg/mL solution)	0.01mg/kg (<u>0.1 mL/kg</u>)	Subcut.	Used for: <i>anaphylaxis</i> . Max. dose is 0.5 mL
Glucagon (Glucagen)	0.1 mg/kg	IM, IN, IV, IO	Hypoglycemia without vascular access: 0.1 mg/kg IM, IN Esophageal foreign body obstructions: less than 16 yrs old – 0.5 mg/IV/IN
Lidocaine	1 mg/kg	IV, IO, ET	Can repeat once. If successful, start continuous infusion at 20-50 mg/kg/min. Also useful before intubating for cerebral protection and decreases airway reactivity.

PEDIATRIC

PHARMACOLOGY REVIEW Continued

MEDICATION	DOSE	ROUTE	REMARKS
Morphine	0.1 mg/kg	IV/IM	Useful for moderate pain, may cause respiratory depression. Hypotension and reflex bradycardia may develop from histamine release.
Naloxone (Narcan)	0.1 mg/kg	IV, IO, ET, IN	Useful for unknown unconscious, known narcotic overdoses.
Versed (Midazolam)	0.1 mg/kg	IV, IN	Seizure (WITH VASCULAR ACCESS): 0.1 mg/kg IV maximum dose 4 mg Seizure (WITHOUT VASCULAR ACCESS): 0.3 mg/kg IN (Use high concentration Versed 5 mg / 1 ml – (1/2dose up each nostril) See <u>PEDIATRIC DRUG ADMINISTRATION CHART</u> for weight based administration Hypnotic and sedative: monitor respirations status closely. Effective for status epilepticus given IntraNasal if no IV access.

Common Medications used in Pediatric Emergency Care

Medication	Indication(s)	Dosage	Precautions	Special Considerations
Adenosine (Adenocard)	SVT	IV/IO: Initial dose 0.1 mg/kg (up to 6 mg) as rapidly as possible IV push followed by NS flush Second dose 0.2 mg/kg rapid IV push Maximum single dose is 12 mg	Dysrhythmias at time of rhythm conversion Use with caution in patients with asthma; severe bronchospasm has been reported in several asthmatic patients following adenosine administration Discontinue in any patient who develops severe respiratory difficulty Do not use in second-degree or third-degree heart block or sick sinus syndrome	Constant ECG monitoring is essential. Onset of action 10 to 40 sec: duration 1 to 2 min. Higher doses may be needed when a patient is taking methylxanthine preparations.
Albuterol (Proventil, Ventolin)	Bronchospasm, Status asthmaticus	Nebulized albuterol (0.5% solution) 0.15 mg/kg/dose up to 5 mg diluted in 2 to 3 mL of NS Severe airflow obstruction may benefit from continuous Albuterol nebulization (0.6 to 1 mg/kg/h) The patient in severe distress may require albuterol nebulizations every 20 min for up to 1 hr Repeated dosage produces incremental bronchodilation	Watch for tachycardia, nausea, vomiting, tremor	The onset of action of inhaled bronchodilators is within 5 min. Their duration of action in severe asthma is unknown and may vary with the severity of the disease. Evaluate the patient's response to the initial inhaled albuterol treatments. Assess clinical signs of respiratory distress including pulse and respiratory rate, oxygen saturation, and perfusion. Any deterioration may require prompt intervention.
Amiodarone (Cordarone)	Pulseless VT/VF Perfusing tachycardias- Particularly ectopic atrial tachycardia, junctional ectopic tachycardia, and VT	IV/IO pulseless VT/VF: 5 mg/kg IV/IO perfusing tachycardias: 5 mg/kg loading dose over 20 to 60 min. Repeat as needed to max dose of 15 mg/kg/day	Like all antiarrhythmic agents, amiodarone may cause a worsening of existing arrhythmias or precipitate a new arrhythmia. Common side effects include hypotension (most common), bradycardia, and AV block. Slow infusion rate or discontinue if seen. Forms a precipitate when mixed with Sodium bicarbonate or heparin	Max dose 15 mg/kg/day Cordarone IV contains the preservative Benzyl alcohol. Benzyl alcohol has been associated with "gaspings syndrome" characterized by metabolic acidosis, CNS depression, respiratory distress, and death in neonates. Concerns about benzyl alcohol exposure and the lack of safety and efficiency data in children have prompted the manufacturer to state that the use of amiodarone IV in pediatric patients is not recommended.

Common Medications used in Pediatric Emergency Care

Medication	Indication(s)	Dosage	Precautions	Special Considerations
Atropine sulfate	Symptomatic Bradycardia Anticholinesterase Poisoning. To reduce secretions during RSI or block reflex bradycardia induced by succinylcholine and laryngoscopy during RSI	<u>Symptomatic bradycardia</u> IV/IO: First dose - 0.02 mg/kg IV/IO (minimum dose 0.1 mg, maximum single dose of 0.5 mg for a child and 1 mg for an adolescent). May repeat dose every 3 – 5 minutes. (maximum total dose of 1 mg for a child and 3 mg. for an adolescent). ET dose 0.03 mg/kg; follow with 5 mL normal saline flush and 5 ventilations. <u>Anticholinesterase poisoning</u> IV: 0.05 mg/kg Repeat as needed for clinical effect	Do not administer in less than minimum recommended dose – may cause paradoxical bradycardia (particularly in infants) with lower doses Monitor for tachycardia	Anticholinesterase poisonings may require large doses of atropine. Symptomatic bradycardia should first be treated with oxygenation and ventilation. Epinephrine is the drug of choice if bradycardia is due to hypoxia and oxygenation and ventilation do not correct the bradycardia. Give atropine before epinephrine if the bradycardia is due to increased vagal tone or if AV block is present.
Diazepam (Valium)	Status epilepticus Extreme anxiety or agitation	IV: 0.1 mg/kg every 2 min; maximum dose 0.3 mg/kg (maximum 10 mg/dose); administer at a rate no faster than 2 mg/min Rectal: 0.5 mg/kg up to 20 mg Onset after rectal administration is 5 to 10 min.	Do NOT give IM. Do not dilute with solutions or mix with other drugs in syringe, tubing, or IV container – incompatible. May cause local irritation when given rectally.	Does not provide analgesia Monitor oxygen saturation. Monitor IV site frequently for phlebitis, which may occur rapidly.
Diphenhydramine (Benadryl)	Anaphylaxis Dystonic reactions	IM/IV: 1 mg/kg deep IM or slow IV push over 1 to 4 min; maximum dosage 50 mg	Should not be used in newborn or premature infants May cause hypotension. No subcut. due to irritating effects.	May cause paradoxical CNS excitation, palpitations, and seizures in young children.

Common Medications used in Pediatric Emergency Care

Medication	Indication(s)	Dosage	Precautions	Special Considerations
Dopamine (Intropine, Dopastat) Infusion	Persistent hypotension or shock after volume resuscitation and stable cardiac rhythm Inadequate cardiac output Cardiogenic shock, septic shock	IV/IO: 2 to 20 mcg/kg/min; Titrate to desired effect. For the child in shock, consider starting dosage of 10 mcg/kg/min. To prepare a dopamine infusion: Six times body weight in kilograms = the number of milligrams of dopamine to be added to an IV solution for a total volume of 100 mL (6 x kg = mg). Then: 1 mL/h = 1 mcg/kg/min 2 mL/h = 2 mcg/kg/min	Gradually taper drug before discontinuing the infusion. Tachycardia, palpitations, dysrhythmias (due to increased myocardial oxygen demand). Extravasation may cause necrosis and sloughing. Should only be infused via an infusion pump.	Monitor blood pressure, ECG, and drip rate closely. Dose-related effects: Low dose (0.5 to 5 mcg/kg/min), mesenteric, renal, and coronary vessel vasodilation. Moderate dose (5 to 10 mcg/kg/min), increases myocardial contractility, and stroke volume, increasing cardiac output. High dose (10 to 20 mcg/kg/min), systemic vasoconstriction
Epinephrine for bradycardia	Symptomatic bradycardia unresponsive to oxygenation and ventilation	IV/IO: 0.01 mg/kg (0.1 mL/kg) of 1:10,000 solution ET: 0.1 mg/kg (0.1 mL /kg) of 1:1000 solution Max IV/IO dose = 10 mg; max ET dose 10 mg	Should not be administered in the same IV line as alkaline solutions – inactivates epinephrine. Follow ET dose with 5 mL normal saline flush and 5 ventilations.	ET absorption is unpredictable.

Common Medications used in Pediatric Emergency Care

Medication	Indication(s)	Dosage	Precautions	Special Considerations
Epinephrine for cardiac arrest	Pulseless VT VF Asystole Pulseless electrical Activity	IV/IO: 0.01mg/kg (0.1mL/kg) of 1:10,000 solution. May repeat every 3 to 5 min. ET: 0.1 mg/kg (0.1 mL/kg) of 1:1,000 Solution Max IV/IO dose = 1.0 mg: max ET dose 10 mg	Should not be administered in the same IV line as alkaline solutions – inactivates epinephrine. Follow ET dose with 5 mL normal saline flush and 5 ventilations.	
Furosemide (Lasix)	Congestive heart failure Fluid overload	IV/IO/IM: 1 mg/kg: if given IV/IO, give slowly	Potassium depletion, low blood pressure, dehydration, hyponatremia Because furosemide is a sulfonamide derivative, it may induce allergic reactions in patients with sensitivity to sulfonamides (sulfa drugs).	Monitor intake and output, daily weight, and serum electrolytes regularly. Ototoxicity and transient deafness can occur with rapid administration.
Glucose	Hypoglycemia	IV/IO: Newborn: 0.5 to 1 g/kg (5 to 10 mL/kg) of D ₁₀ W over 20 min. For patient 1 mo to 2y: 0.5 to 1 g/kg (2 to 4 mL/kg) of D ₂₅ W For children older than 2 y: 0.5 to 1 g/kg (1 to 2 mL/kg) of D ₅₀ W	Administer through a large vein. Determine glucose levels before and during administration. Extravasation can cause severe local tissue damage.	If large volumes of dextrose are administered, include electrolytes to prevent hyponatremia and hypokalemia. Diluting a 50% dextrose solution 1:1 with sterile water or NS = D ₂₅ W. Diluting 50% dextrose solution 1:4 with sterile water or NS = D ₁₀ W.

Common Medications used in Pediatric Emergency Care

Medication	Indication(s)	Dosage	Precautions	Special Considerations
Ketorolac (Toradol)	Moderate to severe pain	Children 8 – 16 years of age should receive only a single dose of Toradol injection, as follows: IM dosing: one dose of 1 mg/kg up to a maximum of 30 mg. IV: one dose of 0.5 mg/kg up to a maximum of 15 mg.	Anaphylactoid reactions may occur in patients without a known previous exposure or hypersensitivity to aspirin, ketorolac, or other NSAIDs, or in individuals with a history of angioedema, asthma, and nasal polyps.	NSAID Possesses no amnesic or sedative properties.
Lidocaine	VT, VF Adjunctive agent in RSI	<u>Ventricular dysrhythmias</u> IV/IO: 1 mg/kg <u>Adjunctive agent in RSI</u> IV/IO/ET: 1 to 2 mg/kg Maximum IV bolus dose is 3 mg/kg.	Signs and symptoms of lidocaine toxicity are primarily CNS related (e.g., drowsiness, disorientation, muscle twitching, seizures) Give IV dose over 1-2 min if the patient has a pulse.	Diminishes the cough and gag reflexes, and may diminish the rise in ICP associated with intubation. If indicated, administer 2 to 5 min before RSI procedure.
Lidocaine Infusion	VT, VF	IV/IO: 20 to 50 mcg/kg/min To prepare a lidocaine infusion: 60 x body weight in kg = no. of mg of lidocaine to be added to a solution with a total volume of 100 mL (60 x kg = mg). <u>Then:</u> 1 mL/h = 10 mcg/kg/min. 2 mL/h = 20 mcg/kg/min, etc.	Metabolized (90%) in the liver; decrease infusion rate in congestive heart failure or liver impairment (infusion rate should not exceed 20 mcg/kg/min).	If there is a delay of more than 15 min between the initial dose of lidocaine and the start of the infusion, consider giving a second bolus of 0.5 to 1 mg/kg to reestablish a therapeutic level.
Magnesium Sulfate	Torsades Severe asthma Documented Hypomagnesemia	Torsades: IV/IO 25 to 50 mg/kg slow bolus over 10 to 20 min. Maximum dose 2 g. Severe asthma: 75 mg/kg (Maximum dose 2 g) IV over 20 min every 6 h	Rapid administration may result in hypotension, bradycardia, and decreased cardiac contractility. Contraindicated in renal failure, heart block, or myasthenia gravis	While treating TdP, search for possible reversible causes of the dysrhythmia, such as an electrolyte disturbance. Monitor magnesium levels.

Common Medications used in Pediatric Emergency Care				
Medication	Indication(s)	Dosage	Precautions	Special Considerations
Morphine Sulfate	Pain	IV (slowly) or IM: 0.05 to 0.1 mg/kg. Repeat dose as necessary until desired effect is achieved.	Watch closely for bradycardia, CNS depression, nausea/vomiting, respiratory depression, hypotension. Histamine release can cause bronchospasm, hypotension, and facial itching. Hypovolemia makes the occurrence of hemodynamic side effects more common.	Monitor the patient's vital signs and oxygen saturation. Be prepared to provide respiratory support. Ensure naloxone and airway equipment is readily available before administration. Respiratory depressant effects are potentiated when administered in conjunction with benzodiazepine.
Naloxone (Narcan)	Coma of unknown etiology to rule out (or reverse) opioid-induced coma Opiate-induced respiratory depression	<u>Acute opiate intoxication:</u> IV/IO/IM/ET/IN: If 5 y or younger or 20 kg or less: 0.1 mg/kg, If older than 5 y or more than 20 kg: 2 mg minimum dose. Repeat as needed to maintain opiate reversal. ET: Dilute dose with 5 mL of NS and follow with 5 positive-pressure ventilations. <u>Respiratory depression during pain management</u> IV/IO/IM/ET: 0.01 mg/kg titrated to effect For IN deliver ½ dose per nares.	May induce acute withdrawal in opioid dependency resulting in nausea, vomiting, sweating, tachycardia, increased blood pressure, tremor, seizures, or cardiac arrest. IM absorption may be erratic in the hypoperfused patient.	Effects of narcotics are usually longer than naloxone; thus, respiratory depression may return when naloxone has worn off. Monitor the patient closely and observe for at least 2 h after the last dose of naloxone.
Nitrous Oxide	Moderate to severe pain	Self-administered and self-regulated by the patient who must hold the mask to the face to create an airtight seal until the pain is significantly relieved or the patient drops the mask. The child must be old enough to follow the instructions for use and large enough so that the mask creates an airtight seal. Give oxygen during intervals that nitrous oxide is not being used.	Contraindications: Unresponsive patient Inability to comply with instructions Head injury with altered mental status Abdominal pain, unless intestinal bowel obstruction has been completely ruled out Possible drug overdose Respiratory compromise or distress (pulmonary edema, pneumothorax) Otitis, air embolism, decompression sickness (expands air pockets and can Exacerbate these problems) Administration by a healthcare provider or anyone other than the patient	Produces CNS depression and decreases sensitivity to all types of pain. Effects dissipate within 2 to 5 min after cessation of administration. Produces sedation and some amnesia.

Common Medications used in Pediatric Emergency Care				
<u>Medication</u>	<u>Indication(s)</u>	<u>Dosage</u>	<u>Precautions</u>	<u>Special Considerations</u>
Oxygen	All arrest situations Hypoxemia and/or respiratory distress Carbon monoxide poisoning Shock	In the spontaneously breathing patient, nasal cannula, simple face mask, blow-by, or other device as tolerated. In cardiac or respiratory arrest, positive-pressure ventilation with 100% oxygen	With prolonged administration of high-concentrated oxygen, concern regarding toxic effects on the lungs and, in premature infants, on the eyes.	Supplemental oxygen should be considered during EVERY pediatric emergency. Do NOT withhold oxygen if signs of hypoxemia are present.
Sodium Bicarbonate	Severe metabolic acidosis Tricyclic antidepressant overdose Hyperkalemia	IV/IO: 1 mEq/kg (1 mL/kg of 8.4% solution) per dose slowly-administer only after ensuring ventilation is adequate.	Extravasation may lead to tissue inflammation and necrosis Do not mix with parenteral drugs because of the possibility of drug inactivation or precipitation.	Administer slowly. The solution is hyperosmotic. The 0.5 mEq/mL concentration (4.2% solution) should be used for newborns.