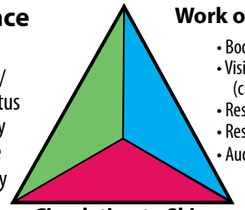
Pediatric Assessment (Initial Impression)

Appearance

Tone
Interactivity/ mental status
Consolability
Look or gaze
Speech or cry



Work of Breathing

- Body position
- Visible movement (chest/abdomen)
- Respiratory rate
- Respiratory effort
- Audible airway sounds

Circulation to Skin
Skin Color

General Patient Care (GPC) for Pediatric Patients

a) Pediatric section of the treatment protocol will be used for children who have not reached their 15th birthday (trauma) or their 18th birthday (medical), except as otherwise stated in the treatment protocol.

b) Medication dosing
(1) Pediatric doses apply to patients weighing less than 50 kg.
(2) For pediatric patients equal to or greater than 50 kg, utilize adult dosing.

c) The developmental age of the infant/child must be considered in the communication and evaluation for treatment.

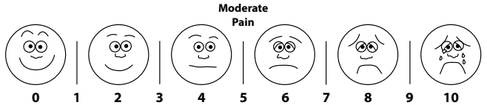
d) Infants and children must be properly restrained prior to and during transport.

e) A parent/guardian/care-taker may remain with a pediatric patient during transport, but must be secured in a separate vehicle restraint system at all times during transport.

f) For patients with fever documented by EMS as greater than 100.4 F (38 C), clinicians may treat with acetaminophen.

Pain Rating Scale (Wong-Baker FACES)

Use for pediatric patients ages 3 and older



FLACC Score (add up in range from 0-10)

Use for pediatric patients ages 2 months – 7 years

CATEGORY	0 POINTS	1 POINT	2 POINTS
Face	No expression or smile	Occasional grimace, withdrawn	Quivering chin, clenched jaw
Legs	Normal/relaxed position	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position	Squirming, tense	Arched, rigid, or jerking
Cry	No crying	Moans or whimpers	Constant crying, screams, or sobs
Consolability	Content, relaxed	Distractible	Inconsolable

Acetaminophen Dosing

AGE	Liquid 160 mg / 5 mL
< 3 months	Not indicated
3 months	1.25 mL
4 – 11 months	2.5 mL
12 – 23 months	3.75 mL
2 – 4 years	Unit dose (160 mg / 5 mL)
5 – 12 years	TWO unit doses (320 mg / 10 mL)
13+ years	FOUR unit doses (320 mg / 10 mL) or two 325 mg pills/tablets for a total of 650 mg with sips of water as tolerated by the patient

Trauma Decision Tree

When in doubt, take patient to an appropriate Trauma Center

Measure vital signs and level of consciousness and assess for major injury

Category Alpha

- ❑ Motor GCS less than 6: Adult patients unable to follow commands or pediatric patients without spontaneous or purposeful movement.
- ❑ SBP:
  - Age 65 or older: SBP less than 110 mmHg
  - 10-64 y.o.: SBP less than 90 mmHg
  - Under 10 y.o.: SBP less than 70 + 2 x (age in years) mmHg
- ❑ HR greater than SBP: For patients greater than or equal to 10 y.o.
- ❑ Respiratory rate less than 10 or greater than 29 (less than 20 in infant less than 1 year) or need for ventilatory support.
- ❑ Pulse ox less than 90%.

→ YES: Transport to trauma center or specialty center per protocol, if age less than 15 years should be taken to pediatric trauma center. Alert trauma team; consider helicopter transport if quicker and of clinical benefit (refer to GPC Section I).

NO

Assess for other injuries.

Category Bravo

- ❑ 2 or more proximal long-bone fractures
- ❑ Amputation proximal to wrist or ankle
- ❑ Chest wall instability or deformity (e.g., flail chest)
- ❑ Crushed, degloved, mangled, or pulseless extremity
- ❑ Open or depressed skull fracture
- ❑ Penetrating injuries to head, neck, torso, or extremities proximal to elbow and knee
- ❑ Pelvic fracture
- ❑ Suspected spinal injury with new motor or sensory loss
- ❑ Active bleeding requiring a tourniquet or wound packing with continuous pressure

→ YES: Transport to trauma center or specialty center per protocol, if age less than 15 years should be taken to pediatric trauma center. Alert trauma team; consider helicopter transport if quicker and of clinical benefit (refer to GPC Section I).

NO

Evaluate for evidence of mechanism of injury and high-energy impact.

Category Charlie

- ❑ Child (age 0-9 years) unrestrained or in unsecured child safety seat in high impact crash (high speed, intrusion, head on collision, roll over)
- ❑ Fall from height greater than 10 feet (all ages)
- ❑ Exposure to blast or explosion
- ❑ High Risk Auto Crash
  - Intrusion (including roof) greater than 12 in. into occupant site; or greater than 18 in. at any site
  - Need for extrication for patients who are pinned (excluding straightforward door opening or "door pops")

High Risk Auto Crash (continued)
- Ejection (partial or complete) from vehicle
- Death in same passenger compartment
- Vehicle telemetry data consistent with high risk of injury
- Rollover without restraint
- Auto v. pedestrian/bicyclist thrown, run over, or with significant (greater than 20 mph) impact
- Visible seat belt sign
- Rider separated from transport vehicle with significant impact (e.g., motorcycle, ATV, horse, watercraft, etc.)

→ YES: Transport to Trauma Center; consider pediatric trauma center if age less than 15 years; alert trauma team. Patients within a **30-minute drive time** to the closest appropriate trauma/ specialty center shall go by ground unless there are extenuating circumstances. Receiving Trauma Center medical consultation required when considering whether helicopter transport is of clinical benefit (refer to GPC Section I).

NO

Evaluate for other considerations.

Category Delta

- ❑ Older adults (greater than 55 years old)
  - Risk of injury/death increases after age 55
  - Low-impact mechanisms (e.g., ground-level falls) may result in severe injury
- ❑ Low-level falls in young children (age less than or equal to 5 years) with significant head impact; symptoms may include: Altered Mental Status, prolonged LOC, seizures, non-frontal hematoma, or vomiting.
- ❑ Burns*
  - Without trauma mechanism, triage to Burn Center
  - With trauma mechanism, triage to Trauma Center
- ❑ Pregnancy greater than 20 weeks
- ❑ EMS clinician judgment
- ❑ Anticoagulants and bleeding disorders (Patients with head injury are at high risk for rapid deterioration)

→ YES: Consider transport to trauma center; obtain medical direction if uncertain; consider pediatric trauma center if age less than 15 years. Patients within a **30-minute drive time** to the closest appropriate trauma/ specialty center shall go by ground unless there are extenuating circumstances. Receiving Trauma Center medical consultation required when considering whether helicopter transport is of clinical benefit (refer to GPC Section I).

NO

Transport according to protocol.

* Patients who meet criteria for transport to a burn center do not require medical consultation for use of the Medevac.

Pediatric trauma is defined as age less than 15 years of age. Pediatric trauma centers include Children's National Hospital and Johns Hopkins Children's Center.

Pediatric Glasgow Coma Scale

	Child	Infant
Eyes		
4	Opens eyes spontaneously	Opens eyes spontaneously
3	Opens eyes to speech	Opens eyes to speech
2	Opens eyes to pain	Opens eyes to pain
1	NO RESPONSE	NO RESPONSE
Motor		
6	Obeys commands	Spontaneous movements
5	Localizes pain	Withdraws to touch
4	Withdraws to pain	Withdraws to pain
3	Flexion	Flexion (decorticate)
2	Extension	Extension (decerebrate)
1	NO RESPONSE	NO RESPONSE
Verbal		
5	Oriented	Coos and babbles
4	Confused	Irritable cry
3	Inappropriate words	Cries to pain
2	Incomprehensible words	Moans to pain
1	NO RESPONSE	NO RESPONSE

Pediatric Spinal Protection

Patients who have a blunt trauma with a high-energy mechanism of injury that has potential to cause spinal cord injury or vertebral instability and the presence of or inability to assess one or more of the following should receive spinal protection.

(1) Midline cervical, thoracic or lumbar spinal pain, tenderness, or deformity
(2) Signs and symptoms of new paraplegia or quadriplegia
(3) Focal neurological deficit (sensory or motor)
(4) Altered mental status or disorientation or intoxication
(5) Distracting injury
(6) Neck pain or torticollis
(7) High impact diving incident or high risk motor vehicle crash
(8) Substantial torso injury
(9) Conditions predisposing to spine injury

Pediatric trauma is defined as age less than 15 years of age. Pediatric trauma centers include Children's National Hospital and Johns Hopkins Children's Center.

Maryland Pediatric Reference

Pediatric Vital Signs

Age	Est. Weight	Heart Rate	Resp. Rate	Systolic BP
Premature	< 3 kg	160	>40	60
Newborn	3.5 kg	130	40	70
3 mo.	6 kg	130	30	90
6 mo.	8 kg	130	30	90
1 yr.	10 kg	120	26	90
2 yrs.	12 kg	115	26	90
3 yrs.	15 kg	110	24	90
4 yrs.	17 kg	100	24	90
6 yrs.	20 kg	100	20	95
8 yrs.	25 kg	90	20	95
10 yrs.	35 kg	85	20	100
12 yrs.	40 kg	85	20	100
14 yrs.	50 kg	80	18	110
Adult	>50 kg	80	18	120

Reassess unstable patients frequently (recommended every 5 minutes).
Reassess stable patients at a minimum of every 15 minutes.

Definition of Hypotension by Age and Systolic Blood Pressure

Age	Systolic Blood Pressure
Term neonates (0 to 28 days)	< 60 mm Hg
Infants (1 to 12 months)	< 70 mm Hg
Children 1 to 10 years	< 70 mm Hg + (age in years x 2) mm Hg
Children > 10 years	< 90 mm Hg

Important Numbers

Poison Center ..... 800-222-1222 Maryland EMRC 877-840-4245
(Hospital Use Only) – C4 Critical Care Coordination Center 410-706-7797

Funded in part by the Maryland EMSC Partnership Grant DHHS/HRSA/MCHB/EMSC Program

Revised 2024

Estimating Total Burn Surface Area

The Palmar Method

The surface of the patient's hand (palm and 5 fingers) is approximately 1% of their body surface area.

ALERT

CHILDREN WHO MEET BURN INCLUSION CRITERIA WHO HAVE NOT REACHED THEIR 15TH BIRTHDAY SHOULD BE TRANSPORTED TO A PEDIATRIC BURN CENTER. PEDIATRIC BURN CENTERS INCLUDE CHILDREN'S NATIONAL HOSPITAL AND JOHNS HOPKINS CHILDREN'S CENTER.

TBSA calculation should NOT include first degree or superficial burns

Pediatric Sepsis

Recent fever or illness and …

- Confused or decreased mentation?
- Rapid heart rate and/or breathing?
- Developmentally delayed or bed bound?

THINK SEPSIS!

Suspected infection/illness and 3 of the following criteria?						
	<28 days	**1-12 mo**	**1-2 yr**	**2-4 yr**	**5-12 yr**	**13-17 yr**
Heart Rate (greater than)	205	205	190	140	140	100
Resp Rate (greater than)	60	60	40	40	34	25
Systolic BP (less than)	60	70	70 + age x2	70 + age x2	70 + age x2	90
Mental Status	Unresponsive, confused, inappropriate, lethargic					
High Risk Condition	Cancer, Asplenia or Sickle Cell Disease, Previous Transplant			Central or Indwelling Line/Catheter Immunodeficiency/Suppression		
Temp	Greater than 38.0° C (100.4° F)					
Cap Refill/Skin	Delayed (>3 seconds), mottled					

- ❑ Oxygen (if hypoxia present)
- ❑ ***Consider ALS Rendevous***
- ❑ Notify receiving facility of "Sepsis Alert"
- ❑ If patient meets sepsis rule-in criteria plus any shaded criteria
  - ❑ Consult with pediatric base station in addition to local base station
  - ❑ Initiate IV/IO access and provide 20 mL/kg of Lactated Ringers (For fluid sensitive children, provide 10 mL/kg). Watch for signs of respiratory distress

Universal Algorithm for the Newly Born for BLS

This applies to the infant within the first hour of after delivery.

Dry, Warm, Position, Stimulate

Suction if non-vigorous or obvious airway obstruction

If Apnea/Gasping, HR is less than 100 or central cyanosis
Ventilate with BVM @ 40–60 breaths/min using room air for the first minute (40-60 breaths) before connecting to 100% oxygen

HR less than 60 after 30 seconds of BVM
120 compressions/minute
with 3:1 compressions: ventilations

ALERT AED NOT INDICATED FOR NEWLY BORN

ALS Care for Rhythm Management & Treatment Medications (ALS Only)

APGAR Chart

SIGN	0	1	2
MUSCLE TONE (ACTIVITY)	LIMP	SOME FLEXION	ACTIVE, GOOD FLEXION
PULSE	ABSENT	LESS THAN 100/MIN	GREATER THAN 100/MIN
REFLEX IRRITABILITY* (GRIMACE)	NO RESPONSE	SOME GRIMACE OR AVOIDANCE	COUGH, CRY OR SNEEZE
COLOR (APPEARANCE)	BLUE, PALE	PINK BODY, BLUE HANDS/FEET	PINK
RESPIRATIONS	ABSENT	SLOW/IRREGULAR, INEFFECTIVE	CRYING, RHYTHMIC EFFECTIVE

**Nasal or Oral Suction Catheter Stimulus*

Acceptable Target SpO_2 After Birth

1 min — 60-65%	4 min — 75-80%
2 min — 65-70%	5 min — 80-85%
3 min — 70-75%	10 min — 85-95%

Cardiac Arrest — On-Scene Resuscitation

- **On-scene resuscitation:** Patients who are found in arrest or who arrest prior to transport must be resuscitated in place (with minimal movement, no attempts at patient loading, and no attempts at transport) until the following have been accomplished:
  - **Medical etiology:** the patient has received a minimum of fifteen two-minute cycles of chest compressions and rhythm interpretation
  - **Traumatic etiology:** patient has received treatments for reversible causes per *Trauma Protocol: Trauma Arrest* protocol
- **Exemptions** from on-scene resuscitation:
  - Physical barriers prevent resuscitation
  - Clinicians are in danger
  - Pregnant patients
  - Patients in cardiac arrest thought to be secondary to hypothermia or submersion
- **Performing High Performance CPR**
  - Provide continuous compressions at a rate of 100-120 bpm with ventilations timed at the upstroke of the 14th and 15th compression

Simplified Epinephrine (0.1mg/mL) IV/IO Dosing

Age	Weight (kg)	Dose (mg)	Dose (mL)*
Neonate 0–28 days	4 kg	0.05 mg	0.5 mL
29 days–11 months	8 kg	0.1 mg	1 mL
1 year–4 years	15 kg	0.15 mg	1.5 mL
5 years–12 years	30 kg	0.3 mg	3 mL
13 years–18th birthday	Under 50 kg	0.5 mg	5 mL
13 years–18th birthday	Over 50 kg	1.0 mg (Adult dose)	10 mL

*Must use epinephrine 0.1 mg/mL concentration for IV/IO dosing.
The volumes listed in the chart are based on this concentration.

i-Gel Sizing Chart

Patient Size	Size	Weight
Neonate	1	2 – 5 kg
Infant	1.5	5 – 12 kg
Small pediatric	2	10 – 25 kg
Large pediatric	2.5	25 – 35 kg
Small adult	3	30 – 60 kg
Medium adult	4	50 – 90 kg
Large adult	5	90+ kg

Pediatric High Performance CPR (HPCPR)

Assess Patient (less than 10 seconds)

Remain on Scene
Begin HPCPR

Unresponsive
Not Breathing
No pulse

Clinician # 1
Start Chest Compressions (100-120/min)
Ventilations 2 Breaths: 30 Compressions
Call for AED/Defibrillator

2 minute cycles

Clinician #2
Attach AED/Defibrillator
Assume Ventilation Role – 2 Breaths: 15 compressions
Place Airway Adjunct
Suction

Continue HPCPR for 2-minute cycle – less than10 second pause for coordinated activities
- Check pulse
- Check rhythm (AED)
- Shock if indicated
- Change compressors

Clinician #3 or More
BLS – HPCPR Coach
BLS – Family Support
ALS – Establish IO
ALS – Administer medication
ALS – Establish ALS airway

Pediatric HPCPR Team Member Initial Roles When 2 or More Clinicians Are Present

Clinician #1:
- Chest compressions at 100-120 per min
- Call for AED

Clinician #2:
- Ventilate at 2 breaths:15 compressions
- Attach AED

Clinician #3 or MORE:
- Assume timekeeper role
- Assume AED role
- IO Access
- Medications
- Establish ALS Airway
- Family Support

Essentials of High Performance CPR for Pediatrics

1. Ensure proper chest compression rate
   - 100-120/min
2. Ensure proper compression depth
   - Less than 1 year – 1 ½ inches (4 cm)
   - Greater than or equal to 1 year – 2 inches (5 cm)
3. Minimize interruptions (less than 10 second pause)
4. Ensure full chest recoil
5. Coordinate 2 minute cycles
6. Rotate Compressor

***Once an advanced airway is in place:**
- Less than 13 years of age: 1 ventilation every 3 seconds interposed asynchronously
- 13 years and older: 1 ventilation every 5 seconds interposed asynchronously

Average Equipment Sizes

Age	Estimated Weight	Oral Airway	NP Airway	BVM	ETT Blade	ETT Size	Suction Catheter	Gastric Tube
Preemie	<3 kg	0	NP airways are not recommended for children under 1 year of age	Infant	0	2.5 - 3.0	6 F	5 F
Newborn	3.5 kg	0		Infant	0 - 1	3.0 - 3.5	6 F	5-8 F
3 mo.	6 kg	1		Infant	1	3.5	6-8 F	5-8 F
6 mo.	8 kg	1		Infant	1	3.5 - 4.0	8 F	8 F
1 yr.	10 kg	1	18-20	Child	1	4.0	8 F	8 F
2 yrs.	12 kg	2	20	Child	1 - 2	4.0 - 4.5	8-10 F	8-10 F
3 yrs.	15 kg	2	22-24	Child	2	4.5	10 F	10 F
4 yrs.	17 kg	3	24	Child	2	4.5 - 5.0	10 F	10-12 F
6 yrs.	20 kg	4	24-26	Child	2	5.0 - 5.5	10 F	12-14 F
8 yrs.	25 kg	4	28	Child/ Adult	2	5.5 - 6.0	10-12 F	14 F
10 yrs.	35 kg	5	28-30	Adult	3	5.5 - 6.5	12 F	14 F
12 yrs.	40 kg	5	30	Adult	3	6.5 - 7.0	12 F	14-18 F
14 yrs.	50 kg	5	32-34	Adult	3	6.5 - 7.5	12-14 F	16-18 F
Adult	>50 kg	5	34	Adult	3 - 4	6.5 - 7.5	12-14 F	16-18 F