Pediatric Basic Life Support

King Saud University
College of Nursing
Medical-Surgical Department

NURS 327
Clinical Application for Child Health Nursing

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Pediatric Basic Life Support

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Pediatric Basic Life Support

Basic Life Support, in general, involves a systematic approach to:

- Initial patient assessment
- Activation of emergency medical services
- Initiation of cardiopulmonary resuscitation (CPR), including defibrillation

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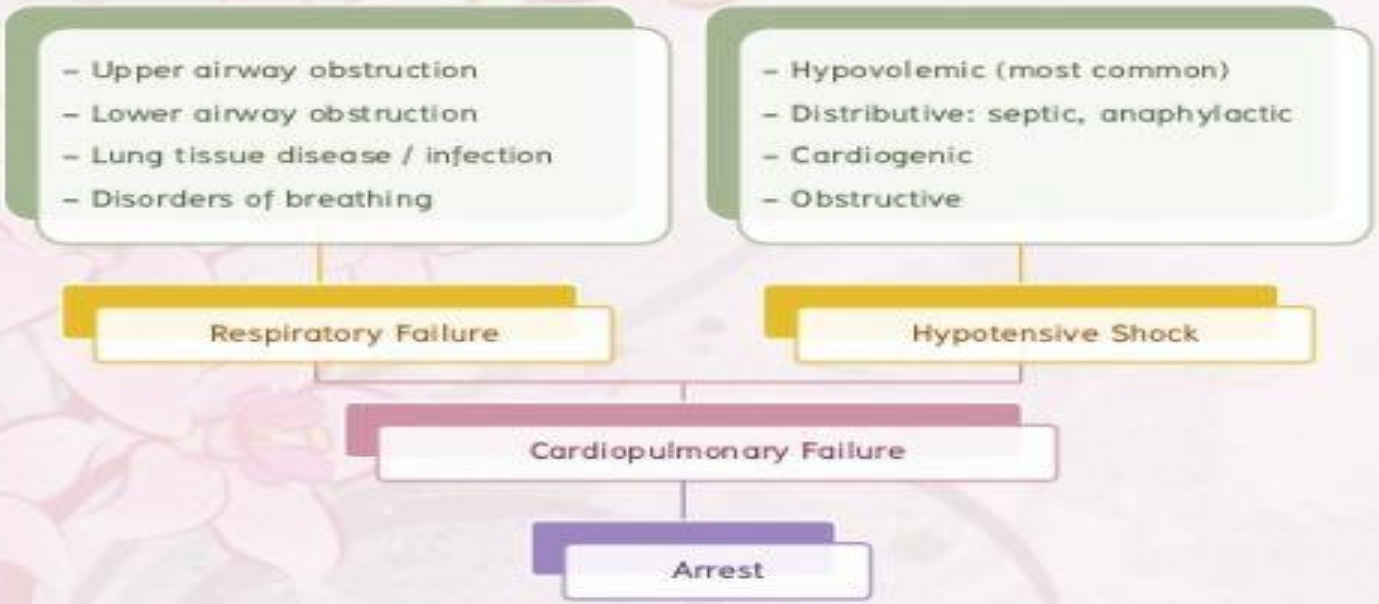
Cardiopulmonary Arrest in children



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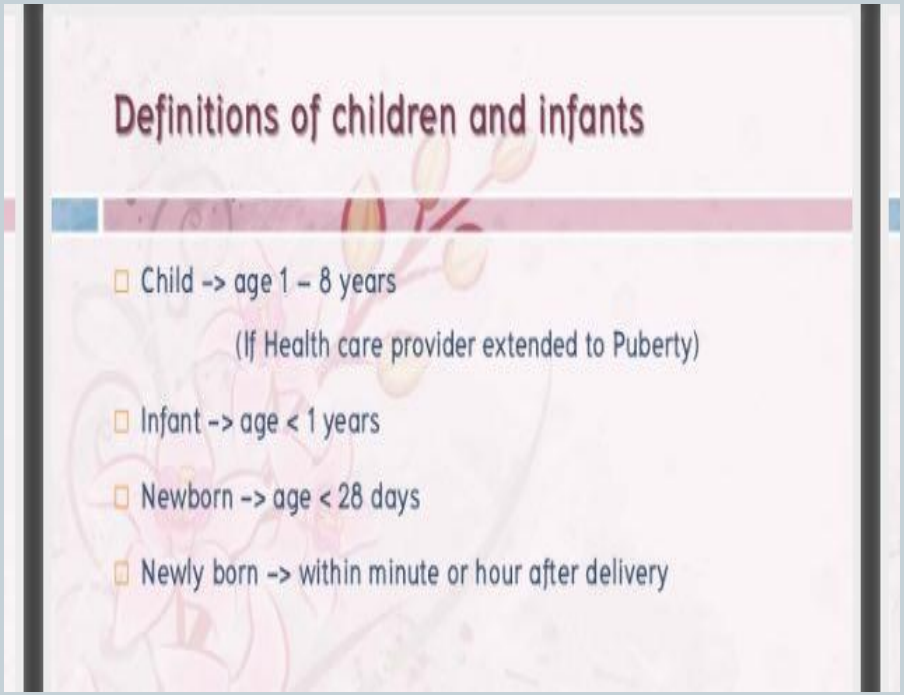
International CPR Guidelines by American Heart Association (AHA) and International Liaison Committee on Resuscitation (ILCOR) in 2015



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When Is a Child a Child?

In most instances, determining whether to treat a child as a child or as an adult has been based on age. Typically, an adult is defined as someone about the age of 12 (adolescent) or older; someone between the ages of 1 and 12 has been considered to be a child for CPR care; and an infant is someone younger than 1 year of age. However, for the purposes of this course, a child is defined as the age of 1 to the onset of puberty as evidenced by breast development in girls and underarm hair development in boys. An infant is considered under the age of 1 year.

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Key Actions in Pediatric BLS

1. Verify scene safety
2. Determine unresponsiveness, get help, and activate emergency medical services (EMS)
3. Assess breathing and brachial pulse
4. Initiate cardiopulmonary resuscitation (CPR)

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1. Verify Scene Safety

- Ensure that the scene is safe for the rescuers and the victim

- e.g. removing the victim from a burning building or safely retrieving a drowning victim

Arriving on Scene

When you arrive on the scene, you need to recognize that an emergency exists, size up the scene, form an initial impression and complete a primary assessment. The information gathered from these steps is used to determine your immediate course of action. **Pedia BLS ---rbt2016---**

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2. Determine unresponsiveness, get help, and activate emergency medical services (EMS)

- If victim is unresponsive, single rescuer should shout for nearby help and activate emergency medical response system
- For two or more rescuers, one rescuer continues care for the victim and a second rescuer activates EMS and retrieves automated external defibrillator (AED)

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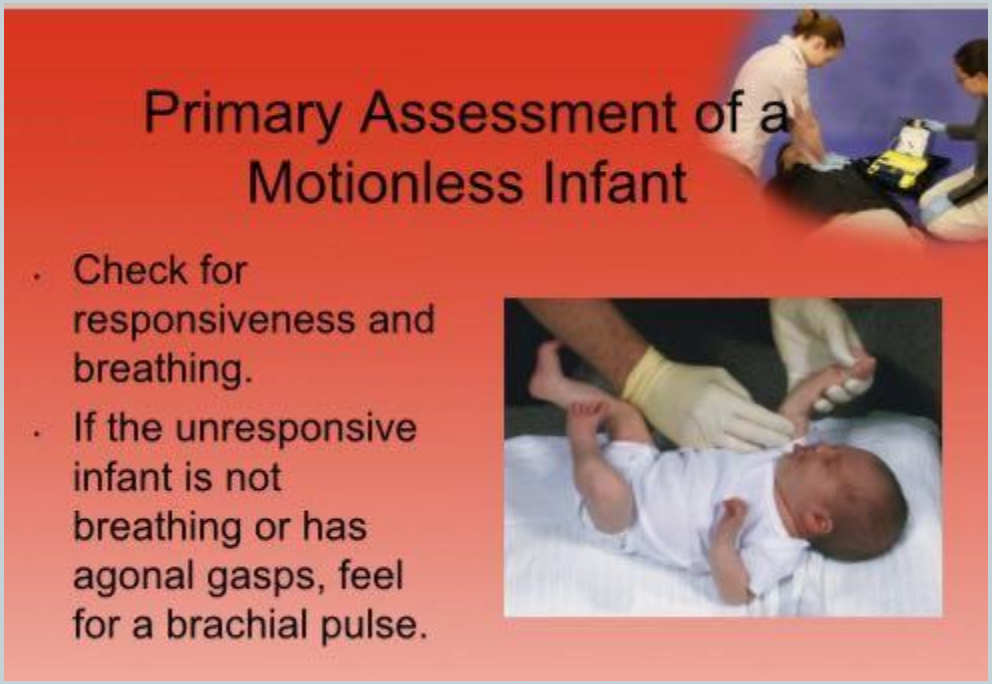
3. Assess breathing and pulse

- Rescuer should determine if the victim is breathing or only gasping while simultaneously checking for a pulse within 10 seconds



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3.1 No breathing or only gasping and no definite pulse after 10 seconds (SINGLE RESCUER)

- IF THIS IS **NOT** A WITNESSED SUDDEN COLLAPSE THEN THE RESCUER SHOULD START CARDIOPULMONARY RESUSCITATION (COMPRESSIONS-AIRWAY-BREATHING, **C-A-B**) WITH A RATIO OF 30 COMPRESSIONS TO 2 BREATHS.

- IF THIS IS A WITNESSED SUDDEN COLLAPSE, THEN THE RESCUER SHOULD ACTIVATE EMS (IF NOT ALREADY DONE) AND RETRIEVE AN AED, AND THEN USE THE AED.

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3.1 No breathing or only gasping and no definite pulse after 10 seconds (TWO OR MORE RESCUERS)

- RESCUERS SHOULD START CPR (COMPRESSIONS-AIRWAY-BREATHING, **C-A-B**), STARTING WITH A RATIO 15 COMPRESSIONS TO 2 BREATHS.

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	Adult	Child (Age 1 Through Onset of Puberty)
Compressions		
Hand Position	 Hands centered on lower half of sternum	 Hands centered on lower half of sternum
Rate	100–120/minute	100–120/minute
Depth	At least 2 inches	About 2 inches
Compressions: Ventilations Ratio	One rescuer: 30:2 Two rescuers: 30:2	One rescuer: 30:2 Two rescuers: 15:2

Providing CPR/AED for Children and Infants

While the differences in care for infants and children may appear subtle, it is important to understand them in order to achieve the best possible outcomes.

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3.2 No normal breathing but pulse is present (same actions for single or multiple rescuers)

-START RESCUE BREATHING BY PROVIDING 1 BREATH EVERY 3 TO 5 SECONDS (12 TO 20 BREATHS/MIN).

-ADD COMPRESSIONS IF PULSE REMAINS ≤60/MIN WITH POOR PERFUSION.

-CONTINUE RESCUE BREATHING. CHECK PULSE EVERY 2 MINUTES. IF NO PULSE, START CPR (COMPRESSIONS-AIRWAY-BREATHING, C-A-B)

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Airway Manoeuvres

- Airway manoeuvres and appropriate positioning in children can differ from adults, dependant upon size.
- Infants (<1yr) should have their head in the *horizontal* or *neutral* position.

- Head tilt/Chin lift
  - Tilt head backwards (not neck)
  - Support jaw at the point of the chin
- Jaw Thrust
  - Good if neck injury is suspected
  - Difficulty with obtaining adequate airway with Head tilt/chin lift.

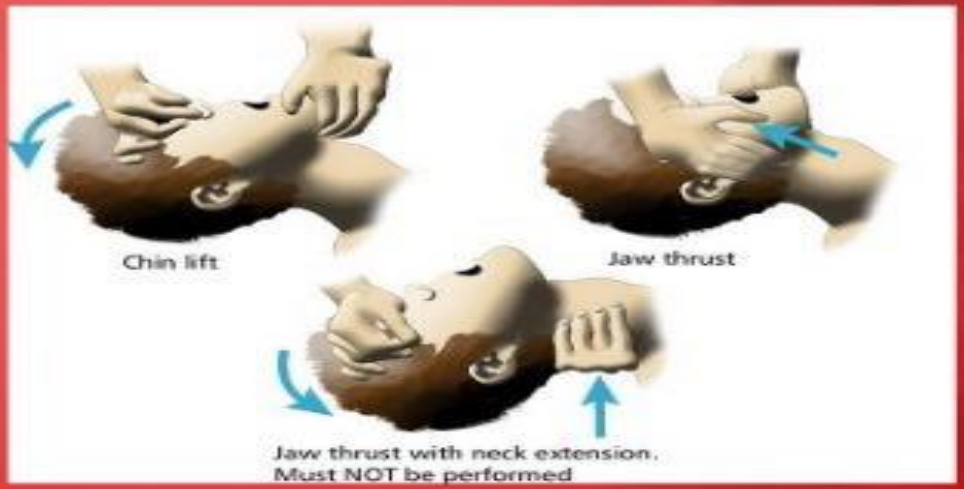

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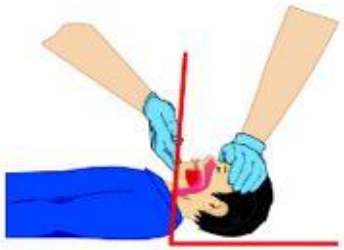
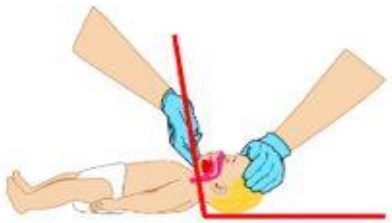
Table 1-4 Airway and Ventilation Differences: Adult, Child and Infant

	Adult	Child (Age 1 Through Onset of Puberty)	Infant (Birth to Age 1)
Airway			
Head-Tilt/ Chin-Lift	 Past neutral position	 Slightly past neutral position	 Neutral position

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3.3 Normal breathing and pulse are present (same actions for single or multiple rescuers)

- MONITOR THE VICTIM UNTIL EMERGENCY RESPONDERS ARRIVE.

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4. Initiate cardiopulmonary resuscitation (CPR)

- THE ACTIONS THAT CONSTITUTE CPR ARE PERFORMING CHEST COMPRESSIONS, OPENING THE AIRWAY, AND PROVIDING VENTILATIONS (RESCUE BREATHS) OR **C-A-B**.

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Compression **A**irway Opening Rescue **B**reaths

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CPR sequence of actions for infants and children

1. INITIATE CPR IN AN INFANT OR CHILD WHO IS UNRESPONSIVE, HAS NO NORMAL BREATHING, AND NO DEFINITE PULSE AFTER 10 SECONDS.

2. START COMPRESSIONS BEFORE PERFORMING AIRWAY OR BREATHING MANEUVERS (C-A-B).

3. AFTER 30 COMPRESSIONS (15 COMPRESSIONS IF TWO RESCUERS), OPEN THE AIRWAY AND GIVE 2 RESCUE BREATHS.

4. IF THE PULSE IS ≥60 BEATS PER MINUTE (BPM) AFTER ABOUT 2 MINUTES OF CPR, CONTINUE VENTILATION.

5. APPLY THE AED AND PROCEED BASED ON AED ANALYSIS.

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Chest Compressions

- THE **2015 INTERNATIONAL RESUSCITATION GUIDELINES** CONTINUE TO EMPHASIZE THE IMPORTANCE OF PROPER TECHNIQUE WHEN PERFORMING CHEST COMPRESSION, **WITH FULL CHEST RECOIL AND MINIMAL INTERRUPTIONS.**

- CHEST COMPRESSIONS SHOULD BE PERFORMED **OVER THE LOWER HALF OF THE STERNUM.**

- COMPRESSION OF THE XIPHOID PROCESS CAN CAUSE TRAUMA TO THE LIVER, SPLEEN, OR STOMACH, AND MUST BE AVOIDED.

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THE EFFECTIVENESS OF COMPRESSIONS CAN BE MAXIMIZED BY ATTENTION TO THE FOLLOWING:

- THE CHEST SHOULD BE DEPRESSED **AT LEAST ONE-THIRD OF ITS ANTERIOR-POSTERIOR DIAMETER** WITH EACH COMPRESSION:
  - APPROXIMATELY **4 CM [1.5 INCHES] IN MOST INFANTS**
  - **5 CM [2 INCHES] IN MOST CHILDREN**
  - COMPRESSIONS IN ADOLESCENTS SHOULD ATTAIN THE RECOMMENDED ADULT DEPTH OF 5 TO 6 CM, BUT SHOULD NOT EXCEED 6 CM (2.4 INCHES).

- THE OPTIMUM RATE OF COMPRESSIONS IS APPROXIMATELY **100 TO 120 PER MINUTE**. EACH COMPRESSION AND DECOMPRESSION PHASE SHOULD BE OF EQUAL DURATION.

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CHEST COMPRESSIONS FOR INFANTS (YOUNGER THAN ONE YEAR)

- MAY BE PERFORMED WITH EITHER **TWO FINGERS** (FOR SINGLE RESCUER) OR WITH THE **TWO THUMB-ENCIRCLING HANDS** (FOR MULTIPLE RESCUERS)

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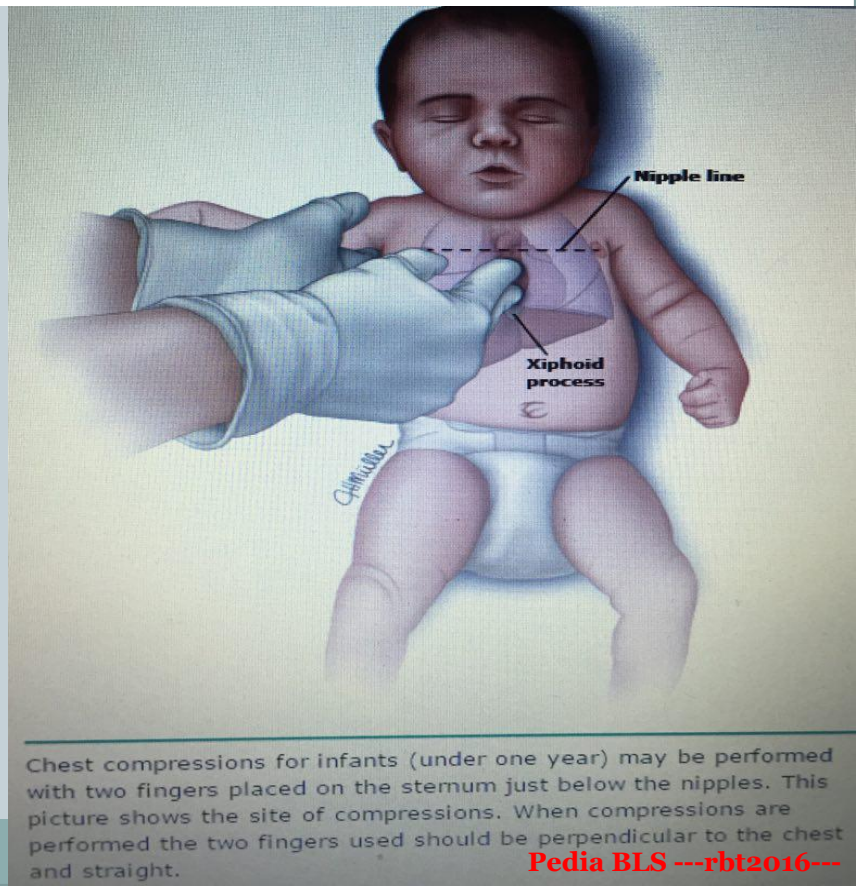
Two fingers technique for infants' chest compression

- Compressions are performed with index and middle fingers, placed on the sternum just below the nipples.



Chest compressions for infants (under one year) may be performed with two fingers placed on the sternum just below the nipples. This picture shows the site of compressions. When compressions are performed the two fingers used should be perpendicular to the chest and straight.

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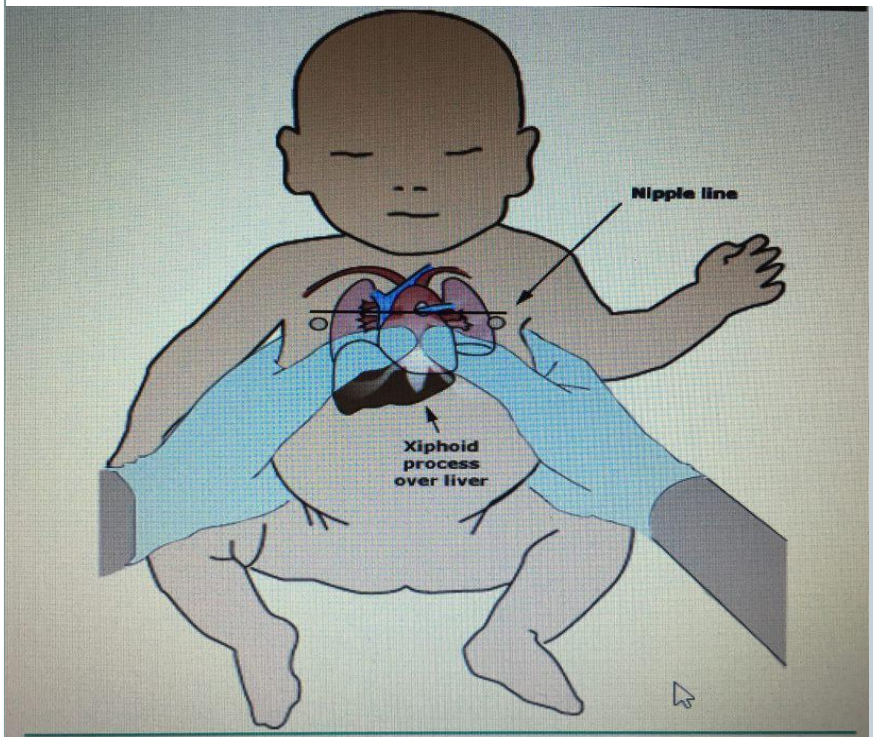

The thorax is encircled with the hands and cardiac compressions are performed with both thumbs. The compression site is approximately one finger's breadth below the intermammary line. The area over the xiphoid process should be avoided to prevent injury to the liver, spleen, or stomach.

Two thumb-encircling hands technique for infants' chest compression

- The thorax is encircled with both hands and cardiac compressions are performed with thumbs which compress over the lower half of the sternum, avoiding the xiphoid process, while the fingers are spread around the thorax.

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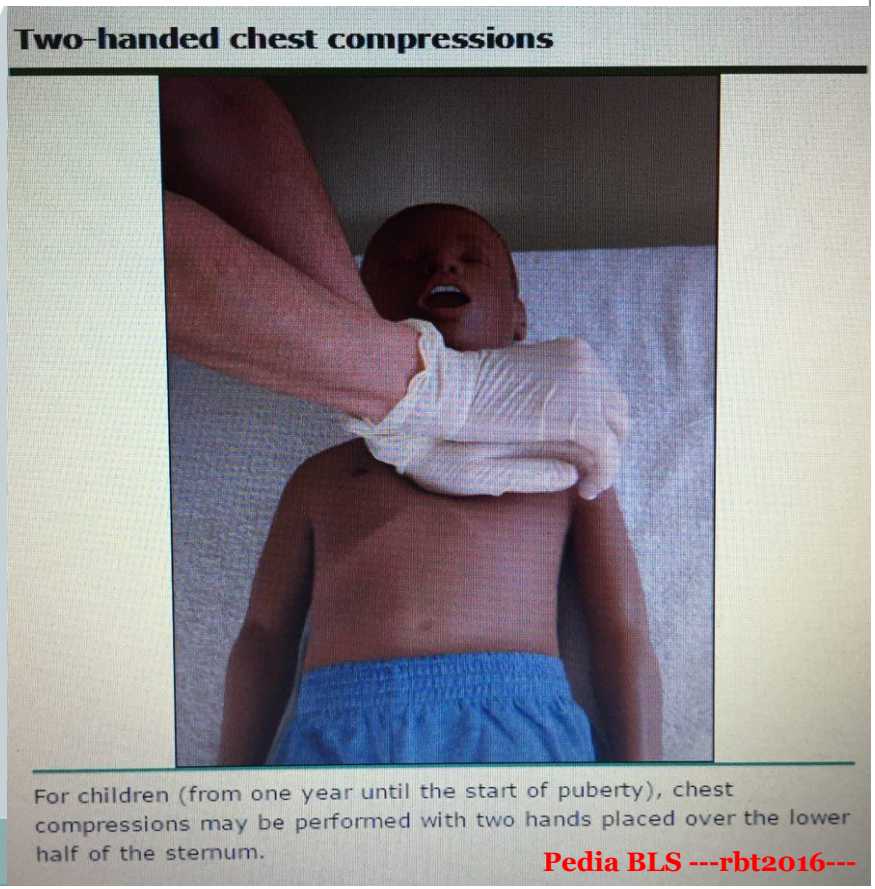
Two-handed chest compressions for children (from one year until the onset of puberty)

- Compressions should be performed over the lower half of the sternum with either the heel of one hand or with two hands.



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Ventilation

- CAN BE PROVIDED WITH MOUTH-TO-MOUTH, MOUTH-TO-NOSE, OR WITH A BAG AND MASK.

The stem hold

The two point top hold

The OK rim hold

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Ventilation must be provided as follow:

- EACH RESCUE BREATH SHOULD BE **DELIVERED OVER 1 SECOND.**
- THE VOLUME OF EACH BREATH SHOULD BE SUFFICIENT TO SEE THE CHEST WALL RISE.
- A CHILD WITH A PULSE ≥60 BPM WHO IS NOT BREATHING SHOULD RECEIVE 1 BREATH EVERY 3 TO 5 SECONDS (12 TO 20 BREATHS PER MINUTE).
- INFANTS AND CHILDREN WHO REQUIRE CHEST COMPRESSIONS SHOULD RECEIVE 2 BREATHS PER 30 CHEST COMPRESSIONS FOR A LONE RESCUER AND 2 BREATHS PER 15 CHEST COMPRESSIONS FOR TWO OR MORE RESCUERS.

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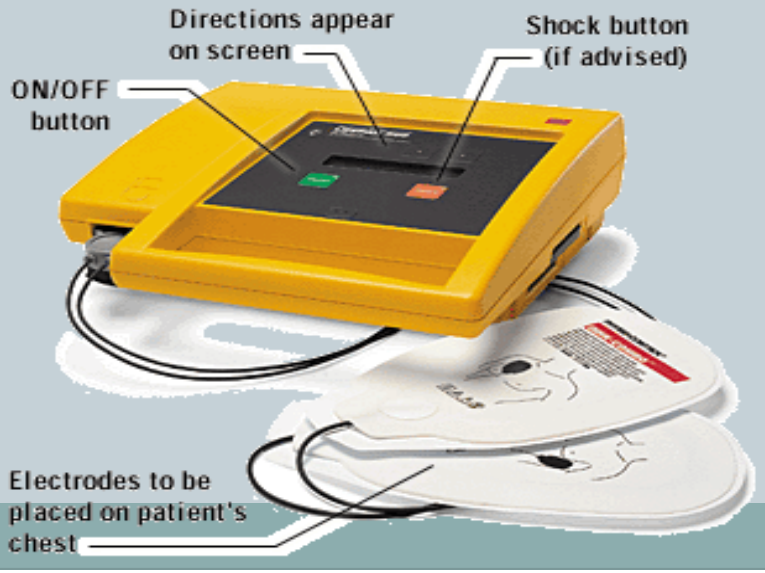
Automated External Defibrillator (AED)

– a portable device that is used extensively to provide prompt defibrillation to victims in cardiac arrest.



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Actions based on AED Analysis:

SHOCKABLE RHYTHM – GIVE 1 SHOCK AND RESUME CPR IMMEDIATELY FOR ABOUT 2 MINUTES OR UNTIL PROMPTED BY THE AED. CONTINUE UNTIL ADVANCED LIFE SUPPORT PROVIDERS TAKE OVER OR THE VICTIM STARTS TO MOVE.

NO SHOCKABLE RHYTHM – RESUME CPR IMMEDIATELY FOR ABOUT 2 MINUTES OR UNTIL PROMPTED BY THE AED. CONTINUE UNTIL ADVANCED LIFE SUPPORT PROVIDERS TAKE OVER OR THE VICTIM STARTS TO MOVE.

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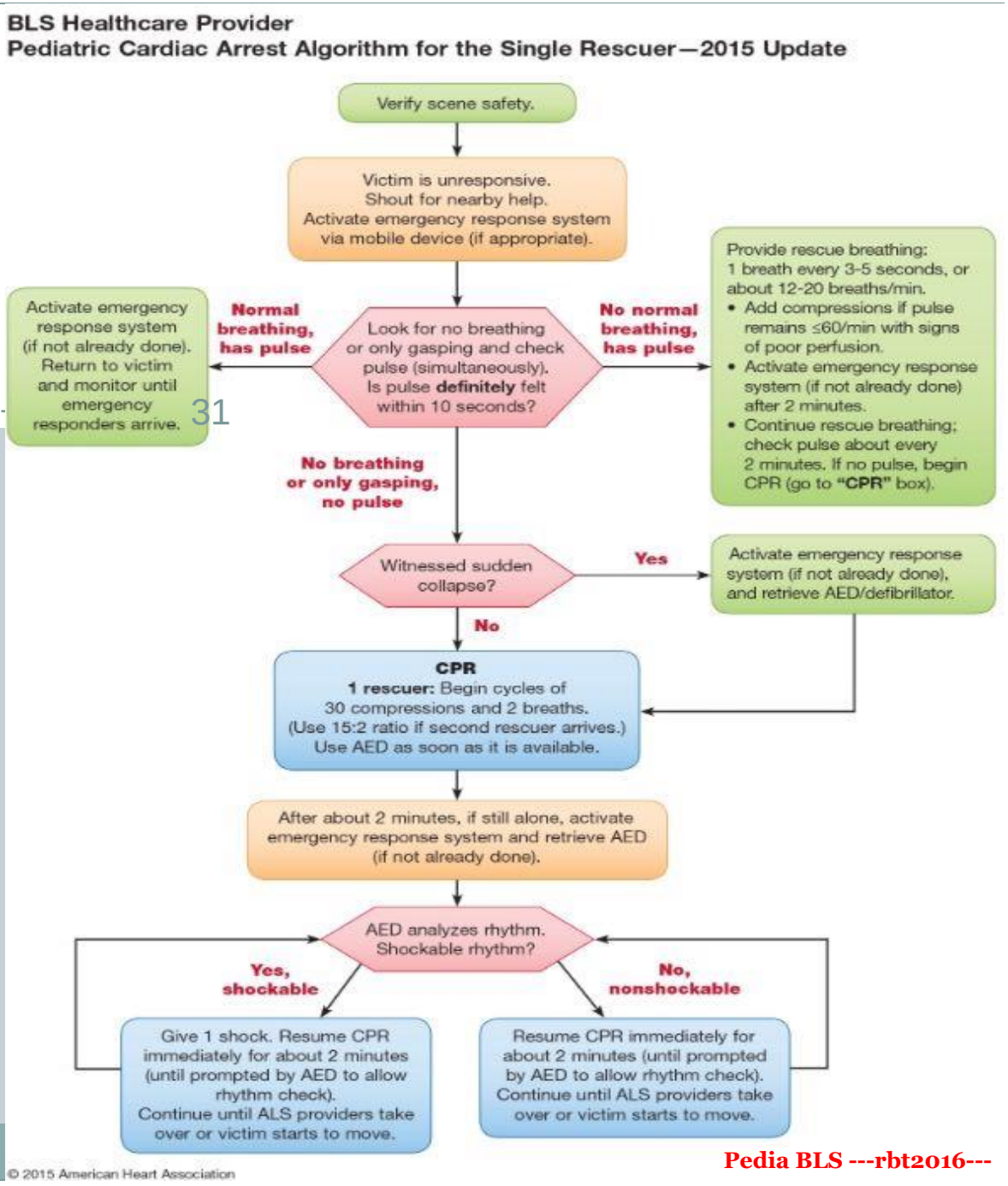

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