



UNIVERSITATEA DE STAT DE MEDICINĂ ȘI FARMACIE
"NICOLAE TESTEMIȚANU" DIN REPUBLICA MOLDOVA



**NATIONAL EMERGENCY MEDICAL ASSISTANCE SERVICE
in the REPUBLIC of MOLDOVA**



THEME nr. 6

BASIC LIFE SUPPORT IN CHILDREN

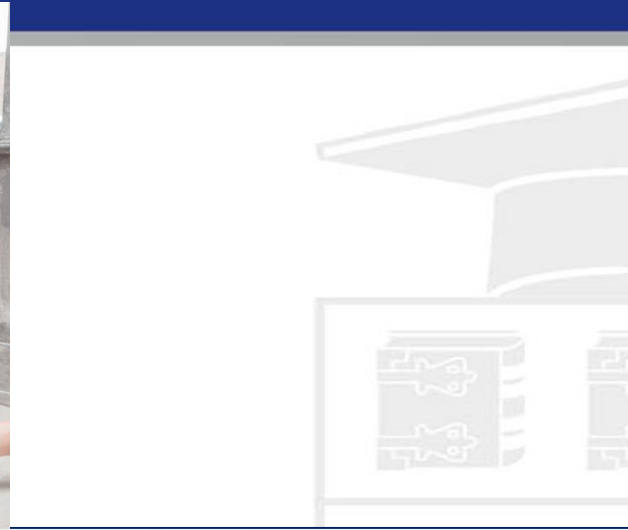


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2023



BASIC LIFE SUPPORT IN CHILDREN



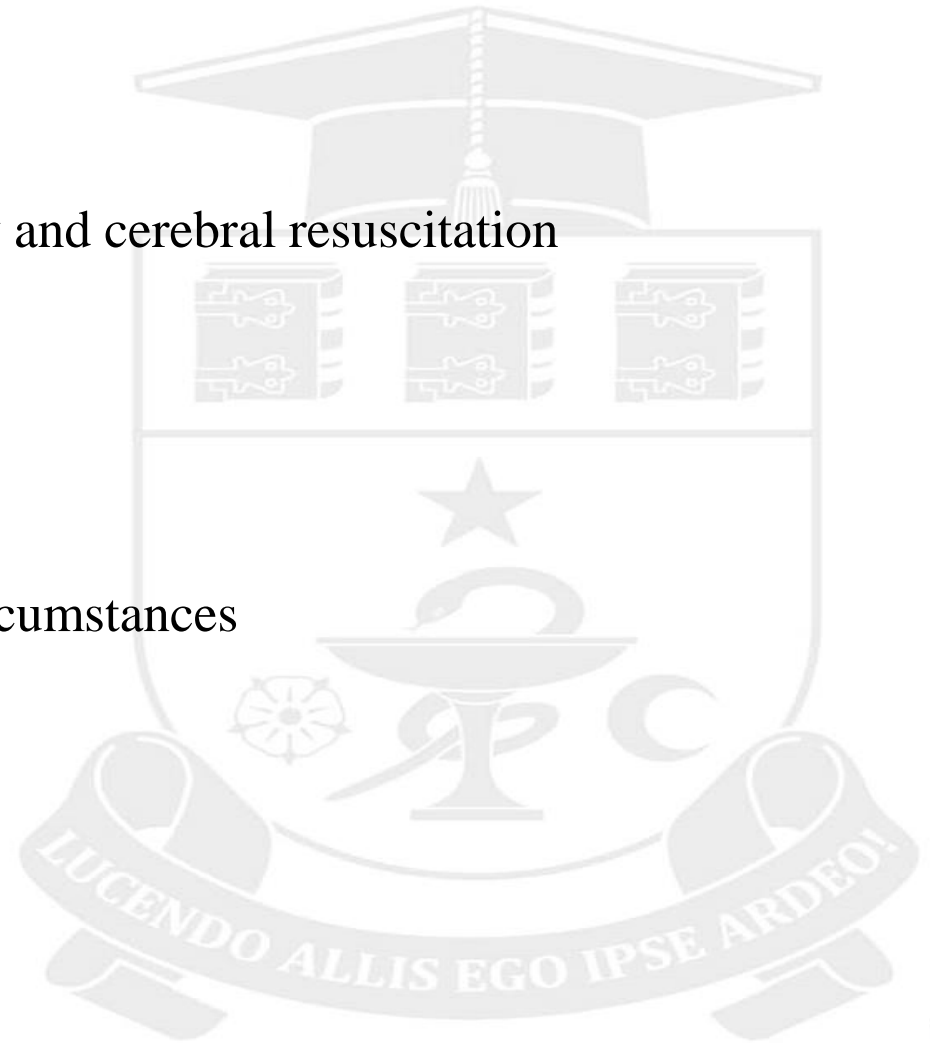


THEME nr. 5

Basic life support(BLS) and cardio-respiratory and cerebral resuscitation
(ABCDE) in children.

External automatic defibrillation in children.

General concepts, use of AEDs and special circumstances





•INTRODUCTION



1. General information

2. Definitions:

- a) Newborn, neonate, infant, child.
- b) Respiratory arrest, cardiac arrest, recuperation.
- c) Cardio pulmonary resuscitation.





•INTRODUCTION



1. General information

Outcomes from pediatric in-hospital cardiac arrest (IHCA) have markedly improved over the past decade.

From 2001 to 2009, rates of pediatric IHCA survival to hospital discharge improved from 24% to 39%.

Recent unpublished 2013 data from the AHA's Get With The Guidelines® Resuscitation program observed 36% survival to hospital discharge for pediatric IHCA.

Prolonged CPR is not always futile, with 12% of patients who receive CPR for more than 35 minutes surviving to discharge and 60% of those survivors having a favorable neurologic outcome.



•INTRODUCTION



1. General information

Unlike IHCA, survival from out-of-hospital cardiac arrest (OHCA) remains poor.

Data from 2005 to 2007 from the Resuscitation Outcomes Consortium, a registry of 11 US and Canadian emergency medical systems, showed age-dependent discharge survival rates:

of 3.3% for infants (younger than 1 year),

9.1% for children (1 to 11 years), and

8.9% for adolescents (12 to 19 years).

More recently published data from this network demonstrate 8.3% survival to hospital discharge across all age groups.

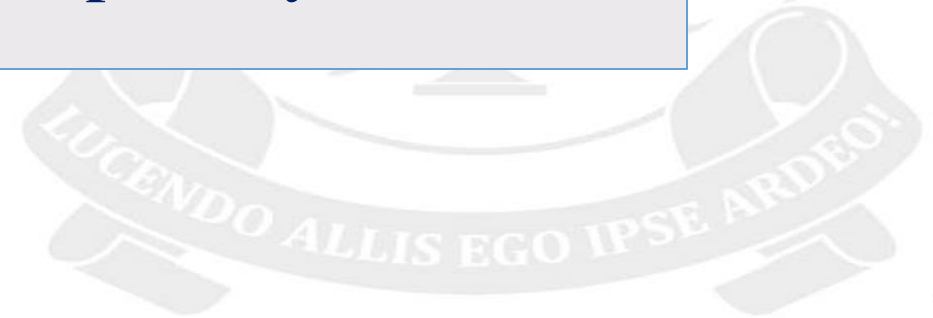


•INTRODUCTION



Definitions

- ◎ A **newborn** is a child just after birth.
- ◎ A **neonate** is a child in the first 28 days of life.
- ◎ An **infant** is a child under 1 year.
- ◎ A **child** is between 1 year and puberty.





European Resuscitation Council 2015



General information

R. Cardio respiratory arrest occurs less frequently in children than in adults; thus, both healthcare professionals and lay people are less likely to be involved in pediatric resuscitation. It is therefore important to be familiar with the knowledge and skills required for pediatric BLS so that the best care possible can be delivered in what is often a stressful situation.

The majority of pediatric cardio respiratory arrests are not caused by primary cardiac problems, but are secondary to other causes, mostly respiratory insufficiency, hence the order of delivering the resuscitation sequence: Airway (A), Breathing (B) and Circulation (C).



European Resuscitation Council 2015



All providers should be encouraged to initiate CPR in children even if they haven't been taught specific pediatric techniques. CPR should be started with the C:V ratio that is familiar and for most, this will be 30:2. The specific pediatric sequence incorporating the 15:2 ratio is primarily intended for those who have the potential to resuscitate children as part of their role.



R. Definitions



- ⦿ **Respiratory arrest** is defined by the absence of spontaneous respiration (**apnea**) or a severe respiratory insufficiency (**agonal gasping**) that require respiratory assistance.
- ⦿ **Cardiac arrest** is defined as the absence of central arterial pulse or signs of circulation (movement, cough or normal breathing) or the presence of a central pulse less than 60 lpm in a child who does not respond, not breath and with poor perfusion.



- ◎ **Recuperation.** After resuscitation the return of spontaneous circulation is defined as the recuperation of central arterial pulse or signs of circulation in a child with previous cardiorespiratory arrest. It is maintained when the duration is longer than 20 minutes.
- ◎ Injuries, sudden infant death syndrome, and respiratory diseases are the most frequent etiologies of cardiorrespiratory arrest in children.
- ◎ The prevention and the formation of citizens in basic cardiopulmonary resuscitation are the most effective measures to reduce the mortality of cardiorespiratory arrest in children.



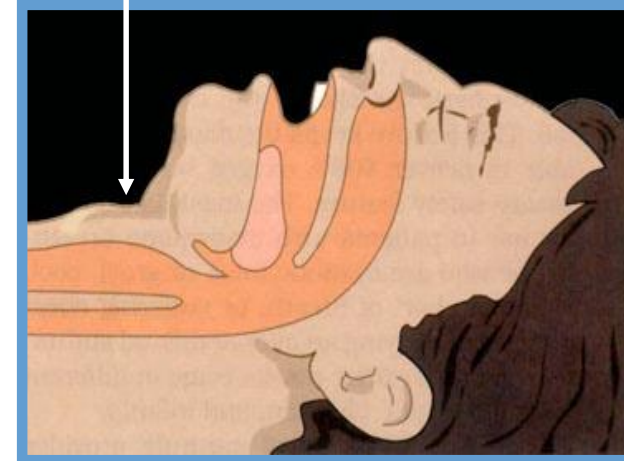
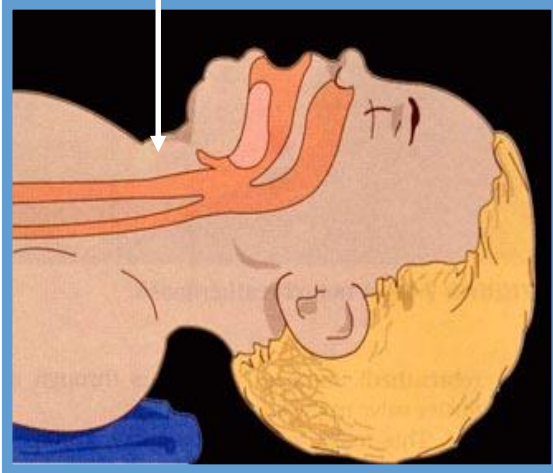
Cardiorespiratory arrest (CRA) in children



- ☉ **The most frequent cause of CRA in child**
= respiratory insufficiency
- **It is rarely a sudden event**
- **result of progressive deterioration of respiratory and cardio-circulatory function**
- **cardio-respiratory failure and cardio-respiratory arrest**

Child &

Adult Airways



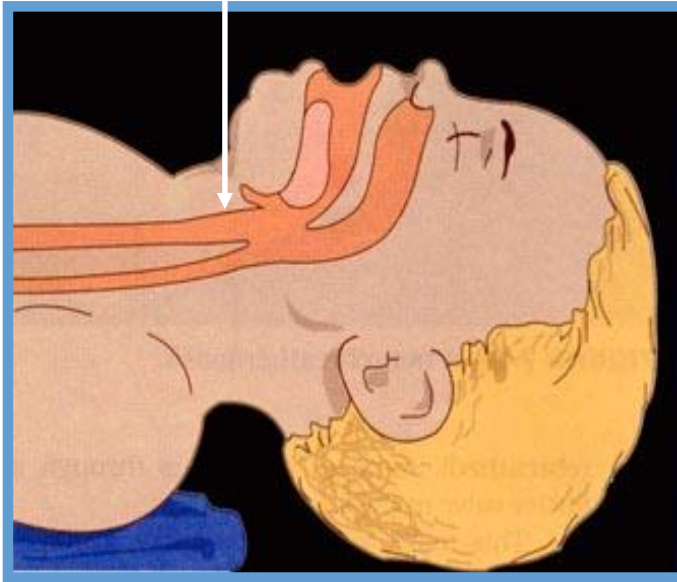
- The airway of anatomy of infants and children are slightly different:
- The mouth and nose are smaller and more easily obstructed than in adults.
- The tongue takes up more space in the mouth than adults.
- The trachea in infants and children are narrower and more easily obstructed by swelling. The trachea is softer and more flexible as well.



Child &

Adult Airways

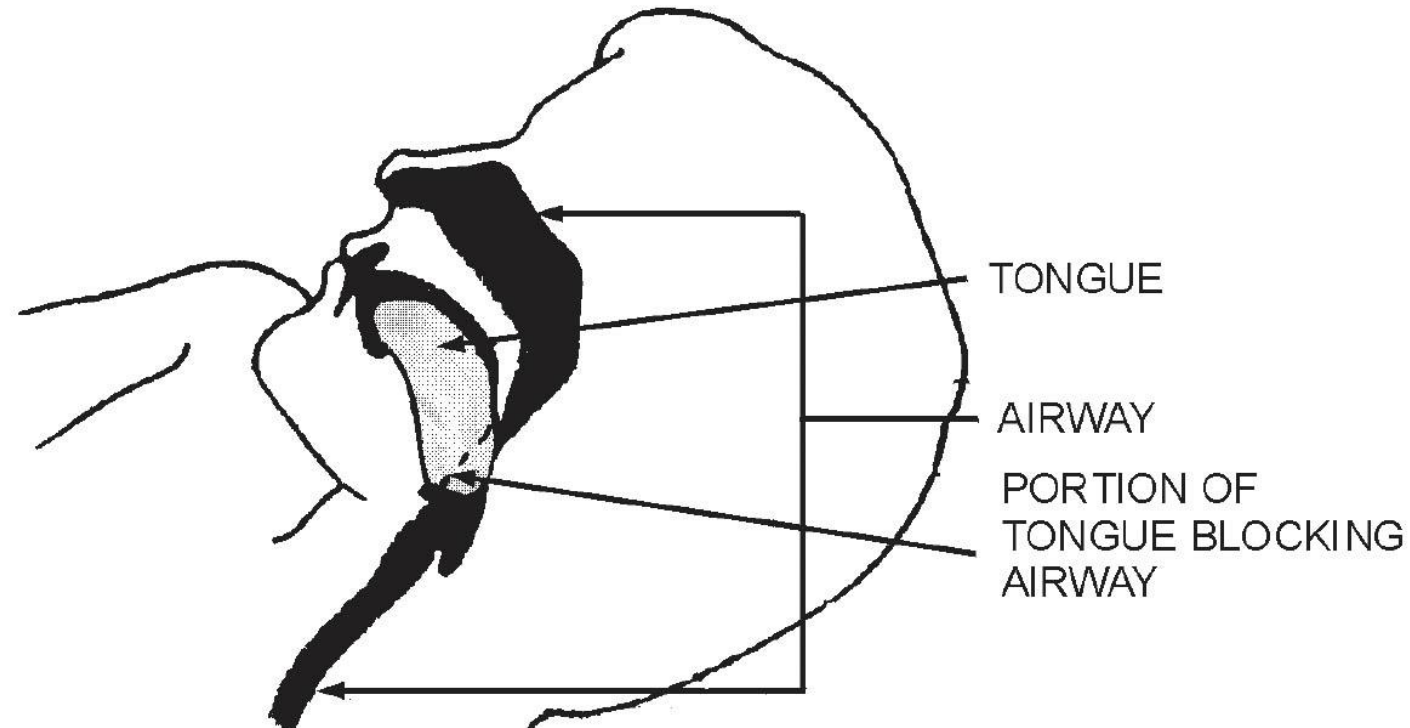
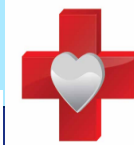
Cricoid Cartilage



- The cricoid cartilage like other cartilage in the infant and child is less developed and less rigid.
- The Chest wall is softer in infants and children and so they tend to depend more heavily the diaphragm for breathing.
- The primary cause of cardiac arrest in infants and children is an uncorrected respiratory problem.



ABNORMAL POSITION OF THE TONGUE



In unresponsive or obtunded patients, the tongue becomes *flaccid* and, by the force of gravity, falls into the posterior pharynx.

This is the most common form of airway obstruction.

Fortunately, because the tongue is attached to and moves with the mandible, this form of airway obstruction is easily resolved with basic maneuvers such as the “chin lift” or the “jaw thrust”.

The “Jaw thrust” maneuver is most favored in trauma patients as it does not overtly manipulate the cervical spinal process.



Adequate Breathing: Normal Rates

Children **15-30/min.** Infant **25-40/min.** New born **30-60/min.**

Respiration is another word for breathing. The body system that allows breathing to occur is the **Respiratory System**.

Signs of Adequate Breathing

To determine signs of adequate breathing you should:

Look for adequate and equal expansion of both sides of the chest when the patient inhales





Adequate Breathing: Normal Rates

Children **15-30/min.** Infant **25-40/min.** New born **30-60/min.**

Listen for air entering and leaving the nose, mouth, and chest. The breath sounds (when auscultated, or listened to, with a stethoscope) should be present and equal on both sides of the chest. The sounds from the mouth and nose should be typically free of gurgling , gasping , crowing , wheezing, snoring and stridor (harsh, high-pitched sound during inhalation).

Feel for air moving out of the nose or mouth.

Normal respirations are regular with occasional sighs that serve to keep the alveoli open.





Signs of Inadequate Breathing



- ◎ Signs of inadequate breathing include the following:
- ◎ Chest movements are absent minimal, or uneven.
- ◎ Movement associated with breathing is limited to the abdomen (abdominal breathing).
- ◎ No air can be felt or heard at the nose or mouth, or the amount of air exchanged is below normal.
- ◎ Breath sounds are diminished or absent.
- ◎ Noises such as *wheezing, crowing, stridor, snoring, gurgling, or gasping* are heard during breathing.
- ◎ Rate of breathing is too rapid or too slow.
- ◎ Breathing is very shallow, very deep, or appears labored.

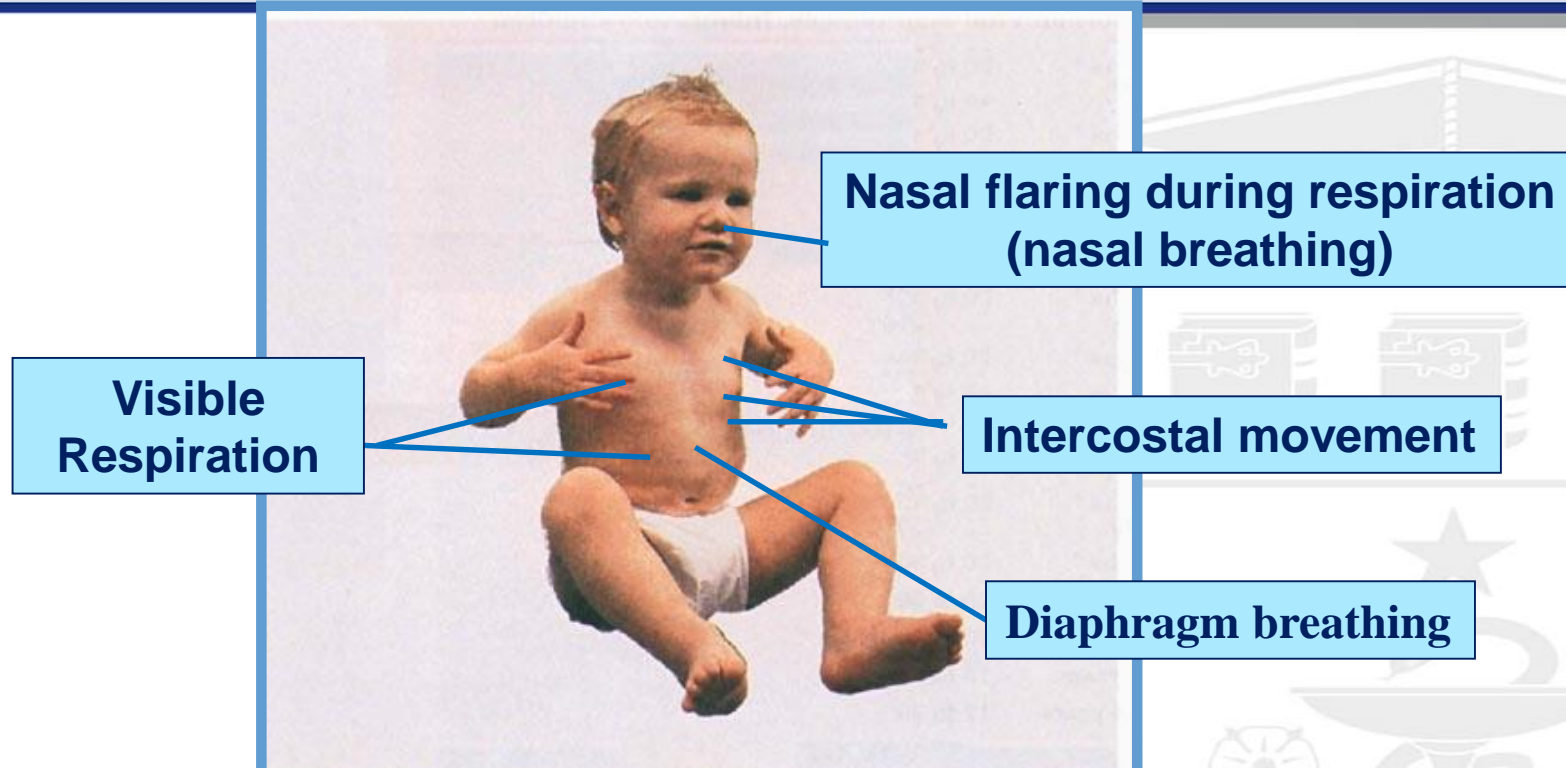


Signs of Inadequate Breathing (continuation)

Signs of Inadequate Breathing (continuation)

- ⦿ Patient is cyanotic; that is, the patient's skin, lips, tongue, ear lobes, or nail beds are blue or gray. This is called **cyanosis**.
- ⦿ Inspirations are prolonged (**indicating a possible upper airway obstruction**) or expirations are prolonged (**indicating a possible lower airway obstruction**).
- ⦿ Patient is unable to speak, or the patient cannot speak full sentences because of shortness of breath.
- ⦿ In children, there may be retractions (a pulling in of the muscles) above the clavicles and between and below the ribs.
- ⦿ Nasal *flaring* (widening of the nostrils of the nose with respirations) may be present, especially in infants and children.

Signs of Inadequate Breathing in infants and newborns



Respiratory rate ($<10/\text{min}$)

- Flaccid muscle tone
- Unconscious
- Respiration / puls weak or absent



Definitions



- ◎ **CPR** *is a combination of rescue breathing (which provides oxygen to the victim's lungs) and chest compressions (which keep the victim's heart circulating oxygenated blood).*
- ◎ **Considerations:** *CPR can be lifesaving, but it is best performed by those who have been trained in a CPR course. Time is very important when dealing with an unconscious person who is not breathing. Death can occur in 8 to 10 minutes and brain death begins after 4 to 6 minutes without oxygen.*
- ◎ **Causes:** *Cardiopulmonary arrest is a combination of 2 life-threatening conditions: absence of breathing and no heartbeat.*

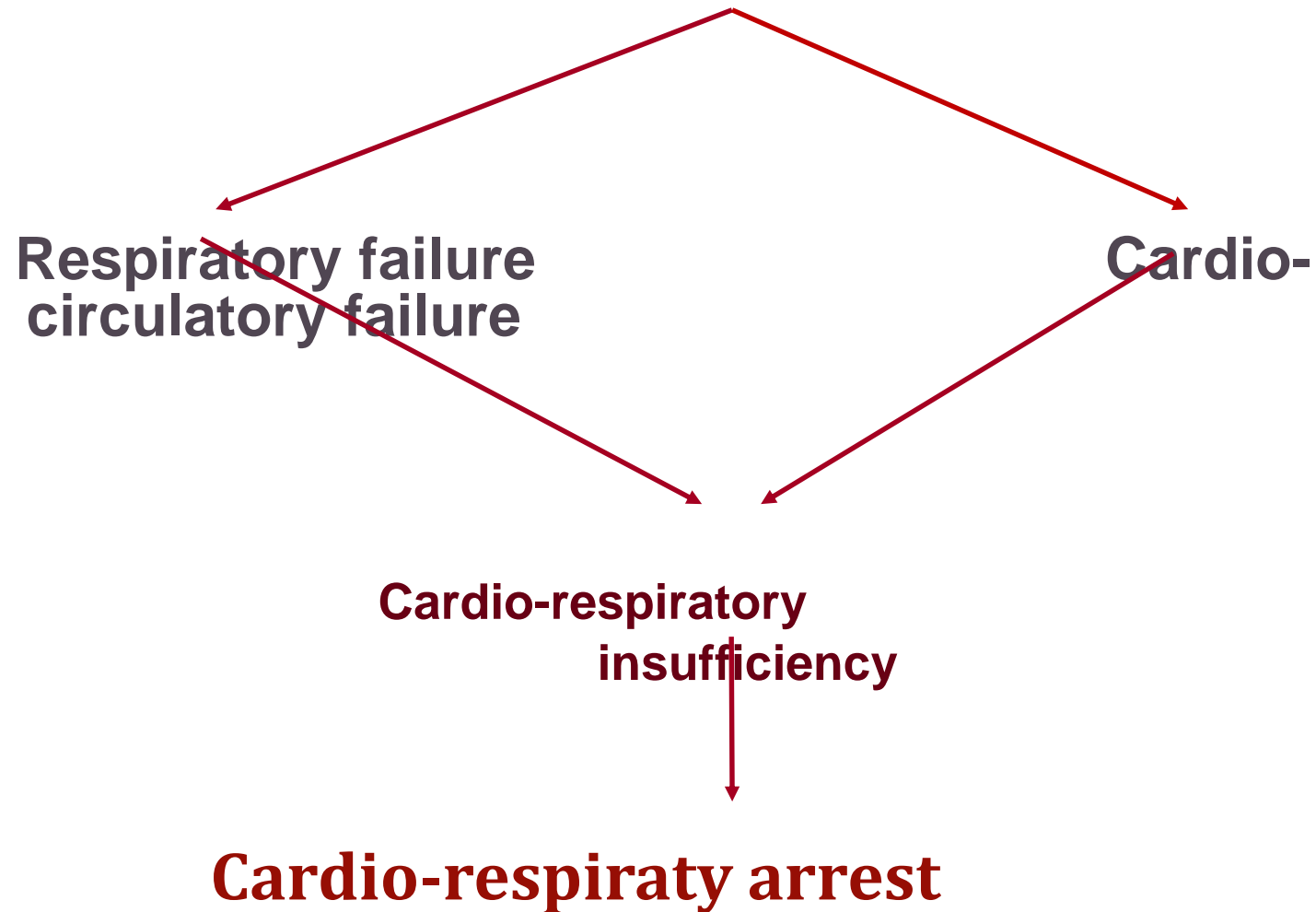


CARDIO RESPIRATORY ARREST IN CHILDREN

- rarely a sudden event
- result of progressive deterioration of respiratory and cardio-circulatory function
- cardio-respiratory failure and cardio-respiratory arrest

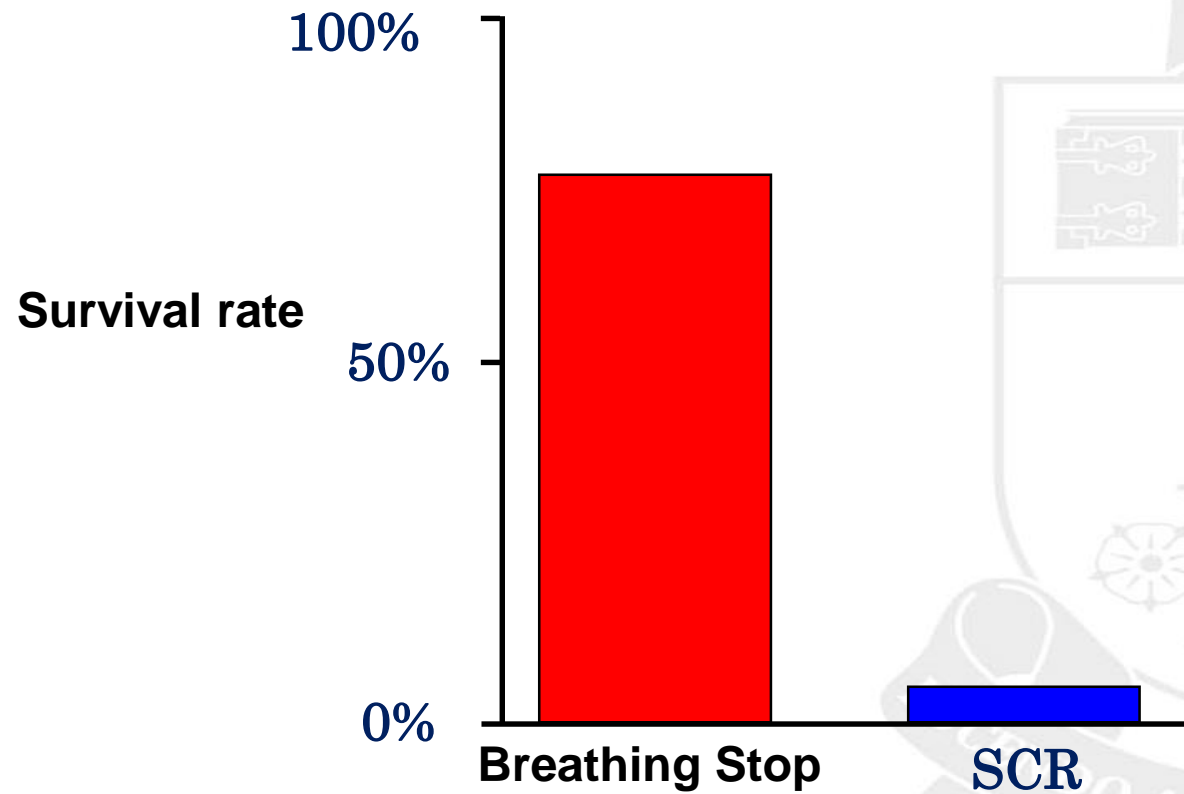


CAUSES





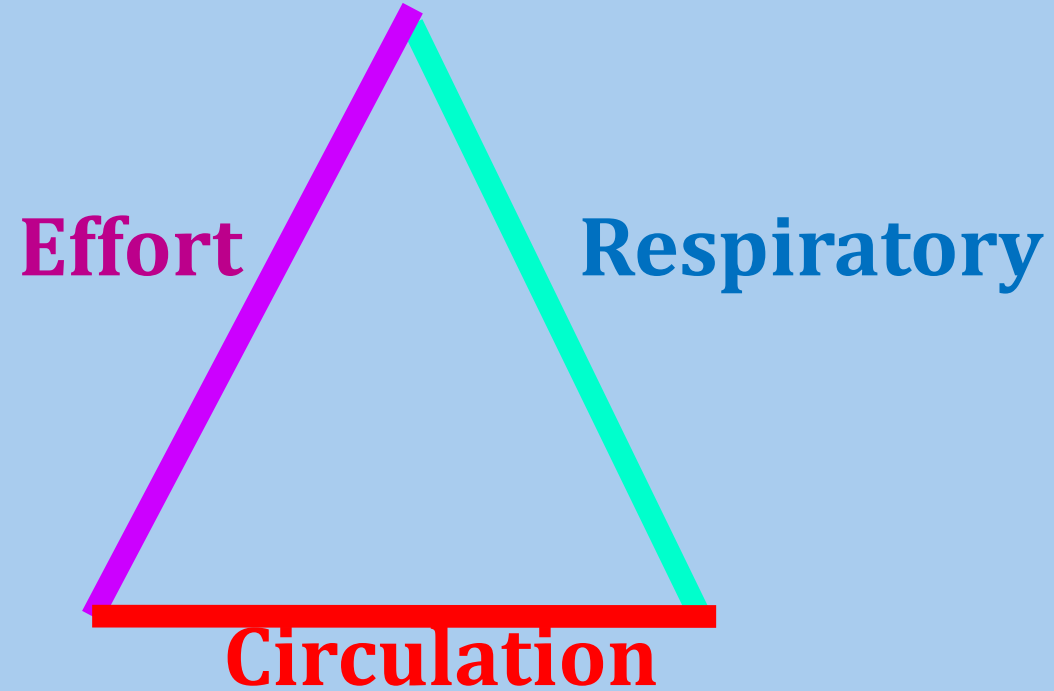
Survival after respiratory arrest and cardiopulmonary arrest in children





pediatric critical evaluation of the patient

GENERAL ASSESSMENT





The signs of cardiac arrest are:

- I. The patient is unresponsive (to your voice or touch)**
- II. The patient is not breathing. (Respirations usually stop within 30 seconds of cardiac arrest.)**
- III. The patient has no pulse.**



I. The patient is unresponsive (to your voice or touch)

Unconsciousness

Unconsciousness is when the victim seems to be asleep but has lost all awareness and is not able to respond to questions or to touch or gentle shaking.

A sleeping person will usually respond to a loud noise, shouting, or gentle shaking.

An unconscious person will not respond to noise or shaking.

When unconscious, a person can not cough or clear the throat, which can block the windpipe (**trachea**) and cause suffocation and death.



I. The patient is unresponsive (to your voice or touch)



Unconsciousness

People with a major illness or injury or who have had recent surgery are at risk for losing consciousness.

Just before a person loses consciousness, symptoms may include:

- ◎ **lack of response to voice or touch**
- ◎ **disorientation or stupor**
- ◎ **light-headedness**
- ◎ **headache**
- ◎ **sleepiness**



II. The patient is not breathing. (Respirations usually stop within 30 seconds of cardiac arrest.)

- ⦿ **Not breathing, which is also called apnea, is the lack of spontaneous breathing. It requires immediate medical attention. The victim may become limp and lifeless, have a seizure , or turn blue.**
- ⦿ **Prolonged apnea is called respiratory arrest.**
- ⦿ **In children, this can lead quickly to cardiac arrest in which the heart stops beating. In adults, cardiac arrest usually happens first and then respiratory arrest.**



II. The patient is not breathing. (Respirations usually stop within 30 seconds of cardiac arrest.)

- ◎ The common causes of apnea in adults are obstructive sleep apnea (something blocks the airway during sleep), choking, drug overdose, near-drowning, head injury, heart irregularities (arrhythmia, fibrillation) or cardiac arrest, nervous system disorders, or metabolic disorders.
- ◎ In children the causes may be different, such as prematurity, bronchial disturbances or pneumonia, airway blockage or choking on a foreign object, holding the breath, seizures, meningitis, regurgitating food, or asthma attacks.

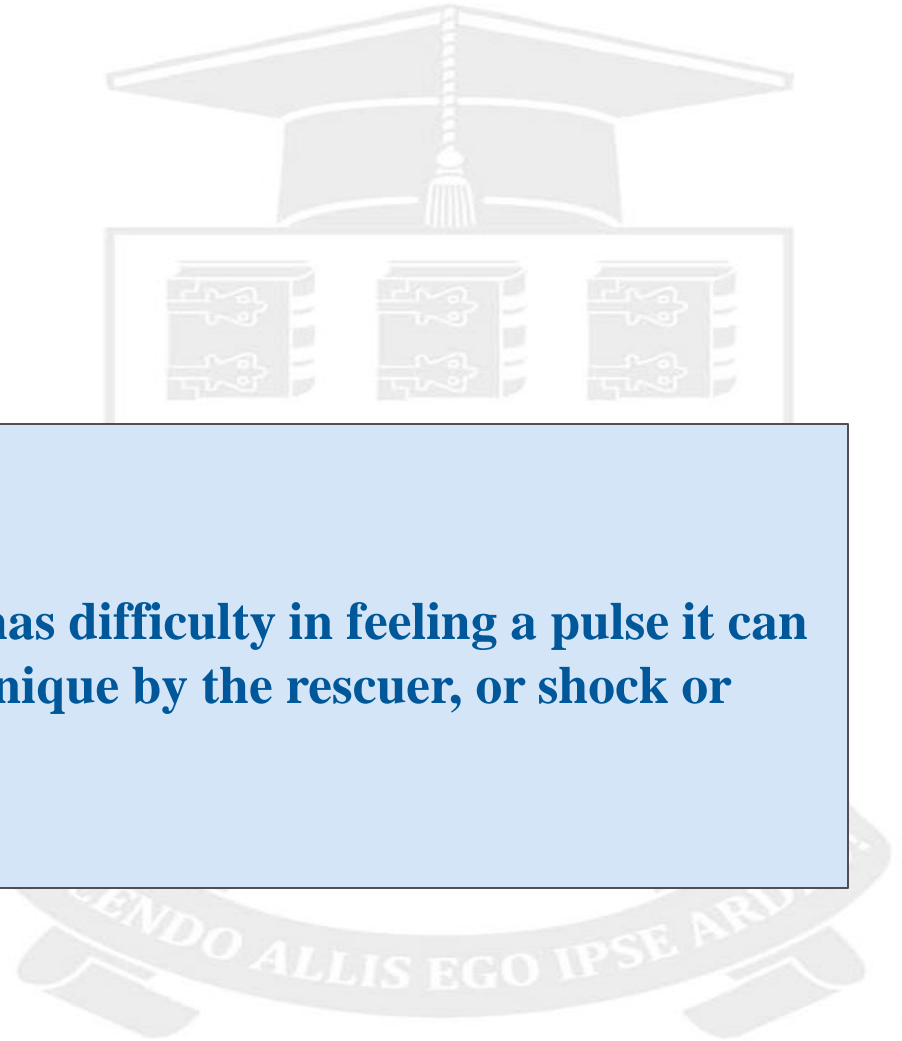




III. The patient has no pulse.

◎ *No pulse detected :*

◎ If the rescuer is unable to detect a pulse or has difficulty in feeling a pulse it can be an indication of the use of improper technique by the rescuer, or shock or cardiac arrest in the victim.





III. The patient has no pulse.



⦿ *No pulse detected :*

⦿ **If a sudden, severe decrease occurs in pulse quality (such as pulse weakness) or pulse rate (how many beats in a minute) when other symptoms are also present, life-threatening shock is suspected.**





The Chain of Survival are called the actions linking the victim of sudden cardiac arrest with survival.

It includes:

- **Prevention of cardiac arrest.**
- **Early cardio-pulmonary resuscitation.**
- **(pediatric Basic Life Support).**
- **Ambulance activation.**
- **Pediatric Advanced Life Support.**



Pediatric Basic Life Support

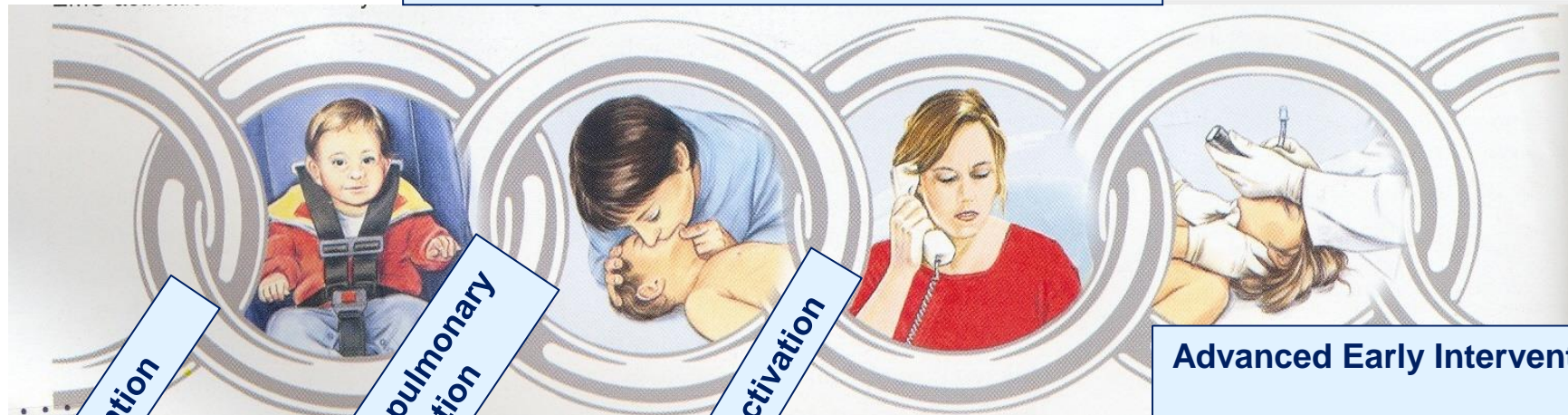


- 1) Prevent Cardiac Arrest
- 2) Early cardiopulmonary resuscitation (CPR)
- 3) Prompt access to the emergency response system
- 4) Rapid pediatric advanced life support (PALS)
- 5) Integrated post— cardiac arrest care

Berg M D et al. Circulation

American Heart Association
Learn and Live

Pediatric chain of survival



prevention

Early cardio-pulmonary
resuscitation

Ambulance activation

Advanced Early Intervention:

Stabilisation

Transport

Rehabilitation



Precautions

There are certain important precautions for rescuers to remember in order to protect the victim and get the best result from CPR.

These include:

- **Do not leave the victim alone.**
- **Do not give chest compressions if the victim has a pulse. Chest compression when there is normal circulation could cause the heart to stop beating.**





Precautions (continuation)

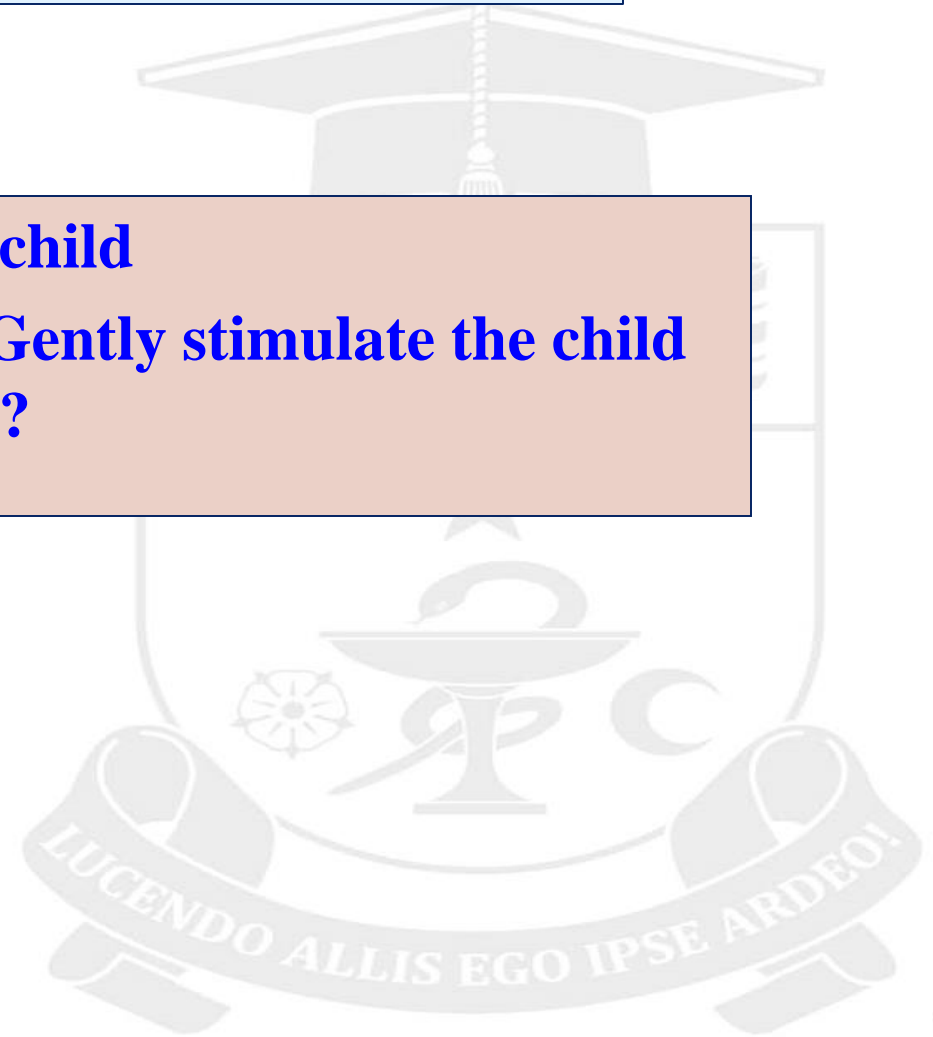
- **Do not give the victim anything to eat or drink.**
- **Avoid moving the victim's head or neck if spinal injury is a possibility. The person should be left as found if breathing freely. To check for breathing when spinal injury is suspected, the rescuer should only listen for breath by the victim's mouth and watch the chest for movement.**
- **Do not slap the victim's face, or throw water on the face, to try and revive the person.**
- **Do not place a pillow under the victim's head.**





When providing CPR for an infant or child,
it will be necessary to:

- 1. Ensure the safety of rescuer and child**
- 2. Check the child responsiveness. Gently stimulate the child and ask loudly: Are you all right?**





When providing CPR for an infant or child,
it will be necessary to:

3A. If the child responds by answering or moving:

- **Leave the child in the position in which you find him (provided he is not in further danger)**
- **Check his condition and get help if needed**
- **Reassure him regularly.**



When providing CPR for an infant or child,
it will be necessary to:



3B. If the child does not respond:

- **Shout for help**
- **Turn carefully the child on his back**
- **Open the child airway by tilting the head and lifting the chin**



When providing CPR for an infant or child, it will be necessary to:

4. Keeping the airway open, look, listen and feel for normal breathing by putting your face close to the child face and looking along the chest:

- ◎ **Look for chest movements**
- ◎ **Listen at the child nose and mouth for breath sounds**
- ◎ **Feel for air movement on your cheek.**

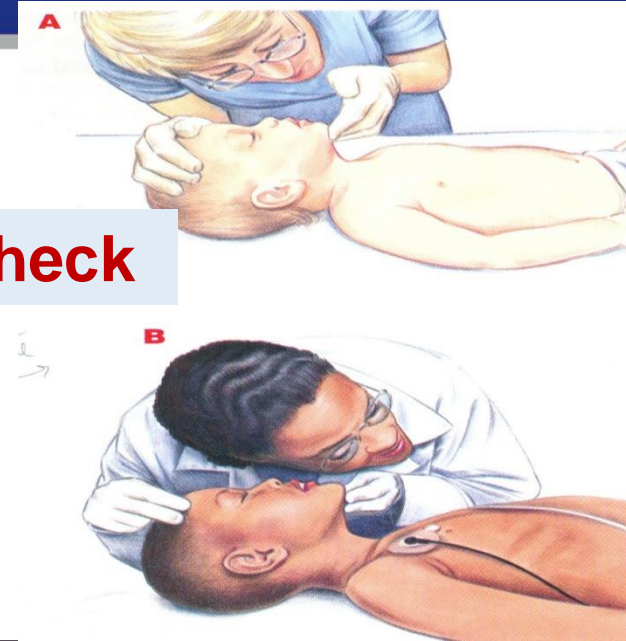
Look, listen and feel for no more than 10 seconds



A – AIRWAY (AER) – UPPER RESPIRATORY



Breathing check



LOOK - movements of the chest / abdomen

LISTEN - respiratory sounds (Place your ear close to the victim's mouth and watch for chest movement. For 5 seconds, look, listen, and feel for breathing.)

FEEL - breath in the nose / mouth



Newborn: cephalic extremity is prominent → roll under the shoulders to put him in neutral position



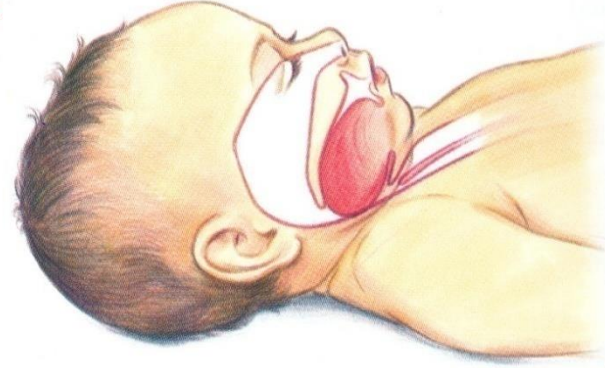
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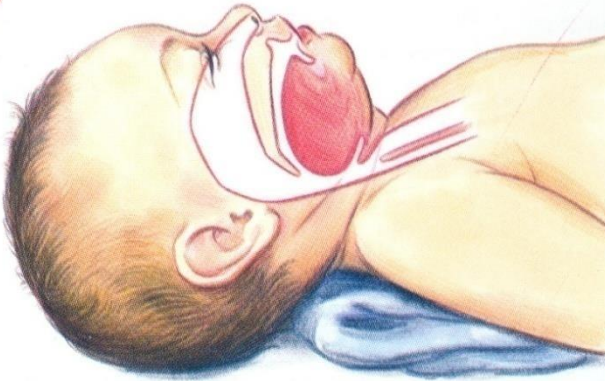
E



A



B





If the child is breathing normally:

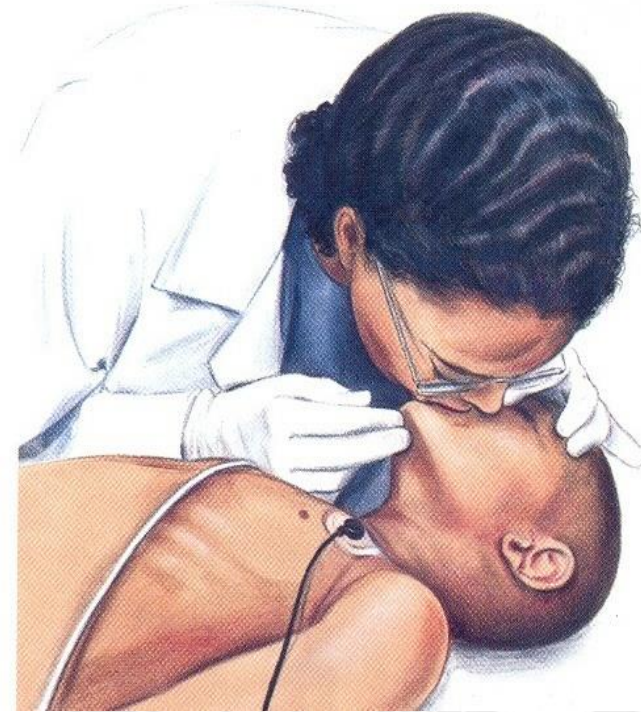
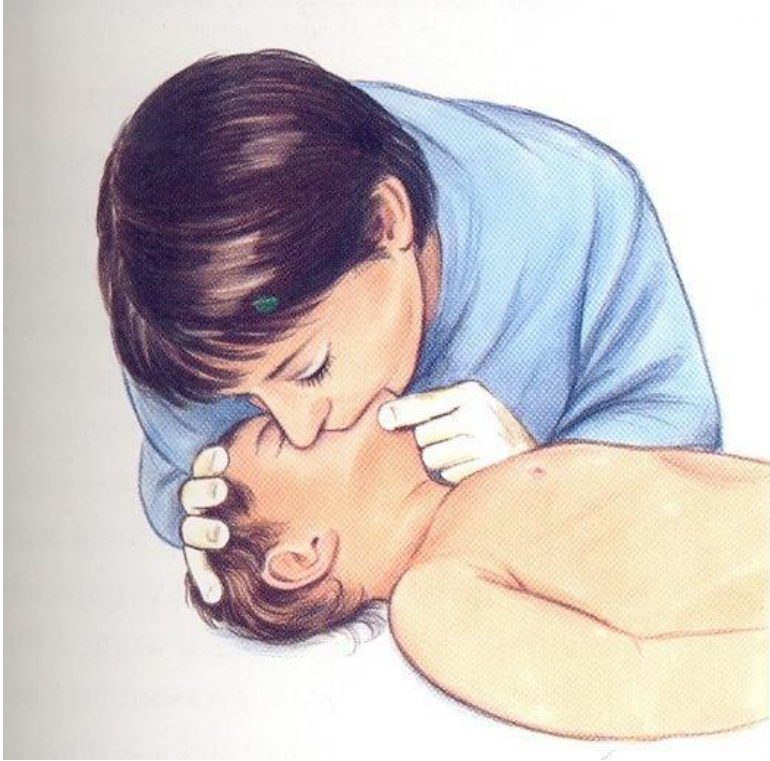
- ◎ Turn the child on his side into recovery position.
- ◎ Send or go for help – call the local emergency number for an ambulance.
- ◎ Check for continued breathing.

INADEQUATE BREATHING WITH PULSE

If there is a palpable pulse ≥ 60 per minute but there is inadequate breathing, give rescue breaths at a rate of about 12 to 20 breaths per minute (1 breath every 3 to 5 seconds) until spontaneous breathing resumes.



If breathing is not normal or absent:



◎ Remove carefully any obvious airway obstruction.

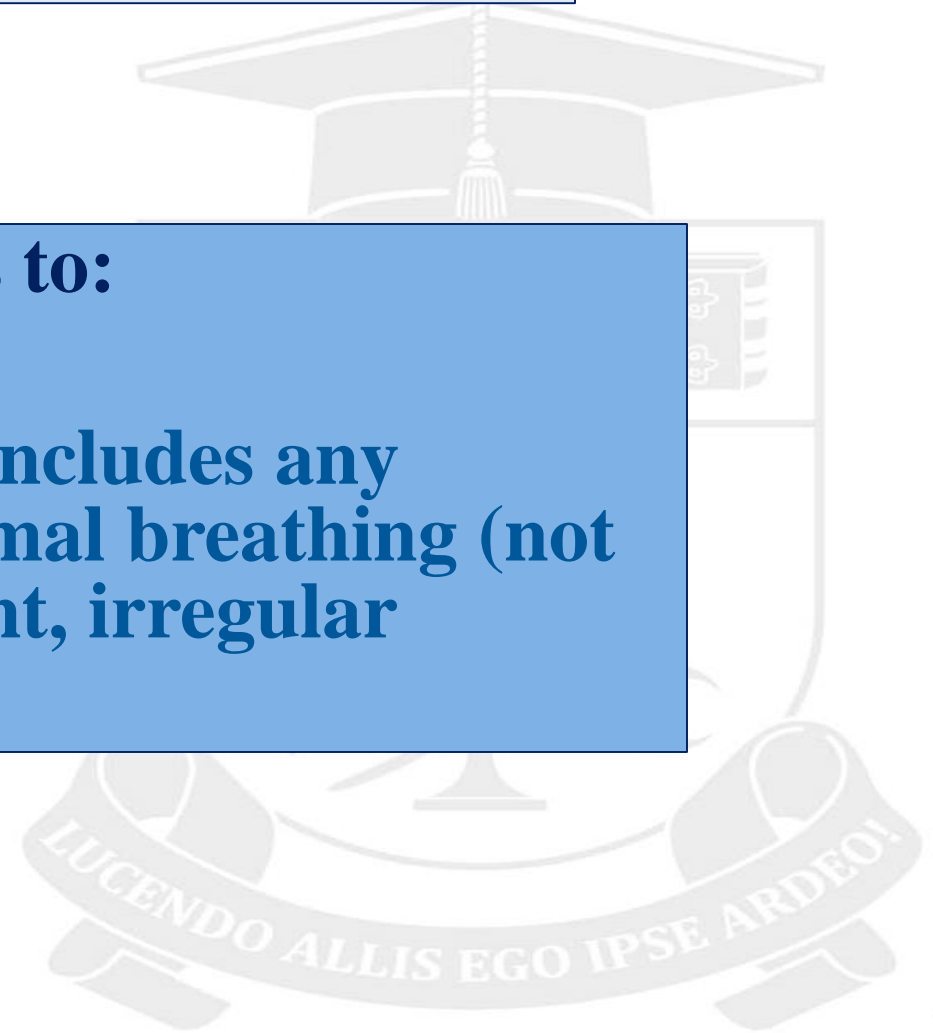
◎ Give five initial rescue breaths.



6. Assess the child circulation

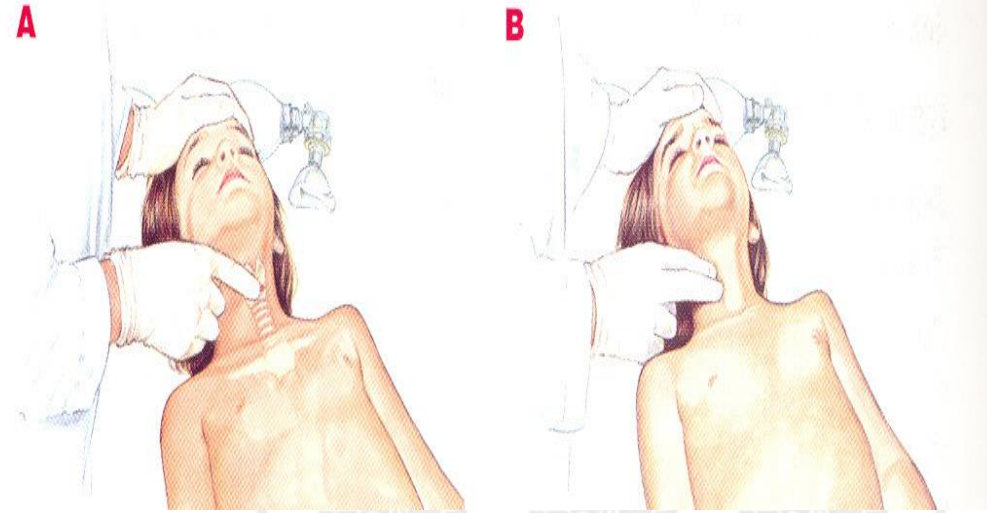
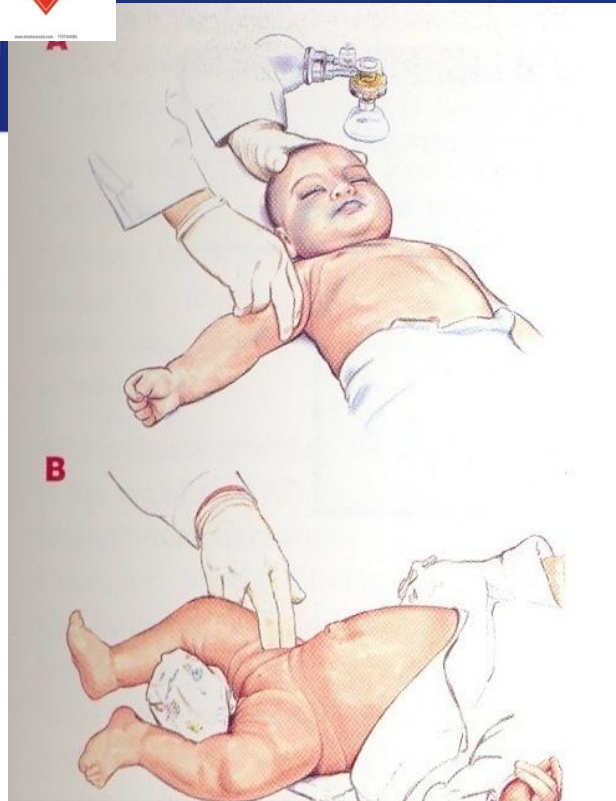
Take no more than 10 seconds to:

©Look for signs of life – this includes any movement, coughing or normal breathing (not abnormal gasps or infrequent, irregular breaths).





Circulation verification – 10 sec



- feel the pulse: brachial artery (infant)
- femoral artery
- carotid artery (child)

● The brachial artery

- On the medial part of the arm
- Palpate with the index and medius

The carotid artery Locate the thyroid cartilage with two fingers displace the fingers lateral carotid artery is palpated in the space between trachea and the sternocleidomastoid muscle



If you are confident that you can detect signs of life within 10 sec.

- ◎ Continue rescue breathing, if necessary, until the child starts breathing effectively on his own.
- ◎ Turn the child on his side (into the recovery position) if he remain unconscious.
- ◎ Re-assess the child frequently.





If there are no signs of life, unless you are **CERTAIN** you can feel a definite pulse or less than 60 beats min. for newborns, within 10 sec.

1. Start chest compressions.

2. Combine rescue breathing and chest compressions

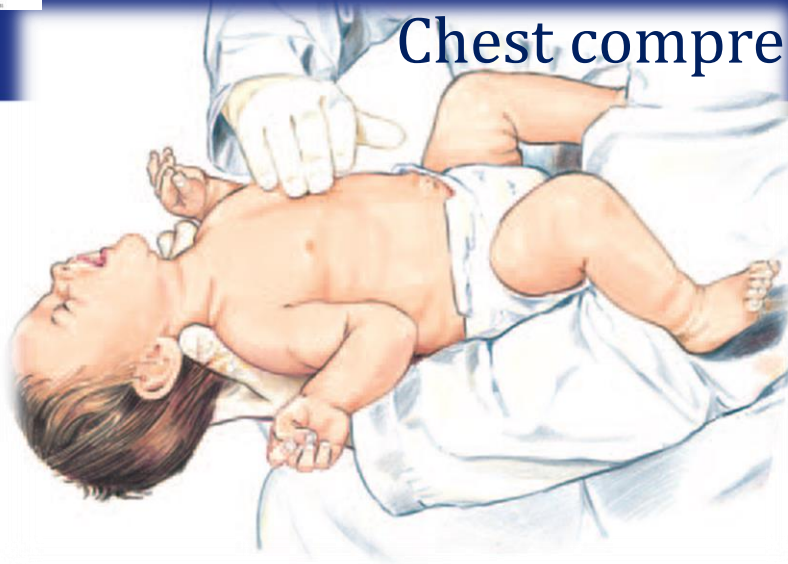




For all children, compress the lower half of the sternum:

- ◎ To avoid compressing the upper abdomen, locate the xiphisternum by finding the angle where the lowest ribs join in the middle.
- ◎ **Compress the sternum one finger's breadth above this.**
- ◎ Compression should be sufficient to depress the sternum by at least onethird of the depth of the chest.
- ◎ **Don't be afraid to push too hard. Push "hard and fast".**
- ◎ Release the pressure completely, then repeat at a rate of 100 - 120 min-1
- ◎ **After 15 compressions, tilt the head, lift the chin, and give two effective breaths.**
- ◎ Continue compressions and breaths in a ratio of 15:2.

Chest compression in infants:



- ◎ The lone rescuer should compress the sternum with the tips of two fingers.
- ◎ **If there are two or more rescuers, use the encircling technique:**
 - Place both thumbs flat, side by side, on the lower half of the sternum (as above), with the tips pointing towards the infant's head.
 - Spread the rest of both hands, with the fingers together, to encircle the lower part of the infant's rib cage with the tips of the fingers supporting the infant's back.
 - Press down on the lower sternum with your two thumbs to depress it at least one-third of the depth of the infant's chest.



Chest compressions in infants one revived



Reassess the pulse about every 2 minutes but spend no more than 10 seconds



Airway opening



- **Head Extension; Closure of jaw; Mandible subluxation**
- **The traumatized patient - jaw subluxation**
- **Child - neutral position (roll under the shoulders)**



Head Extension + mandible raise



- Place your hand on his forehead and gently tilt his head back.



- **At the same time, with your fingertip(s) under the point of the child chin, lift the chin. Do not push on the soft tissues under the chin as this may obstruct the airway.**



Airway opening



Head Extension



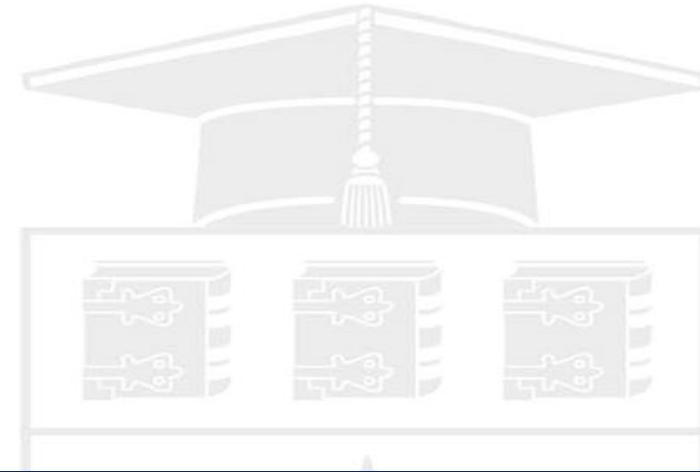
Mandible subluxation



- **The traumatized patient - jaw subluxation**



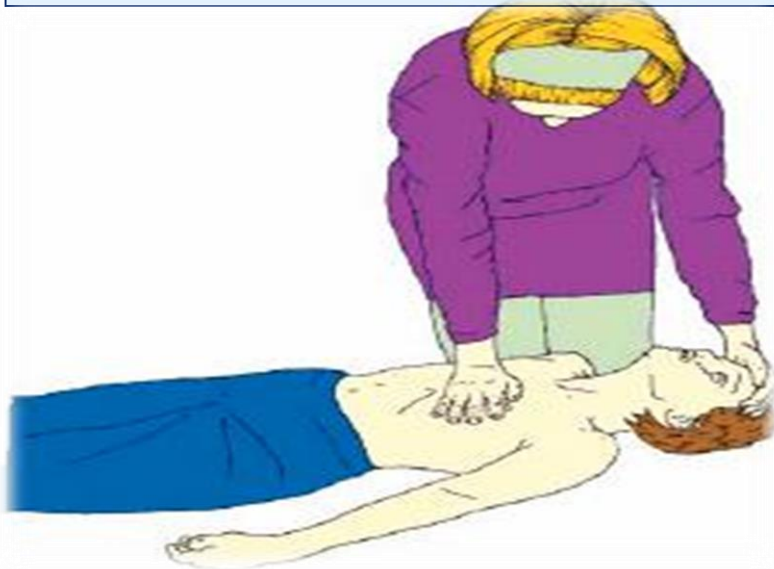
Chest compression in children aged over 1 year:



- ◎ **Place the heel of one hand over the lower half of the sternum (as above).**
- ◎ **Lift the fingers to ensure that pressure is not applied over the child's ribs.**
- ◎ **Position yourself vertically above the victim's chest and, with your arm straight, compress the sternum to depress it by at least one-third of the depth of the chest.**



CHEST COMPRESSIONS IN CHILDREN (CONTINUATION 1)



- In larger children, or for small rescuers, this may be achieved most easily by using both hands with the fingers interlocked
- Interruption of chest compressions should be minimal because:
- It is associated with decreased perfusion pressure in coronary arteries
- There should be less than 10 seconds - for evaluation



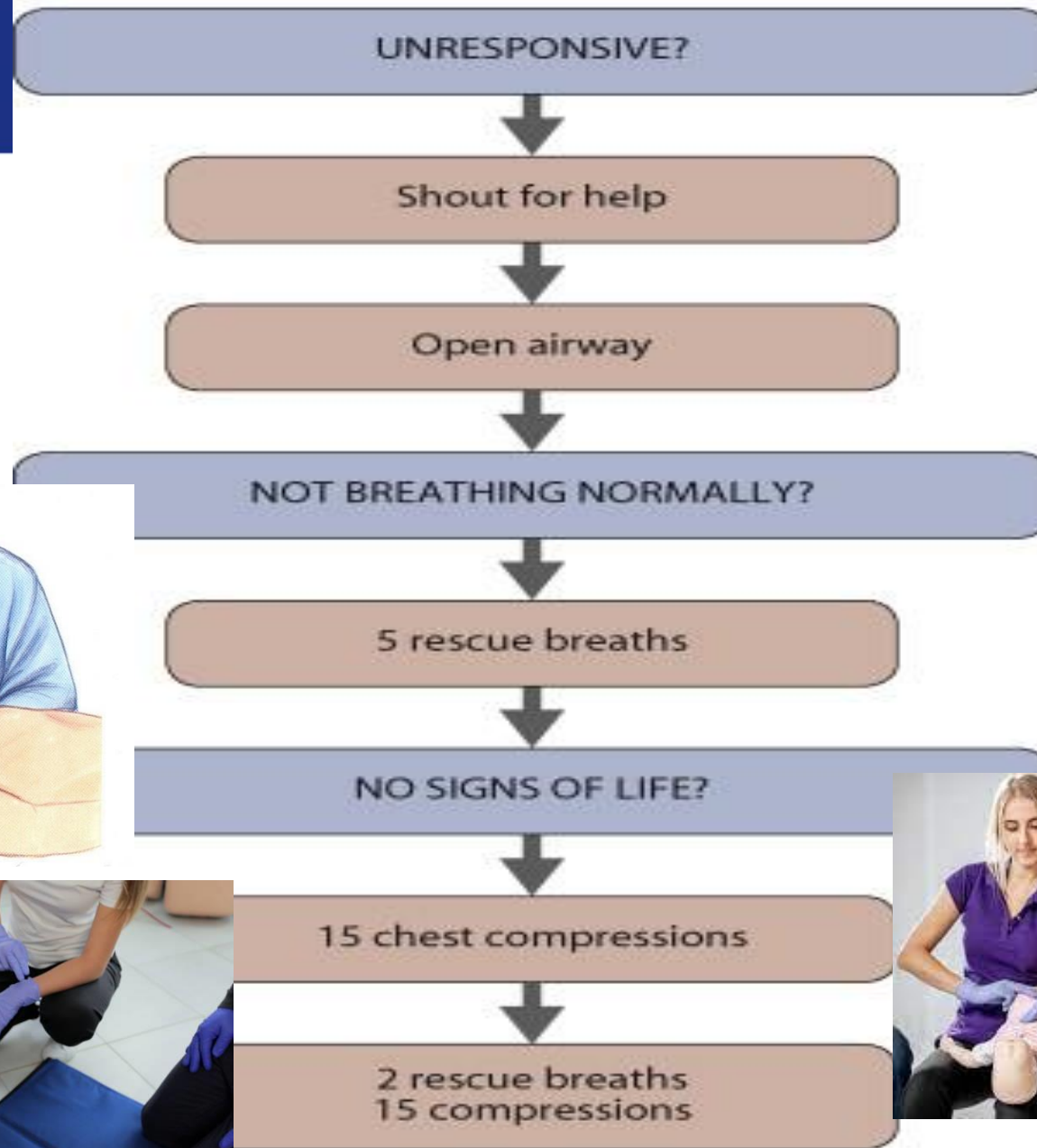
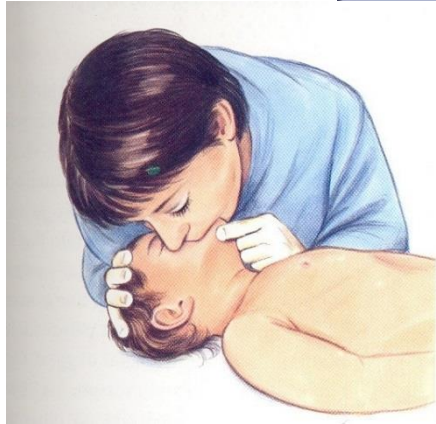
Continue resuscitation until:

- ◎The child shows signs of life (normal breathing, cough, movement or definite pulse of greater than 60 min⁻¹).
- ◎Further qualified help arrives.
- ◎You become exhausted.





Paediatric basic life support



Call cardiac arrest team or Paediatric ALS team



Automated external defibrillators (AEDs)



Since the publication of Guidelines 2010 there have been continuing reports of safe and successful use of AEDs in children less than 8 years demonstrating that AEDs are capable of identifying arrhythmias accurately in children and are extremely unlikely to advise a shock inappropriately.

Nevertheless, if there is any possibility that an AED may need to be used in children, the purchaser should check that the performance of the particular model has been tested in pediatric arrhythmias.



Automated external defibrillators (AEDs)



Although shockable rhythms are extremely unusual in infants, and the focus of infant resuscitation should be on high quality CPR, there are rare case reports of the successful use of AEDs in this age group. For an infant in a shockable rhythm, the risk: benefit ratio favors the use of an AED (preferably with an attenuator) if a manually adjustable model is not available.



Automated external defibrillators (AEDs)



An AED with a pediatric attenuator is also preferred for children

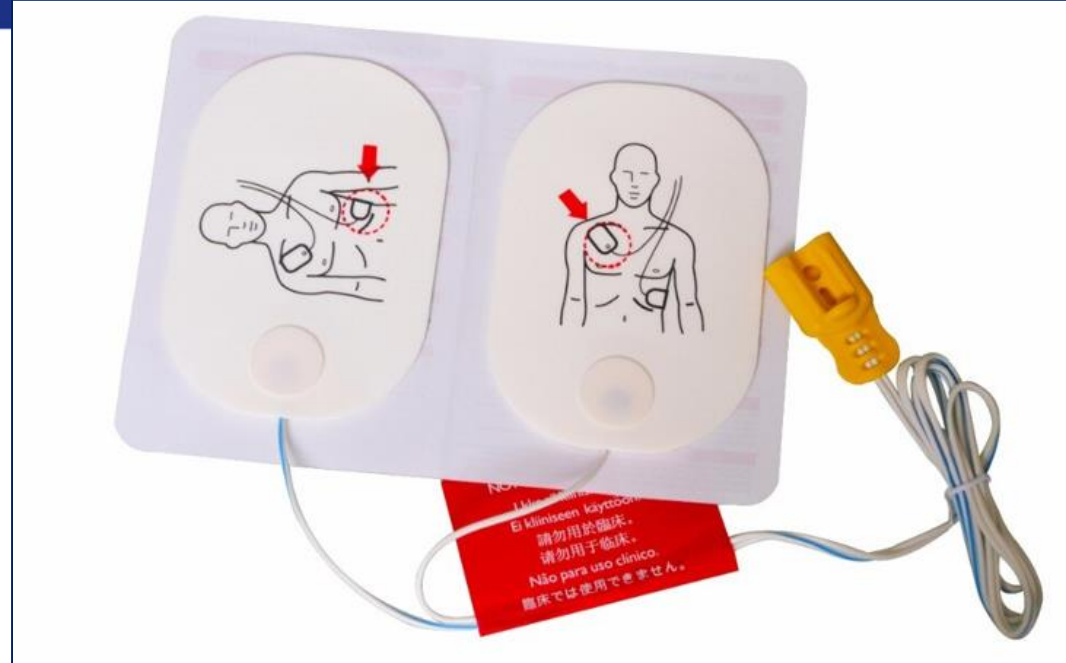
AEDs that deliver relatively high energy doses have been successfully used in infants with minimal myocardial damage and good neurological outcomes.

Rescuers should coordinate chest compressions and shock delivery to minimize the time between compressions and shock delivery and to resume CPR, beginning with compressions, immediately after shock delivery.

The AED will prompt the rescuer to re-analyze the rhythm about every 2 minutes. Shock delivery should ideally occur as soon as possible after compressions.



Automated external defibrillators (AEDs)



Defibrillation Sequence Using an AED

Turn the AED on.

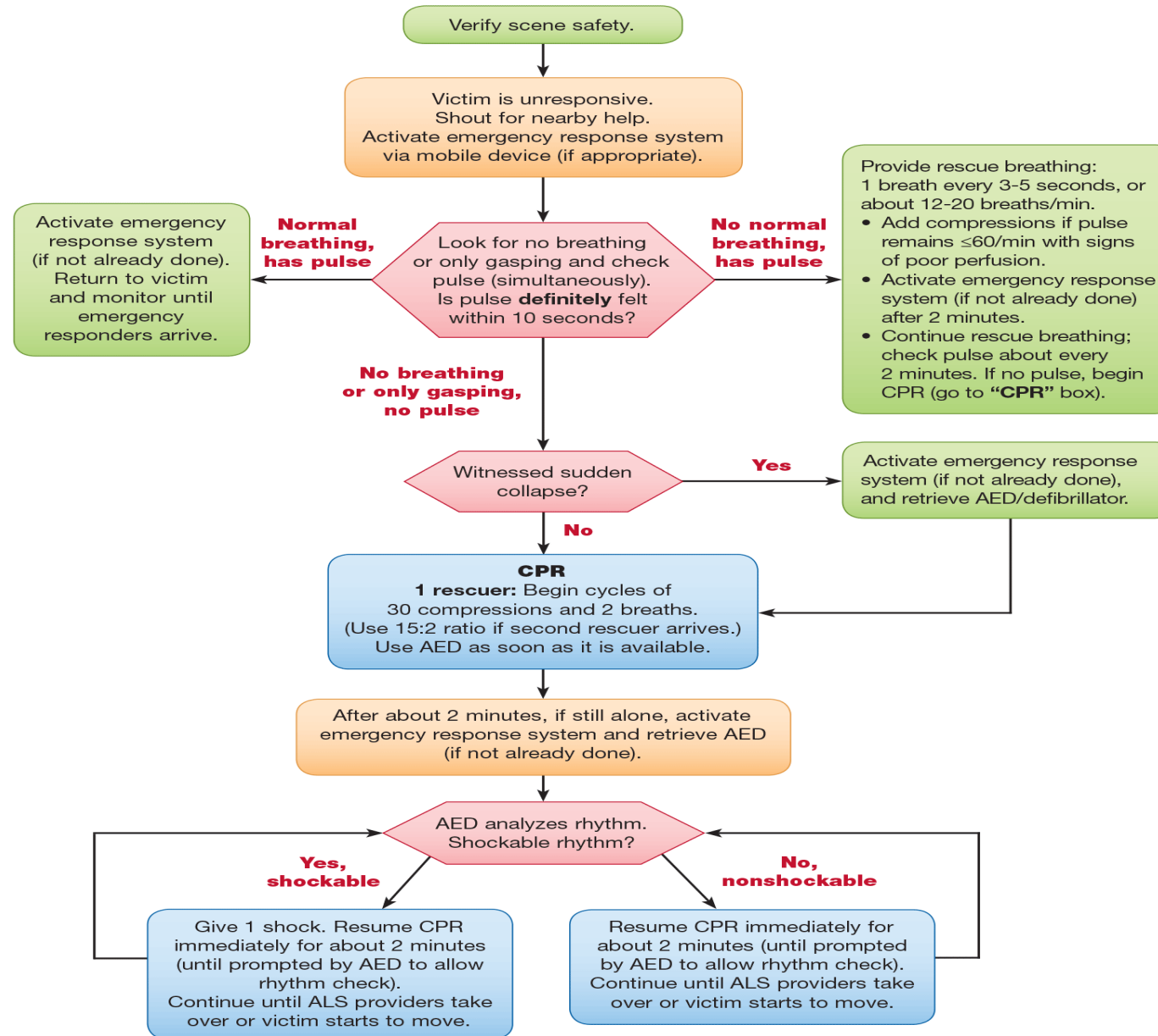
Follow the AED prompts.

End CPR cycle (for analysis and shock) with compressions, if possible.

Resume chest compressions immediately after the shock. Minimize interruptions in chest compressions.

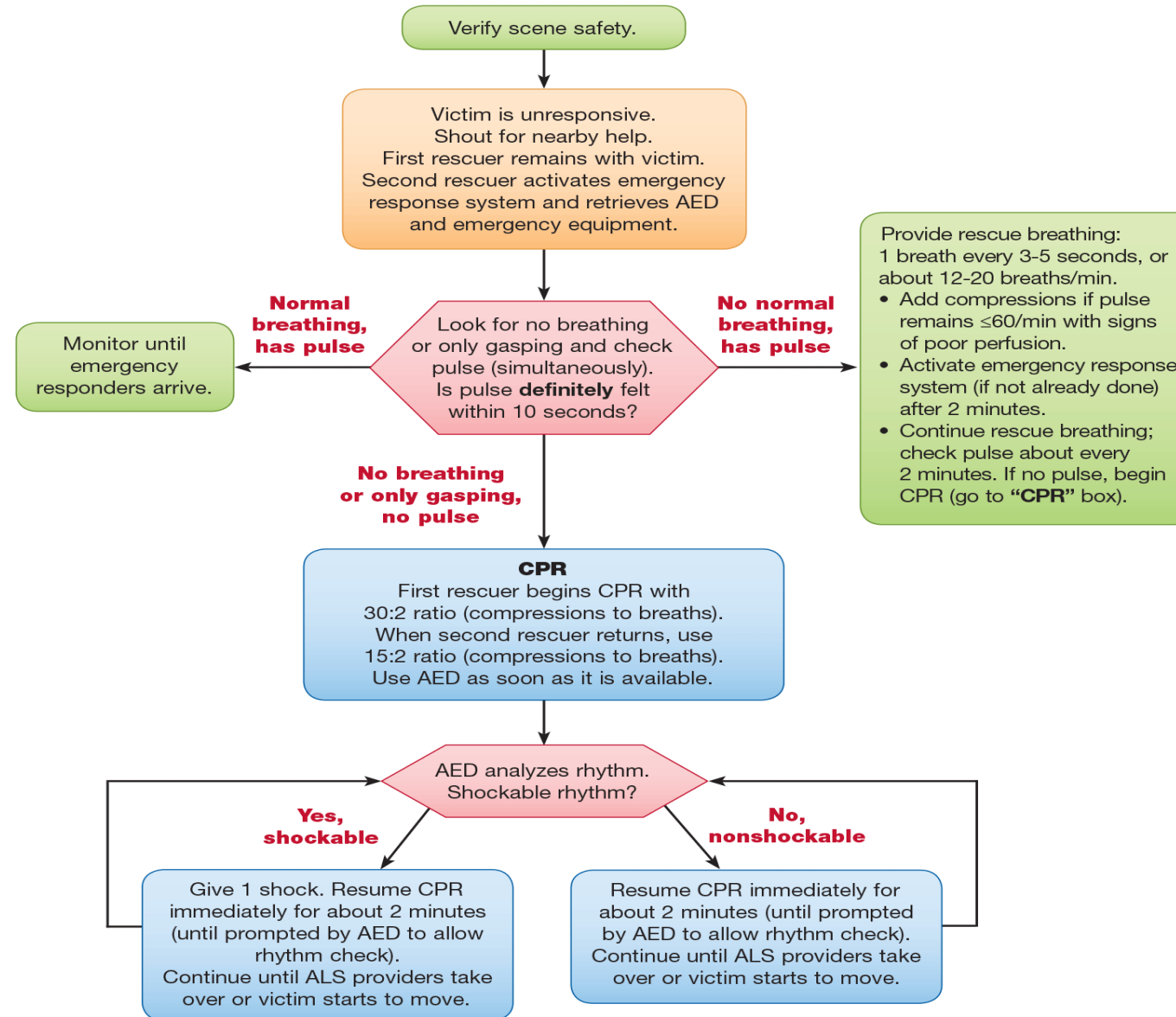


BLS Healthcare Provider Pediatric Cardiac Arrest Algorithm for the Single Rescuer—2015 Update





BLS Healthcare Provider Pediatric Cardiac Arrest Algorithm for 2 or More Rescuers—2015 Update



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•SEQUENCE OF CPR - UPDATED 2015





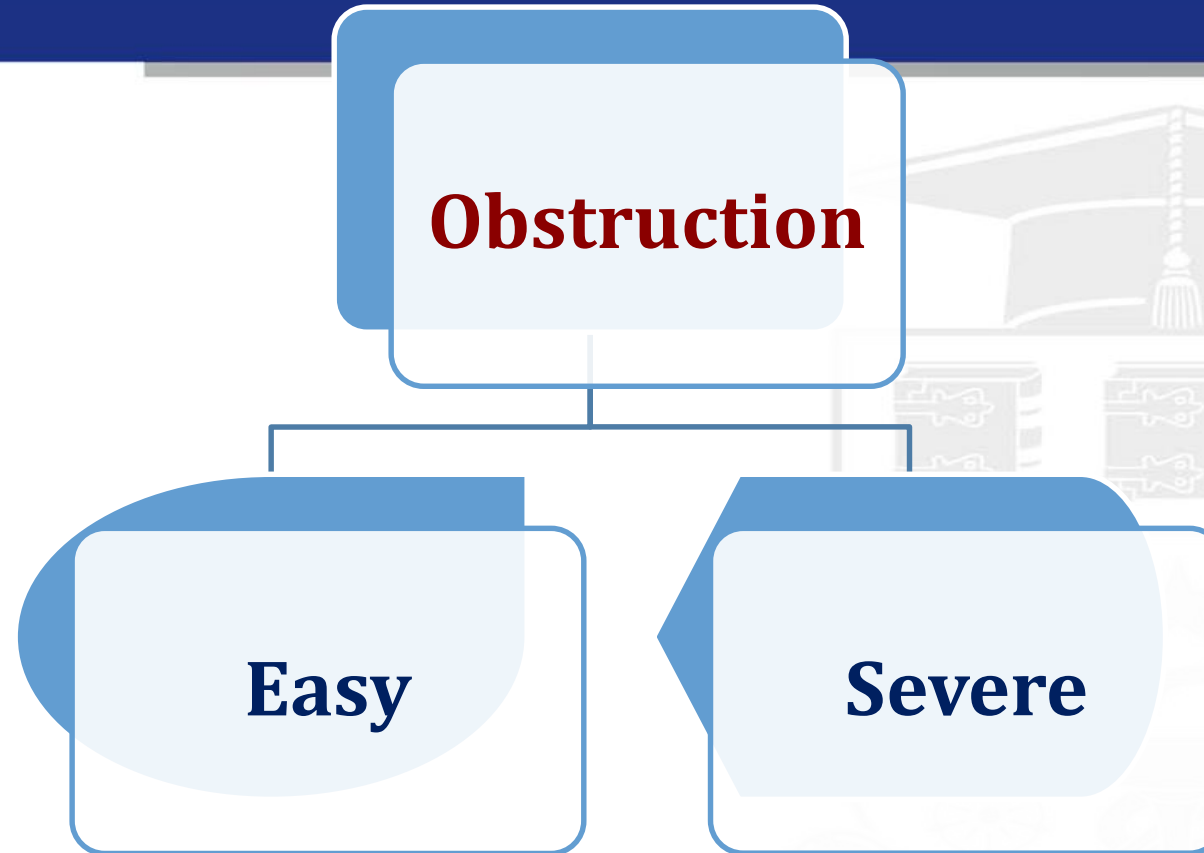
ASPIRATION WITH FOREIGN BODY

◎Vegetate (seeds, grain etc)



◎Metal or plastic (toys, nail, metallic or plastic pieces etc)







Choking



7. Choking. Recognition of choking

When a foreign body enters the airway the child reacts immediately by coughing in an attempt to expel it. **A spontaneous cough is likely to be more effective and safer than any maneuver a rescuer might perform.** However, if coughing is absent or ineffective, and the object completely obstructs the airway, the child will become asphyxiated rapidly. Active interventions to relieve choking are therefore required only when coughing becomes ineffective, but they then must be commenced rapidly and confidently.

General signs of choking

Witnessed episode

Coughing or choking

Sudden onset

Recent history of playing with or eating small objects

Ineffective coughing

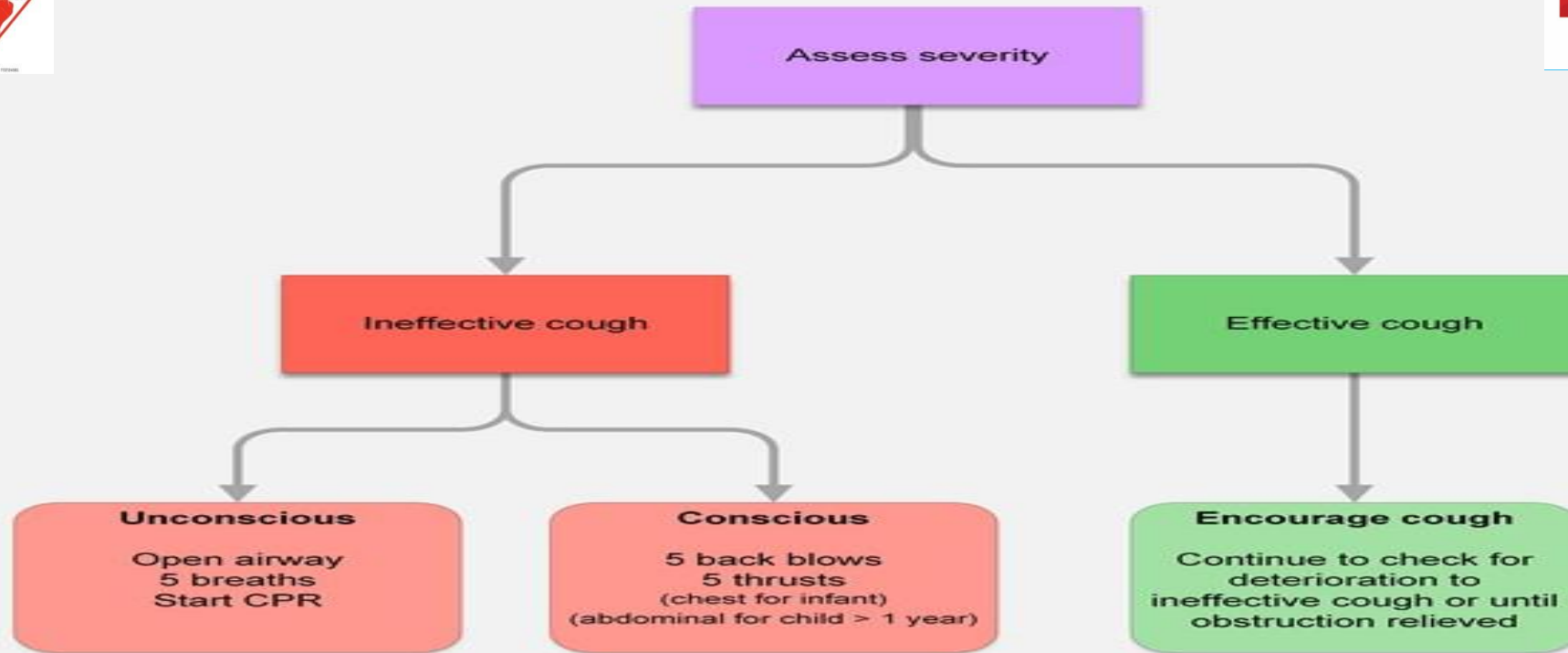
- Unable to vocalize
- Quiet or silent cough
- Unable to breathe
- Cyanosis
- Decreasing level of consciousness

Effective cough

- Crying or verbal response to questions
- Loud cough
- Able to take a breath before coughing
- Fully responsive



CHOKING ALGORITHMS



The majority of choking events in children occur during play or whilst eating, when a carer is usually present. Events are therefore frequently witnessed, and interventions are usually initiated when the child is conscious.

Choking is characterized by the sudden onset of respiratory distress associated with coughing, gagging, or stridor. Similar signs and symptoms may also be associated with other causes of airway obstruction, such as laryngitis or epiglottitis, which require different management. Suspect choking caused by a foreign body if: the onset was very sudden; there are no other signs of illness; there are clues to alert the rescuer (e.g. a history of eating or playing with small items immediately prior to the onset of symptoms).

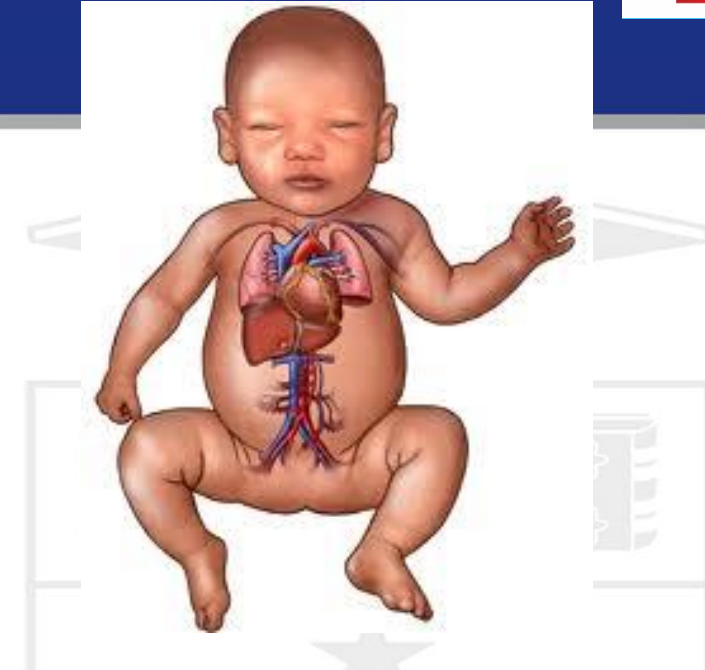


Back blows **In a child over 1 year:**

- ◎ Back blows are more effective if the child is positioned head down.
- ◎ A small child may be placed across the rescuer's lap as with an infant.
- ◎ If this is not possible, support the child in a forward-leaning position and deliver the back blows from behind.
- ◎ If back blows fail to dislodge the object, and the child is still conscious, use chest thrusts for infants or abdominal thrusts for children. Do not use abdominal thrusts for infants.



Conscious child, ineffective coughing



- ☉ *New-born: 5 interscapular hits followed by 5 chest compressions*
- ☉ Abdominal compressions are not performed because of the risk of liver injury
- ☉ Continue until:
 - Foreign body is removed → Hospital
 - The child becomes unconscious - SPC → Hospital



Interscapulare shots – to infant



- Apply 5 shots interscapulare with palm If foreign body is removed, interscapulare shots are interrupted



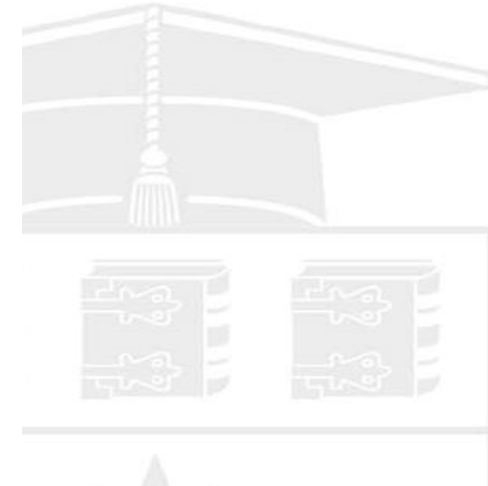
Chest thrusts for infants:



- ◎ Turn the infant into a head-downwards supine position. This is achieved safely by placing your free arm along the infant's back and encircling the occiput with your hand.
- ◎ Support the infant down your arm, which is placed down (or across) your thigh.
- ◎ Identify the landmark for chest compression (lower sternum approximately a finger's breadth above the xiphisternum).
- ◎ Deliver up to 5 chest thrusts. These are similar to chest compressions, but sharper in nature and delivered at a slower rate.
- ◎ The aim is to relieve the obstruction with each thrust rather than to give all 5.



Abdominal thrusts for children over 1 year:



- ◎ Stand or kneel behind the child. Place your arms under the child's arms and encircle his torso.
- ◎ Clench your fist and place it between the umbilicus and xiphisternum.
- ◎ Grasp this hand with your other hand and pull sharply inwards and upwards.
- ◎ Repeat the sequence for 5 times.
- ◎ Ensure that pressure is not applied to the xiphoid process or the lower rib cage as this may cause abdominal trauma.
- ◎ The aim is to relieve the obstruction with each thrust rather than to give all 5.



Following chest or abdominal thrusts, reassess the child:

- If the object has not been expelled and the victim is still conscious, continue the sequence of back blows and chest (for infant) or abdominal (for children) thrusts.
- Call out, or send, for help if it is still not available.
- Do not leave the child at this stage.



Unconscious child with choking:

- If the choking child is, or becomes, unconscious place him on a firm, flat surface.
- Call out, or send, for help if it is still not available.
- Do not leave the child at this stage.
- Open the airway and attempt 5 rescue breaths.
- Assess the effectiveness of each breath: if a breath does not make the chest rise, reposition the head before making the next attempt.
- Attempt 5 rescue breaths and if there is no response, proceed immediately to chest compression regardless of whether the breaths are successful.



THE PRINCIPLES OF BLS IN TRAUMATIZED PATIENTS :

- ◎ The principles of BLS resuscitation for the injured child are the same as those for the ill child, but some aspects require emphasis.
- ◎ The following are important aspects of resuscitation of pediatric victims of trauma:
- ◎ Anticipate airway obstruction by dental fragments, blood, or other debris. Use a suction device if necessary.
- ◎ Stop all external bleeding with direct pressure.
- ◎ When the mechanism of injury is compatible with spinal injury, minimize motion of the cervical spine and movement of the head and neck.



THE PRINCIPLES OF BLS IN TRAUMATIZED PATIENTS :

- **If there are 2 rescuers, 1 can manually restrict cervical spine motion while the other rescuer opens the airway.**
- **To limit spine motion, secure at least the thighs, pelvis, and shoulders to the immobilization board. Because of the disproportionately large size of the head in infants and young children, optimal positioning may require recessing the occiput or elevating the torso to avoid undesirable backboard-induced cervical flexion.**
- **If possible, transport children with potential for serious trauma to a trauma center with pediatric expertise.**



- **VIII. DROWNING**

- **Epidemiology**

- Drowning is a major injury burden worldwide causing an estimated 500000 deaths annually. In many countries, including the United States, the incidence of drowning is consistently highest among children younger than 5 years and next highest in those 15 to 19 years old. Children younger than 5 years accounted for nearly 50% of drowning, and children 5 to 14 years nearly 25%.

- **Definition**

- “Process of experiencing respiratory *impairment from submersion/immersion in liquid*”.





◎ **VIII. DROWNING (continuation)**

◎ **Treatment Approach**

- ◎ The 'Drowning Chain of Survival' refers to a series of interventions that, when put into action by laypersons or professionals, may reduce morbidity and mortality associated with drowning.
- ◎ The links of the chain are as follows:
 - ◎ Prevention - be safe in and around water.
 - ◎ Recognize distress - ask someone to call for help.
 - ◎ Provide flotation - to prevent submersion.
 - ◎ Remove from the water - only if safe to do so.
 - ◎ Provide care as needed - seek medical attention.



- ◎ Recognize distress and call for help.
- ◎ Provide flotation to stop the process of drowning. A responder who is not properly trained in advanced water rescue should never enter the water to attempt a rescue. If possible, reaching/throwing an object or maneuvering a craft to the victim is safest.
- ◎ Remove the victim from the water in as near a horizontal position as possible, with the airway open.



- For the unconscious victim, immediate removal from the water increases the likelihood of neurologically intact discharge from the hospital. If there is no response to in-water ventilation, the victim should be assumed to be in cardiac arrest.
- Cardiopulmonary resuscitation (CPR) with chest compression and ventilation should be initiated once the victim is out of the water.
- Routine spinal motion restriction is not indicated for the majority of drowning victims because the incidence of cervical spine injury is extremely low. If cervical spine injury is suspected, the cervical spine may be held in midline, but attempts at further motion restriction with cervical spine collars or long spine boards should never impede resuscitative efforts.



- **Cardiopulmonary resuscitation (CPR)**
- Should be given 5 rescue breaths before beginning chest compressions. This is to address the primary issue of hypoxemia. CPR should follow with a breath to compression ratio of 30:2 for adults and 15:2 for children. If an automated or manual defibrillator is available, it may be applied as long as this does not impede positive pressure ventilations and high-quality CPR; the majority of drowning cardiac arrest patients will be in pulseless electrical activity or asystole.
- Advanced Cardiac Life Support medications should be administered per local protocols, with the understanding that reversal of hypoxemia is the priority.



COMPONENTS OF HIGH-QUALITY CPR - UPDATED

Five key
aspects
to Great
CPR



Rate

Depth

Release

Ventilation

Uninterrupted

**AVOID EXCESSIVE
VENTILATION**



Questions?
We're Helpful and
Very Friendly.

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APPLE OF EYE of THE MEDICINE - IS THE EMERGENCY MEDICINE



**ALL OF THEM "HIT THE GROUND RUNNING" –
THIS MEANS THAT THEY ARE THE BEST SPECIALISTS in THE WORLD**



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PEDIATRIC BASIC LIFE SUPPORT



Abbreviations

1. Out-of-hospital cardiac arrest (OHCA)
2. American Heart Association (AHA)
3. Cardiopulmonary Resuscitation (CPR)
4. Emergency Cardiovascular Care (ECC)
5. Basic life support (BLS)
6. International Liaison Committee on Resuscitation (ILCOR)
7. In-hospital cardiac arrest (IHCA)
8. Compressions, airway, breathing (C-A-B)
9. Airway, breathing, compressions (A-B-C)
10. Foreign-Body Airway Obstruction (Choking) (FBAO)
11. Allow Natural Death (AND)
12. Do Not Attempt Resuscitation (DNAR)



BASIC LIFE SUPPORT

