



**Dial 997 – Civil Defense/ Fire Brigade will answer**  
**Dial 999 – Police Central Operation Department will answer**

Within your healthcare facility dial \_\_\_\_\_,  
to activate the Emergency Medical System (EMS).

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### **Core Reference, Authorship and Publication**

The Federal Department of Nursing, Ministry of Health, United Arab Emirates (FDON, MOH, UAE) used various international guidelines on Cardio-Pulmonary Resuscitation and Emergency Cardiovascular Care (See bibliography) as a basis to author this educational document. The FDON, MOH, UAE thus considers this document as their intellectual property and has the exclusive rights to decide to publish the work in its entirety or parts thereof as well as choose the form of publication.

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### **Inquiries to be directed to:**

**Director,  
The Federal Department of Nursing,  
P.O. BOX 848  
Abu Dhabi, UAE**



True to its mission, the Ministry of Health (MOH) is committed to provide quality health care to all the people of the UAE. Apart from putting the necessary infrastructures in place, the MOH endeavors to provide world class medical and other equipment to support the daily work of health carers. Also, the MOH accepts its obligation to ensure that health carers perform according to contemporary scientific protocols and guidelines.

This **2<sup>nd</sup> Edition** resource document on Basic Life Support (BLS) and the accompanying educational initiatives are tangible examples of the MOH and the Federal Department of Nursing's (FDON) commitment to ensure that a patient receives the best care possible at such a critical moment – providing scientifically sound and appropriate care during cardiopulmonary resuscitation.

The MOH sincerely appreciates the concerted efforts of all involved in making this publication possible – expressing our special gratitude to

- The In-service Education Department of Tawam Hospital who kindly provided the base document and
- Members of the FDON Taskforce on Basic Life Support who carefully modified the document according to wider utilization needs.

Our sincerest best wishes accompany this initiative that will contribute to nurses' skills development but most of all help to save precious lives –  
In Sha'Allah (God willing).

**Dr. Abdul Ghaffar Abdul Ghafour**

Assistant Undersecretary,  
Curative Medicine,  
Ministry of Health, UAE.

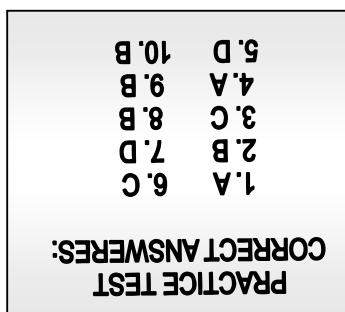
**Fatima Al-Rifai**

Director,  
Federal Department of Nursing  
Ministry of Health, UAE.

**NOTE:**

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- 1. The In-service Education Department of Tawam Hospital, who kindly provided the base document.**
- 2. The previous members of the BLS taskforce for their contribution to the 1<sup>st</sup> edition of the Handbook for the Basic Life Support Provider (May 2002).  
They were:**
  - Dr. Anita S van der Merwe
  - May Haddad
  - Shaun Bowden
  - Filestine Jaber (Quality Department, Mafraq Hospital)
- 3. The members of the 'Basic Life Support' Taskforce (BLST) and other staff of the FDON, who modified the document for approval and distribution by the FDON, MOH, UAE.  
They were:**
  - Maisa Maay'a (Chair, BLST; CE, FDON)
  - Mireille Maalouf ( NRCD, FDON)
  - Antoinette Yazbeck (Training and Development, Tawam Hospital)
  - Fatimah Albarracin (Training and Development, Tawam Hospital)
  - Brigitte Peetz ( Nursing Faculty, Higher Colleges of Technology)
  - Nawal Ahmed (Training and Development, Mafraq Hospital)
- 4. The author of 'Learn CPR' for permission provided to use their diagrams. See Young, R. (2000) in bibliography.**





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Cardiopulmonary Resuscitation (CPR) is an important life saving skill for the public and healthcare professionals alike. CPR is an emergency procedure that keeps oxygenated blood moving to the important organs, including the brain, when the heart of a person is no longer pumping. CPR alone does not usually save lives but can keep a person's oxygenated blood pumping until appropriate medical assistance arrives. The *Basic Life Support (BLS) Provider Course* aims to provide an opportunity to develop the knowledge and skills required to address first line assistance for cardiac arrests, foreign body airway obstruction and also the use of equipment such as barrier devices and defibrillators. Together with appropriate medical assistance, applying the knowledge and skills learnt in the *BLS Provider Course*, increases the chances of survival of someone having a critical health emergency.

The Ministry of Health – Federal Department of Nursing (MOH-FDON) has compiled and produced this supportive material to be used along with the *BLS Provider Course*. It is important to note that this booklet:

- **Is supportive and summary material for the MOH - FDON approved BLS provider course only.**
- **Does not replace appropriate BLS training by a MOH – FDON approved/certified BLS trainer.**
- **Can be used as supportive material for BLS provider training for the healthcare providers.**
- **Has been extensively reviewed by the FDON, Continuing Education(CE), Nursing Research and Competency Development (NRCD) Sections, and the BLS Taskforce and found to be in line with international guidelines and recommendations available; the authors however cannot guarantee nor accept responsibility for accuracy, currency or fitness once applied in diverse situations.**
- **Has been revised in accordance with the 2005 International Liaison Committee on Resuscitation (ILCOR) Guidelines (American Heart Association [AHA] Standard).**
- **Contains diagrams that show rescue breathing without a barrier device covering the mouth and/or latex gloves. However, the FDON recommends that all rescuers carry and use a barrier device in cases of respiratory or cardiac arrest.**
- **Shall not be used for diagnosis or treatment of any medical condition.**

## 2. WHY CARDIOPULMONARY RESUSCITATION (C. P. R.)?

**C.P.R. alone may not save lives!** The purpose of CPR is to keep the person's brain and heart supplied with blood and oxygen until medical help arrives. Any trained individual can perform C.P.R., so your hard work and study can make a difference.

To understand how C.P.R. can prevent death, let us look at definitions of two classifications of death:

- **Clinical Death** means that the heartbeat (pulse) and breathing have stopped. This "death" is sometimes reversible. (Indication for CPR)
- **Biological Death** is permanent brain death due to lack of oxygen. This death is irreversible (usually occur after **4-6 minutes** of clinical death)

Promptly initiated C.P.R. may reverse clinical death and may prevent biological death.

It is important that you recognize the warning signs of respiratory and cardiac distress and strive to prevent an arrest:

- Call for help and activate EMS
- Immediately begin C.P.R.

### 2.1 COMMON CAUSES OF SUDDEN DEATH

<ul style="list-style-type: none"><li>• Sudden Cardiac Arrest (SCA)</li><li>• Drug Reactions</li><li>• Suffocation</li></ul>	<ul style="list-style-type: none"><li>• Obstructive Airway</li><li>• Electric Shock</li><li>• Other Sensitivity Reactions</li></ul>	<ul style="list-style-type: none"><li>• Stroke</li><li>• Drowning</li><li>• Trauma</li></ul>
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In **adults**, the most common cause of sudden death is cardiac arrest (usually ventricular fibrillation).

In **infants and children**, the most common cause of sudden death is respiratory arrest leading to cardiac arrest.

### 2.2 RISK FACTORS (RFs).

Extensive studies of family medical history, physical conditions, and lifestyles have identified factors, which contribute to an increased risk of heart attack and stroke. Most scientific evidence available today indicates that reducing risk factors help to prevent heart attack, stroke and other cardiovascular conditions.

RFs - CANNOT be modified	RFs - CAN be modified:	
<ul style="list-style-type: none"><li>• Heredity</li><li>• Gender</li><li>• Age</li></ul>	<ul style="list-style-type: none"><li>• Cigarette Smoking</li><li>• Hypertension</li><li>• High Blood Cholesterol</li></ul>	<ul style="list-style-type: none"><li>• Obesity (overweight)</li><li>• Diabetes</li><li>• Sedentary lifestyle</li></ul>

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*NOTE: In this booklet, the use of "EMS" (Emergency Medical System) and "Call a Code" are interchangeable.*

### 3

## 3.1 MYOCARDIAL INFARCTION (MI) - Heart Attack

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A heart attack occurs when the oxygen demand of the heart muscle greatly exceeds the oxygen availability. This usually results from the severe narrowing or complete blocking of a diseased coronary artery (atherosclerosis) and results in death of the heart muscle cells supplied by that artery. Acute myocardial infarction means “death of the heart muscles”. The most serious danger of the heart is cardiac arrest. When you and someone else suffer a heart attack, minutes count!

**REMEMBER** many people deny that they are having a heart attack. The usual reasons are:

- “It’s indigestion or something I ate”.
- “It can’t happen to me I’m too healthy”.

### SO KNOW THE WARNING SIGNS!

#### WARNING SIGNS

- **Chest discomfort** is the most significant sign of heart attack.

Character: Uncomfortable pressure, squeezing, fullness, crushing sensation, tightness/aching, “Heartburn”, pain, indigestion. May be mild or severe.  
Often does not go away with rest.

Location: In the center of the chest behind the breastbone, it may spread to the shoulder, neck, jaw, arms or back.

Duration: The discomfort of heart attack will usually last longer than two minutes.

- Other signs of a heart attack may include any or all of the following:

**Sweating** – cool, clammy skin

**Weakness** – “feeling of tiredness”

**Nausea** – indigestion-like, may vomit

**Shortness of breath** – difficulty of breathing

**Anxiety & denial**

#### EFFECTIVE MANAGEMENT

If you are with someone who is having any of these signs, have them stop activity and sit or lie down. If the pain persists, seek medical attention at once.

Providing Basic Life Support (BLS) includes early recognition of symptoms – intervention to gain prompt entry into emergency care as well as initiation of C.P.R. on victims of cardiac arrest. Cardiopulmonary Resuscitation (C.P.R.) is a basic, life saving technique for sudden cardiac or respiratory arrest and it involves a combination of rescue breathing and chest compressions (see section on Providing BLS). CPR relies on three basic rescue skills: the A B C’s of C.P.R.

**A = Airway**

**B = Breathing**

**C = Circulation**

## **3.2 CEREBRAL VASCULAR ACCIDENT (CVA) - STROKE**

A stroke is a sudden interruption of blood supply to an area of the brain. It can be caused by either a blockage or rupture of a blood vessel. The size and severity of a stroke depends on the area of the brain affected and ***how much damage there is***. A stroke may cause weakness or loss function in the part of the body controlled by the affected part of the brain.

A transient ischemic attack (TIA) is often called a “mini stroke”. It is caused by a temporary blockage of a blood vessel and does not result in permanent brain damage. Signs of TIA are the same as for a stroke and may last from a few minutes to a few hours. A TIA is an important warning sign of stroke and should never be ignored. Prompt medical attention may prevent a major stroke from occurring.

### **WARNING SIGNS**

The following signs may vary from mild to severe:

- **Weakness** – sudden weakness, numbness or tingling in the face, arm or leg
- **Difficulty in speaking** – sudden temporary loss of speech or trouble understanding speech
- **Vision problems** – sudden loss of vision in one or both eyes
- **Headache** – sudden severe and unusual headache
- **Dizziness** – sudden loss of balance especially with any of the above signs

### **EFFECTIVE MANAGEMENT**

Early recognition of the warning signs of heart attack and stroke is important so that treatment/ medication can be provided as soon as possible. Thrombolytic or fibrinolytic drugs (“clot bluster”) can be effective in reducing damage to the heart or brain. To be effective, these drugs must be given as soon as possible, after the symptoms begin.

***[REMEMBER, recognize warning signs, intervene appropriately, call EMS or transport victim to a medical facility as soon as possible].***

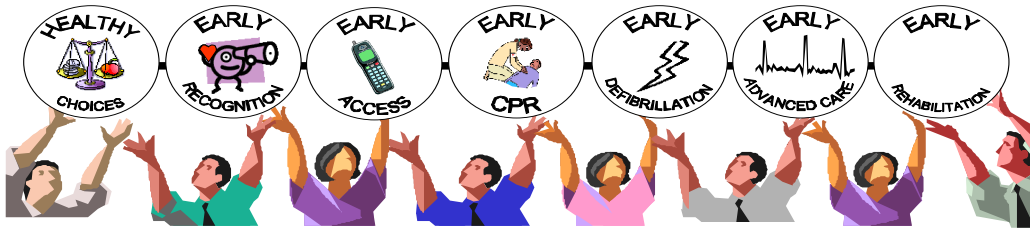
## **3.3 SOMETHING ABOUT SIDS:**

Sudden Infant Death Syndrome (SIDS) happens very suddenly and silently, usually during sleep. Positioning of infant correctly can reduce the risk of SIDS. Place the infant on his/her side or back when sleeping. The most common age of infants to die of SIDS is 1 month to 1 year of age. It is slightly more common in boys than girls. The incidence of SIDS per 1000 live births ranges from 0.25 (Finland) to 1.04 (New Zealand)\*.

\* International Statistics from SIDS Global Taskforce (updated August 2000)



## 4.1 ADULT LINKS FOR SURVIVAL



Adapted from HSFC 2001

The links for survival illustrate how to care for our own heart and brain and how to support a person, whose breathing and heart have stopped. The first two links are important for prevention and the last link for rehabilitation, but the core links are numbers three to six. The following are the seven links:

1. **HEALTHY CHOICES** - Making healthy choices in life can reduce your personal risk for heart disease, stroke and/ or injury.
2. **EARLY RECOGNITION** - Recognizing warning signs of heart disease, stroke and/ or illness and injury (especially to infants and children) can reduce delays in treatment.
3. **EARLY ACCESS** - Calling your local facility/ area EMS to bring trained help and advanced life support to the scene.
4. **EARLY CPR** - Providing CPR as soon as possible on a person who does not have visible signs of circulation (normal breathing, coughing or movement) and has no pulse, ensures that the vital organs receive oxygen until further help/ advanced life support arrives.
5. **EARLY DEFIBRILLATION** - Providing an electrical shock to the heart that has stopped beating effectively, may allow it to assume a normal rhythm.
6. **EARLY ADVANCED CARE** - Advanced Cardiac Life Support (ACLS) trained health care professionals providing care on the scene, on the way to the hospital and/or at the hospital, add to the success of the resuscitation.
7. **EARLY REHABILITATION** - Providing/ enhancing rehabilitation directly after critical events (such as heart attack or stroke) can help survivors and caregivers in facing new challenges and returning the survivor to a productive life in the community.

**REMEMBER** that each link is important and when joined together enhances a person's chance for survival. Each person must be responsible for his/her own health and be willing to help others.

## **4.2 SAFETY HINTS TO PREVENT INJURIES IN CHILDREN**

**Injuries cause more deaths in infants and children than all other diseases combined. The most serious causes of injuries are motor vehicle accidents, poisoning, choking, suffocation, falls, burns and smoke inhalation, drowning and incidents involving weapons. Regardless of age, accidents often occur in or around the home or the office. It is important that you establish a “SAFETY FIRST” policy at work, home and while play practices at all times. Most injuries are preventable and everyone is responsible for injury prevention.**

- Always supervise children while eating and do not give peanuts, popcorn, nuts to children under 4 years of age.
- Keep small objects like marble, beads, balloon and small toys or parts away from infants and small children.
- Secure windows especially on the upper floors.
- Keep emergency numbers and address by every telephone.
- Keep a first aid kit and fire extinguishers at home.
- Develop a plan for your family to escape from a fire and practice together.
- Store matches and lighters in a safe place away from children.
- Use back burners on the stove and ensure that pot handles are turned toward the center.
- Cover all unused electrical outlets.
- Teach children “street smart” skills as how to cross the street, how to deal with strangers, and what to do if lost.
- Drive carefully, buckle up every passenger in the vehicle and follow guidelines related to “infant car seat”.
- Never leave infants or small children alone in a bathtub or pool without supervision.

## **4.3 PROTECT YOURSELF**

### **During training**

There is very little chance of catching any kind of diseases through the sharing of manikins during CPR training or through performing CPR skills in an emergency. Instructors are trained to disinfect manikins during and between CPR training courses, making them safe for CPR practice.

### **At home and in the field**

Approximately 80% of sudden cardiac arrests occur at HOME. This means if you are to perform CPR it will likely be a relative or friend and you may know the victim’s medical history.

### **Use of Barrier Devices**

Barrier devices are now recommended for use in any rescue operation to provide physical protection for the rescuer. Some of the recommended barrier devices include:

- Vinyl or latex gloves to protect the rescuer’s hands from contact with the victim’s body fluids. A cloth or paper tissue does not provide protection against catching a disease.
- Breathing barrier devices to prevent fluid from passing from the victim to the rescuer such as the devices used in the following 3 scenarios:

### ***Use of Barrier Devices continued:***

#### **1. Mouth - face- shield rescue breathing**

Face shields are typically a clear plastic or a silicone sheet that separates the rescuer mouth from the victim. It may or may not have a short tube attached. The person's exhaled air will escape between the shield and their face. These shields do not protect the person from vomit during rescue attempts.

#### **2. Mouth- to- mask rescue breathing**

The masks are typically transparent and have an inflated cuff and a one-way valve. Some masks have oxygen outlets that allow more oxygen to be given during rescue breaths.

#### **3. Bag-valve-mask rescue breathing**

These devices consist of a self- refilling bag, a non-rebreather valve and a facemask. Other features include standard fitting and a system for delivering high concentration of oxygen.

### **4.4 SOME FREQUENTLY ASKED QUESTIONS**

#### **4.4.1 What should I do about vomiting?**

Vomiting may occur during C.P.R. as a result of gastric distention. It is important to turn the victim to the side( to minimize aspiration ), sweep out the mouth and resume CPR.

#### **4.4.2 How will I know if CPR is effective?**

A good way to assess your performance is for a second rescuer to check the carotid pulse for adult, carotid or femoral pulse for child and the brachial or femoral pulse for infant, while you perform CPR. A good carotid/femoral/brachial pulse should be present with each compression.

#### **4.4.3 If I am alone and I find a victim, should I activate EMS first or begin C.P.R.?**

For adult, ACTIVATE FIRST is a priority because advanced life support is necessary for any medical emergency. So do that or ask someone else to call for you. But if unable to phone, ACTIVATE FAST. For child and infant activate after performing 5 cycles of CPR.

#### **4.4.4 What do I do if the victim is wearing dentures?**

Since making an airtight seal around the victim's mouth is necessary to get effective ventilation, LEAVE THE DENTURES IN PLACE to help you make this seal. Only remove the dentures if they are so loose or ill-fitting that they get in your way and become an obstruction.

#### **4.4.5 What should I do about gastric (stomach) distention?**

Distention of the stomach occurs most often in children. It results from too much air entering the stomach when excessive pressures are used for ventilation. If the stomach becomes distended during breathing, recheck and position the airway, observe the rise and fall of the chest, and avoid excessive airway pressure. Also give the breaths slowly over one second for adult, child and infant.

#### **4.4.6 What factors may lead to inadequate lung ventilation?**

- Lack of airtight seal
- Inadequate head tilt / chin lift
- Excessive air in the stomach

## 5.1 † (ONE) RESCUER CPR ♥ - ADULT (Adolescent & older)



### A ASSESSMENT & AIRWAY

Objectives	Critical Actions	Important Notes
1. Ensure safety of direct environment.	Establish physical safety of both rescuer(s) and victim.	Remember to use barrier devices and gloves Do not move victim except when absolutely necessary.
2. Determine unresponsiveness of victim.	Gently tap the victim's shoulder and ask loudly "are you OK"? <b>If unresponsive act quickly!</b>	<b>If responsive</b> continue assessment & take appropriate action.
3. Activate help / EMS.	<b>Phone First!</b> Call your local EMS	If alone, phone EMS right away. If another person is available, have him/her phone EMS. May need Advanced Life Support due to, for example ventricular fibrillation
4. Establish open airway.	<ul style="list-style-type: none"> <li>Position victim flat on back on flat surface.</li> <li>Use head-tilt/ chin-lift maneuver to lift tongue from back of the throat (the use of jaw thrust maneuver is advised in cases of head, neck &amp; back trauma; if airway is still not open use head-tilt/chin-lift technique).</li> <li>Remove any vomit or foreign material that can block airway.</li> </ul>	Take care in turning victim: <ul style="list-style-type: none"> <li>Spine to remain aligned to prevent any further damage.</li> <li>Head and neck to be supported and person to be rolled as a single unit.</li> </ul> Real or suspected head, neck & back trauma cases to be handled with extreme care. Manually stabilize head & neck; do not use immobilization devices.

### B BREATHING

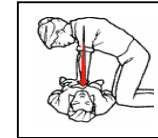


Objectives	Critical Actions	Important Notes
5. Check for adequate breathing by "Looking, Listening & Feeling".	<ul style="list-style-type: none"> <li>Maintain open airway.</li> <li><b>Look</b> for chest &amp; abdomen for movement.</li> <li><b>Listen</b> for sounds of breathing by holding your ear close to victim's mouth and nose.</li> <li><b>Feel</b> for exhaled breath on your cheek.</li> </ul>	<ul style="list-style-type: none"> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> <li><b>Remember:</b> The victim's chest may be moving, but if you don't hear or feel any respirations, the victim is not getting oxygen and may have an airway obstruction.</li> <li>Treat the victim who has occasional gasps as if he/she is not breathing and give rescue breaths</li> </ul>
6. Give two (2) effective rescue breaths.	<ul style="list-style-type: none"> <li>Maintain open airway (head-tilt/ chin-lift or jaw thrust maneuvers).</li> <li>Seal mouth and nose properly.</li> <li>Ventilate <b>2 times SLOWLY</b> – over <b>1 second/ breath</b>.</li> <li>Observe chest rising – providing adequate ventilation volume.</li> <li>If chest does not rise, re-attempt to open airway and ventilate twice again, if chest still does not rise, follow 'Unresponsive FBAO – Adult' sequence.</li> </ul>	<ul style="list-style-type: none"> <li>Use of barrier device recommended.</li> <li>Create an airtight seal.</li> <li>Watch for rise and fall of chest – exhalation by victim occurs by passive normal relaxation of chest.</li> <li>Allow adequate deflation between breaths.</li> </ul>

† (ONE) RESCUER CPR ♥ - ADULT (Adolescent and older) Continued

**C**

**CIRCULATION  
(PUSH HARD – PUSH FAST)**



Objectives	Critical Actions	Important Notes
7. Check for circulation	<ul style="list-style-type: none"> <li>Look, listen &amp; feel for other signs of circulation, for example breathing, coughing &amp; movement.</li> <li>Determine pulselessness by feeling for carotid pulse.</li> </ul>	<ul style="list-style-type: none"> <li>Before rescuer attempts to do compressions there must be either an absence of breathing and pulse OR rescuer cannot confirm / is unsure that pulse is present.</li> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> </ul>
<b>If BOTH PULSE &amp; BREATHING ARE PRESENT</b>		
Maintain open airway	<ul style="list-style-type: none"> <li>Monitor pulse &amp; breathing.</li> <li>Place victim in recovery position.</li> </ul>	<ul style="list-style-type: none"> <li>Constant assessment for spontaneous breathing is vital.</li> <li>Remain with victim until advanced life support arrives.</li> </ul>
<b>If PULSE IS PRESENT BUT BREATHING IS ABSENT</b>		
Give effective rescue breaths.	<ul style="list-style-type: none"> <li>Perform rescue breaths at 10 - 12 times/min.</li> <li>Monitor pulse.</li> </ul>	<ul style="list-style-type: none"> <li>About a breath <b>every 5 to 6 seconds</b>.</li> <li>Avoid excessive ventilation.</li> </ul>
<b>If PULSE IS ABSENT</b>		
8. Provide effective chest compressions.	<ul style="list-style-type: none"> <li>Kneel next to victim's chest – halfway between shoulders and waist.</li> <li>Place the heel of one hand on the center of the chest between nipples; other hand on top</li> <li>Position your shoulders over victim's sternum.</li> <li>Push hard, push fast</li> <li>Compress <b>1½ to 2 inches (4-5 cm)</b> straight down.</li> <li>Maintain a rate of 100/min.</li> <li>Allow full chest recoil after each compression</li> </ul>	<p><b>Remember:</b></p> <ul style="list-style-type: none"> <li>Chest compressions replace the heartbeat to pump blood to the lungs, brain and other major organs. Even when compressions are properly done, complications such as fractured ribs, liver lacerations and punctured lungs are not uncommon.</li> <li>Keep arms straight, elbows locked.</li> <li>Extend or interlock fingers not to exert pressure over the ribs.</li> <li>Rate refers to speed and not actual number per minute.</li> <li>Keep hands on the sternum during the upstroke (relaxation).</li> </ul>
9. Maintain compression / ventilation cycles.	Provide a proper compression / ventilation ratio of <b>30 compressions / 2 ventilations per cycle.</b>	Limit interruptions to no more than 10 sec at a time
10. Reassess circulation after completion of <b>5 cycles of CPR (2 min.)</b>	<ul style="list-style-type: none"> <li>Feel for pulse and observe for any visible signs of circulation.</li> <li>Continue compression and ventilation cycles if NO sign of circulation by starting with compressions.</li> </ul>	<ul style="list-style-type: none"> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> <li>Reassess every few minutes thereafter until advanced life support arrives or you notice a change in victim's condition.</li> </ul>

## 5.2 † (ONE) RESCUER CPR ♥ - CHILD (1year to onset of puberty – 12 - 14 years)

### A ASSESSMENT & AIRWAY

Objectives	Critical Actions	Important Notes
1. Ensure safety of direct environment.	Establish physical safety of both rescuer(s) and child.	Remember to use barrier devices and gloves. Do not move child except when absolutely necessary.
2. Determine unresponsiveness of child.	Gently tap the victim's shoulder and ask loudly "are you OK"?  <b>If unresponsive</b> act quickly!	<b>If responsive</b> continue assessment & take appropriate action.
3. Activate help / EMS.	Provide 5 cycles of CPR before activating EMS.	For sudden witnessed collapse activate EMS after verifying unresponsiveness.
4. Establish an open airway.	<ul style="list-style-type: none"> <li>Position child flat on back on flat surface.</li> <li>Use head-tilt/ chin-lift maneuver to lift tongue from back of the throat (the use of jaw thrust maneuver is advised in cases of head, neck &amp; back trauma; If airway is still not open use head-tilt/chin-lift technique).</li> <li>Remove any vomit or foreign material that can block airway.</li> </ul>	Take care in turning victim: <ul style="list-style-type: none"> <li>Spine to remain aligned to prevent any further damage.</li> <li>Head and neck to be supported and person to be rolled as a single unit.</li> </ul> Real or suspected head, neck & back trauma cases to be handled with extreme care. Manually stabilize head & neck; do not use immobilization devices.

### B BREATHING

Objectives	Critical Actions	Important Notes
5. Check for presence or absence of breathing by "Looking, Listening & Feeling".	<ul style="list-style-type: none"> <li>Maintain open airway.</li> <li><b>Look</b> for chest &amp; stomach for movement.</li> <li><b>Listen</b> for sounds of breathing by holding your ear close to child's mouth and nose.</li> <li><b>Feel</b> for exhaled breath on your cheek.</li> </ul>	<ul style="list-style-type: none"> <li>Take at least <b>5 seconds</b> and <b>no more than 10 seconds</b> for assessment.</li> <li><b>Remember:</b> The child's chest may be moving, but if you don't hear or feel any respirations, the victim is not getting oxygen and may have an airway obstruction.</li> <li>Treat the victim who has occasionally gasps as if he/she is not breathing and give rescue breaths</li> </ul>
6. Give two (2) effective rescue breaths.	<ul style="list-style-type: none"> <li>Use the hand that is resting on the child's forehead to pinch his nostrils shut and place the fingers of your other hand under the bony part of the lower jaw near the chin and lift the chin forward.</li> <li>Seal child's mouth properly with yours.</li> <li>Ventilate <b>2 times SLOWLY – over 1 second / breath.</b></li> <li>Observe chest rising – providing adequate ventilation volume.</li> <li>If no breathing, give 2 breaths (you may need to try a couple of times to open the airway and give a total of 2 breaths that make the chest rise). If chest still does not rise, follow 'Unresponsive FBAO – child' sequence.</li> </ul>	<ul style="list-style-type: none"> <li>Use of barrier device recommended.</li> <li>Create airtight seal.</li> <li>Allow adequate deflation between breaths.</li> <li>Watch for rise and fall of chest – exhalation by victim occurs by passive normal relaxation of chest.</li> </ul>

† (ONE) RESCUER CPR ♥ - CHILD (1 YEAR to onset of puberty – 12 to 14 years)  
Continued

# C CIRCULATION

Objectives	Critical Actions	Important Notes
7. Check for circulation.	<ul style="list-style-type: none"> <li>Look, listen &amp; feel for other signs of circulation, for example breathing, coughing &amp; movement.</li> <li>Determine pulselessness by feeling for carotid or femoral pulse.</li> </ul>	<ul style="list-style-type: none"> <li>Before rescuer attempts to do compressions there must be either an absence of breathing and pulse OR rescuer cannot confirm / is unsure that pulse is present.</li> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> </ul>
<b>If BOTH PULSE &amp; BREATHING ARE PRESENT</b>		
Maintain open airway.	<ul style="list-style-type: none"> <li>Monitor pulse &amp; breathing.</li> <li>Place child in recovery position.</li> </ul>	<ul style="list-style-type: none"> <li>Constant assessment for spontaneous breathing is vital.</li> <li>Remain with child until advanced life support arrives.</li> </ul>
<b>If PULSE IS PRESENT BUT BREATHING IS ABSENT</b>		
Give effective rescue breaths.	<ul style="list-style-type: none"> <li>Perform rescue breaths at 12 to 20 times/min.</li> <li>Monitor pulse.</li> </ul>	About a breath every <b>3 to 5 seconds</b> . Avoid excessive ventilation
<b>IF PULSE IS ABSENT OR &lt; 60 BPM *</b>		
8. Provide effective chest compressions.	<ul style="list-style-type: none"> <li>Kneel next to child's chest.</li> <li>Place the heel of one or two hands on the lower half of the sternum (at the nipple line)</li> <li>Position your shoulders over child's sternum and press down.</li> <li>Compress <math>\frac{1}{3}</math> to <math>\frac{1}{2}</math> depth of the chest.</li> <li>Maintain a rate of 100/min.</li> <li>Allow full chest recoil after each compression</li> </ul>	<ul style="list-style-type: none"> <li>Keep arms straight, elbows locked.</li> </ul>
9. Maintain compression / ventilation cycles.	Provide a proper compression / ventilation ratio of <b>30 compressions / 2 ventilation per cycle</b> .	Limit interruptions to no more than 10 sec at a time
10. Reassess circulation after completion of <b>5 cycles of CPR (2 min)</b>	<ul style="list-style-type: none"> <li>Feel for pulse and observe for any visible signs of circulation.</li> <li>Continue compression and ventilation cycles if NO sign of circulation by starting with compressions.</li> </ul>	<ul style="list-style-type: none"> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> <li>Reassess every few minutes thereafter until advanced life support arrives or you notice a change in child's condition.</li> </ul>

\* Chest compressions are recommended if heart rate < 60 bpm with signs of poor perfusion despite adequate oxygenation and ventilation

### 5.3 † (ONE) RESCUER CPR ♥ - INFANT (BIRTH TO 1 YEAR OLD)

## A ASSESSMENT & AIRWAY



Objectives	Critical Actions	Important Notes
1. Ensure safety of direct environment.	Establish physical safety of both rescuer(s) and infant(s).	Remember to use barrier devices and gloves. Do not move victim except when absolutely necessary.
2. Determine unresponsiveness of infant.	Gently tap the soles of infant's feet or make loud sounds like clapping.  <b>If unresponsive</b> act quickly!	<b>If responsive</b> continue assessment & take appropriate action.
3. Activate help / EMS.	Before activating EMS provide 5 cycles of CPR	For sudden witnessed collapse activate after verifying unresponsiveness
4. Establish open airway.	<ul style="list-style-type: none"> <li>Position infant flat on back on flat surface.</li> <li>Use head-tilt/ chin-lift maneuver to lift tongue from back of the throat. <b>DO NOT hyperextend head.</b></li> <li>The use of jaw thrust maneuver is advised in cases of suspected head, neck &amp; back trauma (if airway is still not open use head-tilt/chin-lift technique).</li> <li>Remove any vomit or foreign material that can block airway.</li> </ul>	<p>If turning is necessary infant must be turned in a unit with firm support of head and neck so that the head does not roll, twist or fall backward or forward.</p> <p>Real or suspected head, neck &amp; back trauma cases to be handled with extreme care. Manually stabilize head &amp; neck; do not use immobilization devices</p>

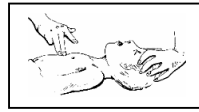
## B BREATHING

Objectives	Critical Actions	Important Notes
5. Check for presence or absence of breathing by "Looking, Listening & Feeling".	<ul style="list-style-type: none"> <li>Maintain open airway.</li> <li><b>Look</b> for chest &amp; stomach for movement.</li> <li><b>Listen</b> for sounds of breathing by holding your ear close to infant's mouth and nose.</li> <li><b>Feel</b> for exhaled breath on your cheek.</li> </ul>	<ul style="list-style-type: none"> <li>Take at least <b>5 seconds</b> and <b>no more than 10 seconds</b> for assessment.</li> <li><b>Remember:</b> The infant's chest may be moving, but if you don't hear or feel any respirations, the infant is not getting oxygen and may have an airway obstruction.</li> </ul>
6. Give two (2) effective rescue breaths.	<ul style="list-style-type: none"> <li>Use the hand that is resting on the child's forehead to maintain the head tilt position. Place the fingers of your other hand under the bony part of the lower jaw near the chin and lift the chin forward.</li> <li>Open your mouth wide and take a breath and cover the infant's mouth &amp; nose tightly with yours.</li> <li>Ventilate <b>2 times SLOWLY</b> – over <b>1 second / breath</b>.</li> <li>Observe chest rising – providing adequate ventilation volume.</li> <li>If no breathing, give 2 breaths (you may need to try a couple of times to open the airway and give a total of 2 breaths that make the chest rise). If chest still does not rise, follow 'Unresponsive FBAO – Infant' sequence.</li> </ul>	<ul style="list-style-type: none"> <li>Use of barrier device recommended.</li> <li>Create airtight seal.</li> <li>Allow adequate deflation between breaths.</li> <li>Watch for rise and fall of chest – exhalation by victim occurs by passive normal relaxation of chest.</li> </ul>

# † (ONE) RESCUER CPR ♥ - INFANT (BIRTH TO 1 YEAR OLD)

Continued

## C CIRCULATION



Objectives	Critical Actions	Important Notes
7. Check for circulation.	<ul style="list-style-type: none"> <li>Look, listen &amp; feel for other signs of circulation, for example breathing, coughing &amp; movement.</li> <li>Determine pulselessness by feeling the brachial or femoral pulse.</li> </ul>	<ul style="list-style-type: none"> <li>Before rescuer attempts to do compressions there must be either an absence of breathing and pulse OR rescuer can not confirm / is unsure that pulse is present.</li> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> </ul>
<b>IF BOTH PULSE &amp; BREATHING ARE PRESENT</b>		
Maintain open airway.	<ul style="list-style-type: none"> <li>Monitor pulse &amp; breathing.</li> <li>Place victim in recovery position.</li> </ul>	<ul style="list-style-type: none"> <li>Constant assessment for spontaneous breathing is vital.</li> <li>Remain with infant until advanced life support arrives.</li> </ul>
<b>If PULSE IS PRESENT BUT BREATHING IS ABSENT</b>		
Give effective rescue breaths.	<ul style="list-style-type: none"> <li>Perform rescue breaths at 12 - 20 times/min.</li> <li>Continue to monitor pulse.</li> </ul>	About a breath every 3 to 5 seconds.
<b>IF PULSE IS ABSENT or &lt; 60 BPM *</b>		
8. Provide effective chest compressions.	<ul style="list-style-type: none"> <li>Place your middle and ring fingers just below the nipple line</li> <li>Compress <math>\frac{1}{3}</math> to <math>\frac{1}{2}</math> the depth of the chest</li> <li>Maintain a rate of 100/min.</li> <li>Allow full chest recoil after each compression</li> </ul>	<b>REMEMBER:</b> <ul style="list-style-type: none"> <li>CPR can be performed carrying the infant while going for help if necessary.</li> <li>Use only 2 tips of fingers of one hand to do compressions and the other hand (closest to the child's head) to maintain the neutral head position.</li> <li>Keep fingers on the sternum during the upstroke (relaxation).</li> </ul>
9. Maintain compression / ventilation cycles.	Provide a proper compression / ventilation ratio of <b>30 compressions / 2 ventilation per cycle.</b>	Keep fingers on the sternum while providing rescue breath.
10. Reassess circulation after completion of <b>5 cycles of CPR (2 min).</b>	<ul style="list-style-type: none"> <li>Feel for pulse and observe for any visible signs of circulation.</li> <li>Continue compression and ventilation cycles if NO sign of circulation by starting with compressions.</li> </ul>	<ul style="list-style-type: none"> <li>Take at least <b>5 seconds and no more than 10 seconds</b> for assessment.</li> <li>Reassess every few minutes thereafter until advanced life support arrives or you notice a change in infant's condition.</li> </ul>

\* Chest compressions are recommended if heart rate < 60 bpm with signs of poor perfusion despite adequate oxygenation and ventilation.

## 5.4 † † (Two) RESCUERS CPR ♥ - Adult / Child / Infant

Rescuer (R#)	Critical Action(s)	Important Notes
Both	Check the scene and ensure safety of victim and rescuers.	Use barrier devices and gloves.
R1:	Perform one person CPR.	
R2:	<ul style="list-style-type: none"> <li>Identify self as CPR-trained and offer assistance.</li> <li>Confirm that EMS has been activated.</li> </ul>	R1 now knows that 2 <sup>nd</sup> person (R2) is available to assist.
R1:	<ul style="list-style-type: none"> <li>Continue CPR till end of compressions and give 2 rescue breaths for adult, child and infant.</li> <li>Reassess victim for movement, breathing or signs of circulation.</li> <li>Check carotid pulse for adult, carotid or femoral pulse for child and brachial or femoral pulse for infant.</li> </ul>	R2 cooperates with R1 during assessment, which should take at least <b>5 seconds and no more than 10 seconds</b>
R1 or R2:	<ul style="list-style-type: none"> <li>Position self by adult, child or infant s side.</li> <li>Perform chest compressions. *</li> </ul>	Compression rate is also 100/minute for a 2 rescuer CPR.
R2 or R1:	<ul style="list-style-type: none"> <li>Position self by adult, child or infants head.</li> <li>Maintain open airway.</li> <li>Perform rescue breaths.</li> </ul>	Maintain ratio of 30 comp. / 2 breaths for adults and 15 comp. / 2 breaths for child and infant.
<b>ROTATE COMPRESSOR ROLE EVERY 2 MINUTES OR 5 CYCLES OF CPR</b>		

### 5.4 ADVANCED AIRWAY CONSIDERATIONS

Until an advanced airway (eg, laryngeal mask airway[LMA], esophageal-tracheal combitube [Combitube], or endotracheal tube) is in place, the compression-ventilation ratio is:

Adult	Child
<b>30:2</b>	<b>15:2</b>

When an advanced airway is in place during 2-person CPR for victims of all ages (infant, child, adult), give breaths at a rate of 1 breath every 6 to 8 seconds (8 to 10 breaths per minute), without attempting to synchronize breaths between compressions. There should be no pause in chest compressions for delivery of breaths.

Following table shows the differences in compressions for victims with and without an advanced airway in place:

No Advanced Airway in Place	Advanced Airway in Place
Compression rate: approximately 100 per minute	Compression rate: approximately 100 per minute
Ventilation rate: 2 breaths following 30 compressions	Ventilation rate: approximately 1 breath every 6 to 8 seconds (8 to 10 breaths per minute)
Pause compressions to give 2 breaths. The first exhalation occurs between the 2 breaths and the second during the first chest compression of the next cycle of CPR	Do not pause chest compressions to provide breaths.

### **Advanced Airway Considerations:**

Avoid delivering too many breaths per minute (hyperventilation) during CPR, particularly once an advanced airway is in place. Hyperventilation may worsen the outcome of cardiac arrest. It can decrease venous return to the heart and reduce blood flow during chest compressions. (BLS for Healthcare Providers, AHA, 2006, pp 26 – 27)

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- \* **The TWO-THUMB ENCIRCLING HANDS TECHNIQUE (is the preferred technique for healthcare providers** when performing two-rescuer CPR on an infant, whose size permits it):
  - *Place both of your thumbs side by side along the length of the lower half of the infants breastbone, below the imaginary line between the nipples. Make sure thumbs are not over the xiphoid process. Your thumbs may be placed one over the other if infant is so small that your thumbs cannot be safely placed side by side.*
  - *With you hand encircling the chest and providing support for the back, use both thumbs to depress the breastbone about 1/3 to 1/2 the depth of the chest.*
  - *Release the chest after each compression without lifting your thumbs off the chest.*
  - *Maintain a rate of compressions at approximately 100/minute*
  - *After every set of 15 compressions, pause for the second rescuer to provide the rescue breath at a ratio of 15 compressions: 2 ventilation.*

## 5.5 FOREIGN-BODY AIRWAY OBSTRUCTION (FBAO)

### INTRODUCTION

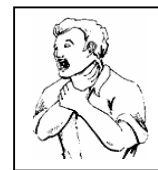
Death from FBAO is an uncommon but preventable cause of death. Most reported cases of FBAO in adults are caused by impacted food and occur while the victim is eating. Most reported episodes of choking in infants and children occur during eating or playing, when parents or childcare providers are present. The choking event is therefore commonly witnessed, and the rescuer usually intervenes while the victim is still responsive.

Foreign bodies may cause either mild or severe airway obstruction. Terms used to distinguish choking victims who require interventions from those who do not have been simplified to refer only to signs of mild versus severe airway obstruction. The rescuer should intervene if the choking victim has signs of severe airway obstruction.

<b>Mild Airway Obstruction</b>	<b>Severe Airway Obstruction</b>
<p>Signs:</p> <ul style="list-style-type: none"><li>• Good air exchange</li><li>• Responsive and can cough forcefully</li><li>• May wheeze between coughs</li></ul>	<p>Signs:</p> <ul style="list-style-type: none"><li>• Poor or no air exchange</li><li>• Weak, ineffective cough or no cough at all</li><li>• High-pitched noise while inhaling or no noise at all</li><li>• Increased respiratory difficulty</li><li>• Possible cyanosis (turning blue)</li><li>• Unable to speak</li><li>• Clutching the neck with the thumb and fingers, making universal choking sign</li><li>• Unable to move air</li></ul>
<p>Rescuer actions:</p> <ul style="list-style-type: none"><li>• As long as good air exchange continues, encourage the victim to continue spontaneous coughing and breathing efforts.</li><li>• Do not interfere with the victim's own attempts to expel the foreign body, but stay with the victim and monitor his/her condition.</li><li>• If mild airway obstruction persists, activate the emergency response system.</li></ul>	<p>Rescuer actions:</p> <ul style="list-style-type: none"><li>• Ask the victim if he/she is choking. If the victim nods yes and cannot talk, severe airway obstruction is present and you must activate the emergency response system.</li></ul>

(BLS for Healthcare provider, AHA, 2006, pp 59-60)

## 5.6 ◉ FOREIGN BODY AIRWAY OBSTRUCTION (FBAO) RESPONSIVE - ADULT / CHILD



### A SSESSMENT

Objectives	Critical Actions	Important Notes
1. Determine airway obstruction.	<p>Ask the victim, "Are you choking?"</p> <p>If the victim can speak, breathe or cough, do not interfere (mild airway obstruction).</p> <p>If the person indicates that he/she is choking (severe airway obstruction), tell the person that you are trained and know how to help. Act quickly!</p>	<p>With severe airway obstruction, the victim is unable to speak, breathe, or cough. <b>Do not let the person be alone until you are sure that the airway is completely clear.</b></p>

### I NTERVENTION (HEIMLICH MANEUVER)



Objectives	Critical Actions	Important Notes
<p>2. Perform HEIMLICH MANEUVER (abdominal thrusts) in series of up to 5.</p> <p>In the case of pregnant women or overweight persons, perform chest thrusts.</p>	<p>Stand behind the adult or kneel behind the child and wrap your arms around his/ her waist.</p> <p>Place one hand over the navel. Make a fist with this hand and place the thumb side against victim's abdomen in the midline slightly above the navel and well below the tip of the xiphoid process.</p> <p>Grasp fist with the other hand and press fist into the person's abdomen with quick thrusts <u>inward and upward</u> (like a reversed "J"). Give up to 5 thrusts. Each thrust should be a <u>separate and distinct movement</u>.</p> <p>Repeat abdominal thrusts or chest thrusts until effective or the victim becomes unresponsive.</p> <p>If the victim becomes unresponsive, follow the sequence for unresponsive adult or child.</p>	<p>Provide a steady base support.</p> <p>Do not touch the xiphoid process or lower margins of rib cage.</p> <p>Guide the victim to lower the head while technique is being performed so that gravity will assist in expelling foreign body</p> <p>Damage to internal organs is possible. Training in the proper technique is essential. Do not perform these techniques during practice sessions because injuries to the participants may occur.</p> <p>Perform each thrust with the intention of relieving the obstruction</p> <p>Following the event, the person should be seen by a physician to rule out complications from the obstruction or the interventions.</p>

## 5.7 ⊗ FOREIGN BODY AIRWAY OBSTRUCTION (FBAO) RESPONSIVE - INFANT

### A SSESSMENT

Objectives	Critical Actions	Important Notes
1. Determine airway obstruction.	<p>Observe the infant for signs and symptoms of severe airway obstruction:</p> <ul style="list-style-type: none"> <li>• Sudden onset of difficulty of breathing.</li> <li>• Coughing, gagging, or stridor.</li> <li>• High-pitched noise.</li> <li>• Weak cry.</li> <li>• Gray color of lips or gums.</li> </ul> <p>If any of the above is observed, act quickly!</p>	FBAO typically develops abruptly, as compared to airway obstruction caused by infection and/ or allergy.

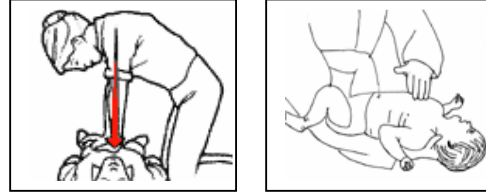
### I NTERVENTION



Objectives	Critical Actions	Important notes
2. First give up to (5) back blows.	<p>Hold the infant prone (face down) on your forearm with the head slightly lower than the chest, rest your forearm on your thigh.</p> <p>Support the head by firmly supporting the jaw.</p> <p>Deliver 5 back blows in the middle of the back between the infant's shoulder blades, using the heel of the other hand.</p>	<p>Be sure you are not pressing the soft tissue of the infant's throat.</p> <p>Do not place your finger in infant's mouth.</p> <p>Each blow should be delivered with enough force to try to dislodge the object.</p>
3. Then give 5 chest thrusts.	<p>Place your forearm on the infant's back while supporting the back of the head with the palm of your hand.</p> <p>Turn the infant as a unit while supporting the head and neck.</p> <p>Hold the infant in supine position (face up) while still keeping the head lower than the chest.</p> <p>Provide up to 5 quick downward chest thrust in the same location as for the chest compressions.</p>	<p>Your forearm should be resting on your thigh for better support.</p> <p>The purpose of performing chest thrusts is to create 'artificial coughs'.</p> <p>Abdominal thrusts are not used to relieve FBAO for infants, because of possible injury to abdominal organs.</p>
4. If airway remains obstructed, repeat sets of up to 5 back blows and chest thrusts until effective.	If infant becomes unresponsive, follow the sequence of FBAO for unresponsive infant.	Following the event, the infant should be checked by a doctor for possible complications.

This intervention should be performed on a conscious infant, only if the airway obstruction is due to a witnessed or strongly suspected aspiration. If the obstruction is caused by an allergy or an infection, such as epiglottitis or croup, these interventions will not be effective and may be harmful. The infant should be rushed to the nearest Medical facility.

## 5.8 ⊗ FOREIGN BODY AIRWAY OBSTRUCTION (FBAO) UNRESPONSIVE - ADULT / CHILD / INFANT



Objectives	Critical Actions	Important Notes
1. Ensure safety of direct environment.	Refer to section on 'Protect Yourself'.	Remember to use barrier devices and gloves.
2. Determine unresponsiveness of victim.	<p><b>For adult and child:</b> Gently tap the shoulder and ask loudly "are you OK?"</p> <p><b>For infant:</b> Tap the soles of the feet or make loud sounds like clapping.</p> <p>If unresponsive, act quickly!</p>	Infants are sensitive to sounds.
3. Activate help/ EMS.	<p><b>PHONE FIRST!</b> Call your local EMS.</p>	If alone, phone EMS right away. If another person is available, have him/her phone EMS.
4. Open the airway.	<ul style="list-style-type: none"> <li>Use head-tilt/ chin-lift maneuver to lift tongue from back of the throat (the use of jaw thrust maneuver is advised in cases of head, neck &amp; back trauma; If airway is still not open use head-tilt/chin-lift technique).</li> <li>Remove any vomit or foreign material that can block airway.</li> </ul>	Use the jaw thrust without the head tilt if head, neck or spine injury is suspected.
5. Check for breathing.	<p><b>Look, listen and feel</b> for breathing for at least 5 seconds and no more than 10 seconds. Place your ear over victim's mouth and observe the chest rise.</p> <p>If airway is obstructed and victim is not breathing, act quickly!</p>	<p>If the person is breathing normally or starts breathing independently, place in <b>recovery position</b>.</p> <p>Stay with the victim and continue to monitor until advanced life support arrives.</p>
6. Open the airway	<ul style="list-style-type: none"> <li>Open the airway and look for an object in the pharynx. If you <u>see</u> an object remove it with your fingers</li> <li>If you are alone with a <u>child choking victim</u>, open the airway, remove an object if you see it, and begin CPR. After about 5 cycles (2 minutes) of CPR, activate the EMS if you have not already done so.</li> </ul>	
7. Give 2 slow rescue breaths.	<p><b>For adult, child, and infant:</b> 1 second / breath.</p> <p>If the first rescue breath does not go in, reposition the head and try again.</p> <p>If the rescue breaths do not go in and the airway of the unresponsive victim is still blocked, act quickly!</p>	<p><b>Remember to:</b></p> <ul style="list-style-type: none"> <li>Seal mouth and nose of victim properly.</li> <li>Take a deep breath before providing each rescue breath.</li> <li>Watch the chest visibly rise.</li> <li>Allow for exhalation between rescue breaths. (For victim's chest to return to its normal position).</li> <li>Look for visible signs of circulation between rescue breaths.</li> </ul>

Continued.

## ⊙ FOREIGN BODY AIRWAY OBSTRUCTION (FBAO) UNRESPONSIVE - ADULT / CHILD / INFANT

Continued.

Objectives	Critical Actions	Important Notes
8. Perform chest compressions.	<b>For adult, child and infant</b> give: 30 compressions/ 2 ventilations.	For infants and children maintain the head tilt while giving the chest compressions at the appropriate rate and depth.
9. Look in the mouth.	Open the mouth using the HEAD TILT – CHIN LIFT technique  <b>Only if you see</b> an object in the back of the throat, remove it by performing a FINGER SWEEP: Insert the index finger of your hand down along the inside of the cheek, deep into the throat to the base of the tongue. Use a hooking action to dislodge the object. Maneuver the object to the mouth and remove it.	This alone may be enough to relieve an obstruction.  If no object is seen in the mouth, continue with opening the airway. <b>Do not perform blind finger sweeps.</b>
10. Maintain open airway	Use the head tilt chin lift.	
11. Follow the CPR sequence.	Begin with 2 rescue breaths, if still unable to go in, continue by attempting 2 rescue breaths and provide chest compressions.  Look in the mouth after each cycle until the airway obstruction is cleared or advanced life support arrives.	If there is a change in the victim's condition, stop CPR and reassess for visible signs of circulation and pulse.  Stay with the person until advanced life support arrives.

After FBAO is cleared, and if the victim remains unresponsive, ventilate twice and proceed with CPR technique then reassess as indicated.

## 5.11 Automated External Defibrillator (AED)

### Definition

Automated External Defibrillator (AED) is a highly sophisticated, micro-processor-based device that is designed to automatically analyze the ECG signal of a pulseless victim and deliver a shock as required.



### Value of early defibrillation

Providing early defibrillation improves survival rates in adult cardiac arrest victims by re-establishing a heart rhythm with a pulse. Early defibrillation is a critical link in the Links For Survival because of the following:

- The most frequent initial cardiac rhythm in witnessed sudden cardiac arrest is ventricular fibrillation (VF), which is an uncoordinated quivering of the heart muscle caused by chaos in the electrical signal triggering heart beats. VF is associated with sudden death.
- The most effective treatment for VF is shocking or defibrillation.
- The sooner defibrillation occurs in the onset of VF, the more likely that a cardiac rhythm with a pulse will be restored. With each passing minute from the time of an arrest until the first shock, the chance of successful defibrillation is reduced by about 7-10 % (HSFC, p. 37).
- It is important to perform CPR while awaiting the arrival of the defibrillator. Without early CPR and early defibrillation, a person who has no visible signs of circulation is unlikely to survive.

### How do AEDs work?

Adhesive electrode pads attached to wires connect the victim to the AED. The AED carries out the analysis of the heart rhythm and advises whether an electrical "shock" is necessary. Voice prompts and/ or displayed messages from the AED usually remind the user of what must be done at different steps in the defibrillation process. Some AEDs have a display showing an electrocardiogram (ECG) waveform.

Note that AEDs will not allow delivering a shock if the heart rhythm is analyzed as non-shockable.

### When are AEDs recommended?

- Adults with shockable rhythm (ventricular fibrillation and pulseless ventricular tachycardia)
- Children 1 year of age and older
  - AED must be capable of delivering a "child" energy dose
  - Child pads must be available
  - If child pads are not available, use adult pad

Insufficient evidence for or against the use of AEDs in infants under 1 year of age.

### Who should use AEDs?

Until recently, the use of defibrillators was reserved for medical practitioners, emergency care and other healthcare providers who are highly trained in all aspects of Advanced Cardiac Life Support (ACLS). AEDs were mostly used by emergency personnel and trained family members and associates of people at high risk for sudden cardiac death. However, according to the recent ILCOR guidelines, ACLS and BLS providers, both in-hospital and pre-hospital settings should know the protocols and be able to use AEDs.

### Important note...

Although the recent ILCOR guidelines advocate the use of the AED's by trained BLS providers, the author need to state that:

- At the time of this publication we are not aware of any MOH policy, guideline or standard that governs the use of AED's by trained BLS providers. This matter will be further pursued with the relevant MOH authorities and across professions.
- The above section (5.11) on AED is provided for information purposes only - trained BLS providers should agree on the way forward to provide the best possible care for the victim.



**Circle the correct answer** - There is only one correct answer to each question.

1. Chest pain is:
  - A A warning sign that the heart is not getting enough oxygen
  - B A symptom of an upper respiratory infection
  - C Normal when someone is working hard or is emotionally stressed
  - D Is not an emergency and does not require emergency attention
  
2. CPR is a combination of:
  - A Chest compressions and abdominal thrusts
  - B Chest compressions and rescue breaths
  - C Abdominal thrusts and finger sweeps
  - D Rescue breaths and abdominal thrusts
  
3. Which of the following choices are the most modifiable risk factors for stroke and heart attack?
  - A Heredity, sedentary lifestyle, diabetes
  - B Age, smoking, obesity
  - C Smoking, high cholesterol, high blood pressure
  - D Smoking, high cholesterol, gender
  
4. Brain damage may be permanent following cardiac arrest if CPR is not initiated within:
  - A 4 to 6 minutes of the arrest
  - B 6 to 8 minutes of the arrest
  - C 8 to 10 minutes of the arrest
  - D 10 to 15 minutes of the arrest
  
5. You should continue CPR until:
  - A You are too exhausted or it is unsafe
  - B Another trained rescuer takes over
  - C The person has signs of circulation and is breathing
  - D All of the above

## PRACTICE TEST

### Continued

6. Once you have opened the airway, checked for breathing, and found the victim is not breathing, you should:
  - A Start CPR
  - B Switch the AED 'on' and attach it
  - C Use barrier devices and administer 2 slow rescue breaths
  - D Give 5 abdominal thrusts
  
7. The correct compression – ventilation ratio for an adult is:
  - A 15 compressions to 2 breaths
  - B 5 compressions to 1 breath
  - C 30 compressions to 1 breath
  - D 30 compressions to 2 breaths
  
8. To perform rescue breathing on an infant or child, you should:
  - A Give breaths continuously until he/she begins breathing independently
  - B Give 1 breath every 3 to 5 seconds
  - C Give 1 breath every 5 to 6 seconds
  - D Give 5 cycles of CPR
  
9. The correct compression – ventilation ratio for 2-rescuer CPR for a child/infant without advanced airway is:
  - A 30 compressions to 2 breaths
  - B 15 compressions to 2 breaths
  - C 5 compressions to 1 breath
  - D No specific ratio
  
10. AED/s (automated external defibrillators) can only be used in adults:
  - A True
  - B False

**Correct answers are listed on page 3.**

## SUMMARY SHEET

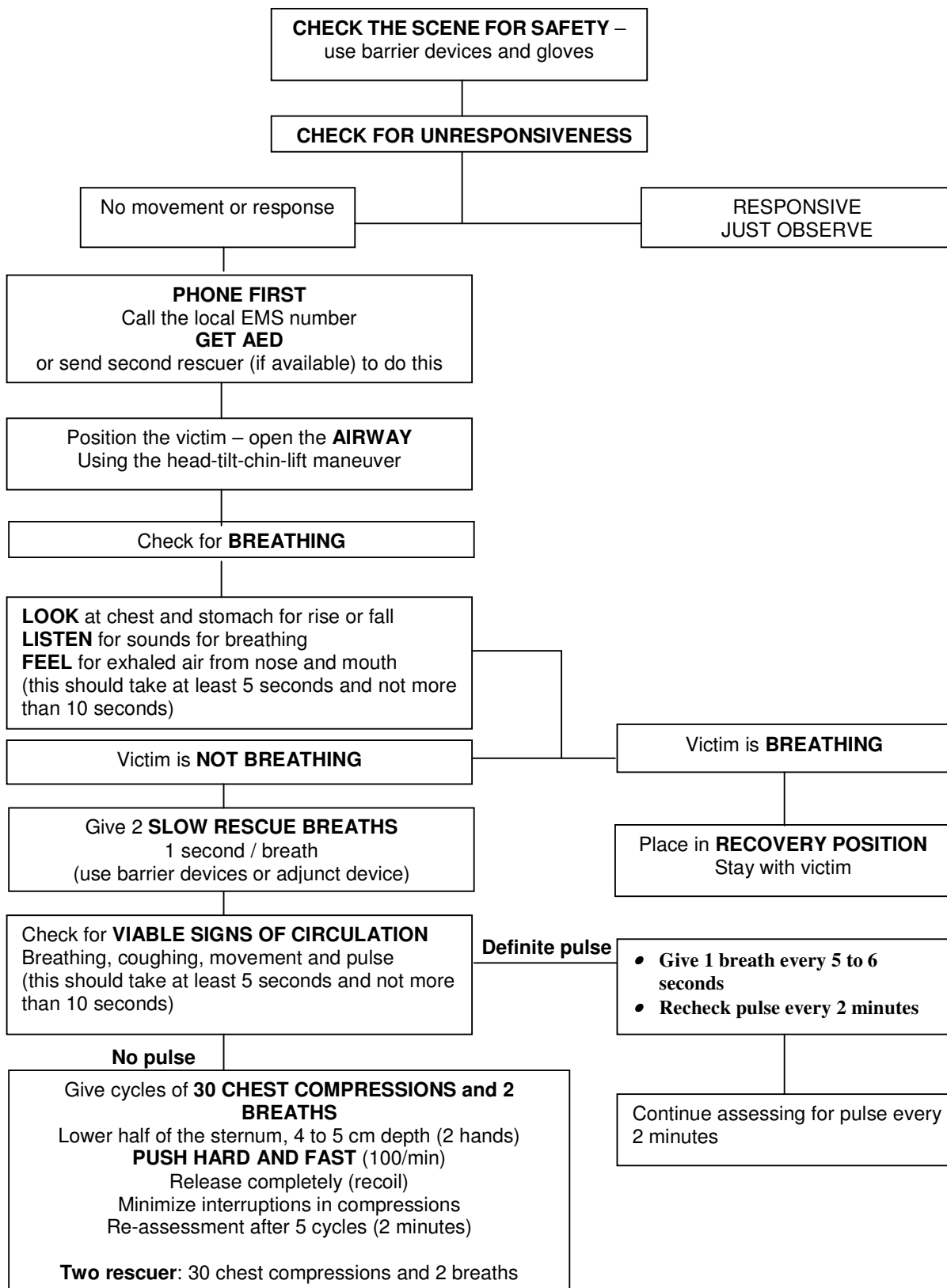
### Important information and numbers to remember

Age of Victim	Open airway	Check for signs of:		If pulse present: continue 'Rescue Breathing'	If no pulse (no AED available): Do 'Chest Compressions'.					
		•Breathing: Look, Listen, & Feel	•Circulation (Take at least 5 seconds and no more than 10 seconds)		Maneuver	Give effective rescue breaths	Pulse	Frequency	Where	With what
<b>Adult (adolescent &amp; older)</b>	Head-Tilt Chin-Lift	2 mouth-to-mouth or mouth-to-mask slow 1 sec.	Carotid (middle of the neck)	1 : 5 - 6 sec 10 - 12 / min	Center of Chest between nipples	Heel of 2 hands	1 ½ to 2 inches (4 – 5 cm)	About 100 / min	30:2 for both one or two person CPR	
<b>Child (1 year to adolescent)</b>	Head-Tilt Chin-Lift	2 mouth-to-mouth or mouth-to-mask slow 1 sec	Carotid or femoral	1 : 3 - 5 sec 12 - 20 / min	Center of Chest between nipples	Heel of 1 or 2 hands	App. 1/3 or ½ the depth of the chest	About 100 / min	30 :2 for one person CPR 15 :2 for two person CPR	
<b>Infant (&lt; 1 year)</b>	Head-Tilt Chin-Lift Do not hyperextend	2 mouth-to-mouth or mouth-to-mask slow 1 sec	Brachial or femoral	1 : 3 – 5 sec 12 - 20 / min	Just below nipple line	1 rescuer: Tip of two fingers 2 rescuer: 2-thumb encircling hands	App. 1/3 or ½ the depth of the chest	About 100 / min	30 :2 for one person CPR 15 :2 for two person CPR	

### **Remember:**

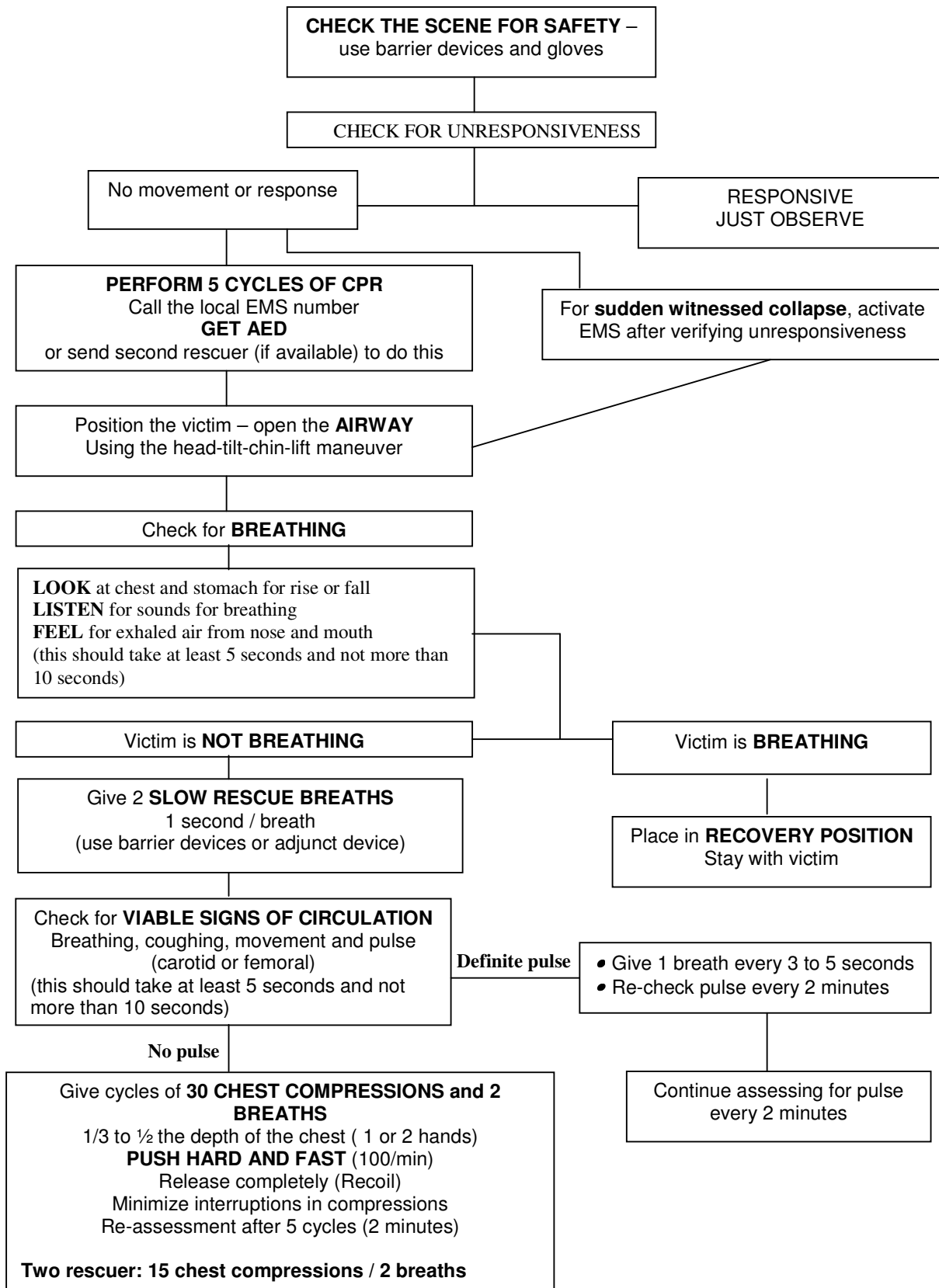
- For adults, activate when victim found unresponsive
- For child and infant, activate after performing 5 cycles of CPR; for a sudden witnessed collapse, activate after verifying that victim is unresponsive
- **Reassessment for pulse and signs of circulation** (breathing, coughing, movement) should occur at the completion of 5 cycles (2 minutes) of CPR
- Reassessment should **take at least 5 seconds and no more than 10 seconds**
- Use of barrier devices is recommended
- Use head-tilt/ chin-lift maneuver to lift tongue from back of the throat (the use of jaw thrust maneuver is advised in cases of head, neck & back trauma; if airway is still not open use head-tilt/chin-lift technique).
- When an advanced airway is in place during 2-person CPR for victims of all ages, give breaths at a rate of 1 breath every 6 to 8 seconds, without attempting to synchronize breaths between compressions. There should be no pause in chest compressions for delivery of breaths.

# ADULT CPR



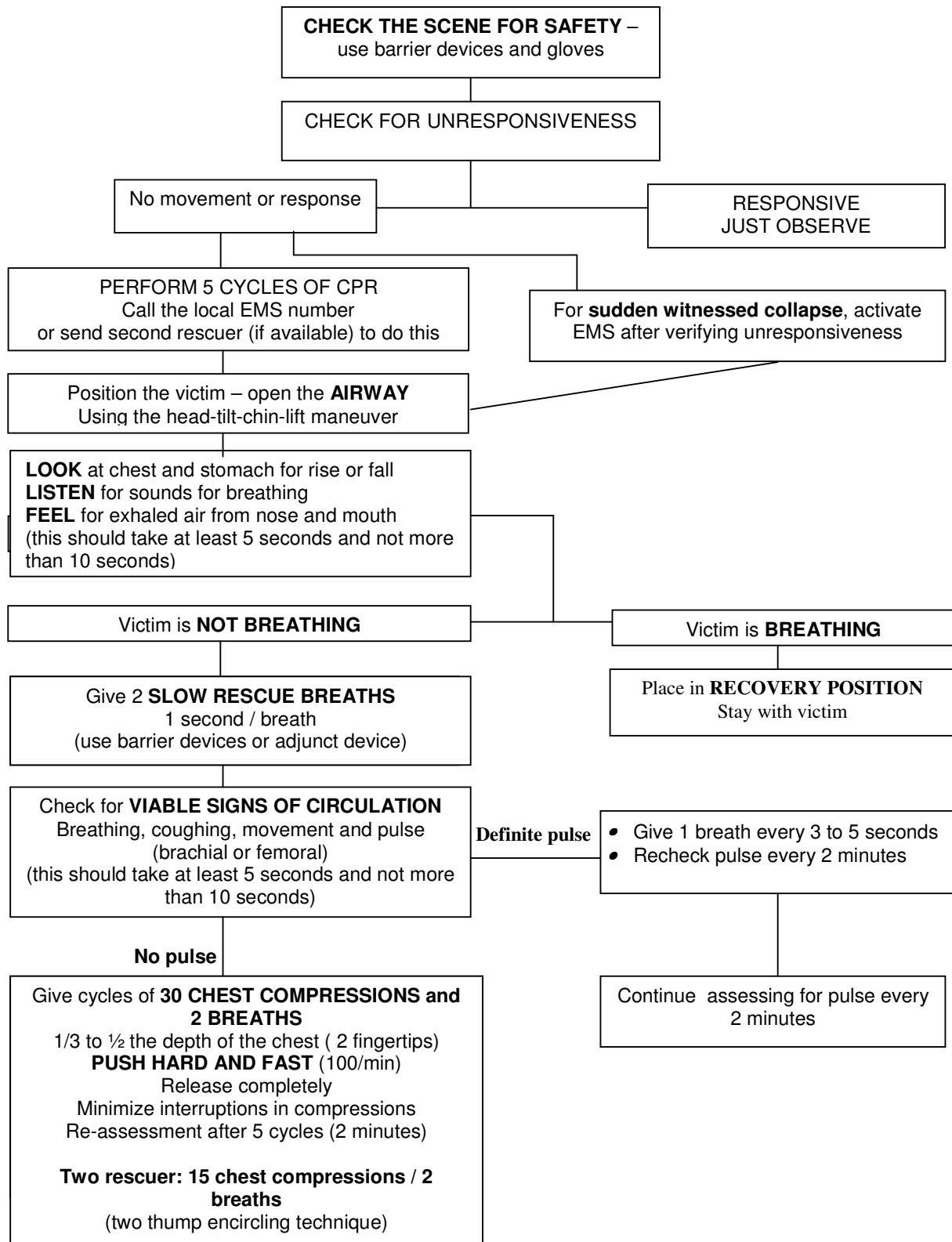
When AED / defibrillator arrives refer to AED / defibrillator algorithm

## CHILD CPR

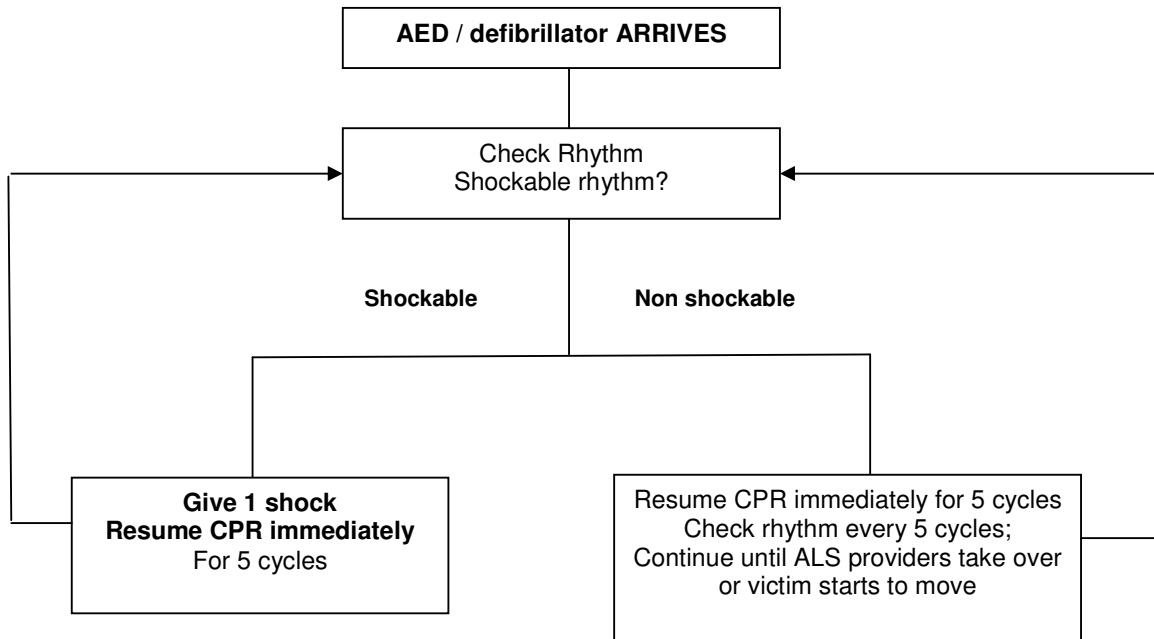


When AED / defibrillator arrives refer to AED / defibrillator algorithm

## INFANT CPR



# AED / DEFIBRILLATOR ALGORITHM



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