



This guideline was developed by:

The BLS Subcommittee,
National Committee on Resuscitation Training
Ministry of Health Malaysia



Second Edition

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Second Edition

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ABBREVIATIONS

AED	AUTOMATED EXTERNAL DEFIBRILLATOR
AHA	AMERICAN HEART ASSOCIATION
ALS	ADVANCED LIFE SUPPORT
BLS	BASIC LIFE SUPPORT
BMV	BAG MASK VENTILATION
CPR	CARDIO PULMONARY RESUSCITATION
EMS	EMERGENCY MEDICAL SYSTEM
ERS	EMERGENCY RESPONSE SYSTEM
FBAO	FOREIGN BODY AIRWAY OBSTRUCTION
HCW	HEALTH CARE WORKER
IHCA	IN-HOSPITAL CARDIAC ARREST
ILCOR	INTERNATIONAL LIAISON COMMITTEE ON
	RESUSCITATION
LMA	LARYNGEAL MASK AIRWAY
MECC	MEDICAL EMERGENCY COORDINATING CENTRE
MERS	MALAYSIA EMERGENCY RESPONSE SYSTEM
МОН	MINISTRY OF HEALTH
NCORT	NATIONAL COMMITTEE ON RESUSCITATION
	TRAINING
OHCA	OUT-OF-HOSPITAL CARDIAC ARREST
PPE	PERSONAL PROTECTIVE EQUIPMENT
ROSC	OF SPONTANEOUS CIRCULATION
RRT	RAPID RESPONSE TEAM
VF	VENTRICULAR FIBRILLATION
VT	VENTRICULAR TACHYCARDIA

FOREWORD

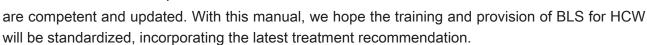
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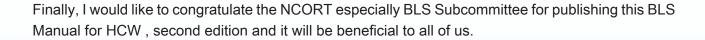
Director General of Health Malaysia

Basic Life Support (BLS) is the foundation for saving lives after cardiac arrest. The emerging of Covid-19 pandemic posed major impact on the way we do resuscitation.

BLS Subcommittee under National Committee on Resuscitation Training, Ministry of Health (NCORT) produced this Second Edition of Basic Life Support training manual for our Healthcare Workers (HCW) which includes guidance during the pandemic. The manual has incorporated the latest update on resuscitation based on the International Liaison Committee on Resuscitation (ILCOR) 2020 treatment recommendations.

Resuscitation training in MOH is one of the important areas that need to be emphasized to ensure all HCW







Director General Ministry of Health Malaysia



FOREWORD

Deputy Director-General of Health (Medical) Ministry of Health Malaysia

Basic Life Support (BLS) skills are essential for all healthcare worker (HCW) involved in the care of patients with potentially life-threatening conditions. These life saving measures play an essential role in improving the chances of survival in patients who develop unexpected sudden cardiac arrest.

Pandemic Covid-19 posed significant challenges to our BLS training and provision of care, wherein rescuers must continuously balance the immediate needs of the patients with their own safety. These guideline address the gap for All HCW to manage patient with infectious risk for providing BLS. It also as a guidence to better equip themselves with these core resuscitation skills in order to better prepare themselves to care for their patients.



Congratulations to the NCORT Basic Life Support (BLS) subcommittee for their continued efforts in ensuring that BLS training in Malaysia is ongoing, accessible, and always kept up to date.

Thank you.

DATO' DR. ASMAYANI BINTI KHALIB

Deputy Director-General of Health (Medical) Ministry of Health Malaysia



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CHAPTER 1-8

CHAPTER 1

COURSE OVERVIEW

This manual contains guidance for Healthcare Workers (HCW) on the techniques used during the initial resuscitation of a cardiac arrest victim. BLS includes airway, breathing and circulatory support with the use of an automated external defibrillator (AED). It also includes the management of choking.

Course Objectives

- i. Understand relevant anatomy and physiology of cardiopulmonary system
- ii. Describe the links in the chain of survival
- iii. Describe, understand and perform BLS
- iv. Describe, understand and perform BLS during pandemic

Course Description

BLS for HCW Minimum Recommended module

TIME	PROGRAMME	
08:00 - 08:15	Registration	
08:15 - 08:30	Introduction to Basic Life Support Course	
08:30 - 09:15	Video/Lecture on BLS	
09:15 - 09:30	Tea Break	
09:30 - 13:00	Practical Sessions	
	1. Airway	
	2. AED	
	3. Adult CPR (1 & 2 rescuers)	
	4. Infant CPR	
	5. Adult FBAO	
	6. Infant FBAO	

CHAPTER 2

INTRODUCTION

Basic life support (BLS) includes:

- 1. Airway
- 2. Breathing
- 3. Circulation
- 4. Automated external defibrillator (AED)
- 5. Management of choking or foreign body airway obstruction (FBAO)

NCORT BLS Training Manual Second Edition (2022) is based on the International Liaison Committee on Resuscitation (ILCOR) 2020 Consensus on Science and Treatment Recommendations (CoSTR) for Basic Life Support and the European Resuscitation Council Guidelines for Resuscitation (2021) Adult Basic Life Support.

There are no major changes in the NCORT Second Edition Basic Life Support Training Manual.

Management of cardiac arrest in patients during pandemic (including COVID-19) is included in this manual.

Top Messages in NCORT BLS Training Manual Second Edition based on 2020 ILCOR CoSTR;

- a. Emphasis on importance of early recognition of cardiac arrest.
- b. Alert Emergency Medical System, dial 999 via MERS (Malaysian Emergency Response System).
- c. Emphasize on early high quality CPR.
- d. Early use of AED.

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The chain of survival

The chain of survival summarizes the vital links needed for successful resuscitation. Most of these links apply to victims of both primary cardiac and asphyxia arrest.



Figure 2.1: The chain of survival (adapted from ERC 2021)

A Early recognition and call for help

Chest pain should be recognized as a symptom of myocardial ischaemia. Cardiac arrest occurs in a quarter to a third of patients with myocardial ischaemia within the first hour after onset of chest pain.

Recognizing the cardiac origin of chest pain, and calling the emergency services before a victim collapses, enables rapid activation of Emergency Response System (ERS).

If cardiac arrest has occurred, early recognition is critical to enable rapid activation of the ERS and prompt initiation of bystander CPR. The key observations are **unresponsiveness** and **not breathing normally**. Emergency medical dispatchers can improve recognition by focusing on these keywords.

B Early bystander CPR

The immediate initiation of CPR can increase the survival rate from cardiac arrest. If able, bystanders with CPR training should give chest compressions together with ventilations.

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C Early defibrillation

Defibrillation within 3–5 minutes of collapse can produce survival rates as high as 50–70%. Each minute of delay to defibrillation reduces the probability of survival to discharge by 10–12%. The links in the chain work better together. When bystander CPR is provided, the decline in survival is more gradual and averages 3–4% per minute delay to defibrillation.

D Early advanced life support and post-resuscitation care

Early initiation of advanced life support and post resuscitation care will improve the survival of the victims.

CHAPTER 3

CLINICAL ANATOMY & PHYSIOLOGY

Anatomy & Physiology of the Heart

The main components of the heart are:

- 1. Heart muscles contract to pump blood.
- 2. Heart chambers collect and channel blood flow.
- 3. Heart valves allows only one way flow of blood.
- 4. Conduction system coordinate heart muscle contraction
- 5. Coronary blood vessels supply blood to the heart

The cardiovascular system maintains blood flow to deliver oxygen and nutrients to every cell and removes the carbon dioxide and waste products made by those cells.

The heart is a muscular organ which pumps a continuous flow of blood through the blood vessels of the circulatory system.

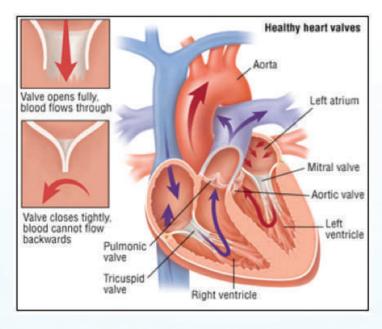


Figure 3.1: Heart anatomy

Importance of adequate chest recoil

Due to this simple way of how the flow of blood occurs, when the heart stops pumping during cardiac arrest, effective external chest compression push blood out of heart chambers and thus maintain blood flow and oxygen delivery to the heart, brain and other vital organs.

The contraction of the heart is coordinated by its conduction system. The heart will fail to maintain a good blood flow if it pumps at a rate that is too slow (less than 60/min), too fast (more than 150/min) or unorganized rhythm (ventricular fibrillation). In a child, a heart rate of less than 60/min requires chest compression to maintain adequate perfusion.

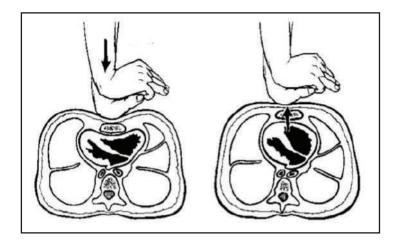


Figure 3.2: Chest compression

The coronary blood vessels supply oxygen to the heart muscles and conduction system. Most of blood flow (perfusion) to the heart muscles occur during the diastole (relaxation) phase. This is the reason why the recommended maximum rate of chest compression is 120/min and full chest recoil is important to allow for adequate perfusion to the heart muscles and blood filling of the heart chambers during the diastole phase.

Anatomy & Physiology of the Respiratory System

The human body needs oxygen to sustain life. After about four minutes without oxygen, brain cells start dying and can lead to irreversible brain damage and ultimately death.

The main components in respiratory system are:

- Airways to channel air to the lungs
- 2. Lungs and blood vessels for gas exchange
- 3. Muscles for breathing to move air in and out of the lungs

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Room air contains 21% oxygen. Rescue breathing using exhaled air contains 16% oxygen.

Most child-related cardiac arrests occur as a result of a hypoxic event. Therefore, breathing and oxygenation are important for a successful resuscitation.

The tongue may occlude the upper airway in an unconscious patient. Thus, opening the airway is essential.

However, due to anatomical differences between an adult, children and neonate airway, head-tilt-chin lift maneuver may differ slightly. Over extension of the neck in an unconscious infant may occlude the airway.

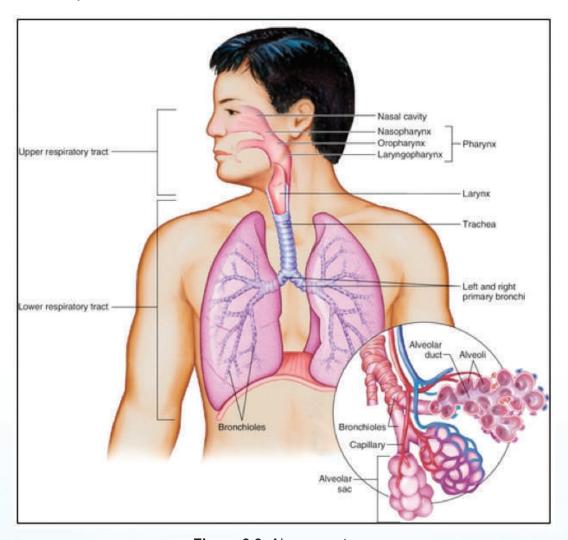


Figure 3.3: Airway anatomy

During cardiac arrest, the body's metabolic demand for oxygen is decreased. Therefore a smaller amount of air is needed. When giving ventilation, a visible chest rise indicates adequate volume of air has been given.

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Overventilation and Hyperventilation

Overventilation and hyperventilation should be avoided because with each ventilation, intra-thoracic pressure increases. The detrimental effects following this are:

- 1. Decrease in atrial/ ventricular filling.
- 2. Reduction in coronary perfusion pressures (blood flow to heart muscles)
- 3. Distention of the stomach with air which will reduce diaphragm mobility and increase risk of regurgitation and aspiration.

Sudden Cardiac Arrest

Sudden cardiac arrest (SCA) is a condition in which the heart suddenly and unexpectedly stops beating. If this happens, blood stops flowing to the brain and other vital organs. SCA usually causes death if it is not treated within minutes.

Signs and symptoms of cardiac arrest: the patient is unresponsive with;

- 1. Abnormal or absent of breathing
- 2. No pulse
- 3. No signs of life

Signs of Life

Following successful CPR, the heart will start pumping effectively causing a Return Of Spontaneous Circulation (ROSC). This will produce adequate perfusion to the brain and other organs and the victim will have "signs of life".

The signs of life are:

- 1. Breathing normally
- 2. Moving
- 3. Coughing

Presence of signs of life is considered as an indicator to stop CPR. However, the victim still has a potential to go into cardiac arrest again. So, frequent reassessment is required and CPR may need to be restarted when the signs of life are absent again. To achieve early commencement of CPR, assessment for signs of life should be performed simultaneously during assessment of breathing.

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Agonal Breathing

Agonal breathing is a natural reflex that happens when the brain is not getting the oxygen needed to survive. It is not true breathing because air is **not effectively inhaled** because the chest wall muscles, and the diaphragm is **not adequately perfused** during cardiac arrest. It is a sign that a person is nearing death.

Agonal breathing is observed in about 50% of cardiac arrest victims. It indicates the presence of brain function and is associated with improved outcomes. Agonal breathing is commonly misinterpreted as a sign of life, presenting a challenge to lay people and healthcare workers. Agonal breathing remains the biggest barrier to recognition of cardiac arrest.

Early recognition of agonal breathing is **very important** for early CPR and defibrillation, and failure by rescuers to recognize agonal breathing is associated with decreased survival. Rescuer **should initiate CPR** with agonal breathing for presumed cardiac arrest without concerns of harm to victims not in cardiac arrest.

Seizure-like movements

Seizure-like movements of short duration among patients in cardiac arrest is another important barrier to recognition of cardiac arrests. The victim is more likely of a witnessed arrest, with an initial shockable rhythm and more likely to survive to hospital discharge. Similar to agonal respiration, seizures complicate the recognition of cardiac arrest for both lay people and HCWs.

Recognizing cardiac arrest after a seizure episode when the victim remains unresponsive with abnormal breathing is important to prevent delayed CPR. The risk of delaying CPR for a cardiac arrest victim far outweighs any risk from performing CPR on a person not in cardiac arrest..

Assess the person after the seizure has stopped: If unresponsive and absencet or abnormal breathing, start CPR.

Myocardial Infarction

A myocardial infarction (MI) or heart attack is defined pathologically as myocardial cell death due to prolonged ischaemia.

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Signs and Symptoms of MI

In general, chest discomfort related to a heart attack or another heart problem may be described by or associated with one or more of the following:

- 1. Angina pectoris described as pain, pressure, fullness, burning or tightness in the chest. It may present with Levine's sign which is clenched fist over the chest.
- 2. Pain typically presents on the left side of the chest but may occur atypically at the epigastric region, centre of the chest or over the right chest.
- 3. Crushing or searing pain that spreads to patient back, neck, jaw, shoulders, and one or both arms
- 4. Pain that lasts more than a few minutes, gets worse with activity, comes and goes, that varies in intensity.
- 5. Shortness of breath
- 6. Cold sweats
- 7. Dizziness or weakness
- 8. Nausea or vomiting



Figure 3.4: Levine's sign of MI

CHAPTER 4

ADULT BLS

The sequence of steps for the initial assessment and treatment of the unresponsive victim is as below. Adult BLS Algorithm assists HCWs in the flow of BLS work process.

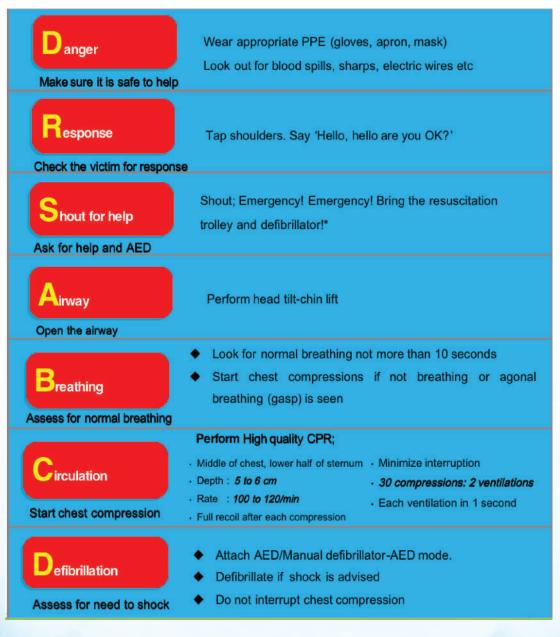


Figure 4.1: Adult BLS for HCW Sequence

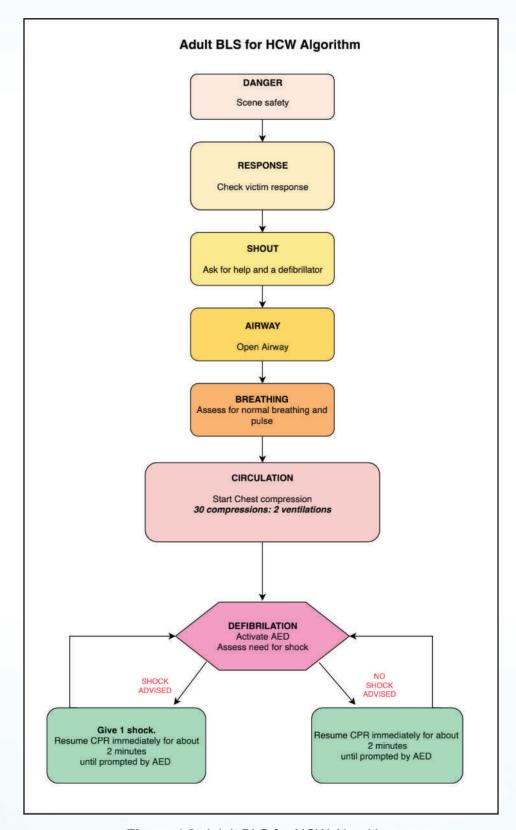


Figure 4.2: Adult BLS for HCW Algorithm

Table 4.1: BLS detailed steps

	lable 4.1: BLS detailed steps		
Sequence	Technical Description		
1. DANGER	Make sure you, the victim and any bystanders are safe a. Wear appropriate PPE (gloves, apron, mask). b. Look out for blood spills, sharps, electric wires, unsteady beds, trolley.		
2. RESPONSE	 a. Gently tap his shoulders and ask loudly: i. "Are you OK?". ii. If no response proceed to next step (Shout for Help) b. If he responds, leave him in the position in which you find him, provided there is no further danger. Get help if needed and re-asses regularly. 		
3. SHOUT FOR HELP Ask for Help and AED	*Shout for help or activate Emergency Response System (ERS) if no response. a. For IHCA, shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator!" and activate Code Blue system if applicable. b. For OHCA, activate ERS. i. Send someone to get an AED if available. ii. Shout "Emergency! Emergency! Bring the AED!" iii. A lone responder with a mobile phone should dial the MERS 999, activate the speaker or another hands-free option on the mobile phone and immediately start CPR.		

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Sequence **Technical Description** 4. AIRWAY Open the airway a. Head tilt-chin lift b. Jaw thrust if suspected cervical injury A. Head tilt chin lift Place your hand on the forehead. Gently tilt the head back and with your fingertips under the point of the victim's chin, lift the chin to open the airway. A. Head tilt Chin lift B. Jaw thrust > Use index and middle fingers to physically push the posterior aspects of the mandible upwards while your thumbs push down on the cheek to open the mouth. B. Jaw thrust 5. BREATHING Look for normal breathing and if you are trained, simultaneously feel for the presence of pulse in not more than 10 seconds a. Determine absent/abnormal breathing simultaneously while opening the airway by looking at the chest, neck and face. b. Do not confuse agonal breathing with normal breathing. Agonal breathing is an abnormal breathing in the first few minutes after cardiac arrest, a victim taking infrequent, slow and noisy gasps. c. Treat absence of breath or presence of abnormal breathing as a sign of cardiac arrest d. If you have any doubt whether or not breathing is normal, act as if they are not breathing normally. e. START chest compression when no breathing, presence of agonal breathing or no definite pulse felt. f. If you are trained to check pulse, if pulse felt but breathing not normal; provide rescue breathing 1

breath every 6 seconds or 10 breath per minute.

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Sequence

Technical Description

6. CIRCULATION (CHEST COMPRESSION)



Place the heel of one hand in the centre of the victim's chest



Place the heel of your other hand on top of the first hand. Interlock the fingers of your hands



Keep your arms straight

Start Chest Compressions

- a. Place the heel of one hand in the centre of the victim's chest at the lower half of the sternum.
- b. Place the heel of your other hand on top of the first hand
- c. Interlock the fingers of your hands and ensure that pressure is not applied over the victim's ribs
- d. Keep your arms straight
- e. Position your shoulders vertically above the victim's chest and press down on the sternum with high quality CPR

High quality CPR

- i. Site: middle chest, lower half of sternum
- ii. Rate: 100 to 120 compressions per minute
- iii. Depth: at least 5 cm and not greater than 6 cm
- iv. Complete recoil of the chest
- v. Minimize interruption on chest compression
- vi. Compression to ventilation ratio 30:2
- vii. Ventilate adequately, each breath delivered over 1 second with visible chest rise
- a. Switched the person applying chest compression every 5 cycles or 2 minutes to avoid fatigue.
- b. Optimal chest compression are best delivered with the patient on a firm surface:
 - Chest compression performed on a hospital mattress is acceptable
 - ➢ Moving a patient from the bed to the floor is NOT recommended.
 - Using backboard is also not recommended

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Sequence **Technical Description** Bag-valve-mask (BVM) ventilation a. Position yourself directly above the victim's head b. Place the mask on the victim's face, using the bridge of the nose as a guide for correct position. c. Use the E-C clamp technique to hold the mask in place while you lift the jaw to hold the airway open: d. Perform head tilt e. Use the thumb and index finger of one hand to make a "C" on the side of the mask, pressing the edges of the mask to the face f. Use remaining fingers to tilt angles of the jaw (3 fingers form g. Squeeze the bag to deliver breath over 1 second while watching for chest rise. Mouth to mask ventilation a. Position yourself at the victim's side b. Place the mask on the victim's face and seal the mask against the face c. Place index finger and thumb along the edge of the mask, remaining fingers along the bony margin of the jaw and perform head tilt-chin lift to open the airway d. While you lift the jaw, press firmly and completely around the outside edge of the mask to seal the mask against face e. Deliver breath over 1 second, look for victim's chest rise f. During delivery of rescue breath, avoid hyperventilation If you are untrained or unable to do rescue breaths, give chest compression only CPR (continuous compression at a rate of at least 100-120 per min)

Sequence	Technical Description
7. DEFIBRILLATION	Assess the need to do defibrillation
	a. Switch on the AED or Defibrillator to AED mode.b. Attach the electrode pads on the victim's bare chest
	 i. 1st pad on victim right upper chest -below clavicle ii. 2nd pad on the apex of the heart
	*If more than one HCW is present, CPR should be continued while electrode pads attached to the chest.
GHASTAL CO	c. Follow the voice prompt or visual directions
	Ensure that nobody is touching the victim while the AED is analysing the rhythm
	d. If a shock is advised,
	 i. Deliver shock within 5 seconds ii. Ensure that nobody is touching the victim with clear CHANT "Everybody clear" iii. Push shock button as directed iv. Immediately restart CPR after shock delivered.
	e. If Shock not advised, continue CPR
	f. Continue management as advised by AED.
	Reassessment
	a. After every 5 cycles or 2 minutes of CPR, HCW shall check for normal breathing and pulse.b. Do not stop resuscitation until:
	i. Victim recovers with normal breathing ii. HCW is exhausted iii. Assistance arrives to take over CPR
	c. Signs that the victim has recovered:
	i. Waking up ii. Moving iii. Open eye iv. Normal breathing

	Technical Description
Recovery Position	If you are certain the victim is breathing normally but is still unresponsive, place the victim in the recovery position a. Keep both victim legs straight b. Place the arm nearest to you at right angles to his body, elbow bent with the hand palm-up c. Bring the far arm across the chest, and hold the back of the hand against the victim's cheek nearest to you d. With your other hand, grasp the far leg just above the knee and pull it up, keeping the foot on the ground e. Keeping his hand pressed against his cheek, pull on the far leg to roll the victim towards you on to his side f. Adjust the upper leg so that both the hip and knees are bent at right angles g. Tilt the head back to make sure that the airway remains open h. Check the breathing regularly is Be prepared to restart CPR immediately if the victim

Table 4.2: Adult BLS 2-Rescuer detailed steps

1st RESCUER- Adult BLS skill		
Sequence	Technical Description	
1. DANGER	Make sure you, the victim and any bystanders are safe a. Wear appropriate PPE (gloves, apron, mask). b. Look out for blood spills, sharps, electric wires, unsteady beds, trolley.	
2. RESPONSIVENESS	a. Gently tap his shoulders and ask loudly: i. "Are you OK?". ii. If no response proceed to next step	
3. SHOUT FOR HELP	Shout for help/activate Emergency Response System (ERS) if no response. a. For IHCA, shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator!" and activate Code Blue system if applicable. b. For OHCA, activate ERS. i. Send 2nd rescuer or someone to get an AED if available. ii. Shout "Emergency! Emergency! Bring the AED!" iii. A lone responder with a mobile phone should dial the MERS 999, activate the speaker or another hands-free option on the mobile phone and immediately start CPR.	

Sequence	Technical Description
4. AIRWAY	Open the airway
a. Head tilt Chin lift	a. Head tilt-chin lift b. Jaw thrust if suspected cervical injury (Detailed in Chapter 8 -Airway Management)
b. Jaw thrust	
5. BREATHING	 a. Look for normal breathing and if you are trained, simultaneously feel for the presence of pulse in not more than 10 seconds. b. START chest compression when there is no breathing ,presence of agonal breathing or no definite pulse felt.

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6. CIRCULATION (CHEST COMPRESSION)



Sequence

Place the heel of one hand in the centre of the victim's chest



Place the heel of your other hand on top of the first hand. Interlock the fingers of your hands



Keep your arms straight



a. Start Chest Compressions

- i. Place the heel of one hand in the centre of the victim's chest at the lower half of the sternum.
- ii. Place the heel of your other hand on top of the first hand. Interlock the fingers of your hands.
- iii. Keep your arms straight.

b. Gives High quality CPR

- i. Site: middle chest, lower half of sternum
- ii. Rate: 100 to 120 compressions per minute
- iii. Depth: at least 5 cm and not greater than 6 cm
- iv. Complete recoil of the chest
- v. Minimize interruption on chest compression
- vi. Compression to ventilation ratio 30:2
- vii. Ventilate adequately, each breath delivered over 1 second with visible chest rise.



BVM



Pocket mask

c. Bag-valve-mask (BVM) ventilation

- i. Use the E-C clamp technique to hold the mask in place while you lift the jaw to hold the airway open:
- ii. Squeeze the bag to give breaths
 - 1 second each breath while watching for chest rise

d. Mouth to mask ventilation

-use pocket mask

2nd RESCUER- AED Skills and Switch Role

Sequence

Technical Description

7. DEFIBRILLATION





2nd Rescuer activate AED



2nd rescuer do chest compression 1st Rescuer - provide ventilation

- a. 2nd rescuer arrives and turn on AED/
 Defibrillator-AED mode.
- b. **2nd rescuer attach pads** while 1st rescuer continue chest compression.
- c. **2nd rescuer** clear the victim allowing AED rhythm analysis,

SWITCH RESCUER ROLE during the analysis.

- d. If shock is advised, 2nd rescuer clear the victim, loudly state "STAND CLEAR" and push the shock button.
- e. After shock, **BOTH rescuers** resume CPR:
 - 2nd rescuer provide chest compression.
 - -1st rescuer provide ventilation.
- f. If no shock indicated, continue CPR.
- g. After 5 cycles or 2 minutes of CPR, the device will prompt to analyze, repeat the steps (c-e), follow the AED advise/prompt.

If AED not availble, rescuers swith role after CPR for 5 cycles or about 2 minutes.

Reassessment

- After every 5 cycles or 2 minutes of CPR,
 HCW shall check for normal breathing and pulse
- b. Do not stop resuscitation until:
 - i. Victim recovers with normal breathing
 - ii. HCW is exhausted
 - iii. Assistance arrives to take over CPR

CHAPTER 5

PAEDIATRIC BASIC LIFE SUPPORT

Introduction

The majority of paediatric cardio-respiratory arrest are mostly caused by respiratory insufficiency rather than primary cardiac problem. Hence, ventilation is a very important component of CPR in children.

HCW who are unable or unwilling to provide breaths should be encouraged to perform at least compression-only CPR. A child is far more likely to be harmed if the bystander does nothing.

All HCWs should initiate CPR in children even if they haven't been taught specific paediatric techniques. CPR should be started with the compression: ventilation ratio of 15:2.

BLS guidelines for paediatrics apply to all children, up to 12 years, except for neonates (less than 30 days old). Infant defined as age more than 30 days until 1 year old. Patients who look adult can be treated as an adult.

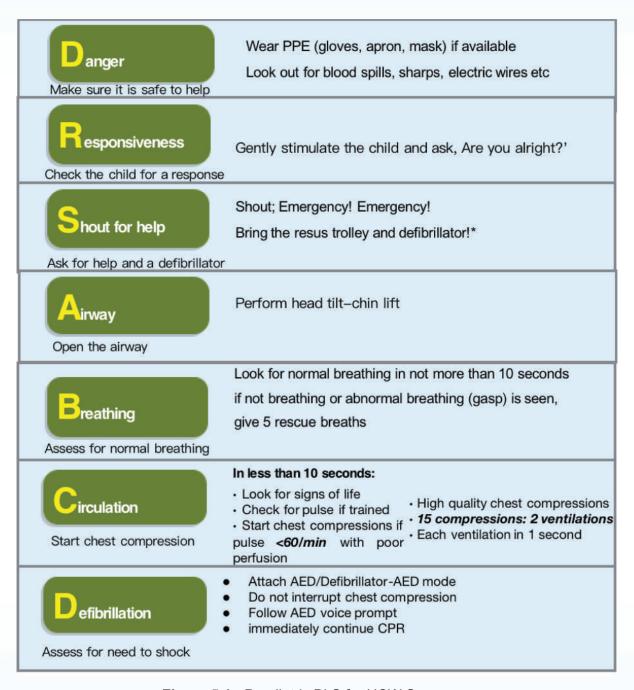


Figure 5.1 : Paediatric BLS for HCW Sequence

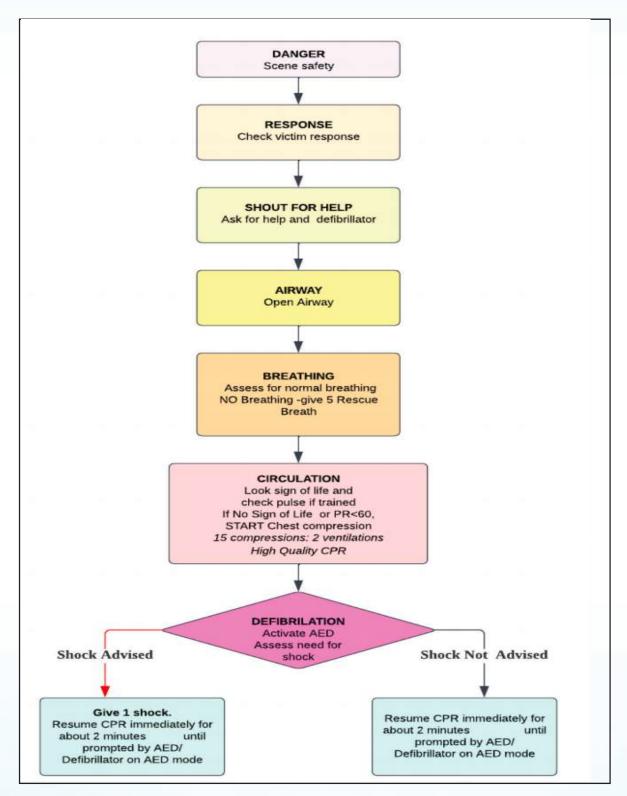


Figure 5.2: Paediatric BLS for HCW Algorithm

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Table 5.1: Technical Description BLS for Paediatric Sequence

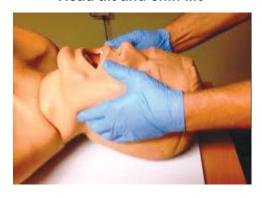
Technical Description BLS for Paediatric Sequence Sequence **Technical Description** 1. Danger a. Ensure the safety of rescuer and child. b. Wear appropriate PPE (gloves, apron, mask). Look out for blood spills, sharps, electric wires, unsteady beds, trolley. 2. Responsiveness a. Check the child's responsiveness: Gently stimulate the child and ask loudly, 'Are you OK?' > If no response proceed to next step (Shout for Help) > If the child responds by answering or moving: Check his condition and get help if needed. Reassess regularly

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Technical Description Sequence 3. Shout for Help Shout for help or activate Emergency Response System (ERS) if no response. a. For IHCA, shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator!", activate Code Blue system if applicable. b. For **OHCA**, activate ERS. Send someone to get an AED if available. Shout "Emergency! Emergency! Bring the AED!" iii. A lone responder with a mobile phone should dial the MERS 999, activate the speaker or another hands-free option on the mobile phone and immediately start CPR. iv. If only one HCW is present, undertake CPR for about **1 min** before going for assistance. v. In cases where the likelihood of a primary shockable rhythm is very high such as in sudden witnessed collapse, if directly accessible, he or she can rapidly collect and apply an AED (at the time of calling EMS). 4. Airway Turn the child onto his back and open the airway using



Head tilt and chin lift



Jaw thrust

Turn the child onto his back and open the airway using either manouvres;

- a. Head tilt and chin lift: (Sniffing position in child)
 - i. Place your hand on his forehead and gently tilt his head back.
 - ii. With your fingertip(s) under the point of the child's chin, lift the chin.
 - iii. Do not push on the soft tissues under the chin as this may block the airway.
- b. Jaw trust (in trauma)
 - Place the first two fingers of each hand behind each side of the child's mandible and push it forward.

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Sequence

Technical Description

5. Breathing



Look, listen & feel technique

- a. While maintaining airway open, Look, listen, and feel for normal breathing for no more than 10 seconds.
 - i. Look for chest movements.
 - ii. Listen at the child's nose and mouth for breath sounds.
 - iii. Feel for air movement on your cheek.
 - iv. if you have any doubts whether breathing is normal, act as if it is not normal.
 - v. In the first few minutes after cardiac arrest a child may be taking infrequent noisy gasps, do not confuse this with normal breathing
- b. If the breathing is NOT normal or absent:
 - Carefully remove any obvious airway obstruction.
 - ii. Give 5 initial rescue breaths.
 - iii. While performing the rescue breaths note any gag or cough response to your action. These responses, or their absence, will form part of your assessment of 'signs of life', described below.

Second Edition

Sequence

Airway opening using 'E-C' clamp

Technical Description

RESCUE BREATHS:

a. Bag-valve-mask (BVM) ventilation

- Position yourself directly above the victim's head
- ii. Place the mask on the victim's face, using the bridge of the nose as a guide for correct position.
- iii. Use the E-C clamp technique to hold the mask in place while you lift the jaw to hold the airway open:
- iv. Perform head tilt
 - ➤ Use the thumb and index finger of one hand to make a "C" on the side of the mask, pressing the edges of the mask to the face
 - ➤ Use remaining fingers to tilt angles of the jaw (3 fingers form an "E")
- v. Squeeze the bag to give breaths 1 second each breath while watching for chest rise

b. Mouth to mask ventilation

- i. Position yourself at the victim's side
- ii. Place the mask on the victim's face and seal the mask against the face
- iii. Place index finger and thumb along the edge of the mask, remaining fingers along the bony margin of the jaw and perform head tilt-chin lift to open the airway
- iv. While you lift the jaw, press firmly and completely around the outside edge of the mask to seal the mask against face
- v. Deliver breath over 1 second, look for victim's chest rise

Sequence	Technical Description
	c. Mouth to mouth
	 i. Ensure head tilt and chin lift manouvre performed. ii. Pinch the soft part of the nose with the index finger and thumb of your hand on his forehead. iii. Open his mouth and maintain the chin lift. iv. Take a breath and place your lips around his mouth, making sure that you have a good seal. v. Blow steadily into his mouth over 1 second sufficient to make the chest rise visible. vi. Maintaining head tilt and chin lift position , take your mouth away and watch for his chest to fall as air comes out. vii. If you have difficulty achieving an effective breath, the airway may be obstructed: Den the child's mouth and remove any visible obstruction. Do not perform a blind finger sweep. Ensure that there is adequate head tilt and chin lift but also that the neck is not over extended.
	During delivery of rescue breath:
	 Avoid hyperventilation The ventilation is given over 1 second till there is a visible chest rise
	If you are untrained or unable to do rescue breaths,
	p give chest compressions only CPR (continuous compression at a rate of at least 100−120 per min.)
	If the child is breathing normally:
	 Turn the child onto his side into the recovery position. Send or go for help – Only leave the child if no other way of obtaining help is possible. Perform regular reassessment.

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Sequence

Technical Description

6. Circulation



Pulse check in child



Chest Compression

- Assess the circulation or signs of life:
 Take not more than 10 seconds to:
 - Look for signs of life, includes any movement, coughing, or normal breathing
 - ii. **If you are trained**, simultaneously check for the pulse:
 - Feel for the carotid pulse in the neck, or
 - ➤ Femoral pulse in the groin (mid-way between the anterior superior iliac spine and the symphysis pubis)
- b. If there are no signs of life or the pulse rate is less than 60 beats/min start chest compressions and perform high quality CPR

c. Chest Compressions

- i. Locate the xiphisternum by finding the angle where the lowest ribs join in the middle.
- ii. Place the heel of one hand over the lower half of the sternum or one finger's breadth above the xiphisternum.
- iii. Position yourself vertically above the victim's chest and, with your arm straight, compress the sternum.
- iv. In larger children, use adult chest compressions method.

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Sequence	Technical Description
	d. High quality CPR
	 i. Site: middle chest, lower half of sternum ii. Rate: 100 to 120 compressions per minute iii. Depth: at least 5 cm iv. Complete recoil of the chest v. Minimize interruption on chest compression vi. Compressions to ventilation ratio 15:2 vii. Ventilate adequately, each breath delivered over 1 second with visible chest rise
	e. Do not stop resuscitation until:
	i. Victim recovers with normal breathing ii. HCW is exhausted iii. Assistance arrives to take over
7 D-6111-41	Access the most few defibuilleties

7. Defibrillation



Assess the need for defibrillation

- a. Switch on the AED/Defibrillator-AED mode and follow the spoken/visual directions.
- b. Attach the electrode pads on the victim's bare chest.
 - i. The pads should be applied as in adults or in antero-posterior position in smaller child.
 - ii. Choose adult pad for children 8 years and older.
- c. Ensure that nobody is touching the victim while the AED is analysing the rhythm
- d. If a shock is advised, deliver shock within 5 seconds;
 - Ensure that nobody is touching the victim and shout "STAND CLEAR"
 - ii. Push shock button as directed
- e. Immediately resume CPR after shock delivered.
- f. Continue as directed by the voice/visual prompts

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Sequence

Technical Description



Recovery position

An unconscious child whose airway is clear and breathing normally should be turned onto the side into the recovery position.

The important principles to be followed are:

- a. The adult recovery position is suitable for use in children.
- b. Place the child in as near a true lateral position as possible to enable the drainage of fluid from the mouth.
- c. It should be possible to turn the child onto his side and to return him back easily and safely, taking into consideration the possibility of cervical spine injury.
- d. Ensure the airway is accessible and easily observed.

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Table 5.2: Technical Description Infant BLS Sequence

Sequence 1. Danger

Technical Description

- a. Ensure the safety of rescuer and infant.
- b. Wear appropriate PPE (gloves, apron, mask).
 Look out for blood spills, sharps, electric wires, unsteady beds, trolley.

2. Responsiveness



- a. Check for responsiveness to verbal and tactile stimulation;
 - i. Gently stimulate the infant and ask loudly, 'Are you OK?'
 - ii. Stimulate by tapping the infant's sole firmly.
- b. If the infant does not respond, no breathing or only gasping proceed to the next step.
- c. The decision to start CPR should take less than 10 seconds from starting the initial assessment.
- d. If there is response;
 - Leave the infant in the position in which you find him (provided he is not in further danger).
 - ii. Check his condition and get help if needed.
 - iii. Reassess regularly.

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Sequence **Technical Description** Shout for help or activate Emergency Response 3. Shout for help System (ERS) if no response. a. For IHCA, shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator!"; Activate Code Blue system if applicable. b. For OHCA, activate ERS. Send someone to get an AED if available. ii. Shout "Emergency! Emergency! Bring the AED!" iii. A lone responder with a mobile phone should dial the MERS 999, activate the speaker or another hands-free option on the mobile phone and immediately start CPR. iv. If only one HCW is present, undertake CPR for **about 1 min** before going for assistance. c. In cases where the likelihood of a primary shockable rhythm is very high such as in sudden witnessed collapse, if directly accessible, he or she can rapidly collect and apply an AED (at the time of calling EMS). 4. Airway Turn the child onto his back and open the airway using either manouvres; a. Head tilt and chin lift: i. Place your hand on his forehead and gently tilt his ii. With your fingertip(s) under the point of the infant's chin, lift the chin. iii. Do not push on the soft tissues under the chin as this may block the airway. b. Jaw trust (in trauma) place the first two fingers of each hand behind each side of the infant's mandible and push it forward. Infant - neutral position

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Sequence Technical Description

5. Breathing







- i. Look for chest movements.
 - ii. Listen at the nose and mouth for breath sounds

a. Keeping the airway open, look, listen, and feel for

normal breathing by putting your face close to the

iii. Feel for air movement on your cheek.

infant's face and looking over the chest:

- iv. In the first few minutes after cardiac arrest an infant may be taking infrequent noisy gasps.
- v. Do not confuse this with normal breathing. Look, listen, and feel for not more than 10 seconds before deciding if you have any doubts whether breathing is normal, act as if it is not normal.

b. If the breathing is NOT normal or absent:

- i. Carefully remove any obvious airway obstruction.
- ii. Give 5 initial rescue breaths.
- iii. While performing the rescue breaths note any gag or cough response to your action. These responses, or their absence, will form part of your assessment of 'signs of life', described below.

c. Rescue breaths for an infant using BVM:

- i. Position yourself directly above the victim's head
- ii. Place the mask on the victim's face, using the bridge of the nose as a guide for correct position.
- iii. Use the E-C clamp technique to hold the mask in place while you lift the jaw to hold the airway open:
- iv. Perform head tilt

v. Squeeze the bag to give breaths 1 second each breath while watching for chest rise. vi. If you have difficulty achieving an effective breath, the airway may be obstructed: > Open the mouth and remove any visible obstruction. Do not perform a blind finger sweep. > Ensure that there is adequate head tilt and chin lift but also that the neck is not over extended. > If head tilt and chin lift has not opened the airway, try the jaw thrust method. > Make up to 5 attempts to achieve effective breaths. If still unsuccessful, move on to chest compression. d. If the infant is breathing normally:
 i. Turn infant into the recovery position. ii. Send or go for help — call the relevant emergency number. iii. Only leave if no other way of obtaining help is possible. iv. Check for continued normal breathing.

Sequence	Technical Description
6. CIRCULATION Pulse check in infant	 a. Assess the circulation (signs of life): Take not more than 10 seconds to: i. Look for signs of life. These include any movement, coughing, or normal breathing (not abnormal gasps or infrequent, irregular breaths). ii. If you are trained, check the pulse simultaneously while look for sign of life. ➢ Feel for the brachial pulse on the inner aspect of the upper arm. ➢ Femoral pulse in the groin also can be used iii. If you can detect signs of a circulation ➢ Continue rescue breathing, if necessary, until the infant starts breathing effectively on his own. ➢ Turn onto his side (into the recovery position) if he starts breathing effectively but remains unconscious. ➢ Re-assess frequently. b. If there are no signs of life, and if you are trained and certained that you CANNOT feel a definite pulse of more than 60 beats/ min within 10 seconds; Start chest compressions. > Site- lower half of sternum > Compression should be sufficient to depress the sternum 1/3 of the of the depth of the chest, which is approximately 4 cm. > rate of 100-120 per min. > Allow full chest recoil > compression to ventilation ratio; 15:2.

Sequence	Technical Description
Compression: Encircling technique	 c. Compression technique: Two thumb encircling technique is preferable technique for chest compression Single rescuer might alternatively use two-fingers technique. Encircling Technique Place both thumbs flat, side-by-side, on the lower half of the sternum 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, or approximately 4 cm Two-finger Technique Place the infant on a firm, flat surface. Place 2 fingers on the lower sternum at least one-third of the depth of the infant's chest, or approximately 4 cm.
Compression: Two finger technique	c. Do not stop resuscitation until: i. Victim recovers with normal breathing ii. HCW is exhausted iii. Assistance arrives to take over CPR

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Sequence Recovery position



Technical Description

- a. Unconscious infant whose airway is clear and who is breathing normally should be turned onto the side into the recovery position.
- b. The important principles to be followed are:
 - Place the infant in as near a true lateral position as possible to enable the drainage of fluid from the mouth.
 - ii. Ensure the position is stable:
 - ➤ A small pillow or a rolled-up blanket may be placed behind infant's back to maintain the position.
 - ➢ It should be possible to turn the infant onto the infant's side and to return him back easily and safely, taking into consideration the possibility of cervical spine injury.
 - ➤ The airway is accessible and easily observed

CHAPTER 6

DEFIBRILLATION / AED (AUTOMATED EXTERNAL DEFIBRILLATOR)

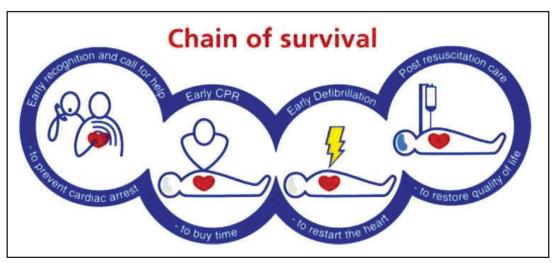


Figure 6.1: Chain of survival (adapted from ERC 2021)

Early defibrillation is one of the key link in the chain of survival. 80-90% of sudden cardiac death is due to ventricular fibrillation/ pulseless ventricular tachycardia (VT). The survival rate reduces by 7-10% each minute, without early CPR and early defibrillation in a shockable rhythm (VF/ pulseless VT). Meanwhile, the survival rate is about 3-5% if only CPR is provided. However, the survival rate will increase drastically to 30-70% by giving early CPR and early defibrillation.

AED (Automated External Defibrillator) is a portable, battery-operated device that can automatically analyze the cardiac rhythm. It required electrical shock if it is a shockable rhythm. It is very simple to operate, allowing laypersons and healthcare providers to attempt defibrillation safely.

During VF, the heart muscle fibres quiver and do not contract to pump blood. Defibrillation delivers a preset electric current across the heart muscle fibres to stop the quivering and restore the normal cardiac rhythm of the heart.

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Picture 6.2: Example of AED



Picture 6.3: Example of Defibrillator machines with AED function

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Table 6.1: Technical Sequence AED for HCW

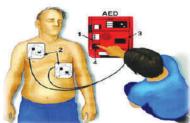
Sequence 1. POWER ON the AED

Technical Description

- a. Place the AED next to the patient and open the carrying case or the top of the AED.
- Turn the power on (some devices will "power on" automatically when you open the lid or case).

2. ATTACH AED pads









Pads placement in infant (antero-posterior)

- a. Choose adult pads for victims 8 years of age or older.
- b. Peel open the AED pads
- c. Attach the adhesive pads to the victim's bare chest.
 - i. Place one AED pad on the victim's right upper chest (directly below clavicle)
 - ii. Place another AED pad to the side of the apex of the heart
 - iii. The placement of the AED should not interrupt the chest compression
 - iv. Any open flow of oxygen should be diverted away from the chest to avoid fire hazard
- d. Children aged between 1 and 8 years old:
 - Special pediatric pads should be used for children aged 1-8 years old.
 - ii. In situation in which there is no AED with a pediatric dose-attenuator system, the HCW may use an adult AED.
 - iii. For infants, the pads should be applied in antero-posterior (back front) position.

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Sequence

Technical Description

2. "Clear" the victim and ANALYZE the rhythm



Clear the victim during the analysis of the cardiac rhythm

- a. AED will prompt you to clear the victim during rhythm analyzing. Be sure no one touches the victim, including the HCW in charge of giving breath.
- b. Some defibrillator with AED function will prompt the operator to push a button for analyzing the heart rhythm; others will do that automatically.
- c. Wait for the AED to prompts rescuer whether a shock is advised or not.

3. Press the SHOCK button If the AED advises to shock



a. If AED advised to shock:

- i . Clear the victim from contact with people before delivering the shock; be sure no one is touching the victim.
- ii. Loudly shout out "STAND CLEAR"
- iii. Rescuer then press the SHOCK button.
- iv. Immediately resume CPR after delivering the shock.
- v After 5 cycles or 2 minutes of CPR, the device will prompt you to analyze, repeat the steps.

b. If AED advised not for shock;

- i. Immediately resume CPR.
- ii. After 5 cycles or 2 minutes of CPR, the device will prompt you to analyze, repeat the steps, follow the AED advise/prompt.

Notes: In some AEDs, there will be real-time feedback to monitor the quality of CPR, enabling the HCW should improve the quality of CPR according the real-time feedback.

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Use of AED in Special situation

1. Hairy chest

A hairy chest will impede the flow of the electricity from the pads through the chest; hinder the adherence of the pads and possibly be a fire hazard. Thus, it is advisable to shave the area in which the pads are to be placed.

2. Immersed in the water or water is covering the victim's chest

Water is a good conductor of the electricity and this will prevent the delivery of the adequate dose of shock to the heart. The victim should be removed from the water prior to attaching the pads. If the chest is covered with water, use a towel to wipe the area before attaching the pads.

3. Implantable defibrillator and pacemaker

The victim may have an ICD (Implantable Cardiac Defibrillator) or pacemaker placed beneath the skin at the upper chest or abdomen. In this case, the HCW should avoid placing the AED pad over the ICD/ pacemaker as it may block the delivery of the shock to the heart. If the ICD is delivering a shock, allow 30-60 seconds for the implantable defibrillator to complete the treatment cycle before delivering a shock from the AED.

4. Transdermal medication patches

Do not place the AED pads direct on top of medication patch (nitroglycerin, nicotine etc) as they may block the transfer of energy to the heart and may cause small burn to the skin. The patch can be removed and wipe the area clean before attaching the AED pads.

CHAPTER 7

FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)

Adult with foreign body obstruction

FBAO or choking is a common problem and important cause of accidental death. It is commonly witnessed and treatable.

Recognition

FBAO usually occurs while the victim is eating or drinking. Suspect FBAO if someone is suddenly unable to speak or talk, particularly if eating. People at increased risk of choking include those with reduced consciousness, drug and/or alcohol intoxication, neurological impairment with reduced swallowing and cough reflexes (e.g. stroke, Parkinson's disease), respiratory disease, mental impairment, dementia, poor dentition and older age.

Treatment for mild airway obstruction

Encourage patient to cough in order to generate high and sustained airway pressures which may expel foreign body.

Put victims under continuous observation until they improve, as severe airway obstruction may develop subsequently.

Treatment for severe airway obstruction

Approximately 50% of airway obstructions following choking are not relieved by a single technique.

Success rate is increased when combinations of back blows or slaps, and abdominal and chest thrusts are used.

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Treatment of FBAO in an unresponsive victim

Higher airway pressures can be generated using chest thrusts compared with abdominal thrusts.

Bystander initiation of chest compressions for unresponsive or unconscious victims of choking is associated with improved outcomes.

Therefore, start chest compressions promptly if the victim becomes unresponsive or unconscious. After 30 compressions, attempt 2 rescue breaths, and continue CPR until the victim recovers and starts to breathe normally.

Aftercare and referral for medical review

Following successful treatment of choking, foreign material may remain in the upper or lower airways and cause complications later.

Patients presenting with signs and symptoms below should seek medical advice.:

- i. Persistent cough
- ii. Difficulty swallowing
- iii. Sensation of an object still being stuck in the throat

Abdominal thrusts and chest compressions can potentially cause serious internal injuries and all victims successfully treated with these measures should be examined afterwards for any injury.

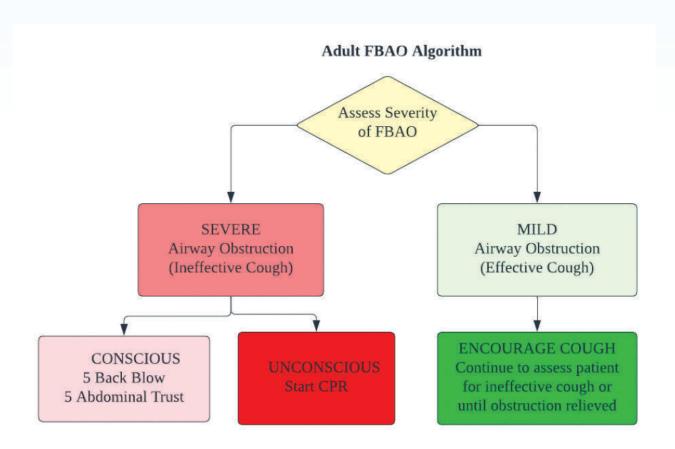


Figure 7.1: Adult FBAO algorithm

Table 7.1: Sequence of steps for managing Adult with foreign body airway obstruction

Sequence	Technical Description
1. SUSPECT FBAO Universal sign of choking	Be alert to choking particularly if victim is eating or present with universal sign of choking
2. ENCOURAGE TO COUGH	Instruct victim to cough
3. GIVE BACK BLOWS	If cough becomes ineffective give up to 5 back blows a. Give five sharp blows between the shoulder blades with the heel of your hand

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Sequence

Technical Description

3. GIVE ABDOMINAL THRUSTS



If back blows are ineffective give up to 5 abdominal thrusts.

- a. Clench your fist and place it between the umbilicus (navel) and the ribcage
- b. Grasp this hand with your other hand and pull sharply inwards and upwards
- c. Repeat up to five times
- d. If the obstruction is still not relieved, continue alternating five back blows with five abdominal thrusts.

3. START CPR IF FBAO VICTIM BECOMES UNSCONCIOUS



Start CPR if the victim becomes unconscious.

- a. Support the victim carefully to the ground.
- b. Immediately activate the Emergency Response Service (ERS).
- c. As you open the airway to give ventilations, look in the person's mouth for any visible object. If you can see it, use a finger sweep motion to remove it. If you don't see the object, do not perform a blind finger sweep, but continue CPR.

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Paediatric Foreign Body Airway Obstruction, FBAO

Recognition of FBAO or choking

FBAO is characterized by the sudden onset of respiratory distress associated with

- 1. coughing,
- 2. gagging, or
- 3. stridor.

Suspect FBAO caused by a foreign body if:

- 1. The onset is very sudden
- 2. There are no other signs of illness
- 3. 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).

Consider the safest action to manage the FBAO child:

- 1. If the child is coughing effectively, then no external maneuver is necessary. Encourage the child to cough, and monitor continuously.
- 2. If the child's is coughing ineffectively, shout for help immediately and determine the child's conscious level.

Conscious child with FBAO

- 1. If the child is still conscious but has absent or ineffective coughing, give 5 back blows.
- 2. If back blows do not relieve choking, give 5 chest thrusts to infants or abdominal thrusts to children. These maneuvers create an 'artificial cough' to increase intrathoracic pressure and dislodge the foreign body.

General signs of FBAO		
Witnessed episode		
Coughing or choking		
Sudden Onset		
Recent history of playing with or eating small object		
Ineffective coughing - SEVERE FBAO	Effective coughing - MILD FBAO	
Unable to vocalize	Crying or verbal response to questions	
Quiet or silent cough	Loud cough	
Unable to breathe	Able to take a breath before coughing	
Cyanosis	No cyanosis	
Decreasing level of consciousness	Fully responsive	

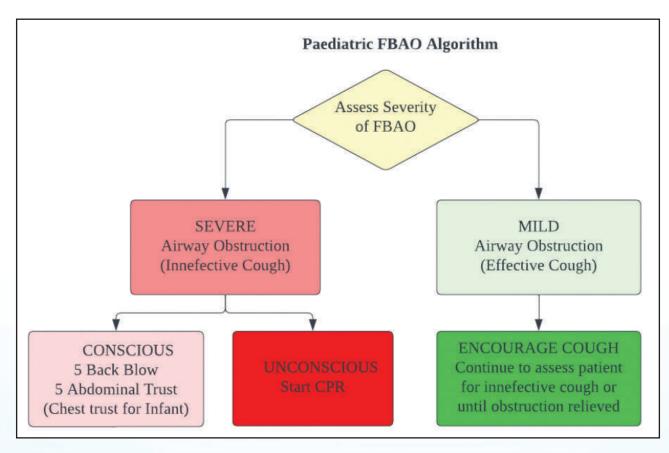


Figure 7.2: Paediatric FBAO algorithm

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Table 7.2: Technique for managing a paediatric victim with FBAO

Technique Description

1. Back blow in an infant



- Support the infant in a head-downwards, prone position, to enable gravity to assist removal of the foreign body.
- b. A seated or kneeling rescuer should be able to support the infant safely across the rescuer lap.
- c. Support the infant's head by placing the thumb of one hand at the angle of the lower jaw, and one or two fingers from the same hand at the same point on the other side of the jaw.
- d. Do not compress the soft tissues under the infant's jaw, as this will exacerbate the airway obstruction.
- e. Deliver up to **5 sharp back blows** with the heel of one hand in the middle of the back between the shoulder blades.

2. Back blow in a child over 1 year



- a. Back blows are more effective if the child is positioned head down.
- b. A small-sized child may be placed across the rescuer's lap as with an infant.
- c. If this is not possible, support the child in a forward-leaning position and deliver the back blows from behind.
- d. 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 (Heimlich manoeuvre) for infants.

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Technique Description

3. Chest thrusts for infants



- a. 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.
- b. Support the infant down your arm, which is placed down (or across) your thigh.
- c. Identify the landmark for chest compression (lower sternum approximately a finger's breadth above the xiphisternum).
- d. Deliver up to **5 chest thrusts**. These are similar to chest compressions, but sharper in nature and delivered at a slower rate.

Abdominal thrusts for children over 1 year



- a. Stand or kneel behind the child. Place your arms under the child's arms and encircle his torso.
- b. Clench your fist and place it between the umbilicus and xiphisternum.
- c. Grasp this hand with your other hand and pull sharply inwards and upwards.
- d. Repeat up to 4 more times.
- e. Ensure that pressure is not applied to the xiphoid process or the lower rib cage as this may cause abdominal trauma.

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Technique	Description
Following chest or abdominal thrusts reassess the child:	 a. 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. b. Call out, or send, for help if it is still not available. c. Do not leave the child at this stage. d. If the object is expelled successfully, assess the child's clinical condition. It is possible that part of the object may remain in the respiratory tract and cause complications. If there is any doubt, seek medical assistance. e. If the child regains consciousness and is breathing effectively, place him in a safe sidelying (recovery) position and monitor breathing and conscious level whilst awaiting the arrival of the ambulance.
	Harana alama alah dari da FDAO

Unconscious child with FBAO

START CPR



Unconscious child with FBAO

- i. If the choking child is, or becomes, unconscious place him on a firm, flat surface.
- ii. Start CPR

While doing Airway opening:

- i. Open the mouth and look for any obvious object.
- ii. If one is seen, make an attempt to remove it with a single finger sweep.
- iii. Do not attempt blind or repeated finger sweepsthese can push the object more deeply into the pharynx and cause injury.

CHAPTER 8

AIRWAY MANAGEMENT

Maintaining a patent airway will enable ventilation and oxygenation of the lungs, which is important during cardiac arrest. Airway intervention is aerosol generating procedure (AGP). HCW must be very cautious to prevent oneself from contracting the disease while dealing with airborne disease eg: Covid-19, details in Chapter 9.

Opening the Airway

A patent airway is essential to ensure effective ventilation. In unconscious patient, the tongue may falls posteriorly and will blocked the upper airway. There are two techniques to open the airway, head tilt-chin lift and jaw thrust.

(i) Head Tilt-Chin Lift



Figure 8.1: Head Tilt-Chin Lift manouvre

To perform head tilt chin lift manouvre, place your hand on the forehead, and gently tilt the head back and with your fingertips under the point of the victim's chin; lift the chin to open the airway.

In children and infants, care shall be exercise while performing head tilt-chin lift to not cause over-extension.

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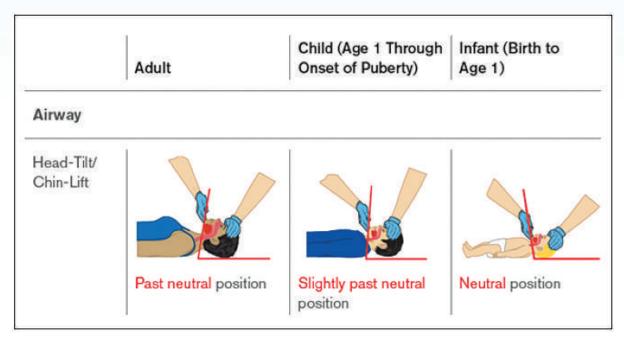


Figure 8.2: Open airway using Head tilt -chin lift technique in different ages.

(ii) Jaw thrust



Figure 8.3: Jaw Thrust

Jaw thrust is the technique of choice for patient with suspected cervical spine injury.

To perform jaw thrust, use index and middle fingers to physically push the posterior aspects of the mandible upwards while your thumbs push down on the cheek to open the mouth.

In children and infants, jaw thrust is performed by placing the fingers behind the angles of the mandible and push anteriorly (towards the tip of the nose).

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Maintaining a patent airway

After opening the airway, maintaining a patent airway is also essential to facilitate effective ventilation. Airway adjunct such as oropharyngeal airway, OPA and nasopharyngeal airway, NPA can be used to maintain airway patency.

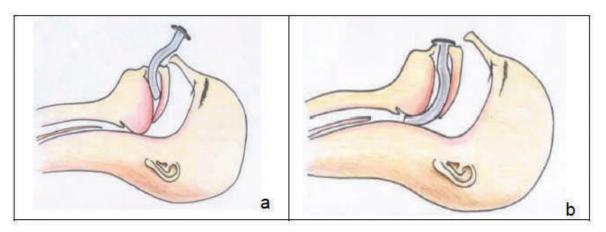
(i) Oropharyngeal Airway (OPA)

Indication : Comatose patients or patients with loss of airway reflex

Caution : Semiconscious patient with gag reflex

Measurement : From angle of the mouth to angle of the jaw

Technique Of Insertion:



- a. Insert the OPA with the concave part facing the roof of the mouth.
- b. Once a third of the OPA has been inserted/ resistance felt, rotate the OPA 180 degrees.

Figure 8.4: Insertion of OPA

In children and infants, use a tongue depressor to displace the tongue, and insert the OPA with the concave part facing the floor of the mouth. This is to avoid hard and soft palate trauma.

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Figure 8.5: Insertion of OPA in infant using tongue depressor

(ii) Oropharyngeal Airway (OPA)

Indication : Semi-conscious patient, patients with difficult mouth opening.

Caution : Patient with Ear Nose Throat (ENT) bleeding, patient with suspected

base of skull fracture

Measurement : From the tip of the nose to the tragus of the ear

Technique Of Insertion:

- 1. Measure and select a correct size NPA.
- 2. Lubricate the NPA prior to insertion.
- 3. Insert the NPA into the nostril along the floor of the nose with a slight twisting action.
- 4. Advanced the NPA until the flange rest on the nostril.

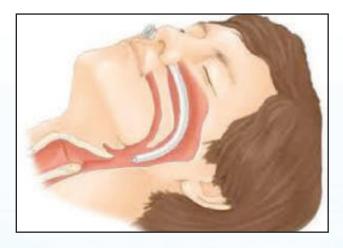


Figure 8.6: Insertion of NPA

Delivery of Rescue Breathing

(i) Mouth-to-Barrier Device

Health care provider is recommended to use standard precaution such as the pocket mask. This mask has a one-way valve that diverts exhaled air, blood/body fluid away from rescuer.



Figure 8.7: Pocket mask





Figure 8.8: Giving mouth to mask breath

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(ii) Bag-Mask Device

Bag-mask device consists of a bag (with one-way valve) attached to a face mask. It is used to give positive-pressure ventilation during CPR. Adequate ventilation is achieved when rescuer squeeze the bag to give breath (1 second each) and there is visible chest rise.

During Covid-19 Pandemic, it is advisable to use a high-efficiency particulate air (HEPA) filter or a heat and moisture exchanger (HME) filter between the self-inflating bag and the mask to minimise the risk of virus spread.

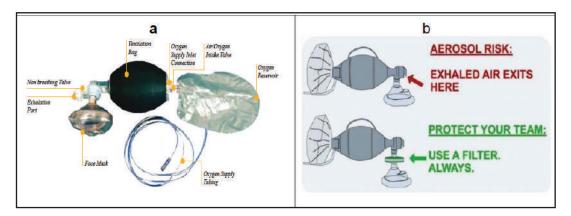


Figure 8.9: a: Bag-Mask Device, b: BVM with HEPA/ HME Filter

The bag mask device is held with an E-C clamp technique using either 1 hand or 2 hands.



Figure 9: E-C clamp technique

a. One hand technique b. Two hands technique

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(iii) Laryngeal Mask Airway (LMA)

LMA is an advanced airway device. It is widely used by healthcare providers, either for the out-of-hospital cardiac arrest or in-hospital cardiac arrest. It is easy to apply as it does not require visualization of vocal cords. However, LMA does not protect against gastric aspiration.

There are various LMA sizes that are available (Refer table 8.10).

When LMA is in place during 2-rescuer Adult CPR, no more cyclical CPR (30 compression: 2 ventilation) is applied. Rescuers are to give 1 breath every 6 sec (10 breaths per minute) and continue compression 100-120 per minute.

In children and infants, insertion of LMA should only be performed by trained personnel.



Figure 8.10: Examples of LMA

Size of LMA	Weight of patient	Max Air in Cuff Not to Exceed
Size 1	< 5 kg	4 ml
Size 1.5	5 to 10 kg	7 ml
Size 2	10 to 20 kg	10 ml
Size 2.5	20 to 30 kg	14 ml
Size 3	30 to 50 kg or small adult	20 ml
Size 4	50 to 70 kg (adult)	30 ml
Size 5	> 70 kg (large adult)	40 ml

^{*}Recommended size of LMA for weight of patient and maximum air in cuff as per manufacture's recommendation

Table 8.1: Example Of Sizes of LMA

CHAPTER 9

BLS DURING PANDEMIC

Cardiac arrest survival rates have decreased dramatically during the COVID-19 pandemic and is dependent on early initiation of CPR. Ministry of Health through NCORT continue to recommend chest compressions as soon as is safely possible. Patients with confirmed or suspected COVID-19 should receive the best resuscitative efforts possible for optimizing patient outcomes whilst maintaining safety for all personnel who attend resuscitation events.

Throughout the pandemic, NCORT resuscitation guideline for known or suspected COVID-19 patients has been consistent, advising AGP PPE for chest compressions and airway procedures. Effective use of PPE is critical for the safety of healthcare providers performing resuscitation.

For patients allocated to the Low Risk category, the standard non-COVID algorithms can be used and all healthcare staff attending resuscitation events should wear a minimum of a Type II fluid resistant surgical mask, eye protection, disposable gloves, and an apron.

Clear communication to all members of staff is vital to ensure that there is no delay to resuscitation and no increased risk to HCWs safety.

HCW who have a duty to respond but who rarely treat cardiac arrest patients, the education should focus on the donning (putting-on) PPE as soon as possible, chest compressions and the proper use of an AED.

- a. In witnessed sudden cardiac arrest, wear appropriate PPE and initiate chest compressions immediately. All persons not wearing appropriate PPE should be immediately excused from the room or area.
- b. No check (listen & feel) for breathing and no mouth to mouth/nose ventilations should be done during the pandemic as these skills pose increased risk for infection.
- c. Healthcare professionals should always use airborne-precaution PPEs for aerosol-generating procedures (chest compressions, airway and ventilation interventions) during resuscitation.
- d. Perform chest compressions and ventilation with a bag-mask and oxygen at a 30:2 ratio, pausing chest compressions during ventilations to minimize the risk of aerosolisation.

- e. BLS teams less skilled or uncomfortable with bag-mask ventilation should not provide bagmask ventilation because of the risk of aerosol generation. These teams should place an oxygen mask on the patient's face, give oxygen 6L/min and provide compression-only CPR.
- f. HCW may consider defibrillation before donning AGP PPE in situations where the provider assesses the benefit may exceed the risk.
- g. Precaution on management of airway during pandemic is very important.

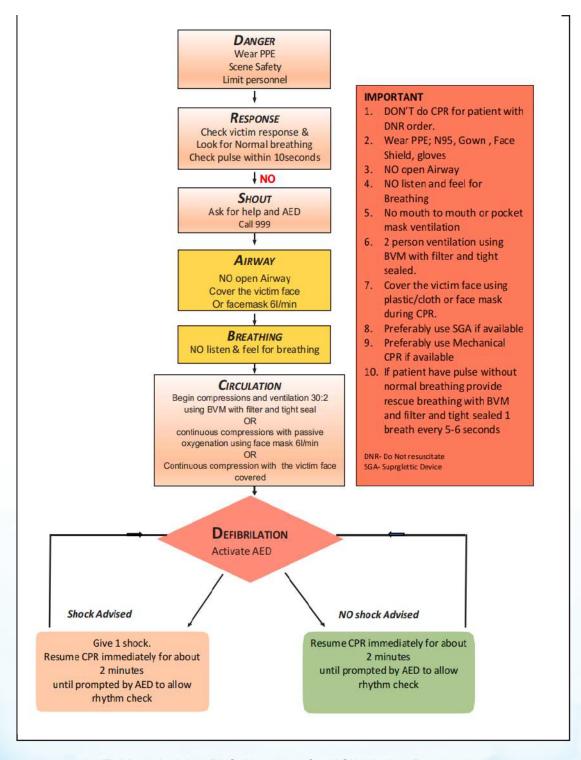


Table 9.1: Adult BLS Algorithm for HCW during Pandemic

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Airway Management During Covid-19 pandemic and Airborne diseases

Top Messages for Airway Management During Covid-19 Pandemic

- 1. Airway intervention is aerosol generating procedure (AGP). HCW must be very cautious to prevent oneself from contracting the disease while dealing with airborne disease (eg: Covid-19).
- 2. Standard operating procedure (SOP) and appropriate PPE (especially N95 masks and eye protection goggles or face shield) are strongly recommended.
- 3. **DO NOT** do mouth-to-mouth ventilation or use a pocket mask.
- 4. During bag-mask ventilation, use two hands technique to ensure a good seal.
- 5. Use HEPA/Viral filter for all ventilation.

Managing airway for patient with airborne disease is challenging due to the nature of transmission of the disease. Standard principle of infection control and droplet precaution must be prioritized when dealing with airway.

While managing airway during the event of resuscitation of a patient with airborne disease in cardiac arrest,

- 1. Wear proper PPE, ie; N95 mask,
- 2. DO NOT open the airway or place your face next to the patient's nose/mouth
- 3. NO mouth-to-mouth ventilation or ventilation using pocket mask.
- 4. While delivering rescue breath via BVM, USE TWO HANDS E-C CLAMP TECHNIQUE to hold the mask and ensure a good seal for bag-mask ventilation. While the first rescuer is holding the mask, the second rescuer (the person doing compressions) can squeeze the bag when they pause after each 30 chest compressions.
- 5. BLS teams less skilled or uncomfortable with bag-mask ventilation should not provide bag-mask ventilation because of the risk of aerosol generation. These teams should place an oxygen mask on the patient's face, give oxygen and provide compression-only CPR.
- 6. Use a high-efficiency particulate air (HEPA) filter or a heat and moisture exchanger (HME) filter between the self-inflating bag and the mask to minimize the risk of virus spread.
- 7. Ideally, endotracheal intubation should be done as early as possible to limit aerosol spread.
- 8. However, if intubation is delayed, SGA (eg: LMA) should be considered. Tracheal intubation and SGA insertion MUST ONLY BE ATTEMPTED by a skilled individual to achieve first-pass success.
- 9. CPR after SGA inserted should still follow 30:2 compression to ventilation ratio to minimize aerosolization.
- 10. Continuous uninterrupted chest compression with 1 ventilation every 6 to 8 seconds is used only in intubated victim.

- 11. CPR in a patient already connected to a ventilator:
 - a. Perform continuous chest compression
 - b. Do not disconnect the ventilator circuit
 - c. Increase FiO2 to 1
 - d. Set ventilator to deliver 10 breaths per minute
 - e. Check the ventilator and tubing for possible contribution to the cardiac arrest



Picture 9.1: BVM with HEPA/ HME Filter

10. APPENDIX

NCORT Healthcare Provider summary of steps of BLS for Adult, Paediatrics and Infants

Component	Recommendation		
	Adult	Peadiatrics	Infants
1.Recognition	Unresponsive		
2.BLS Sequence	DRSABCD	DRSABCD	DRSABCD
3.Compression rate per minute	100-120	100-120	100-120
4.Compression	5cm to but not more	At least 1/3 depth of	At least 1/3 depth of
depth	than 6cm	chest or 5cm	chest or 4cm
5.Compression	Minimize interruption to chest compression & limit interruption for less that		
Interruption		seconds	
6.Compression- Ventilation ratio	30:2	15:2	15:2
7.Ventilation with	10 breath/min	20-30 breath/min	20-30 breath/min
LMA or advanced airway	or	or	or
anway	1 breath every	1 breath every	1 breath every
	6 seconds	2-3 seconds	2-3 seconds
8.Defibrillation	Use AED as soon as available		

Second Edition

1.BLS CHECKLIST FOR HCW Station: Adult 1-Rescuer CPR

	SKILL TEST FOR ADULT 1-RESCUER CPR			
	SKILL PERFORMANCE	√IF DONE CORRECTLY		
1	DANGER			
	Wear PPE (gloves, apron, mask), look out for blood spills, sharps, electric wires, unsteady beds, trolley			
2	RESPONSE			
	a. Shoulder Tap			
	b. Shout & ask - "Are you alright?".			
3	SHOUT FOR HELP			
	 a. For IHCA - Shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator/AED!" b. For OHCA: Alert emergency medical service immediately, call MERS 999, and ask to bring AED. A lone responder with a mobile phone, dials the MERS 999, activate the speaker or another hands-free option and immediately start CPR A lone rescuer and you have to leave a victim to alert the EMS, activate the EMS first and then start CPR 			
4	AIRWAY			
5	Open Airway a. Head Tilt Chin Lift or b. Jaw Thrust in trauma BREATHING Absent / abnormal breathing a. Determine while opening the airway by looking at the chest, in not more than 10 seconds (and if you are trained, simultaneously feel for the presence of pulse).			
	b. Chest compression shall begin with absence of normal breathing or no pulse.			
6	CIRCULATION			
Г	Performed high quality of CPR			
	i. Location -middle of chest, lower half of sternum			
	ii. Rate of compression : 100-120/min			
	iii. Depth of compression :5-6 cm			
	iv. Full recoil after each compression			
	v. Minimize Interruption			
	vi. Compressions to ventilations ratio, 30:2			
7	DEFIBRILATION			
	As soon as the AED arrives, or if one is already available at the site of the cardiac arrest:			
	a. Switch on the AED and follow voice prompt			
	b. Attach the electrode pads			
	c. Clear the victim during rhythm analysis			
	d. If shock is advised, i. Clears the victim and loudly state "Stand Clear" ii. Push shock button as directed iii. immediately resume CPR			
	e. If no shock is indicated, continue CPR.			
TEST RESULT Pass Instructor Potential				
C	Fail			
	STRUCTOR:			
II N	SINGOTON.			

2. BLS CHECKLIST FOR HCW Station: 2-Rescuer CPR

*			
		SKILL PERFORMANCE	√ IF DONE CORRECTLY
		1 ST RESCUER (ADULT BLS SKILLS EVALUATION)	
1	1	DANGER	
		Wear PPE (gloves, apron, mask), look out for blood spills, sharps, electric wires, unsteady beds, trolley	
2	2	RESPONSE	
Γ		a. Shoulder Tap	
		b. Shout & ask - "Are you alright?".	
3	3	SHOUT FOR HELP	
		 a. For IHCA - Shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator/AED!" b. For OHCA: i. Alert emergency medical service immediately, call MERS 999, and ask to bring AED. ii. A lone responder with a mobile phone, dials the MERS 999, 	
		activate the speaker or another hands-free option and immediately start CPR iii. A lone rescuer and you have to leave a victim to alert the EMS, activate the EMS first and then start CPR.	
ŕ	1	AIRWAY	
		Open Airway c. Head Tilt Chin Lift or d. Jaw Thrust in trauma	
5	5	BREATHING	
		 Absent / abnormal breathing a. Determined simultaneously while opening the airway by looking at the chest, in not more than 10 seconds and if you are trained, simultaneously feel for the presence of pulse. b. Chest compression shall begin with absence of normal breathing or no pulse. 	
6	ŝ	CIRCULATION	
		Performed high quality of CPR	
		i. Location (Middle of chest, lower half of sternum)	
		ii. Rate of compression (100-120/min)	
		iii. Depth of compression (5-6 cm)	
		iv. Full recoil after each compression	
		v. Minimize Interruption	
		vi. 30 compressions: 2 ventilations	
		vii. Each ventilation in 1 second	
_			

	2 ND RESCUER (AED SKILLS AND RESCUERS SWITCH ROLE)			
7	DEFIB	RILATION		
	a.	2 nd rescuer arrives and turn on AED		
	b.	2 nd rescuer attach pads while the 1 st rescuer continues chest compression.		
	c. 2 nd rescuer clear the victim allowing AED rhythm analysis, RESCUERS SWITCH ROLE.			
	 d. If shock is advised, 2nd rescuer clears the victim and loudly state "Stand Clear" then press the shock button. e. After shock ,BOTH rescuers immediately resume CPR for 5 cycles or about 2 minutes; > 1st rescuer provide ventilation. > 2nd rescuer provide chest compression. 			
	f.	If no shock is indicated,BOTH rescuers provide CPR as above. (e)		
	g.	After 5 cycles or about 2 minutes of CPR, the AED will prompt rescuers to repeat steps. (c to e.)		
	h. Reassess and RESCUERS SWITCH during AED analysis.			
	*If AED not available, rescuers switch role after CPR for 5 cycles or 2 minutes.			

TEST RESULT	Pass	Instructor Potential	Fail
COMMENTS:			
INSTRUCTOR:			

Second Edition

3. BLS CHECKLIST FOR HCW Station: Infant CPR

E	SKILL TEST FOR INFANT CPR			
	SKILL PERFORMANCE	✓ IF DONE CORRECTLY		
1	DANGER			
	Wear PPE (gloves, apron, mask), look out for blood spills, sharps, electric wires, unsteady beds, trolley			
2	RESPONSE			
	a. Shout & speak- call the infant			
4	b. Tap baby soles			
3	SHOUT FOR HELP			
	 a. For IHCA - Shout "Emergency! Emergency! Bring the resuscitation trolley and defibrillator/AED!" b. For OHCA: If more than one rescuer, a second rescuer dials the MERS 999, preferably using the speaker function or another hands-free option. If one rescuer with mobile phone, dials the MERS 999, activate the speaker or another hands-free option and immediately start CPR. If only one rescuer with no mobile phone, undertake CPR for about 1 min or 5 cycles before going for assistance 			
4	AIRWAY			
	Open airway: a. Head Tilt Chin Lift b. Jaw trust (trauma)			
5	BREATHING			
	Look for normal breathing, should not take more than 10 seconds.			
	Absent / abnormal breathing a. Give 5 initial rescue breaths b. duration of delivering a breath is about 1 second sufficient to produce a visible chest rise			

6	CIRCULATION	
	 a. Assess the circulation Look for signs of life or if you are trained feel for brachial pulse for not more than 10 seconds. 	
	b. Start chest compression if there are no signs of life or the pulse rate is less than 60 beats/min.	
	 c. Compression technique: For one rescuer CPR: the rescuer compresses with the tips of 2 fingers. For two rescuers CPR: two thumb chest compression technique 	
	d. Site of CompressionLower half of the sternum.	
	e. Depth of Compression: At least 1/3 the depth of the chest at least 4cm.	
	f. Rate of Compression: - At least 100-120/mm	
	g. Ratio of Compressions to Breaths:One or two Rescuer CPR - 15:2	
	h. Unconscious infant whoes airway is clear and breathing normally should be put on recovery position; (lateral)	

TEST RESULT	Pass	Instructor Potential	Fail
COMMENTS:			
INSTRUCTOR:			

Second Edition

4. BLS CHECKLIST FOR HCW Station: Adult Choking

	SKILL TEST FOR ADULT CHOKING	
	SKILL PERFORMANCE	✓ IF DONE CORRECTLY
1.	Assess the severity	
	Ask: Are you choking? Are you ok? Mild - effective cough Severe - the cough becomes ineffective	
2.	Mild chocking	
	Encourage the victim to cough	
3	Severe chocking	
	a. Give 5 back blows: i. Lean the victim forwards. ii. Apply blows between the shoulder blades using the heel of one hand	
	 b. If back blows are ineffective, give 5 abdominal thrusts: i. Stand behind the victim and put both your arms around the upper part of the victim's abdomen. ii. Lean the victim forwards. iii. Clench your fist and place it between the umbilicus (navel) and the ribcage. iv. Grasp your fist with the other hand and pull sharply inwards and upwards. 	
	c. Continue alternating 5 back blows with 5 abdominal thrusts until it is relieved, or the victim becomes unconscious.	
	d. Perform chest thrust for pregnant and very obese victims	
4	Victim unconscious	
	Start CPR -During airway opening, check for foreign body, do not perform a blind finger sweep.	
	-During airway opening, check for foreign body, do not perform a blind finger	

TEST RESULT	Pass	Instructor Potential	Fail
COMMENTS:			
INSTRUCTOR:			

Second Edition

5. BLS CHECKLIST FOR HCW Station: Infant Choking

	SKILL PERFORMANCE	✓ IF DONE CORRECTLY
1	Assess the severity	
	Mild: - coughing effectively (fully responsive, loud cough, taking a breath before coughing), still crying, or speaking	
	Severe: - ineffective cough, inability to cough, decreasing consciousness, inability to breathe or vocalise, cyanosis.	
2	Mild airway obstruction	
	- Encourage the child to cough and continue monitoring the child's condition	
3	Severe airway obstruction	
	a. Ask for help i. A second rescuer should call MERS 999, preferably by mobile phone (speaker function). ii. A single trained rescuer should first proceed with rescue manoeuvres (unless able to call simultaneously with the speaker function activated).	
	b. Perform 5 back blows and followed with 5 chest thrusts:	
	Back Blows i. Support the infant in a head-downwards, prone position by placing the thumb of one hand at the angle of the lower jaw. ii. Deliver up to 5 sharp back blows with the heel of one hand in the middle of the back between the shoulder blades.	
	Chest Thrust i. Turn the infant into a head-downwards supine position and place free arm along the infant's back and encircling the occiput with your hand. ii. Identify the landmark - lower sternum approximately a finger's breadth above the xiphisternum to deliver up to 5 chest thrusts. c. Continue the sequence of back blows and chest trust if the foreign	
	body has not been expelled and the victim is still conscious.	
4	Unconscious Patient	
	Start CPR and emphasize on: a. During airway opening, check for foreign body, do not perform a blind finger sweep. b. Repositioning the head if no chest rises after each breath.	

TEST RESULT	Pass	Instructor Potential	Fail
COMMENTS:			
INSTRUCTOR:			

Second Edition

6. BLS CHECKLIST FOR HCW Station: AED (Automated External Defibrillator)

	SKILL TEST FOR AED (Automated External Defibrillator)					
	SKILL PERFORMANCE	✓ IF DONE CORRECTLY				
	AED					
1	Switch on the AED and follow the voice prompt					
2	Attach pads					
	a. Select proper size of AED pads					
	Position pads at correct position i. place one AED pad on the victim's right upper chest (directly below					
	clavicle) ii. place another AED pad to the side of the apex of the heart					
	c. Plug in the pad connector cable into the AED(if necessary.)					
3	Analyze					
	'Clear' to ensures that no one is touching the victim while machine analyzes.					
4	Shock					
	If AED advises a shock , a. Clear the victim b. Loudly state "Stand Clear" c. Press the Shock Button d. Resume CPR immediately					
5	If no shock advised, continue CPR					
	Defibrillator with AED mode					
1	Prepare Defibrillator on AED setting with therapeutic cable and pad					
2	Turns AED mode on and follow the voice prompt.					
3	Exposed patient's chest and Attach pads appropriately					
4	Clears patient to analyze (press the analyze button if necessary)					
5	If shock is advised, clears patient and loudly state "Stand Clear" then press the shock button					
6						
TES	TEST RESULT Pass Instructor Potential					
CO	MMENTS:					
INS	TRUCTOR:					

Second Edition

7. BLS CHECKLIST FOR HCW Station: Airway

	SKILL TEST FOR AIRWAY				
	SKILL PERFORMANCE	✓ IF DONE CORRECTLY			
1	Open airway techniques:				
	Able to perform correctly head tilt chin lift, jaw trust (in trauma suspected cervical fracture/spinal cord injury. a. Head Tilt-Chin Lift i. place your hand on the forehead ii. gently tilt the head back and with your fingertips under the point of the victim's chin iii. lift the chin to open the airway. b. Jaw Trust i. use index and middle fingers to physically push the posterior aspects of the mandible upwards.				
	ii. both thumbs push down on the cheek .				
2	Airway adjunct				
	 a. Oropharyngeal Airway, OPA i. size From angle of the mouth to angle of the jaw ii. technique of insertion Insert the OPA with the concave part facing the roof of the mouth. Once a third of the OPA has been inserted/ resistance felt, rotate the OPA 180 degree b. Nasopharyngeal Airway NPA i. size From the tip of the nose to the tragus of the ear. ii. technique of insertion Lubricate the NPA prior to insertion. Insert the NPA into the nostril along the floor of the nose with a slight twisting action. Advanced the NPA until the flange rest on the nostril. 				
3.	Pocket mask				
	a. size - should cover mouth and nose b. technique -Two hands technique				

4	Bag valve mask ventilation (BVM)				
	a. Types: i. Adult ii. paediatric iii. infant				
	b. Component and Assembly of BVM; i. Proper mask size				
5	LMA				
	a. Anatomy of LMA i. shaft(tube) ii. broad elliptical inflatable cuff at the distal end . iii. pilot balloon.				
	b. Size selection > according to the weight of the patient				
	c. Technique of insertion i. Select the appropriate LMA size ii. Lubricate back of LMA mask and cuff iii. Hold LMA like a pencil, guide the LMA manually along the hard and soft palates by pushing with the index finger iv. Stop when experience definitive resistance				

TEST RESULT	Pass	Instructor Potential	Fail
COMMENTS:			
INSTRUCTOR:			

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