



KEMENTERIAN
PENDIDIKAN
MALAYSIA

DUAL LANGUAGE PROGRAMME

SCIENCE

FORM 4



Chapter

2

Emergency Help

Keywords

- ◆ CPR procedure
- ◆ Chest compression
- ◆ Mouth-to-mouth resuscitation
- ◆ Heimlich Manoeuvre
- ◆ Choking

What do you need to do if you come across someone who is unconscious or choking in a public place before the victim is taken to the hospital?

How do you perform CPR and Heimlich Manoeuvre?

What is the importance of these methods of emergency help?



Science Digest

999 Emergency Helpline

The 999 emergency helpline is an emergency number that combines five agencies, which are, Malaysia Civil Defence Force, Royal Malaysia Police, Ministry of Health Malaysia, Fire and Rescue Department of Malaysia and Malaysian Maritime Enforcement Agency to ease the public to get emergency help immediately. Each emergency call that is made through this line is free and the caller's number is recorded so that prank calls can be traced. As a responsible Malaysian, contact this number only when you require emergency services.

You will learn about:

- cardiopulmonary resuscitation (CPR)
- Heimlich Manoeuvre

2.1

Cardiopulmonary Resuscitation (CPR)

Definition of CPR

Cardiopulmonary resuscitation or CPR is an emergency aid that involves a combination of chest compressions and breathing into the mouth of the victim to restore their heartbeat and breathing. What situations require CPR?



Photograph 2.1 A group of students learning to do CPR
(Photo source: The Star, Malaysia)

Situations that Require CPR

Figure 2.1 is a circle map that shows several situations of individuals requiring CPR.

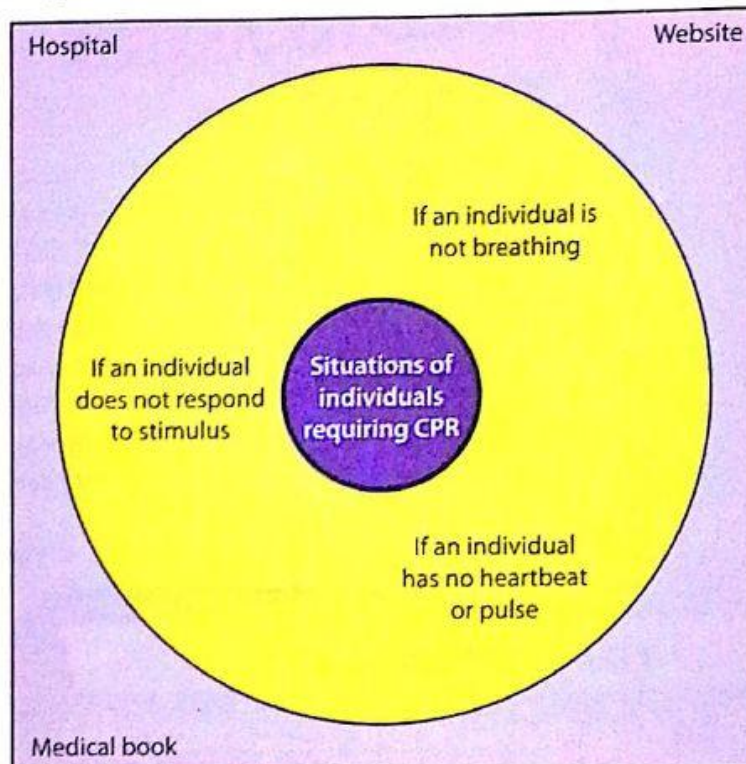


Figure 2.1 Situations of individuals requiring CPR

The situations in Figure 2.1 might be caused by:

Heart attack



Electric shock



Drowning



Lightning strike

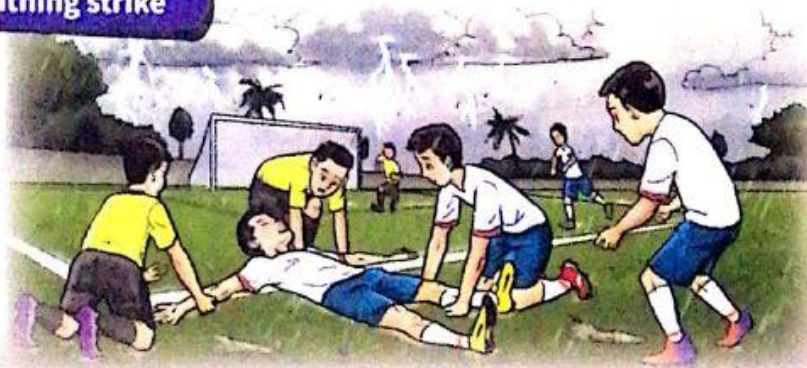


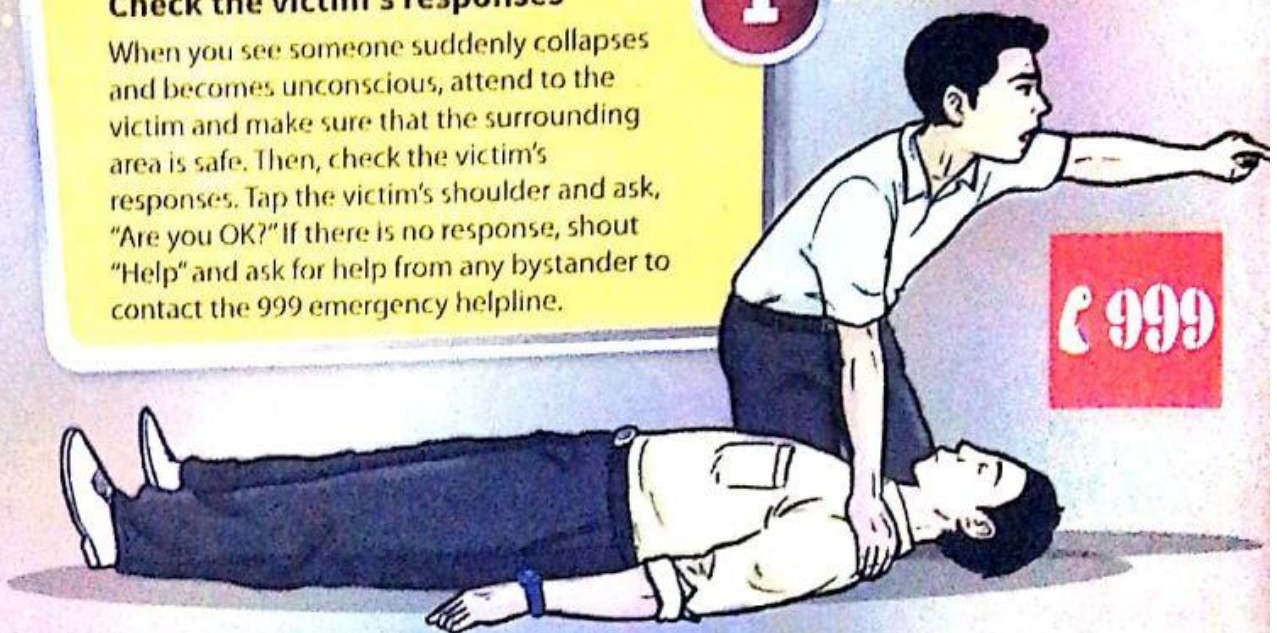
Figure 2.2 Causes of situations that require CPR

CPR Procedure

CPR is a simple procedure that does not require any equipment. The public is greatly encouraged to learn the CPR procedure correctly so that they can help to save someone's life before the paramedics arrive. If this procedure is not performed correctly, the victim's ribs may be fractured or the air that is blown into the victim's mouth may not reach the lungs. Let us look at the correct CPR steps for an adult.

1 Check the victim's responses

When you see someone suddenly collapses and becomes unconscious, attend to the victim and make sure that the surrounding area is safe. Then, check the victim's responses. Tap the victim's shoulder and ask, "Are you OK?" If there is no response, shout "Help" and ask for help from any bystander to contact the 999 emergency helpline.



2

Open the airway

Ensure that the victim is lying down on a flat surface with the chest facing upwards. Tilt the head back and lift the chin to open up the airway. Check whether the victim is breathing or not by listening for the breathing sound from his mouth or nose. Observe the movement of the victim's chest.

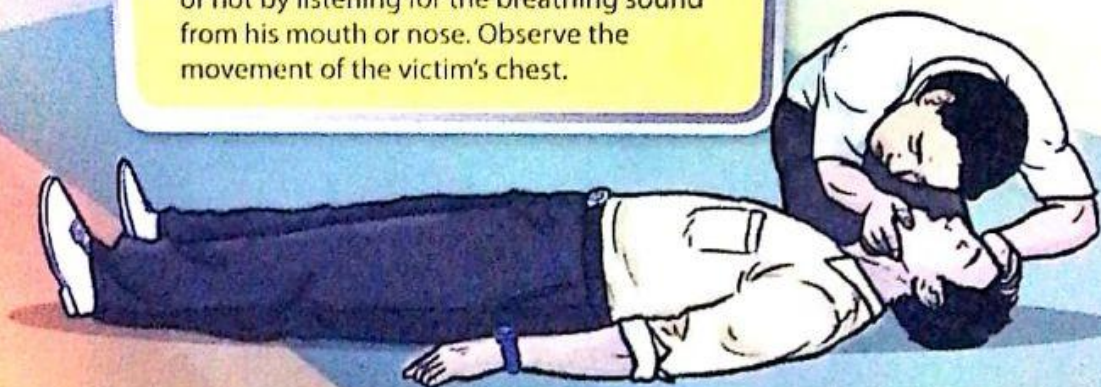


Figure 2.3 CPR procedure

3

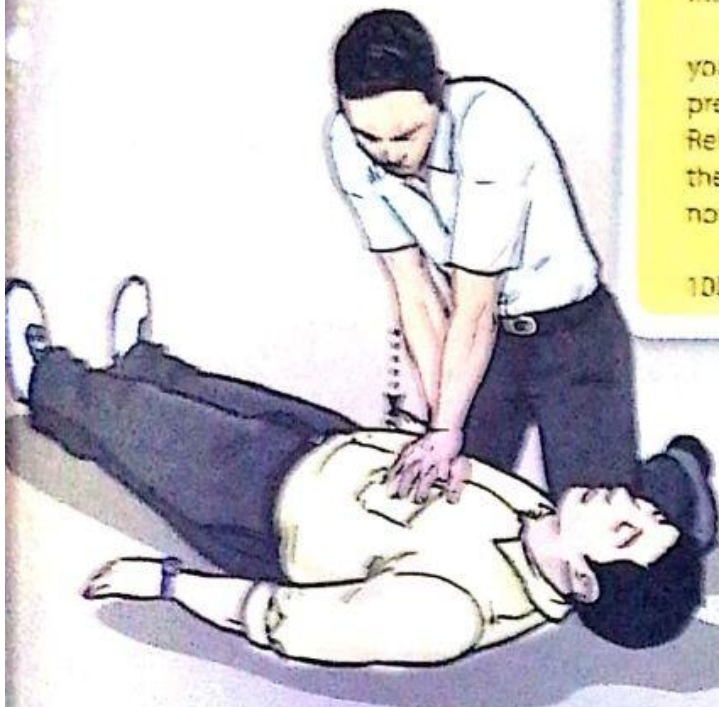
Chest compressions

If no pulse or breath is detected, the chest compression technique must be performed in order to restore blood circulation in the victim's body.

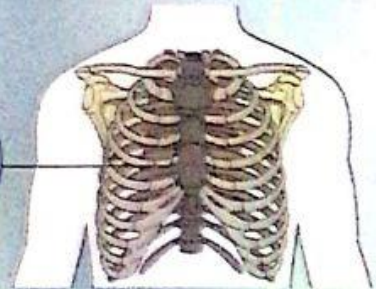
Place the heel of one hand on the centre of the victim's chest. Ensure that your arms are straightened, cover the first hand with your other hand and interlock your fingers.

Rise and lean your body to the front slightly with your shoulders vertically above the victim's chest, and press down at least 5 cm and not more than 6 cm. Release the compression with your hands still on the victim's chest. Allow the chest to return to its normal position.

Chest compressions are performed at a rate of 100 – 120 compressions per minute.



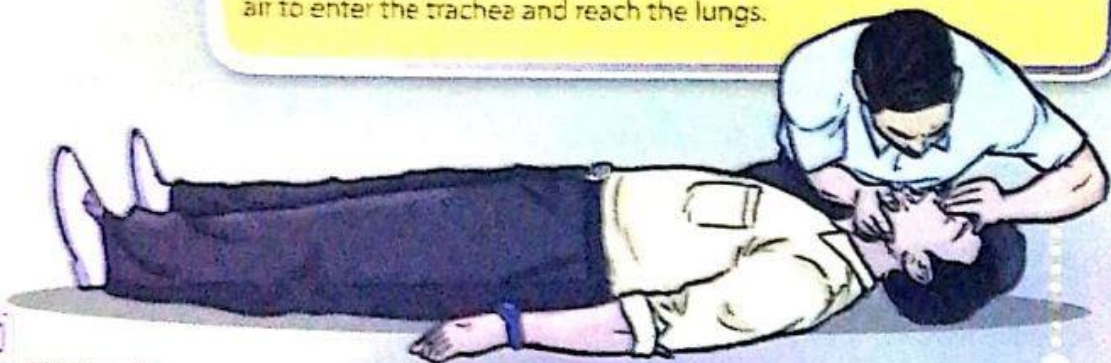
Hand position



4

Mouth-to-mouth resuscitation

If there is still no breath, pinch the victim's nose and blow the air into the victim's mouth for 1 second. This step enables oxygenated air to enter the trachea and reach the lungs.



5

Chest compressions are performed 30 times followed by 2 times mouth-to-mouth resuscitation until the ambulance arrives or until the victim regains consciousness. If the victim breathes but is still unconscious, position the victim's body on his side.



CPR Procedure
<http://busanekol.com/my/Science/F4/CPR/Pg23.mp4>

VIDEO

Source: Basic Life Support Training Manual published by Ministry of Health, Malaysia.



Activity 2.1

Demonstration

21st Century Skills

Aim: To learn how to carry out the CPR procedure.

Instructions:

1. Organise a First Aid Course for Form 4 students in your school with the cooperation of the St. John Ambulance of Malaysia (SJAM) or the Malaysian Red Crescent Society (MRCS).
2. Contact the nearest SJAM or MRCS to get more information about organising a course with the help of their paramedics.
3. Request the paramedics to demonstrate the correct CPR procedure.

Note:

Activity 2.1, page 24 and Activity 2.2, page 28 are to be conducted simultaneously.

Science Gallery

Based on the latest CPR Guidelines (American Heart Association, 2016), if you are uncomfortable with mouth-to-mouth resuscitation, the chest compression method can also help to save a victim's life.

Importance of CPR

You learned about blood transportation and respiration in Form 3. The CPR procedure is performed to restore the victim's blood circulation and to supply oxygen to the body of the victim. Chest compression method is used to **produce artificial blood circulation** by pumping blood through the heart. This method is very important for continuous blood circulation in the victim's body, especially for a victim who is experiencing a heart attack that causes the heart to stop functioning, and to save the victim's life at the same time.

Apart from giving chest compressions, CPR also involves breathing aid for the victim. Mouth-to-mouth resuscitation enables the victim to **receive oxygenated air** into his lungs. Oxygen will reach the brain and the whole body. Brain damage could happen if oxygen does not reach the brain within a certain period of time.



FORMATIVE PRACTICE

2.1

1. Explain the meaning of cardiopulmonary resuscitation (CPR).
2. Give three situations that cause breathing or the heartbeat to stop.
3. Muthu and his father were watching television at home when his father had a heart attack and became unconscious. Can Muthu perform CPR on his father? Explain your answer. 🧠
4. If you have never learned the correct way of performing chest compressions, can you carry out this method on a victim who needs emergency help? What could you do to help? 🧠

2.2 Heimlich Manoeuvre

Definition of Heimlich Manoeuvre

The **Heimlich Manoeuvre** is an emergency procedure that is carried out to save an individual who is **choking**. Choking is a situation that happens when the respiratory tract is blocked because of food or a foreign object.

The Heimlich Manoeuvre must be performed immediately if you find someone who is experiencing the following situations:



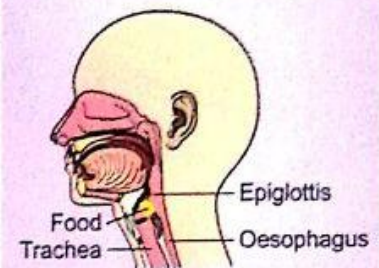
Figure 2.4 Victim's situations that require the Heimlich Manoeuvre

History Corner

In 1974, Dr. Henry Heimlich, a thoracic specialist surgeon, invented the Heimlich Manoeuvre.

Science Gallery

How does someone get choked?



When someone swallows food, the epiglottis folds and blocks the respiratory tract (trachea). Food continues to move into the oesophagus heading to the stomach. If food blocks the respiratory tract, the person will choke.

The Importance of the Heimlich Manoeuvre

As you already know, the human body and brain always need oxygen. Oxygen is obtained from the air and inhaled into the human lungs. It is then absorbed into all the cells of the human body, including the brain. However, when someone is choking, the respiratory tract is blocked and prevents oxygen from reaching the lungs. This will provide insufficient oxygen to the brain. If the emergency help is given too late, the victim can experience brain damage or worse, it will result in death.

Heimlich Manoeuvre

Similar to CPR, this method does not require any equipment and should be learned by the public in order to save the life of a choking victim. Let us look at how this method is performed.

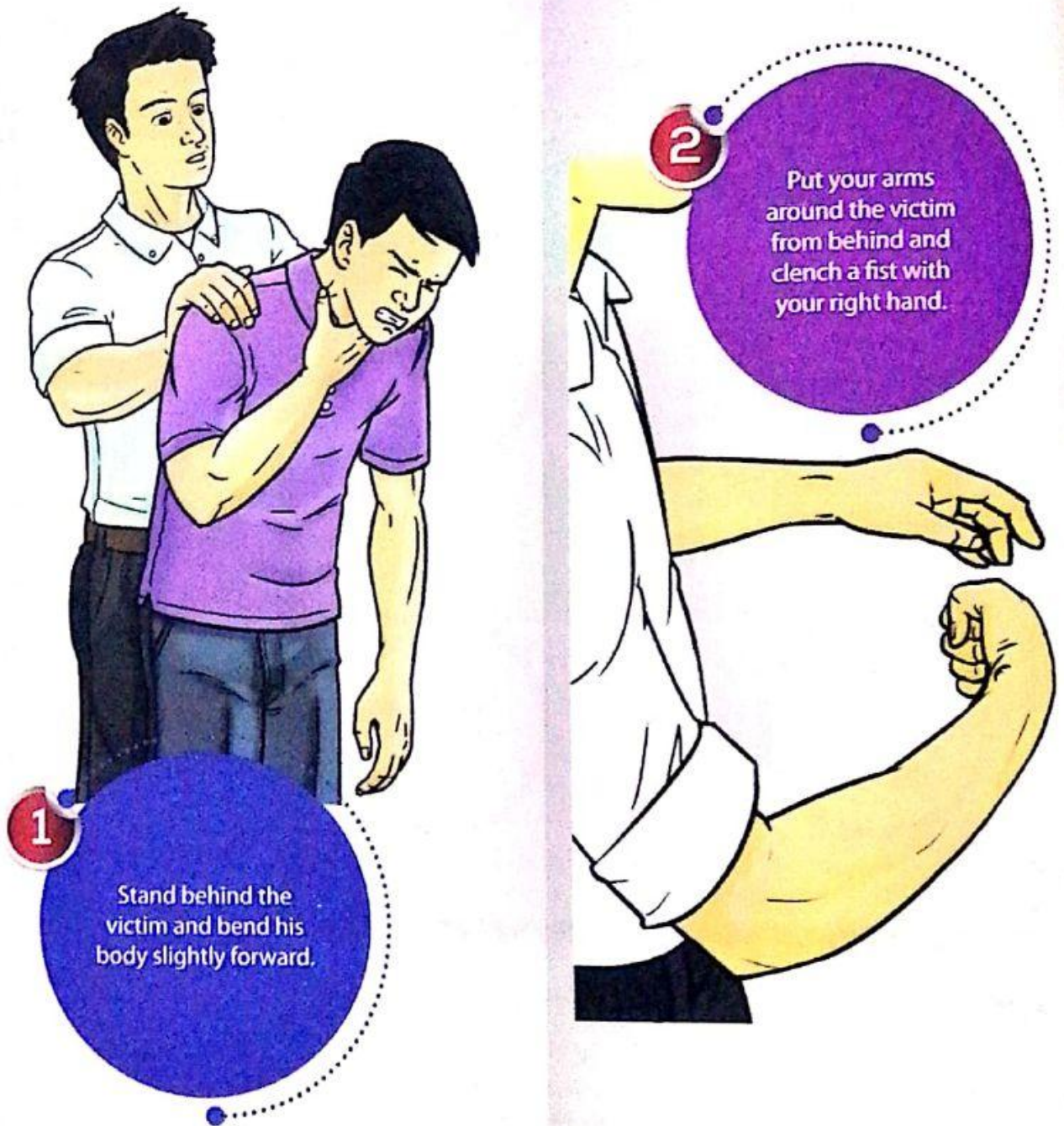
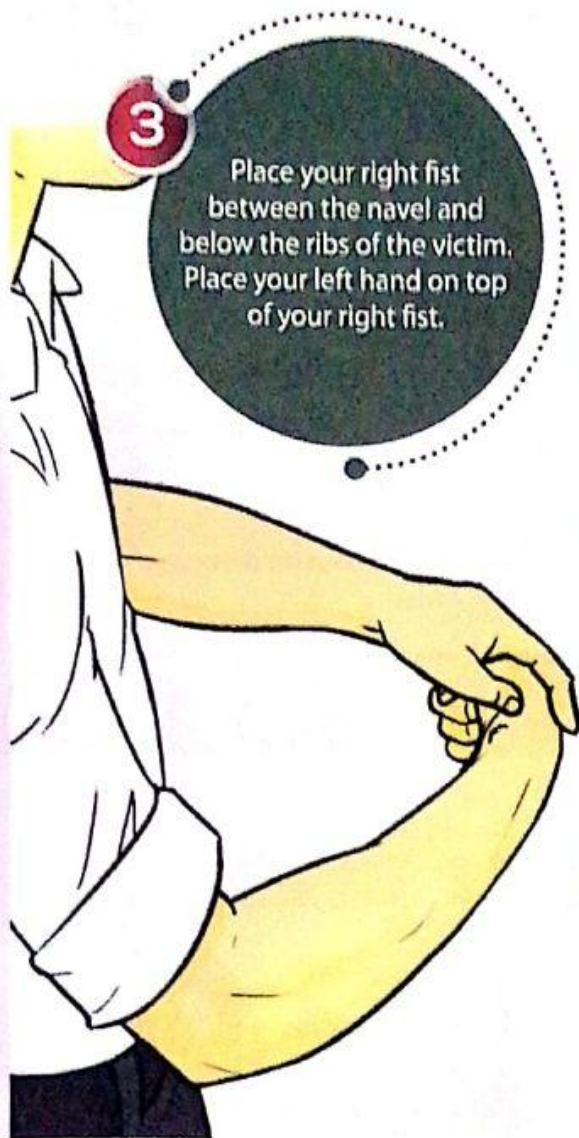


Figure 2.5 Heimlich Manoeuvre



3

Place your right fist between the navel and below the ribs of the victim. Place your left hand on top of your right fist.



4

Press and jerk upwards with quick force. The pressure given will increase pressure in the lungs, causing the foreign object to be ejected.



VIDEO

Heimlich Manoeuvre
http://bukutekskssm.my/Science/F4/HeimlichManoeuvre_Pg27.mp4

(Source: Basic Life Support Training Manual, published by Ministry of Health Malaysia)

If there is no one around when you are choking, the best way to save yourself is to place your hands (following the Heimlich Manoeuvre) between the navel and below the ribs. Try to exert pressure on that area by bending your body. If you have no strength, find an object that is about the height of your waist such as a chair or table, bend forward and push your body with all your strength against the object.



Figure 2.6 Performing Heimlich Manoeuvre on yourself

Activity 2.2

Demonstration

21st Century Skills

Aim: To learn how to carry out the Heimlich Manoeuvre.

Instructions:

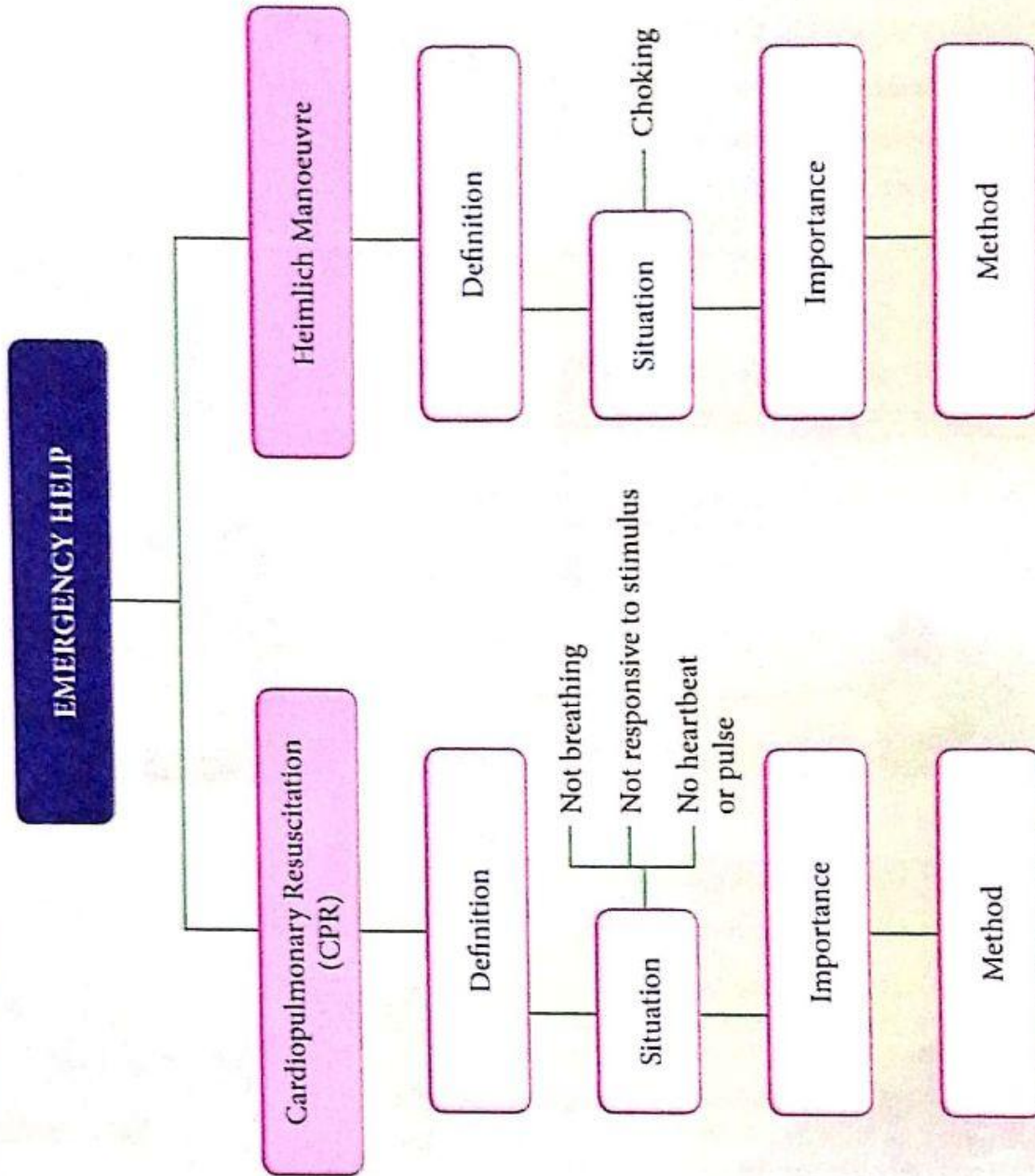
1. Carry out this activity simultaneously with Activity 2.1.
2. Request the paramedics to carry out a demonstration session to show the correct procedure of performing the Heimlich Manoeuvre.

FORMATIVE PRACTICE 2.2

1. Explain what is meant by the Heimlich Manoeuvre.
2. Amirul is eating in a restaurant with his grandfather. Suddenly, his grandfather shows the signs of choking. What should he do to help his grandfather? Your explanation must cover all the steps that are taken.
3. What is the importance of learning the Heimlich Manoeuvre?



Summary



Self-reflection

After studying this chapter, you are able to:

2.1 Cardiopulmonary Resuscitation (CPR)

State the meaning of CPR and the situations that require CPR.

Demonstrate CPR procedure.

Explain the importance of CPR.

2.2 Heimlich Manoeuvre

Explain the Heimlich Manoeuvre and its importance.

Demonstrate the Heimlich Manoeuvre.

Summative Practice 2



Objective Questions
[http://bukutekskssm.
my/Science/F4/Q2](http://bukutekskssm.my/Science/F4/Q2)

1. Figure 1 shows two methods of emergency help, P and Q.



P



Q

Figure 1

- (a) State the methods of emergency help, P and Q.
(b) What is the effect on both victims if no one provides immediate help? 🧠

2. Ronnie falls into the river while crossing the bridge. At the time of the incident, Khairul is also crossing the bridge and manages to pull Ronnie out of the river.

- (a) What emergency help does Khairul need to perform if he finds that Ronnie is unconscious and has no pulse after being pulled out of the river?
(b) If Khairul successfully performs the emergency help stated in 2(a) on Ronnie, what is the next step that he needs to take? 🧠



Figure 2

3. Figure 3 shows food blocking the respiratory tract.

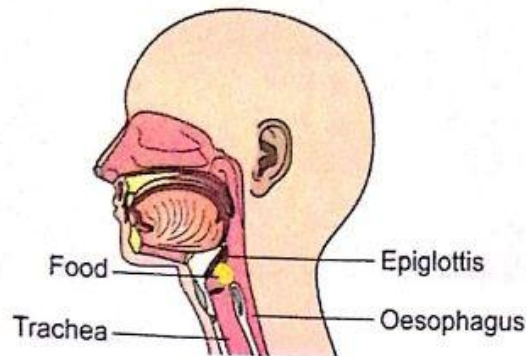


Figure 3

- (a) What happens if someone's respiratory tract is blocked? 🧠
- (b) Briefly explain how the Heimlich Manoeuvre can help the victim. 🧠
- (c) Can the Heimlich Manoeuvre be performed on a pregnant woman? What can be done to save a pregnant woman who is choking? 🧠
4. Jia Hui has a habit of talking while she eats and she is often scolded by her mother. One day, while she is eating with her friends, she starts to choke.
- (a) What emergency help must be performed by her friends to save Jia Hui?
- (b) Explain the method that you stated in 4(a). 🧠

Mind Challenge

5. Emergency help is the first aid or treatment that is given to someone who is suddenly sick or becomes unconscious while waiting for help to arrive. One day, Saiful suddenly collapses and becomes unconscious at a shopping mall. If you are at the scene of the incident, suggest a first aid method that you will give.

Your answer must be based on the following aspects: 🧠

- identify the aim
- identify the first aid methods available
- list the available options according to priority
- make a choice and give a reason for your choice