جمعية القلب السعودية
Saudi Heart Association
National Life Support Committee

HSFA

HeartSaver First Aid CPR AED

Provider Manual

Saudi Heart Association

2023

SHA Heart Saver First Aid CPR AED course
"SHA HSFA Provider Course"

Preface

This course is intended to all healthcare professionals and community members who are involved in the care of cardiac and respiratory arrest either out of hospital or in hospital cardiac or respiratory arrest victims. The attendee of this course will learn how to perform CPR and other basic cardiovascular life support skills in a wide variety of in-hospital facility and prehospital settings.

This course is composed of 13 lessons, for each chapter, the learning objectives are specified and the most important elements are reviewed. The content of this material is dedicated for the SHA HSFA course, it is a summary of the latest evidences in the literature. For further details you can refer to the references indicated in the last chapter.

Acknowledgements

The Saudi Heart Association would like to acknowledge the Clinical Skills and Simulation Center at King Saud University Medical City and their staff for their cooperation and support during the development of the content of this course to enhance the simulation technologies and teaching methods incorporated in this course.

Fahad Alsohime, MD
Associate Professor
College of Medicine, King Saud University,
Riyadh, Saudi Arabia

Hakem Shakkour, RN, MSN
Simulation Technician, Clinical Skill &
Simulation Center, King Saud University,
Riyadh, Saudi Arabia

Jamileh Alqawasmeh, RN, MSN
Simulation Technician, Clinical Skill &
Simulation Center, King Saud University,
Riyadh, Saudi Arabia

Fahad Hazazi, BSEMS,NREMT-P
CPR Officer, Simulation Technology Specialist,
Clinical Skill & Simulation Center,
King Saud University, Riyadh, Saudi Arabia

Maritess Bautista, RN, MSN
Simulation Technician, Clinical Skill &
Simulation Center, King Saud University,
Riyadh, Saudi Arabia

Saudi Heart Association
Heart Saver First Aid/CPR AED Course Agenda
Total time: Approximately 6 hours

Methodology	Lesson 1: Course Introduction
Lecture, interactive discussion and hands on skills practice	Lesson 2: First Aid Basics: First aid (definition, goals) Roles, and Responsibilities of First Aid Provider General Approach Multiple Causalities Universal Precautions (Hand Hygiene, PPE) De-escalation Techniques Medication Administration Oxygen delivery First Aid Kit Supplies/Equipment Assessing the Scene/Victim
Lecture, interactive discussion and hands on skills practice	Lesson 3: Medical Emergencies Breathing Difficulties Asthma Attack Croup Allergic Reactions/Anaphylaxis Use of Epinephrine Pen (Practice/Test) Feeling Faint Chest Pain, Heart Attack, Diabetic emergencies Stroke Seizure Shock
Lecture, interactive discussion and hands on skills practice	Lesson 4: Environmental Emergencies Heat Related Emergencies Frost Bite Dehydration Altitude sickness Bites and Stings Motion sickness

Lecture, interactive discussion and hands on skills practice	Lesson 5: Trauma Emergencies External /Internal Bleeding Cuts and Grazes Dental avulsion Blister Burns Fractures, sprains and strains Spinal Injury Head injury
Lecture, interactive discussion and hands on skills practice	Lesson 6: Adult CPR
Lecture, interactive discussion and hands on skills practice	Lesson 7: Use an AED
Lecture, interactive discussion and hands on skills practice	Lesson 8: Child CPR
Lecture, interactive discussion and hands on skills practice	Lesson 9: Infant CPR
Lecture, interactive discussion and hands on skills practice	Lesson 10: Foreign Body Airway Obstruction

Course Overview

The Saudi Heart Association Heart Saver First Aid/ AED course, a full day course (6 hours) incorporates the recent guidelines and updates.

It teaches and trains the participants how to recognize and treat a variety of emergencies such as fractures, wounds, External /Internal Bleeding, burns, scrapes, sudden illnesses, head, neck, back injuries, heat and cold emergencies and how to respond to breathing and cardiac emergencies for victims in different age groups.

Also, the participants will train how to demonstrate cardiopulmonary resuscitation skills and use an automated external defibrillator (AED) in a safe, timely, and effective manner.

Learning objectives

This manual aims to provide the target participants the knowledge and skills as following:

- Understand the basic principles of heartsaver and first aid.
- Identify medical, traumatic and environmental emergencies requiring immediate first aid.
- Know how to demonstrate the basic first aid for medical, traumatic and environmental emergencies of all ages.
- Know how to demonstrate Advanced first aid for medical, traumatic and environmental emergencies of all ages.
- Know how to demonstrate basic Cardiopulmonary Resuscitation Skills and using an AED safely.

TABLE OF CONTENTS

HeartSaver & First Aid Basics

Introduction

Importance of HeartSaver and First Aid CPR AED

First aid basics are an essential set of skills and knowledge that everyone should possess. Imagine being in a situation where someone is injured or in need of immediate medical attention. With first aid basics under your belt, you can step in confidently and provide the necessary assistance.

The best part is that you do not need any prior medical training to learn these skills. Whether it is a a minor cut or a more serious injury, knowing the basics of first aid can make a significant difference in someone's life.

Learning first aid basics can be an exciting and empowering experience. You become someone who can step up and take control of a situation, providing comfort and care to those who are injured or unwell. The feeling of being able to make a difference in someone's life is truly exhilarating.

First aid basics encompass a wide range of skills, from knowing how to properly clean and dress a wound to performing CPR when someone's heart has stopped. You learn how to assess the situation, identify potential hazards, and take appropriate actions to ensure the safety and well-being of the person in need. These skills are not only have the potential to save lives, but also to prevent further harm or complications.

The beauty of first aid basics is that they are simple and easy to learn. There are numerous resources available, from online courses to community workshops, that can teach you the necessary skills. With a little bit of time and effort, you can become proficient in performing basic first aid techniques. And once you have mastered these skills, you will feel a sense of confidence and preparedness that will stay with you for life.

Imagine being able to respond calmly and effectively in an emergency situation, providing immediate assistance until professional help arrives. By learning first aid basics and CPR AED skills, you become an active participant in the safety and well-being of your community. You can be the person who makes a difference, saves a life, and brings comfort and reassurance to those in need.

Definition of First Aid

First aid is an incredibly important skill that can save lives in emergency situations. It refers to the immediate medical assistance provided to a person who has been injured or has suddenly fallen ill. It is thrilling to think about the impact that knowing first aid can have on someone's life.

From treating minor cuts and burns to performing CPR, first aid knowledge empowers individuals to take action and make a difference in critical moments. It is the first line of defense before professional medical help arrives, and being able to provide immediate care can significantly improve the chances of survival and recovery.

It also includes assessing and stabilizing the injured person's condition until further medical assistance is available. In emergencies, time is of the essence, and being able to quickly assess the situation, prioritize injuries, and take appropriate action can make all the difference. First aid allows individuals to be proactive and take control of the situation, which adds even more excitement to learning about it.

First aid skills are not limited to healthcare professionals; they are applicable to everyone. Whether you are at home, at work, or even out in public, accidents and emergencies can happen at any time. Having a solid understanding of first aid means being prepared for any eventuality and being confident in your ability to respond effectively.

In addition, first aid promotes a sense of community and responsibility. When people have the tools and knowledge to help others in need, it fosters a culture of compassion and care. Knowing first aid creates a sense of empowerment and encourages individuals to take an active role in their community's well-being. It is thrilling to see how a simple act of kindness can ripple out and have a positive impact on others.

In conclusion, the definition of first aid extends beyond just medical assistance. It encompasses the ability to assess, stabilize, and provide immediate care to an injured or ill person until professional help arrives. Learning first aid is an exciting journey that equips individuals with life-saving skills, empowers them to take control in emergency situations, and fosters a culture of compassion. So, what the wait for ? Get excited about learning first aid and make a difference in someone's life today!

Roles and Responsibilities of First Aider

Being a first aider is no ordinary task, it requires quick thinking, knowledge, and most importantly, a passion to help others in times of need.

The first and foremost role of a first aider is to provide immediate assistance to anyone who is injured or suddenly falls ill. They are the first line of defense in emergency situations, ensuring that the person receives the necessary care before professional medical help arrives. This can involve anything from administering CPR to bandaging wounds or even providing emotional support to the patient and their loved ones.

Another crucial responsibility of a first aider is to assess the situation and make informed decisions about the appropriate course of action. They must remain calm and composed, even in the face of chaos, and prioritize the needs of the patient. This requires a good understanding of basic medical procedures and the ability to think on their feet.

In addition to providing immediate care, first aiders play a vital role in preventing further harm or injury. They are responsible for maintaining a safe environment and taking necessary precautions to ensure the safety of both themselves and the patient. This may involve securing the area, removing any potential hazards, or providing guidance on how to avoid further accidents.

Furthermore, education and awareness are the main key of responsibilities of a first aider. They should be knowledgeable about basic first aid techniques and be able to educate others on how to respond in emergency situations. This can include conducting training sessions or workshops to equip individuals with life-saving skills. By sharing their expertise, first aiders empower others to become more confident and capable in handling emergencies.

Last but not least, a first aider must always be prepared for any situation. They should regularly update their skills and knowledge through ongoing training and certifications. This ensures that they stay up-to-date with the latest advancements in first aid techniques and are well-equipped to handle any emergency that comes their way.

Remember, being a first aider is not just a job, it is a calling to serve and make a difference in the lives of others.

General Approach of First Aid provider

The general approach of a first aid provider is one of confidence and readiness. They are always prepared to handle any situation that comes their way, whether it be a minor injury or a life-threatening emergency.

First and foremost, a first aid provider must assess the scene and ensure that it is safe for both themselves and the injured person. This means considering any potential hazards or dangers and removing them if possible.

Once the scene is secure, the first aid provider can then focus on assessing the injured person's condition. They must quickly determine the severity of the injury and prioritize their actions accordingly. This may involve checking for consciousness, breathing, and signs of severe bleeding.

Once the initial assessment is complete,

- The first aid provider should access emergency medical services (EMS) as soon as they think help is needed. If using a phone, care to the ill or injured person should be provided simultaneously by activating the phone's speaker function.

- A lack of first aid equipment should not be a barrier to providing care; first aid providers should use whatever resources are available to them.

The first aid provider can then begin providing care. This may involve applying pressure to a bleeding wound, immobilizing a broken bone, or performing CPR. It is important for the first aid provider to remain calm and focused throughout this process, as their actions can greatly impact the outcome for the injured person. They must also communicate effectively with any bystanders or emergency services that may be involved.

In addition to providing immediate care, a first aid provider must also be prepared to provide ongoing support until professional help arrives. This may involve comforting and reassuring the injured person, monitoring their condition, and providing any necessary updates to emergency services. They must also be prepared to adapt their approach as the situation evolves and be ready to provide additional care if needed.

Overall, the general approach of a first aid provider is one of confidence, preparedness, and compassion. They are trained to handle a wide range of injuries and emergencies, and their quick thinking and decisive actions can make all the difference in saving lives. It is an important role that requires dedication and a genuine desire to help others. So, if you ever find yourself in need of first aid, you can rest assured knowing that there are individuals out there who are ready and willing to provide the care you need.

It is important to follow the **DCI** protocol, which stands for:

1. **D**etect
   - Assess the situation and determine if there are any hazards that may harm you or the victim.
   - Recognize Signs and Symptoms
2. **C**all – Activate EMS/ 997/ 911
3. **I**ntervene – Provide First Aid measures

First Aid provider role in Multiple Casualties

As a first aid provider in a multiple casualty's situation, you become the hope for those who are injured and in desperate need of help. Your presence alone can provide comfort to the victims, assuring them that help has arrived and that they are not alone in their time of need. With each step you take, whether it is applying pressure to control bleeding or performing CPR to revive a person who has stopped breathing, you are making a profound impact on their lives. The excitement and adrenaline fuel your determination to save as many lives as possible, and there is no greater feeling than knowing that your actions have made a difference.

The role of a first aid provider in multiple casualty's situations goes beyond just administering medical treatments. It also involves coordinating with emergency responders, communicating vital information about the victims' conditions, and assisting in the transportation of the injured to medical facilities.

In conclusion, the role of a first aid provider in a multiple casualty's situations is both thrilling and demanding. It requires bravery, compassion, and the ability to think on your feet. The excitement of being on the front lines, providing life-saving interventions, and making a difference in people's lives is unlike anything else. It is a responsibility that should not be taken lightly, as the actions of a first aid provider can mean the difference between life and death. So, if you have the passion and the drive to make a positive impact in times of crisis, consider becoming a first aid provider and embrace the exciting journey that lies ahead.

Universal Precautions

When it comes to providing first aid, it is crucial to take universal precautions to ensure the safety of both the first aid provider and the injured individual.

Universal precautions are a set of guidelines that are followed to prevent the transmission of infectious diseases. These precautions are essential because you never know what kind of illness or infection the injured person may have. By following universal precautions, you can protect yourself and others from potential harm.

One of the most important universal precautions for a first aid provider is to wear personal protective equipment (PPE). This includes gloves, masks, and goggles. Gloves should be worn whenever there is a possibility of coming into contact with bodily fluids or blood. They act as a barrier between your hands and any potential pathogens.

Masks and goggles protect your face from splashes or sprays that may contain harmful bacteria or viruses. Wearing PPE not only protects you from potential infections but also prevents the spread of any germs you may be carrying.

Another crucial universal precaution is proper hand hygiene. Before and after providing first aid, it is essential to wash your hands thoroughly with soap and water for at least 20 seconds. This helps to remove any germs that may be present on your hands. If soap and water are not available, an alcohol-based hand sanitizer can be used as an alternative.

Regular handwashing is vital in preventing the transmission of diseases and maintaining good overall hygiene.

In addition to wearing PPE and practicing good hand hygiene, it is essential to dispose of any contaminated materials properly. This includes used gloves, masks, and any other items that come into contact with bodily fluids or blood. These items should be placed in designated biohazard bags or containers and disposed of according to local regulations. By properly disposing of contaminated materials, you can prevent the spread of infectious diseases and protect the environment.

Universal precautions are not limited to healthcare settings; they apply to anyone providing first aid in any situation. Whether you are at home, at work, or in a public place, it is crucial to follow these precautions to protect yourself and others. By taking the necessary precautions, you can provide first aid confidently and safely.

De-escalation techniques

As a first aid provider, one of the most important skills to have is the ability to de-escalate tense situations. Whether you are dealing with a patient in distress or a bystander who is agitated, being able to diffuse the situation can make all the difference in providing effective care. De-escalation techniques are essential in ensuring the safety and well-being of everyone involved.

One technique commonly used by first aid providers is **active listening**. This involves giving the person your full attention and showing them that you are genuinely interested in their concerns. By actively listening, you can validate their feelings and let them know that you understand their perspective. This can help to calm them down and make them more receptive to your assistance.

Another de-escalation technique is **maintaining a calm and composed demeanor**. It is natural for people to mirror the behavior of those around them, so by remaining calm, you can help to diffuse the situation. This means speaking in a calm and reassuring tone, using non-threatening body language, and avoiding any aggressive or confrontational behavior. By modeling calmness, you can help to create a more peaceful environment.

Empathy is another crucial de-escalation technique. By putting yourself in the other person's shoes and trying to understand their emotions, you can show them that you genuinely care about their well-being. This can help to build trust and rapport, making it easier to address their needs and concerns. Showing empathy can also help to defuse any hostility or anger that may be present.

In some cases, **distraction** can be an effective de-escalation technique. By redirecting the person's attention away from the source of their distress, you can help to shift their focus and alleviate some of their anxiety or frustration. This could involve asking them questions about themselves or engaging them in a calming activity, such as deep breathing exercises or simple tasks.

Overall, de-escalation techniques are essential skills for first aid providers. By actively listening, maintaining a calm demeanor, showing empathy, and using distraction when necessary, you can help to diffuse tense situations and provide effective care. These techniques not only ensure the safety of everyone involved but also contribute to a more positive and supportive healing environment.

Medication Administration

Medication Administration is a crucial aspect of being a first aider. When administering medication, it is important to be mindful of several factors, including the medication, the patient, and the circumstances in which you are giving the medication.

It is essential to always be mindful of these factors and ensure that medication is administered correctly to avoid harm to the patient.

Some key points to remember when administering medication as a first aider include:

1. Always follow the instructions provided on the medication label.
2. Be aware of potential allergies or side effects of the medication.
3. Ask for the patient's consent before administering the medication.
4. Observe the patient closely after administering the medication and monitor for any adverse reactions.
5. Keep accurate records of all medication administered, including the date, time, medication, dose and any noticeable changes in the patient's condition.
6. If you are administering medication to a child, be aware of different dosage requirements.
7. Administer medications according to manufacturer guidelines and follow any relevant guidelines set by your organization.

Oxygen delivery

When administering oxygen to a patient, it is essential to be mindful of several key principles, including:

1. Only use oxygen if it is clinically necessary and it will benefit the patient.
2. Always check the patient's breathing and oxygen saturation before administering oxygen.
3. Always use oxygen at the correct concentration and flow rate.
4. Use appropriate monitoring equipment to monitor thepatient's response to the oxygen delivery.
5. Ensure that the oxygen source is secure and free from entanglement hazards.
6. Always seek appropriate medical advice before administering oxygen.
7. Ensure that the patient is in a safe and comfortable position during oxygen therapy.

A First Aid Kit

A first aid kit is a collection of essential medical supplies and equipment used in emergency situations. The exact contents of a first aid kit may vary depending on the individual's needs and situations they may encounter.

It is important to keep the first aid kit in a clean, dry and easily accessible place and to check the expiry dates of the supplies regularly.

The kit should be clearly labelled with the contents and the expiry date of the supplies. It is important to have a clear understanding of how and when to use the supplies in the kit and to regularly practice first aid procedures.

MEDICAL EMERGENCIES

Introduction

A medical emergency is an acute injury or illness that poses an immediate risk to a person's life or long-term health, sometimes referred to as a situation risking «life or limb». Medical emergencies may occur at any point in time, in any place and in any situation, so you need to have an idea on how to react and keep things under control until trained medical providers arrive at the scene. It is important to stay calm and handle things with a sense during a medical emergency. Overreacting during the situation may lead to confusion, leaving you to lose the opportunity of saving a life.

Learning Objectives

At the end of this chapter students will learn how to:

- Identify different types of medical emergencies
- Recognize the signs and symptoms of each type of medical emergency
- Apply immediate intervention in any medical situation
- Recognize when to call for help and seek medical service

Breathing Difficulties

Breathing difficulty is often described as feeling of suffocation, an intense tightening in the chest, air hunger, or breathlessness

Signs of Breathing difficulties

- Breathing fast or slow
- Having trouble with every breath
- Has noisy breathing
- Cannot speak at the time in between breaths

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Check the airway
- Help the person get into a comfortable position (sit upward and lean forward)
- Loosen any tight clothing.
- Help the person use any prescribed medicine
- Give supplemental oxygen if there is a special trained first aider in the scene

TRAUMATIC EMERGENCIES

INTRODUCTION

First Aid Trauma is a critical aspect of emergency medical care that seeks to provide immediate and appropriate interventions to individuals who have suffered severe injuries or illnesses.

The importance of First Aid Trauma lies mainly in saving lives, decreasing morbidity, and preventing the deterioration of a casualty's condition before emergency medical services arrive.

According to various sources, First Aid can be provided with any level of training and aims to preserve life, alleviate suffering, prevent further illness or injury, and promote recovery.

LEARNING OBJECTIVES:

- Identify different types of trauma emergencies
- Recognize the signs and symptoms of each injury
- Apply immediate interventions to any trauma injury

Bleeding:

There are many different types of bleeding, including:

1. Arterial bleeding:

This type of bleeding occurs when the blood is bright red and spurts out of the wound, typically with each heartbeat. It can be life-threatening and requires immediate medical attention.

ARTERIAL

2. Venous bleeding:

This type of bleeding occurs when the blood is darker red and flows steadily out of the wound. It can be severe and require medical attention, but it is not as life-threatening as arterial bleeding.

VENOUS

3. Capillary bleeding:

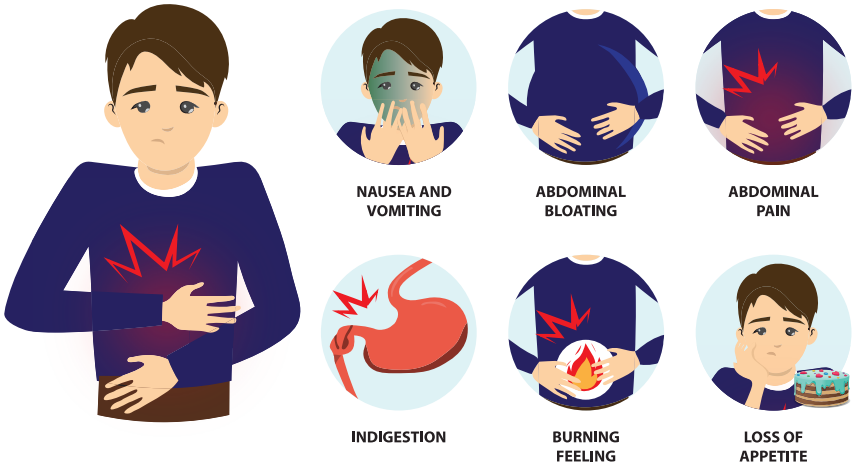
This type of bleeding occurs when the blood oozes from the wound, and is less severe than arterial and venous bleeding, but can still indicate a more significant injury.

CAPILLARY

4. Internal bleeding:

This type of bleeding does not involve the skin or outer body, but can be life-threatening and requires immediate medical attention. Signs of internal bleeding can include bruising, pain, and swelling in the affected area.

GASTRITIS SYMPTOMS



5. Bleeding disorders:

These are conditions that affect the ability of blood to clot properly, which can lead to excessive external or internal bleeding. Hemophilia and von Willebrand's disease are examples of bleeding disorders.

By identifying the type and severity of the external bleeding, proper first aid measures can be taken to control the bleed and promptly seek medical

DETECT – sign and symptom

CALL- 911,997

INTERVENE

Interventions:

- **Direct pressure**

To stop bleeding from a deep wound, the first step is to apply direct pressure to the wound using a clean cloth or gauze pad.

Apply firm pressure to the wound for at least 10-15 minutes without lifting it up. If possible, elevate the wounded area to slow down the bleeding.

If the bleeding does not stop or is severe, you should call for emergency medical assistance immediately. You can also use a tourniquet as a last resort if the bleeding cannot be controlled with direct pressure. However, you should only use it in extreme situations, as it may cause further tissue damage if not applied properly.

It is important to seek medical attention for any deep or severe wounds to prevent complications such as infection or other issues that require advanced medical care.

Hemostatic agents

Hemostatic agents gauze is intended to accelerate blood coagulation in the case of a traumatic injury that involves an arterial bleed.

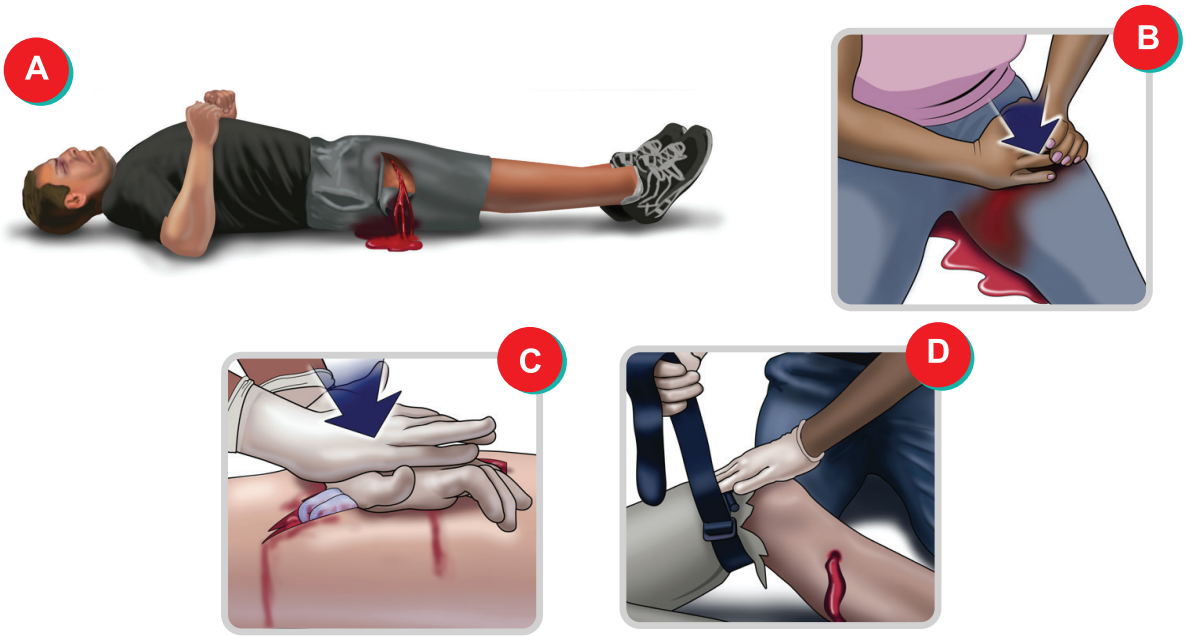
Hold direct pressure for at least three minutes, or in accordance with the manufacturer's recommendations.

- **Tourniquet**

Using a tourniquet is a last-resort measure to control severe bleeding that cannot be stopped by any other means. Tourniquets should only be applied by a trained professional or someone who has received specific instruction on how to apply them properly such as a first aid provider.

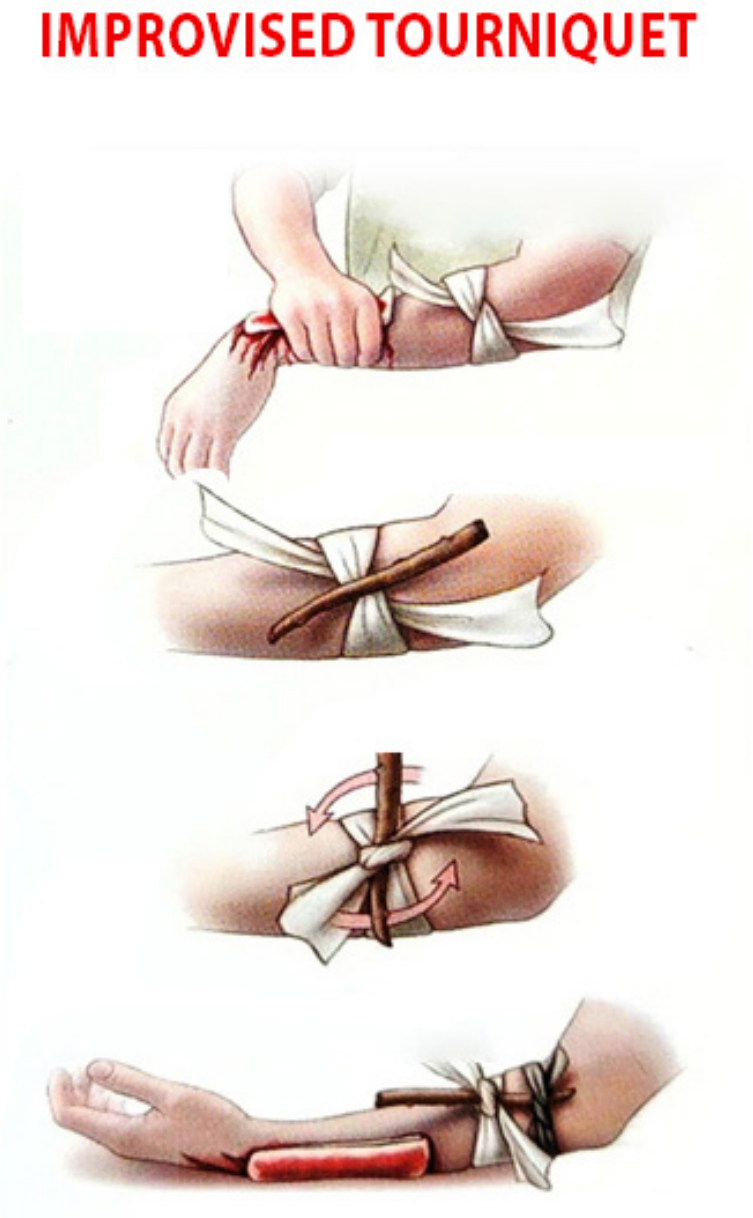
Tourniquets involve using a band or strap to wrap around a limb tightly, crushing and stopping the flow of blood to and from the injured area. This can be both painful and damaging, so it should only be used in severe cases of life-threatening bleeding.

If you decide to use a tourniquet, here are some basic steps to follow:



1. Use a wide and flat band at least 2 inches wide.
2. Place it around the upper arm or upper thigh, above the site of the bleeding about 5cm.
3. Tighten the band until the bleeding stops completely or there are no pulses in the artery below the tourniquet.
4. Note the time the tourniquet was applied and give the information to the medical professionals.
5. Do not release the tourniquet in the field. Loosening the tourniquet can cause immediate blood loss and shock.

- **Homemade tourniquet**



Remember that a tourniquet is meant to be used as a last resort when no other means of stopping.

6. Nose Bleeding

The loss of blood from the tissue lining the nose is referred to as epistaxis, or nose bleeding. It is a widespread disorder that can be brought on by a number of things, such as dry air, allergies, wounds, high blood pressure, and certain medications.

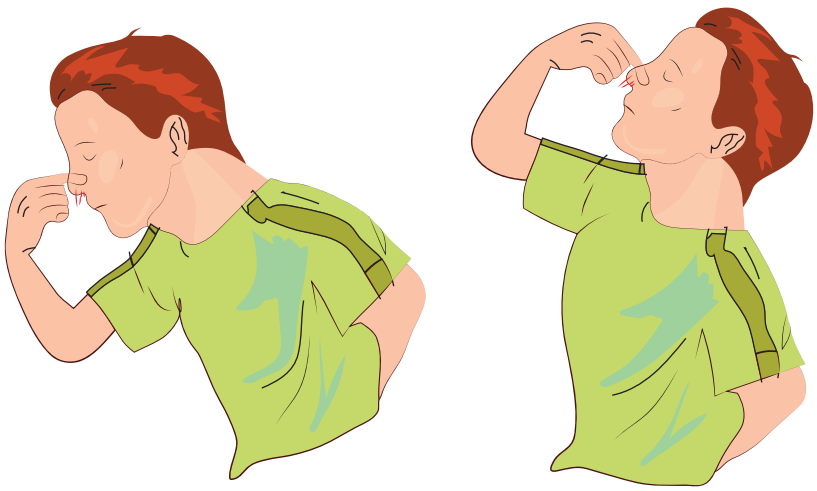
DETECT – sign and symptom

CALL- 911,997

INTERVENE

Interventions:

- Have the person take a seat and lean forward.
- Apply a clean dressing and pinch the soft area of the nose on both sides.
- For a few minutes, apply consistent pressure to the nostrils to halt the bleeding. If the bleeding persists, apply more pressure.



Wounds care kit:

A wound care kit should contain everything you need to clean and cover a wound properly. Some of the essential items that you should consider include:

- 1. Sterile gauze pads and rolls
- 2. Adhesive bandages
- 3. Adhesive tape
- 4. Antiseptic wipes or solution
- 5. Disposable gloves
- 6. Tweezers or forceps
- 7. Scissors
- 8. Instant cold pack
- 9. Sterile saline solution for cleaning wounds
- 10. Sterile water for flushing eyes or wounds

These are just a few of the items you might include in your wound care kit. Be sure to customize your kit according to the needs of your household or workplace, and make sure to check the expiration dates of all items regularly and replace them when necessary.

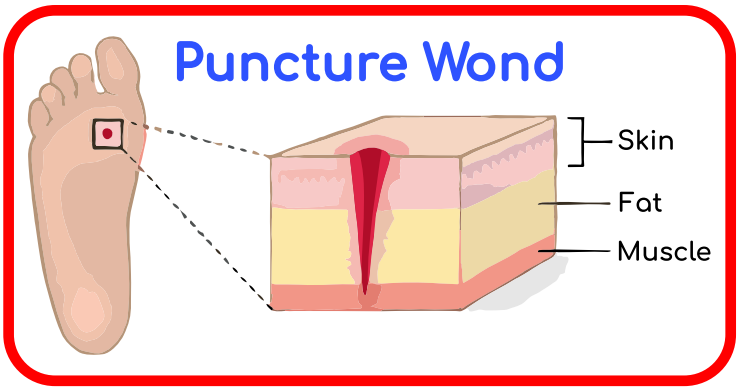
Wounds:

As a first aid provider, it is essential to be familiar with different types of wounds and their corresponding treatments. Common types of wounds include:

1. Abrasions -

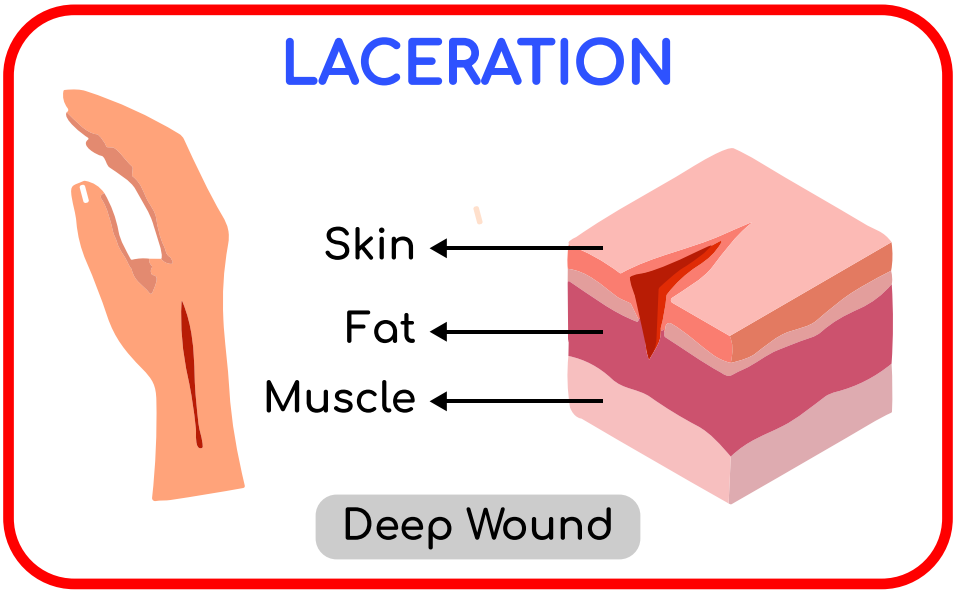
These are superficial wounds that affect the top layer of the skin.

2. Punctures -



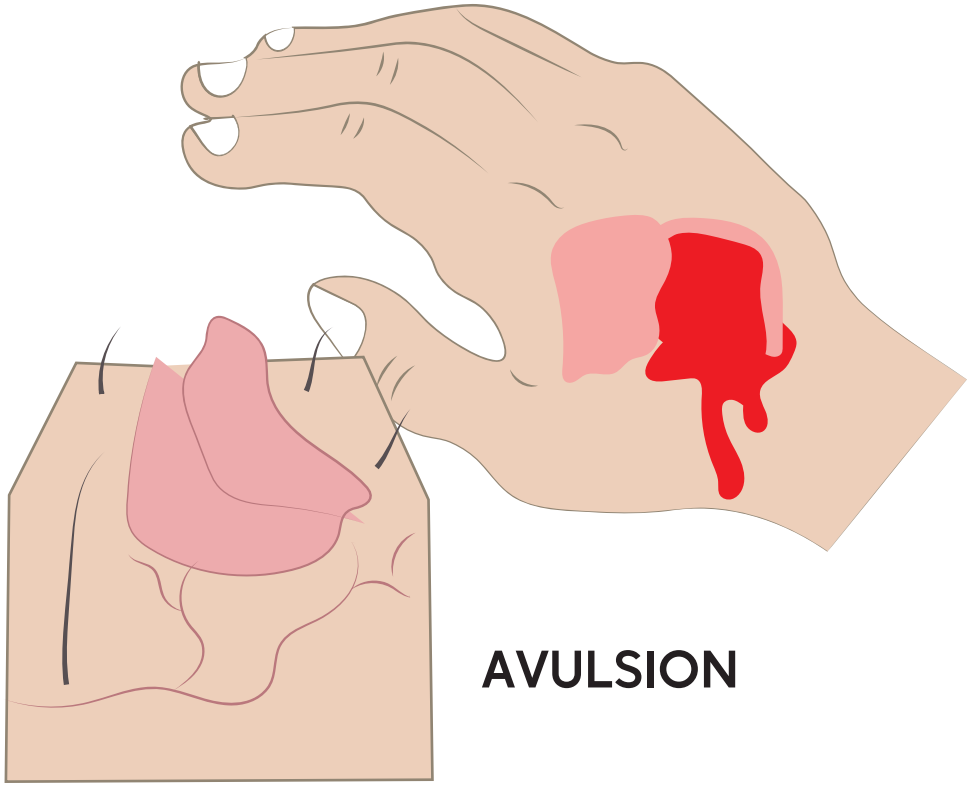
These wounds can be caused by needles, nails, or other sharp objects.

3. Lacerations -



These are deep wounds that can result from a sharp object slicing through the skin.

4. Avulsions -



These wounds occur when the skin is torn away from the body.

DETECT – sign and symptom

CALL- 911,997

INTERVENE

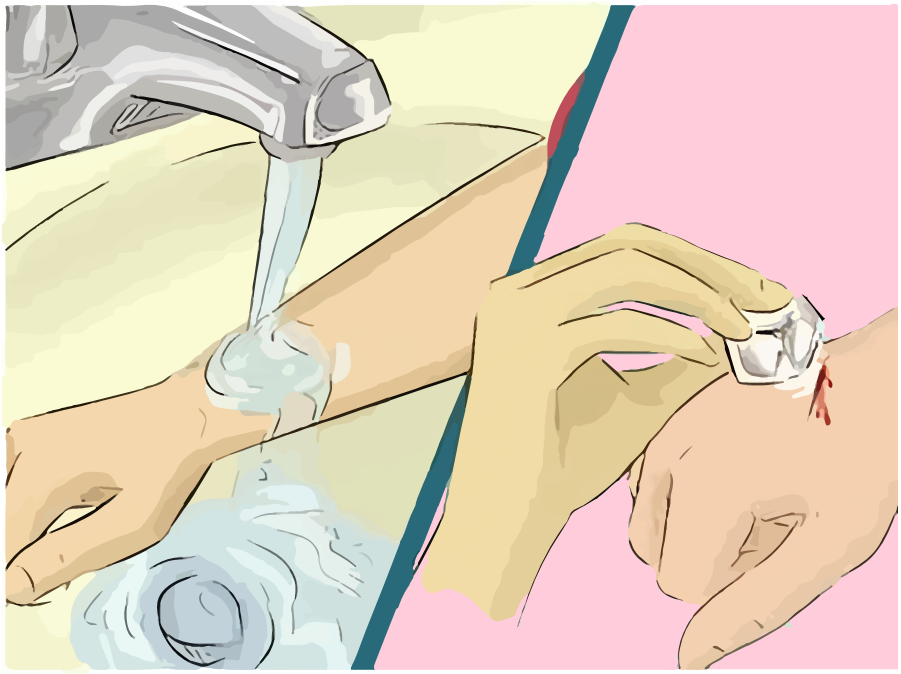
Interventions:

- Clean
- Cover
- Stop bleeding
- Prevent infection

Proper wound care involves cleaning the wound thoroughly, stopping any bleeding, and preventing infection. First aid providers should also monitor wounds for signs of infection and seek medical attention immediately

Cleaning a wound properly is crucial to prevent infection. The first step is to wash your hands thoroughly with soap and water, or use hand sanitizer if soap and water are not available.

Next, gently rinse the wound with clean water to remove dirt and debris. You can use mild soap if the wound is particularly dirty, but be sure to rinse it thoroughly.



After cleaning, pat the area dry with a clean towel or sterile gauze. Do not rub the wound, as this can irritate the skin and increase the risk of infection. Once the wound is dry, you can apply an antibiotic ointment and cover it with a sterile bandage or dressing. Remember to change the dressing regularly, and monitor the wound for any signs of infection, such as redness, swelling, or pus.

Wound infection:

Reducing the risk of wound infection involves taking certain precautionary measures before, during, and after treating the wound, including:

- 1. Washing your hands with soap and water or using hand sanitizer before and after treating the wound
- 2. Using sterile gloves when handling the wound
- 3. Clean the wound thoroughly with mild soap and water or sterile saline solution
- 4. Cover the wound with a clean, dry dressing or bandage to protect it from bacteria and further injury
- 5. Change the dressing or bandage daily or as needed to keep the area clean
- 6. Avoid touching the wound unnecessarily
- 7. Keep the wound dry and avoid exposing it to dirty or contaminated environments
- 8. Do not scratch or pick at the wound or surrounding area
- 9. Seek medical attention if the wound is deep, shows signs of infection, or does not heal after a few days.

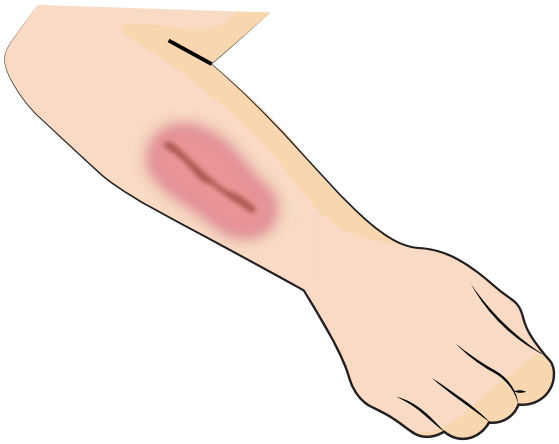
By following these precautionary measures, you can significantly reduce the risk of wound infection.

Signs of infection:

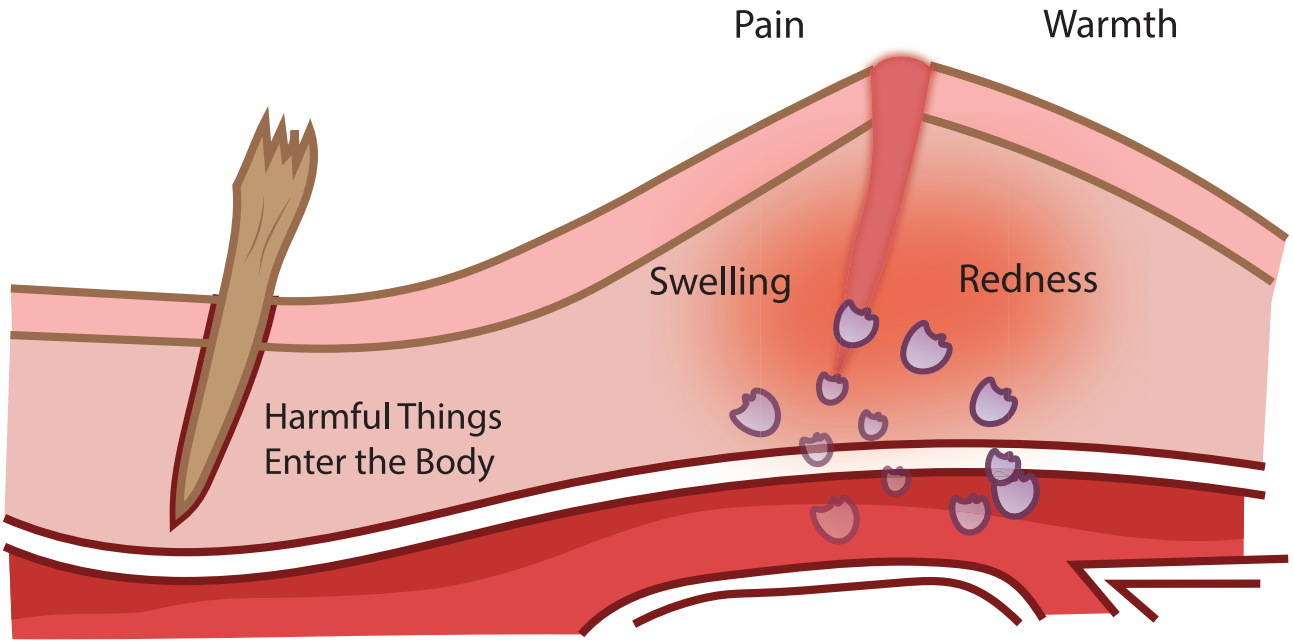
Most common signs are;

- Pus or cloudy fluid is draining from the wound

- Increasing redness occurs around the wound



- Pain, swelling, and fever



5. Amputation -

Loss or removal of a bodily part, such as a finger, toe, hand, foot, arm, or leg.

DETECT – sign and symptom

CALL- 911,997

INTERVENE

Interventions:

- Control bleeding
- Recover the severed part

6- Foreign object

A foreign body is an object that is introduced to the body that is not naturally part of it.

Examples,

- Knife stabbing
- An object to the eye

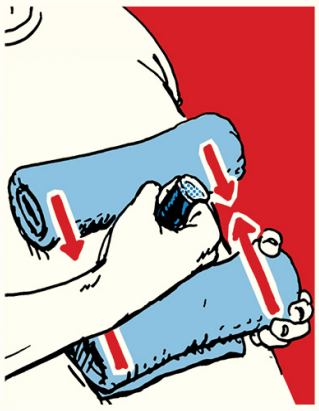
DETECT – sign and symptom

CALL- 911,997

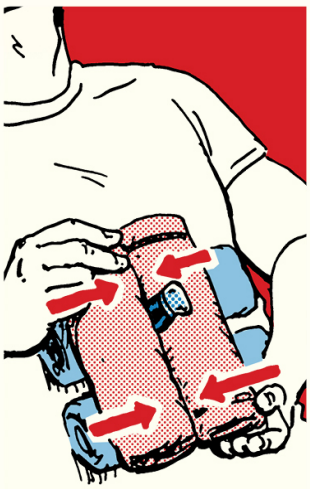
INTERVENE

Interventions:

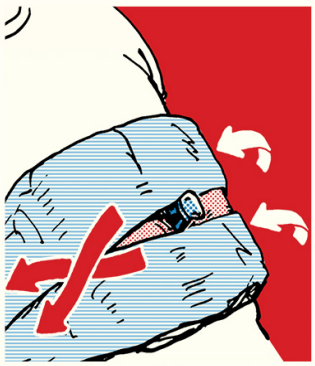
- Stabilize the object
- Do not attempt to remove or move the object
- Prevent unnecessary movement to the victim



1: HAVE the patient stabilize the object by hand, if able. Then roll pieces of available fabric (like hand towels) into a cylindrical shape and place one of these "bulky dressings" on each side of the wound.



2: APPLY two more of these cylinders atop the first two, but in the opposite direction.



3: COVER with rolled gauze (or duct tape/triangular bandages/whatever is available). Wrap the gauze over the bulky dressing and around the affected body part, wrapping alternate sides of the object with each pass. Continue wrapping until the object is fully secured and the dressing is covered.

HOW TO STABILIZE AN IMPALEMENT WOUND

Head and Spinal Injury:

It is important to call 911/997 or seek medical attention as soon as possible. In the meantime, if the person is unconscious but breathing, place them in the recovery position and monitor their breathing.

Signs of a head injury can vary depending on the severity and type of injury, but some common signs include

Signs of Head injury

- Headache
- Dizziness
- Loss of consciousness
- Confusion
- Memory loss
- Nausea or vomiting
- Vision or hearing problems
- Difficulty speaking or walking

Interventions: For head and spinal injuries,

- Do not attempt to move the person unless they are in immediate danger.
- Keep the person still and minimize movement to prevent further injuries.
- Do not twist or turn the person's head, or neck unless it is necessary.

Fractures:

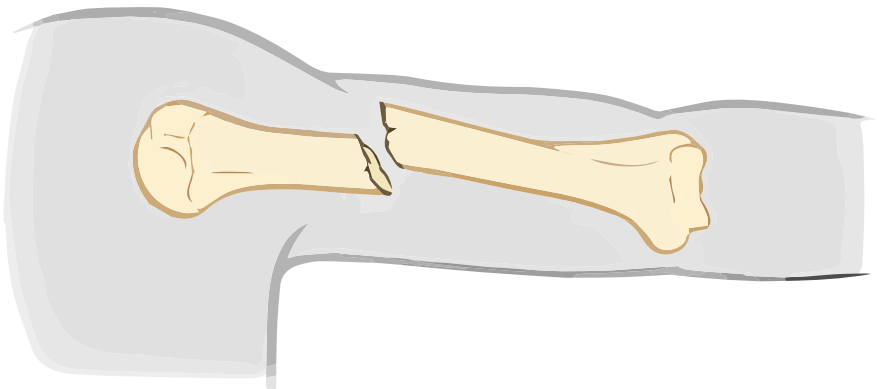
A fracture is a break or a crack in a bone. It can occur due to different reasons, such as trauma, stress, or disease. Fractures vary in severity, from a small crack in the bone, known as a hairline fracture, to a complete break in the bone, known as a compound fracture. Proper interventions of a fracture are important to prevent complications and promote healing.

The symptoms of a fracture can include

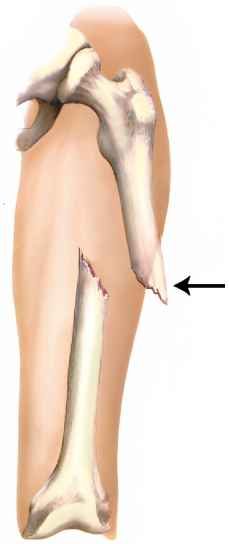
- Pain
- Swelling
- Deformity
- A restricted ability to move the affected area

Some types of bone fractures:

Closed fracture



Open fracture



Open

DETECT – sign and symptom

CALL- 911,997

INTERVENE

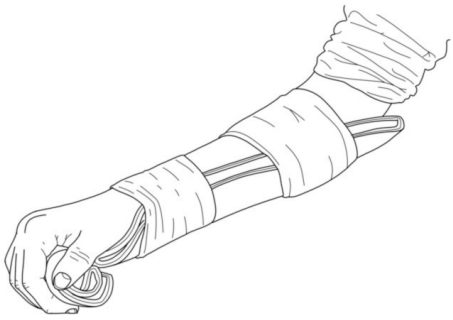
Interventions:

- Immobilizing the affected area
- Elevating the injury above the heart if possible
- If there is an open wound, control bleeding

Immobilizing the affected area

Splinting

If the fracture is in the arm or leg, you can use a splint by fastening a rigid material, such as a flat piece of wood or cardboard. Find an object to support and keep the injured part from moving.



Use a triangular sling around the neck and over the injured arm. Place the person's hand across the chest and use the triangular sling to support the person's arm.

If the injury involves the upper arm add a gauze roll to tie around the chest including the injured upper arm

Remember to immobilize the injury as gently as possible, without bending or twisting the affected area, to avoid causing more pain or damage.

Femur Fracture

The symptoms of a fracture can include

- Pain
- Swelling
- Deformity
- A restricted ability to move the affected area

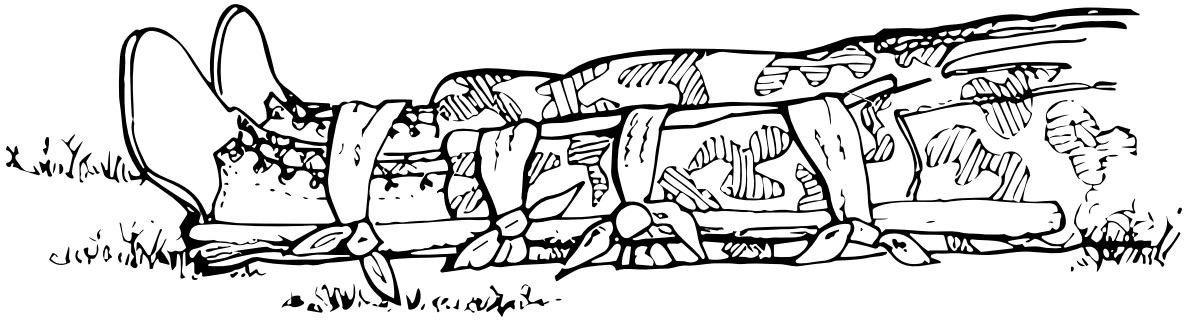
DETECT – sign and symptom

CALL - 911,997

INTERVENE

Interventions:

- Immobilizing the affected area
- Elevating the injury above the heart if possible
- If there is an open wound, control bleeding



Burns:

Damage to the skin or underlying tissues caused by heat, chemicals, electricity, or radiation.

Burns are classified according to their severity, with first-degree burns affecting only the outer layer of skin, second-degree burns affecting the outer and underlying layers of skin, and third-degree burns destroying all of the layers of skin and possibly underlying tissues.

The symptoms of a burn can include

- Pain
- Redness
- Swelling
- Blistering

DETECT – sign and symptom

CALL - 911,997

INTERVENE

Interventions:

Minor burns

Cool the affected area with cold water for several minutes. Do not use ice.

Cover the area with a non-stick sterile or clean dressing.

Large burns

Remove the individual from the source of the burn and stop the burning process by extinguishing flames, or dousing flames with water.

Have the person Stop and Drop then Roll

Cover the person with a wet blanket

After the fire stops, remove any jewelry and clothing that is not stuck to the skin. Do not remove any clothing if stuck to the skin.

Medical Dispatch (Saudi Red Crescent Authority)

Introduction

In emergencies, every second has value. A quick and accurate response starts from the moment of your first call.

The Medical Dispatcher is the First Person to Deal with Your Case; The first person dealing with your case is not the ambulance crew in the field, but the experienced medical dispatcher who receives your report during the call.

The medical dispatcher is a highly trained health specialist who receives and processes medical emergency calls, quickly assesses the situation, and makes critical decisions.

Key Message: The correct call -> Faster response -> Higher chance of survival.

Definition

The medical dispatcher is a highly trained health specialist for receiving and processing medical emergency calls; they possess the knowledge and experience necessary to evaluate cases quickly and accurately and make critical decisions.

The Roles of Medical Dispatcher

1. **Case Assessment:** They assess the severity and priority of the case within seconds through specific and studied questions.
2. **Life-Saving Instructions:** They provide immediate instructions that can be implemented before the ambulance arrives to save a life.
3. **Determining Severity:** Cases are categorized by risk level to ensure the appropriate response is dispatched.
4. **Appropriate Ambulance Type:** They select the right type of ambulance, such as ground, air (for critical or remote areas), or advanced medical support for critical cases.
5. **Ongoing Follow-up:** They stay on the line with you, monitoring the situation and providing support until the ambulance team arrives.

Responsibilities

- **Determining the Risk Level:** They categorize the case based on the degree of risk to ensure an appropriate response.
- **Providing Immediate Instructions:** This includes:

- CPR (Cardiopulmonary Resuscitation).
- Control of hemorrhage.
- The safe and correct patient position.

- **Guiding the Appropriate Ambulance:** They determine the type of response required and send the most suitable medical team for the case:
  - Ground ambulance.
  - Air ambulance for critical or remote areas.
  - Advanced medical support for dangerous cases.
- **Continuous Follow-up:** They stay in communication with you, monitor the situation, and provide necessary support until the ambulance team arrives.

Important Information: The call is not a routine set of questions; every question the dispatcher asks has a specific and necessary medical reason to evaluate your situation.

Medical Dispatcher's Expectations:

- **Remain Calm as Much as Possible:** You should know that it is a stressful situation, but relative calmness helps in effective communication and accurate instruction execution.
- **Clear and Accurate Answer:** Answer questions with complete clarity and without hesitation; accurate information saves lives.
- **Immediate Compliance:** Follow the dispatcher's instructions precisely and quickly; these instructions are designed to save a life.
- **Stay on the Line:** Do not hang up the call unless requested; your presence on the line is important for monitoring the situation.

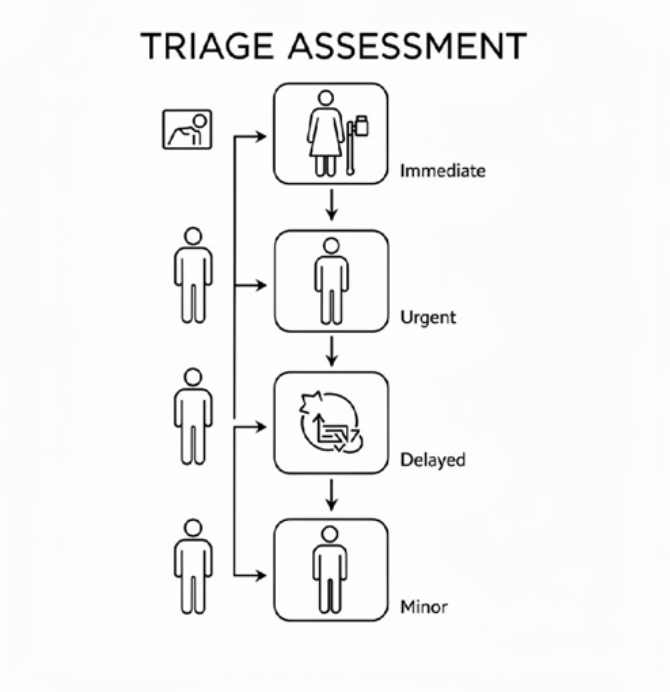
Common Questions and Why We Repeat Them

Question	Purpose
How old is the patient?	Age determines treatment protocols, medication dosages, and special precautions.
Is the patient conscious?	The level of consciousness is a crucial indicator of the case›s severity and determines the required response level.
Is the patient breathing normally?	Breathing is an essential vital sign; any disruption in it requires immediate intervention.
What exactly happened?	Understanding the cause of the case helps with the initial diagnosis and selecting the appropriate treatment.

The clarity of your information might be the decisive factor in saving a human life, with Allah's help.

Why these questions specifically?
These simple questions help the dispatcher to identify the case severity within seconds and take an appropriate decision, e.g.

- ***Cardiac Arrest:*** *start CPR immediately.*
- ***Heart attack or Stroke:*** *time is crucial for management.*
- ***Excessive Hemorrhage:*** *need urgent life intervention to stop the bleeding.*
- ***Non-urgent case:*** *to be referred to suitable care.*



How to Determine Your Location Accurately?

Providing the precise location is of utmost importance for the speed of the ambulance reaching you. Several advanced technologies are used to ensure quick arrival:

1. **Communication Network:** Location tracking through your mobile phone signal and cellular towers.
2. **WhatsApp (GPS Technology):** Accurate geographical location from your smartphone.
3. **Your Description of the Place:** Provide surrounding landmarks, neighborhood name, gate number, floor number, and any distinctive details.

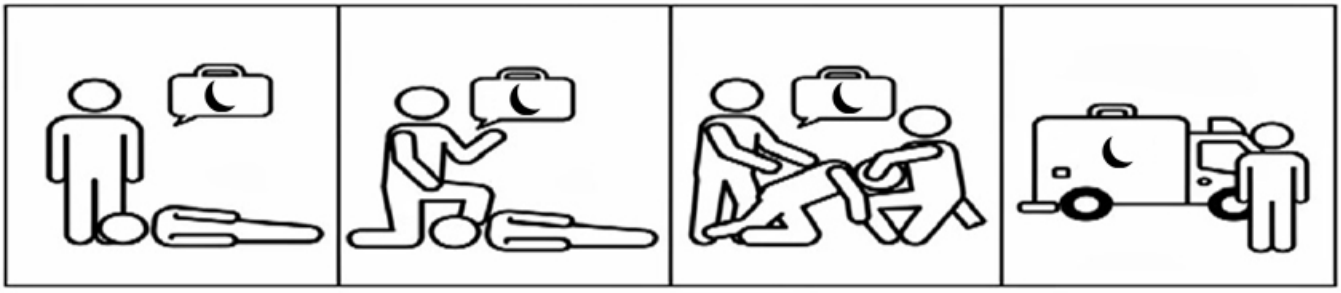
A Golden Tip: If you are in an unfamiliar place, open your phone's location services (GPS) before calling, if possible. This will significantly speed up the process of determining your location.
What if you don't know your location exactly

1. Look around carefully for any landmarks (mosque, gas station, restaurant, grocery shop, etc…)
2. Open the Map App in your mobile and inform that dispatcher about what you see in the screen.
3. Provide any available information: provide any details, even if you think it's not very meaningful.

Vital Instructions Before the Ambulance Arrives

The moments before the ambulance arrives are not just a time for waiting but a real opportunity to save a life. The medical dispatcher will guide you step by step to perform potentially critical actions.

1. **CPR:** Cardiopulmonary resuscitation may begin over the phone with direct and simplified guidance from the medical dispatcher.
2. **The "Golden Time":** The minutes spent waiting are not wasted time but an opportunity for life-saving intervention.
3. **You Are the First Rescuer!** What you do before the ambulance arrives could be the difference between life and death, with God's help.
4.



A Concluding Humanitarian Message

The medical dispatcher is more than just an employee behind a headset; they are a trained and dedicated partner, your first partner in the journey to save a life. Every call the dispatcher receives is a human story, and every second of your communication can make a real difference. Your cooperation means:

- Speed in response and dispatching help.
- Reassurance for you and the patient until the medical team arrives.
- Accuracy in case assessment and treatment selection.

You may not be a professional doctor or paramedic, but your correct call, relative calmness, clear information, and cooperation with the medical dispatcher can all make a real difference. Every citizen is a partner in saving lives.

ENVIRONMENTAL EMERGENCIES

Introduction:

An environmental emergency is defined as a «sudden-onset disaster or accident resulting from natural, technological or human-induced factors, or a combination of these, that causes or threatens to cause severe environmental damage as well as loss of human lives and property.» (UNEP/GC.22/INF/5, 13 November 2002.).

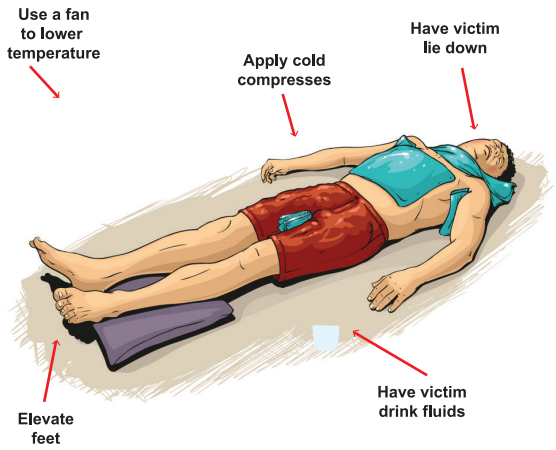
Environmental injuries can happen at home, work or during any outside activities, these injuries require basic knowledge in first aid management.

In this chapter will discuss how we can do first aid management for cold, heat, bites and poison emergencies

Learning objectives

At the end of this chapter you will be able to

- 1-Identify different environmental Injuries.
- 2- Recognize signs and symptoms for heat, cold, bites and poison emergencies
- 3-Identify how to respond to cold emergencies
- 4-Describe how to intervene with heat emergencies
- 5-Explain how to assist someone who has an animal bite, insect bite or sting.
- 6-Describe how to provide first aid to a different poisoning situation.



Asthma Attack

Asthma is a condition in which the airways become narrow and swollen and may produce extra mucus. The muscles around the airways contract and the airways produce extra mucus, causing the breathing (bronchial) tubes to narrow.

Signs and Symptoms

- Severe shortness of breath,
- chest tightness or pain
- coughing or presence of wheezing sound

DETECT – signs and symptoms

CALL- 997 OR 911

- INTERVENE
- Check the airway
- Help the person get into a comfortable position
- Loosen any tight clothing.
- Help the person use any prescribed medicine
- Specifically trained first aid provider may administer bronchodilator at their discretion
- Supplemental oxygen may administer by specifically trained first aider
- Move the person away from things that may trigger the asthma such as pollens, smoke or dust

CROUP

Refers to an infection of the upper airway, which becomes narrow, making it harder to breathe.

Signs and Symptoms

- Loud barking cough
- Fever
- Runny nose
- Hoarseness of voice
- Noisy or labored breathing

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Help the child to rest in a comfortable position and enables to breath easily
- Keep the victim calm
- Provide humidified or cool air
- Give fluids
- Administer antipyretic if needed.

ALLERGIC REACTIONS/ANAPHYLAXIS

ALLERGIC REACTIONS - are exaggerated sensitivities (hypersensitive reactions) that occur when your immune system responds abnormally to common substances

ANAPHYLAXIS - is a severe, potentially life-threatening allergic reaction. It can occur within seconds or minutes of exposure to something the person is allergic to.

Somethings that can cause allergic reactions:

- Chocolates
- Eggs
- Peanuts
- Pollens
- Dust

Signs and symptoms

Mild Allergic Reaction

- Sneezing, itching around the eyes, stuffy nose
- Itching of the skin
- Raised, red rash on the skin

Severe Allergic Reaction:

- Trouble breathing
- Swelling of the tongue
- Chest tightness

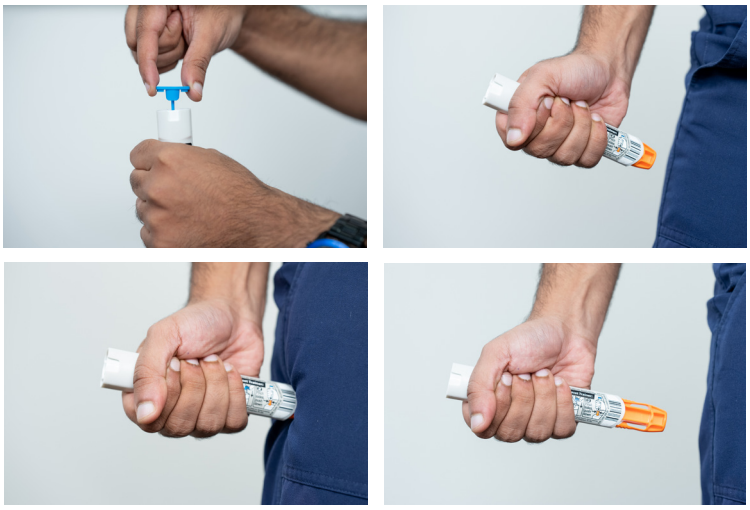
DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Stop further contact with the allergen
- Give epinephrine
- help the person use his medication

How to use the epinephrine pen



FEELING FAINT

Is when a person briefly stops responding in a short period of time, usually less than a minute, and then seems fine. This is common in a warm climate and areas with little fresh air

This may occur when someone

Stands without moving for a long time

- Heart condition
- Suddenly stands after squatting or bending down
- Received unexpected news
- Stands without moving for a long time

Signs and Symptoms

- Dizziness
- Lightheadedness
- Unsteady or unbalance
- Feels weak
- Lose of conscious

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Help the person get into a safe and comfortable position
- If the victim is conscious, ask the victim to do physical counter pressure maneuvers to increase blood flow to the brain.
- If the victim is unresponsive, assess his breathing and circulation
- For pregnant women, lay the person on her left side

CHEST PAIN

A discomfort or pain that you feel anywhere along the front of your body between your neck and upper abdomen. Some causes are not dangerous to your health, while others can be serious or life threatening.

Causes of Chest pain

- Heart problems, such as angina
- Panic attacks
- Digestive problems, such as heartburn or esophagus disorders
- Sore muscles
- Lung diseases, such as pneumonia, pleurisy, or pulmonary embolism
- Costochondritis - an inflammation of joints in your chest

Signs and Symptoms

- Chest discomfort
- Uncomfortable feeling in one or both arms, neck and jaw or the back between shoulder blades
- Cold sweat
- Feeling Nauseated
- Feeling Lightheadedness
- Shortness of breath

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Make sure that the person stays calm and rests
- Have the person swallow or chew (1 adult or 2 low dose aspirin) if he does not have an allergy to aspirin or no serious bleeding.
- Be prepared to do CPR if the person become unresponsive

DIABETIC EMERGENCIES

People who are diagnosed with diabetes may experience diabetic emergencies such as high or low blood sugar

Signs of Low blood sugar

- Confused or irritable
- Weak, hungry, thirsty
- Shakiness
- Sleepy
- Sweaty

DETECT – signs and symptoms

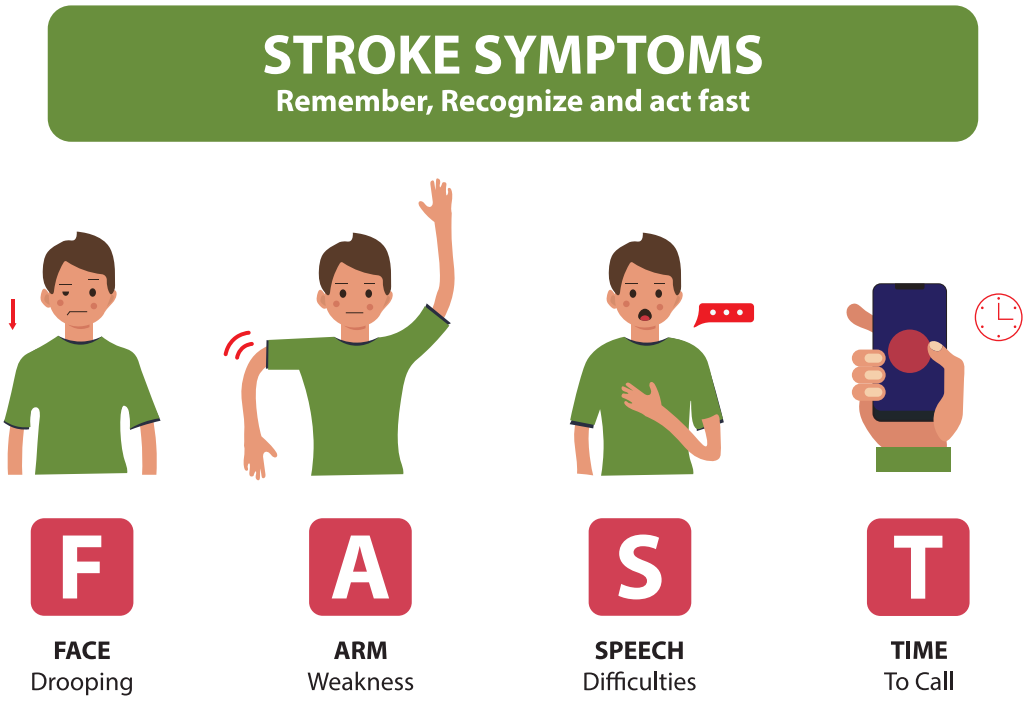
CALL- 997 OR 911

INTERVENE

- Let the person eat something sweet like jelly beans, chocolates or sugar cubes, dried fruit strips, honey
- Have the person drink Sugary drinks such as lemonade, juice, sports drinks, milk or honey
- If the victim is unconscious or semi- conscious, do not ask them to drink or swallow any.
- Give 15g to 20 g of glucose tablet and can be repeated if symptoms continue after 15 minutes

STROKE

A stroke is a serious life-threatening medical condition that happens when the blood supply to part of the brain is cut off



Warning Signs

- F-ace drooping
- A-rm weakness
- S-peech difficulty
- T-ime to call your local emergency number.

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Note the time when the stroke signs first appeared
- Remain with the person until someone with more advanced training arrives and takes over.
- If the person becomes unresponsive and is not breathing normally, do CPR.
- Measure the blood glucose

SEIZURE

It is an abnormal electrical activity in the brain. Most seizures stop in a few minutes and are often caused by a medical condition called epilepsy.

Signs/Symptoms

- Staring
- Twitching of the arms and legs.
- Body becomes rigid.
- Stops breathing or with breathing problem
- Loss of bowel or bladder control.
- Loss of consciousness

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Protect the victim from any harm, by Moving furniture or other objects out of the way
- Place a small pad or towel under the victim's head
- If the victim is wearing eyeglasses, remove it
- Loosen tight clothing around the neck
- Do not restraint the victim
- Record the time of onset

SHOCK

It is an acute medical condition associated with a fall in blood pressure, often caused by loss of blood, severe burns, allergic reaction, or sudden emotional stress.

Signs/Symptoms

- Cold pale and clammy skin.
- Difficulty breathing.
- Rapid and shallow breathing.
- Anxiety.
- Fast heartbeat.
- palpitations.
- Feeling thirsty and with dry mouth
- Small amounts of urine and dark urine.

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Place the victim in a supine position.
- Open the airway of an unresponsive but breathing person by placing him on his side.
- Loosen the patient's tight clothing.
- Do not give anything to drink or eat
- Maintain the patient's normal body temperature.
- Use an epinephrine pen, if the person is in allergic reaction
- let the person lie flat on the floor and immobilize the head and neck by applying neck collar, if you suspect a spinal cord injury,
- Control the bleeding of the person by raising his legs above the level of the heart with the head flat on the floor
- Turn the patient on his side, if vomiting or bleeding from the mouth is present to avoid choking or aspiration
- Monitor the patient's breathing, pulse, and skin color continuously.
- Reassure the patient and stay with him until medical help arrives.

ABDOMINAL PAIN

Abdominal pain is pain felt anywhere from below your ribs to your pelvis. It is also known as tummy pain or stomach pain. Abdominal pain usually goes away without surgery and most people only need relief from their symptoms.

Most common causes of abdominal pain

- Diarrhea.
- Constipation.
- Food allergies and intolerances
- Indigestion.
- Gas and gas pain.
- Food poisoning.

Signs and symptoms

- Severe pain
- Bloody/watery stools
- Continuous vomiting and nausea
- Abdominal tenderness.
- Swelling of the abdomen
- Weight loss
- Fever
- Yellowish skin

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Place the victim in a comfortable position
- Apply warm compress
- Give the victim paracetamol to relieve the pain

INTERVENE

- Provide paracetamol for pain relief
- Apply heat against the affected area to reduce the pain
- Instruct to seek medical advice when the pain is combined with high fever
- There is weakness in the face muscles
- Fluid is draining from the ear,
- There is loss or decreased in hearing
- Symptoms get worst and do not improve within 48 hours

EARACHE

An earache is a sharp, dull, or burning pain in one or both ears. The pain may last a short time.

Some causes of earache

- Ear infection
- Ear injury from pressure changes like high altitude
- Sinus infection
- Ear wax build up
- Object stuck in the ear
- Tooth infection
- Hole in the ear drum
- Sore throat

Signs and Symptoms

- Sharp or dull pain in one or both ears.
- Redness and swelling around the ear.
- Discharge from the ears
- Fever
- Difficulty hearing
- Jaw pain.
- Itching
- Irritability

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Give paracetamol or other pain killers
- Apply cold compress
- Advice to rest, get some fresh air and enough sleep, drink water regularly
- Advise the person to stay in a dark and quiet area
- Advice to seek medical help if:
- It was sudden and with no cause, a new and severe headache.
- With fever, shortness of breath, stiff or sore neck, vomiting and dizziness
- It occurred after a head injury or accident.

HEADACHE

Is a pain in your head or face that is being described as a pressure that's throbbing, constant, sharp or dull. Headache usually will pass and does not have serious causes. Nevertheless, it may indicate a more serious condition in some cases. The most common types of headaches are tension and migraine headaches. Tension headaches are tightening the muscles of the head and neck. While migraines are when super sensitive nerve endings in the brain create pain. Headaches can differ in regard to pain type, severity, location and frequency. It can be triggered by some factors like

- Processed foods, caffeine, cheese, chocolate and alcohol
- Exposure to allergens.
- Secondhand smoke.
- Strong odors from perfumes and chemicals
- Lack of sleep
- Fatigue
- Stress
- Weather changes
- Hunger
- Flu or cold

Signs and Symptoms

- Tightness around the head
- Pain around the eyes
- Sensitive to light or noise
- Feeling nauseated

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Give paracetamol to reduce the pain
- Advise the person to take the recommended dose of paracetamol
- Encourage the person to drink plenty of fluid
- A hot drink can relieve the pain
- Advise to take mouth spray or medicated lozenges to soothe the throat
- Advise to seek medical care if there is
- Drooling
- Inability swallowing
- High pitched breathing sound
- Difficulty breathing
- Painful neck
- Fever

SORE THROAT

It is a painful, dry, or scratchy feeling in the throat. It can also be burning, tender and irritating. Most sore throats were caused by viral infection, like the common cold or flu. And it will typically go away in a few days. However, a bacterial infection can be serious. In some cases, sore throat becomes severe causing the airway to swell so, it is advisable to seek medical help in this kind of situation.

Signs /Symptoms

- Headache
- Fever
- Swollen lymph nodes
- Runny nose.
- Cough.
- Tired or fatigue
- Hoarseness of voice
- Inability to swallowing
- High pitched breath sound
- Severe pain

DETECT – signs and symptoms

CALL- 997 OR 911

HICCUPS

Is an involuntary spasm of the diaphragm, with a sudden closure of the glottis and a characteristic of gulping sound.

CAUSES

- Under emotional stress or excitement
- The Sudden change of weather or temperature.
- Eating large meal
- Drinking carbonated beverages.
- Drinking too much alcohol.
- Chewing a gum or smoking that can cause swallowing of the air

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Comfort the person and reassure that it will end only for a few minutes
- Instruct one of the following simple home remedies that could help
- Hold breath for a couple of seconds
- Breathe into a paper bag
- Sip some granulated sugar or ice cubes
- Drink a glass of ice-cold water
- Tasting vinegar
- Biting into a lemon
- Instruct the person to seek immediate medical help if the hiccups last for more than 48 hours

BACK PAIN

The most common back pain that many adults experience is lower back pain. Heavy lifting, stress, bulging or ruptured disc or even more serious bone disease can injure the muscles and ligaments of the back causing back pain

Lower back pain symptoms include:

- Muscle tightness or spasm
- Dull ache in your hips and/or pelvis
- Sharp, tingling pain that starts in your lower back and travels down one leg
- Pain with sitting and quickly improves while walking
- Pain that is worse in the morning

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Help the person to sit or lay down in the position of comfort
- Give paracetamol to relieve the pain
- Apply warm compress or heat wrap to the provide short term relief

FEVER

It is a rise of body temperature above the normal. Fevers are not harmful because this is the common response of the immune system to fight infection. Fever can generally go away after a few days. While it may affect all ages, this is more common to children

First aid providers should consider the possible causes of a high temperature and help the person access medical care if necessary.

Signs and Symptoms

- High temperature above 38°C (100.4°F)
- Hot, flushed skin
- Sweating
- Chills/shivering
- Irritability
- Headache
- Muscle ache
- Loss of appetite
- General weakness
- Dehydration (dry mucous membrane)

DETECT – signs and symptoms

CALL- 997 OR 911

INTERVENE

- Give recommended dose of paracetamol
- Advise the person to drink fluids regularly
- Do sponge bath with lukewarm water
- Advice to dress lightly and have a rest

When to seek emergency medical services? If the adult person/child has fever combined with:

- Signs of shock
- Persistent cough
- Headache or stiff neck
- A change in mental status
- Difficulty breathing
- Severe abdominal pain
- Rash

Seek medical care if the feverish person is,

- A baby under three months' old
- Over 65 years' old

Seek medical care if the feverish person has,

- Cancer
- Weakened immune system,
- Sickle cell disease,
- Taken paracetamol but the fever did not subside
- Fever more than 3 days
- A temperature higher than 39° C (102.5° F) (child)

TEMPERATURE RELATED EMERGENCIES

Heat Cramps

Definition: painful muscle spasms, usually in the legs and abdomen, occurred usually during heavy exercise in hot environments which causes loss of fluids and electrolytes as a result of sweating.

Signs of heat cramps

- Normal or slightly raised core temperature (37 to 39°C, or 98.6 to 102.2°F)
- flushed skin
- thirst
- Fatigue
- Heavy sweating
- Muscles cramps

DETECT – sign and symptom

CALL - 911,997

Intervene

- Move the person to a cool place
- Loosen any tight clothing
- Cool the person by placing cool packs on the neck, armpits, groin, and Fan the victim
- Have the person drink something with sugar and electrolytes if able to swallow

HEAT EXHAUSTION

Definition: is a condition caused by loss of salt and water from the body through excessive sweating a result of the body overheating.

Signs of Heat Exhaustion

- Nausea
- Headache
- Dizziness
- Heavy sweating
- Muscle cramps
- Feeling faint or fatigued

DETECT – sign and symptom

CALL - 911,997

Intervene

- Have the person lie down in a cool place and elevate the feet
- Remove person's clothing
- Cool the person with a cool water spray. or place cool damp cloths on the neck, armpits and groin and fan him
- Have the person drink something with sugar and electrolytes if not available use cold water.

HEAT STROKE

Definition: condition is caused by a failure of the "thermostat" in the brain to regulate body temperature. The body becomes dangerously overheated, usually due to a high fever or prolonged exposure to heat, this most serious form of heat injury, heatstroke, can occur if your body temperature rises to 104 F (40 C) or higher.

Signs of Heat Stroke

- Confusion
- Feeling faint
- Fainting
- Dizziness
- Muscle cramps
- Seizure
- Rapid deterioration in the level of response.
- Body temperature above
- 104°F (40°C)

DETECT – sign and symptom

CALL - 911,997

INTERVENE

- Have the person lie down in a cool place
- Put the person in cool water up to his neck or spray him with water and fan him, repeat the cooling process as need it and Fan him
- If the person becomes unresponsive and not breathing normally, start CPR

DEHYDRATION

Definition: use or lose more fluid than you take in, and body does not have enough water and other fluids to carry out its normal functions

Symptoms of dehydration:

- Feeling thirsty.
- Dark yellow and strong-smelling pee.
- Feeling dizzy or lightheaded.
- Feeling tired.
- Dry mouth, lips and eyes.

DETECT – sign and symptom

CALL - 911,997

Intervene

- Help the person to sit down and take rest from any physical activity
- Make sure that the person gets enough water and food to stay hydrate
- Provide the person if you can with Oral Rehydration Solution (ORS) to help in replace the minerals

HYPOTHERMIA (LOW BODY TEMPERATURE)

Definition: body temperature falls below 95 F (35 C), when body loses heat faster than it can produce heat, causing a dangerously low body temperature, Normal body temperature is around 98.6 F (37 C).

Signs of Hypothermia

- Shivering, cold, pale, and dry skin.
- Exhaustion or feeling very tired.
- Lethargy or Confusion.
- Slow and shallow breathing
- Memory loss.
- Slurred speech.
- Drowsiness

DETECT – sign and symptom

CALL - 911,997

Intervene

- Get the person out of the cold
- Remove wet cloth cover with a blanket
- Dry the person and put dry cloth
- Cover with a blanket
- Remain with the person until someone with more advanced training arrives and take over

Freezing of Skin to Metal Objects

A person's skin (especially the tongue and lips) can freeze to cold metal objects. This is especially a risk when skin is wet or moist. While this is a concern mainly in cold weather, skin can also freeze to metal objects in other situations (e.g., skin freezing to cold appliances such as freezers).

DETECT – sign and symptom

CALL - 911,997

Intervene

- Do not pull or tug the frozen body part.
- Pour warm (not hot) water on the surface of the object or the skin that is stuck to the object.
- As the skin begins to come free, gently help release the person from the metal object.
- Treat any torn skin as an open wound.

FROSTBITE

Definition: Injury to body tissues caused by exposure to extreme cold, typically affecting the nose, fingers, or toes and often resulting in gangrene.

Signs of Frostbite

- At first, "pins-and-needles"
- Paleness (pallor) followed by numbness
- Hardening and stiffening of the skin
- A color change of the skin of the affected area: first white, then mottled and blue and gangrene occurs, the tissue may become black due to loss of blood supply.

DETECT – sign and symptom

CALL - 911,997

Intervene

- Get the person out of the cold
- Remove wet and tight cloth gently
- Avoid rubbing the affected area because this can damage skin and other tissues.
- Put the affected area in warm water, dry gently and put light dressing of dry gauze
- If possible, elevate the affected extremities above the level of the heart.
- Rehydrate the person by providing plenty of fluids.

SNOW BLINDNESS

Snow blindness occurs when a person's eyes are exposed to ultraviolet rays.

It most commonly occurs when the sun's light is reflected from snow, ice, sand, or water into a person's eyes. Snow blindness can occur even on cloudy days.

Signs of Snow Blindness:

- Redness of the eyes.
- Swelling of the tissue around the eyes.
- Pain, itchiness, or a burning sensation in the eyes that may become intense.
- Temporary color changes in vision, or even vision loss.
- Signs may not appear for several hours following exposure to bright, snowy conditions.

DETECT – sign and symptom

CALL - 911,997

Intervene

- Place the person in a darker environment, if possible, or cover his or her eyes.
- Apply a cool cloth to reduce pain and burning.

ALTITUDE SICKNESS

Definition: is the harmful effect of high altitude, caused by rapid exposure to low amounts of oxygen at high elevation.

Sign of altitude sickness

- headache.
- feeling and being sick.
- dizziness.
- tiredness.
- loss of appetite.
- shortness of breath.

DETECT – sign and symptom

CALL - 911,997

Intervene

- Take the person to a lower altitude as quickly as possible
- Take rest and drink enough water
- Give oxygen if available

BITES AND STINGS

Animal and human Bites that break the skin, the wound can bleed and become infected, the risk of rabies must be considered.

Sign of Bites

- Swelling.
- Redness or rash.
- Pain in the affected area or in the muscles.
- Itching.
- Heat on and around the site of the bite or sting.
- Numbness or tingling in the affected are

DETECT – sign and symptom

CALL - 911,997

Intervene

- Wash the wound with plenty of water and soap
- Apply a dressing and bandage
- Apply a bag of ice and water wrapped in a towel to help with bruising and swelling for 20 minutes

Snake bites:

Snakes that leave one or two puncture holes in the skin. Venom may be injected.

Sign of snake bite if the venom injected:

- Feel a burning sensation
- Swelling and discoloration
- Severe pain
- Weakness
- Sweating, nausea
- Vomiting and chills.
- Breathing may be affected

DETECT – sign and symptom

CALL - 911,997

Intervene

- Place the person at rest in a semi-sitting position
- keep the affected limb below heart level, the venom won't spread as quickly.
- Flush the bite if possible.
- Wrap a large roller bandage around the entire length of the bitten extremity, this is an effective and safe way to slow circulation of the venom.
- Immobilize the limb.

Insects' bites and stings cause only a painful swelling with redness and itching at the site for most people, but some people are severely allergic to these stings and may cause a life-threatening allergic reaction.

Signs insect bite or sting:

- Sudden pain
- Swelling
- Heat
- Redness
- Itching
- In severe allergic reaction:
- General itching and rash
- Generalized swelling—especially of the airway
- Weakness and headache Fever
- Breathing difficulties that may be severe
- Anxiety
- Abdominal cramps and vomiting

DETECT – sign and symptom

CALL - 911,997

Intervene

- If a person was stung with a honey bee, scrape the stinger and venom sac away with something hard and dull like the edge of a credit card or ID
- Wash the sting or bite are with running water and soap
- Put a bag of ice and water wrapped in a towel over the area for up to 20 minutes
- Watch the person for at least 30 minutes for signs of severe allergic reaction, be prepared to use the epinephrine pen

Tick bites: ticks can attract to animals and humans, biting through the skin and set themselves to the tissue with barbed mouth parts.

A tick will suck with the person or animal blood for many hours, and may become quite large. Once the tick is done feeding, it detaches itself and drops off. They sometimes carry diseases that can be transmitted to humans but ticks' bites are usually harmless and do not cause any symptoms.

Signs of an allergic reaction to a tick bite

Tick bites are usually harmless and may produce no symptoms. But if you're allergic to tick bites, you may experience:

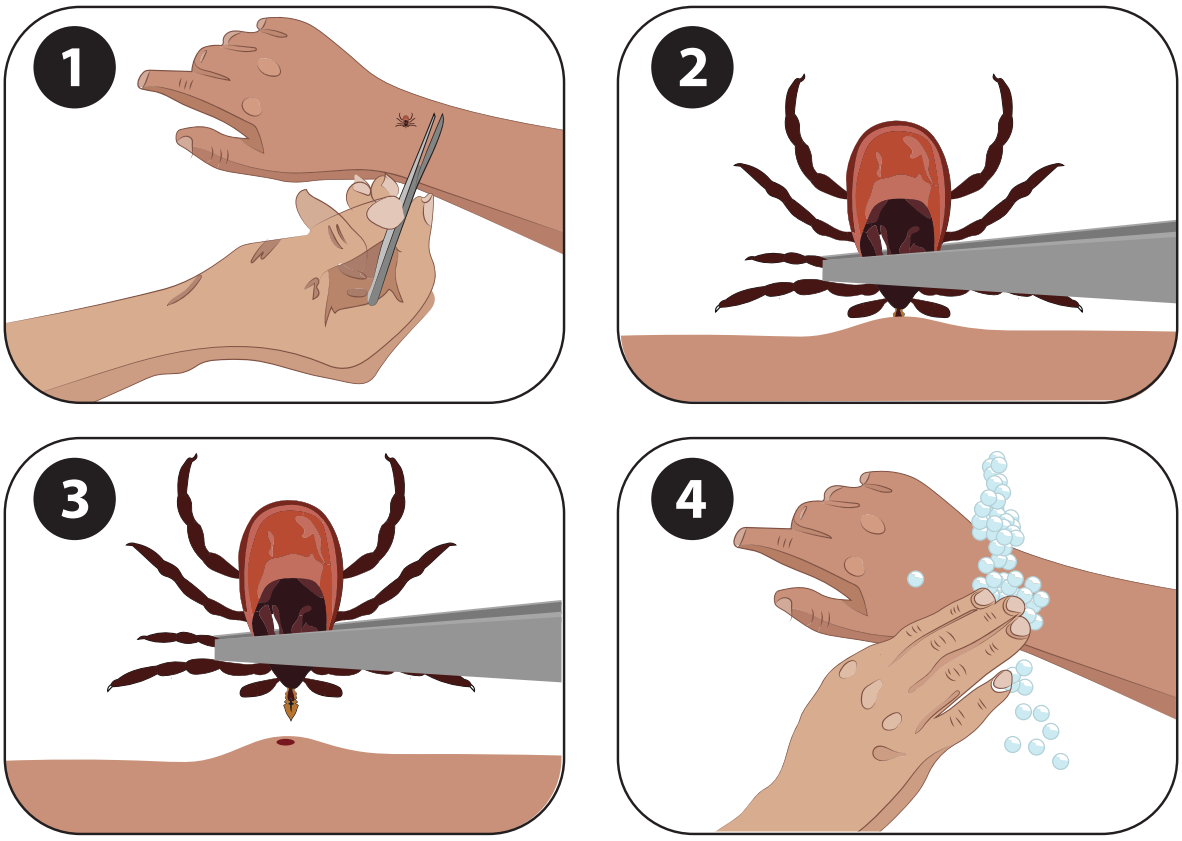
- Pain or swelling at the bite site
- A rash
- A burning sensation at the bite site
- Blisters
- Shortness of breath, if you have a severe allergy

DETECT – sign and symptom

CALL - 911,997

Intervene

- Use tweezers to grasp the tick firmly at its head or mouth, next to the skin.
- Pull firmly and steadily until the tick lets go of the skin. Do not twist the tick or rock it from side to side.
- Wash your hands and the site of the bite with soap and water.
- Swab the bite site with alcohol



Poisons

A substance or object of natural or man-made origin which may be toxic to a living organism(who), poisons are classified according to how they enter the body

Swallowed poisons, Inhaled poisons, absorbed poisons, and injected poisons.

An important part of the first aid to Contact the local poison control center for advice on what to do but first you must quickly gather as much information such as;

- What poison was taken
- How the poison entered the body
- How much poison was taken
- When the poison was taken

Our local poison control center

المركز الوطني لمعلومات الأدوية والسموم
National Drug & Poison Information Center

Contact Information

Website: https://dpic.sfda.gov.sa

Tell: 19999

Fax: 00966112057627

Email: ndpic@sfda.gov.sa

Signs of Inhaled Poisons

If someone has inhaled a poison, they may have:

- Breathing difficulties
- Irritated eyes, nose, or throat
- Dizziness
- Vomiting
- Seizures
- Bluish color around the mouth
- Unresponsiveness
- An unusual smell in the air

DETECT – sign and symptom

CALL - 911,997

Intervene

- Ensure your safety and gather any information about the suspected poison.
- Contact the local poison control center to tell what to do.
- Move the person to fresh air and away from the source of the poison.
- If become unconscious but there is breathing put him in recovery position.
- If unconscious without breathing, start CPR until help arrives.

Signs of Swallowed poisons

If someone has swallowed a poison, they may have:

- Nausea and vomiting
- Pain or burning sensation
- Cramping stomach pains
- Seizures
- Reduced level of response.

DETECT – sign and symptom

CALL - 911,997

Intervene

- Ensure your safety and gather any information about the suspected poison.
- If responsive let him to spit out anything that is remaining in the mouth and ask about was swallowed, when and how much
- Contact the local poison control center to tell what to do.
- Do not encourage him to vomit but if it happens put some of this into a container with any other clues. This may help them identify the poison.
- If become unconscious but there is breathing put him in recovery position
- If unconscious without breathing, start CPR until help arrives.

Signs of Absorbed poisons

- Blasters or redness.
- Swelling skin and itching.
- Breath that smells like chemicals, such as gasoline or paint thinner.
- Vomiting.
- Difficulty breathing.
- Drowsiness.
- Confusion or other altered mental status.

DETECT – sign and symptom

CALL - 911,997

Intervene

- Ensure your safety and gather any information about the suspected poison.
- Contact the local poison control center to tell what to do.
- Remove any contaminated clothing and brush off any poison remaining on the skin.
- Flush the area with water and wash the skin with soap.
- If become unresponsive but there is breathing put him in recovery position
- If unresponsive without breathing, start CPR until help arrived.

Cardiopulmonary Resuscitation (CPR)

Cardiopulmonary resuscitation, or CPR, is an incredible life-saving technique that can make all the difference in a life-or-death situation. It›s a procedure that combines chest compressions with rescue breaths, aiming to restore blood circulation and oxygenation to someone who has suffered a cardiac arrest.

The fact that anyone can learn CPR and use it to potentially save a life is absolutely mind-blowing. Just imagine being able to step in and provide immediate help to someone in need, keeping their heart pumping and their lungs functioning until medical professionals arrive. It›s an empowering feeling knowing that you have the knowledge and skills to be a hero in someone›s darkest hour.

One of the most exciting aspects of CPR is its simplicity. You don›t need to be a doctor or have years of medical training to perform it effectively.

Another thrilling aspect of CPR is its potential to make a real difference in someone›s life. When a person goes into cardiac arrest, their chances of survival decrease rapidly with each passing minute. However, immediate CPR can double or even triple their chances of survival. This means that by performing CPR, you have the power to significantly increase someone›s odds of making a full recovery. It›s an exhilarating thought knowing that your actions could be the determining factor between life and death for someone in need.

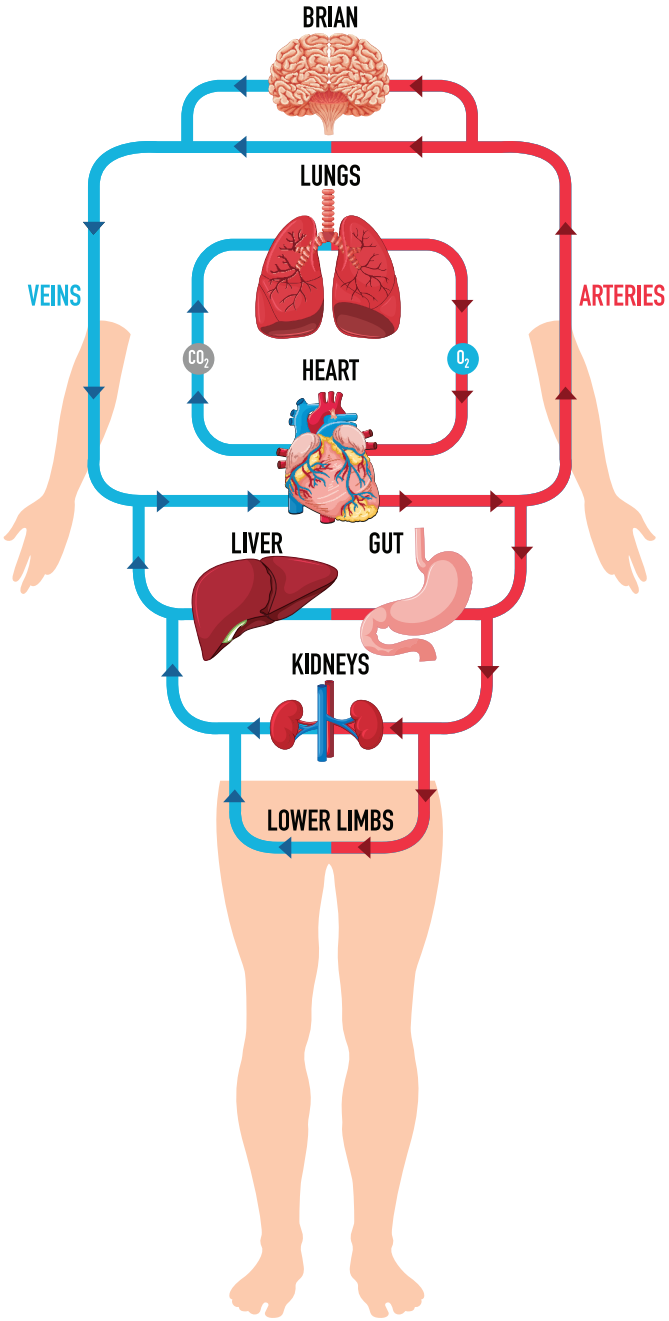
CPR is not just an incredible technique; it›s also a vital skill that everyone should have in their arsenal. Whether you›re a parent, a teacher, or simply a concerned citizen, learning CPR can give you the ability to save lives. The more people who know CPR, the safer our communities become.

Causes of cardiac arrest

Cardiac arrest is a terrifying and life-threatening event that can occur suddenly and without warning. It is a condition where the heart suddenly stops beating, leading to a loss of blood flow to the brain and other vital organs. While there are many potential causes of cardiac arrest, some are more common than others. Let us explore these common causes and gain a deeper understanding of this critical health issue.

One of the most common causes of cardiac arrest is coronary artery disease (CAD). This occurs when there is a buildup of plaque in the arteries, which restricts blood flow to the heart. Over time, this can lead to the development of blockages and can increase the risk of a heart attack.

When a heart attack occurs, it can cause the heart to go into an abnormal rhythm, leading to cardiac arrest. It is crucial to manage CAD through lifestyle changes, medication, and medical procedures to reduce the risk of cardiac arrest.



Another frequent cause of cardiac arrest is arrhythmias. Arrhythmias are abnormal heart rhythms that can disrupt the heart›s electrical system and cause it to stop pumping effectively. These conditions can be caused by various factors such as genetics, high blood pressure, and structural abnormalities in the heart. Proper diagnosis and treatment of arrhythmias are essential in preventing cardiac arrest.

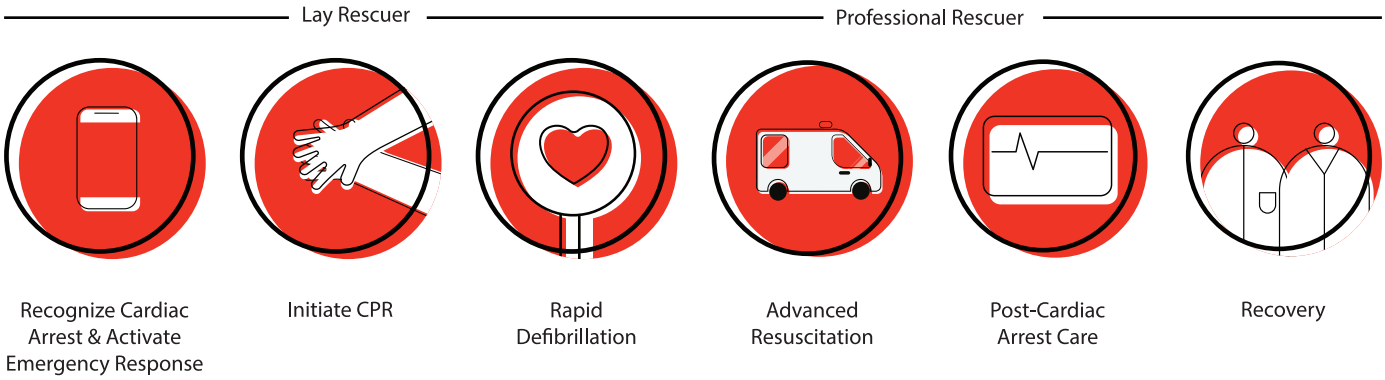
Sudden cardiac death (SCD) is also a significant cause of cardiac arrest. SCD occurs when the heart abruptly stops due to an electrical malfunction. This can happen in individuals with or without prior heart conditions. Certain factors increase the risk of SCD, including a family history of sudden cardiac death, previous heart attacks, and certain medications. Regular check-ups, comprehensive medical evaluations, and awareness of personal risk factors can help identify potential issues and prevent sudden cardiac death.

Other common causes of cardiac arrest include drug overdose, choking, and severe trauma. Drug overdose, particularly from opioids, can depress the central nervous system and lead to respiratory failure and cardiac arrest.

Choking can obstruct the airway, depriving the body of oxygen and causing the heart to stop. Lastly, severe trauma, such as a serious car accident or a significant fall, can disrupt the heart›s normal function and result in cardiac arrest.

While the causes of cardiac arrest may vary, it is crucial to be aware of these common triggers and take proactive steps to prevent them. Maintaining a healthy lifestyle, managing underlying medical conditions, and seeking prompt medical attention for any concerning symptoms are all essential in reducing the risk of cardiac arrest. By staying informed and taking preventative measures, we can work towards a healthier future and minimize the occurrence of this life-threatening event.

Chain of Survival



Adult CPR

At the end of this chapter you will be able to learn :

- Recognize the signs of cardiac arrest in adults (anyone showing signs of puberty and above).
- How to Perform effective chest compression for adults as a single rescuer.
- Explain how to open the airway for adults in different techniques.
- How to provide breaths by using pocket masks for adults.
- Describe the importance of early use of an AED and how to operate it.

Adult CPR

In this part you will learn how to perform high quality CPR when there is a single or multiple rescuers ,we will start to discuss CPR skills for a single rescuer.

Once the rescuer notices that there is someone collapse immediately should do assessment.

1- Assessment:

Assess the surrounding environment by looking if there is any dangerous situation around the victim, quickly move the victim to a safe place without any harm for the rescuer, for example, if the victim is beside fire, try to move the victim to a safer place. If the place is safe, do not try to move the victim as he/she may have other injuries that you cannot see. Simply put him onto his back over a firm surface and start to assess the victim

Assess the Victim by taping at his s

houlder and talk to him loudly, if not responding

- Call for help or EMS system by calling 997 0r 911 and ask to bring AED
- Assess breathing for at least 5 seconds but not more 10 seconds

To save time, assess breathing: look for the chest movement (rise and fall .

If the victim is breathing, put the victim in a recovery position with continuous monitoring for signs of airway occlusion, inadequate or agonal breathing and unresponsiveness.

but if the recovery position is a factor impairing the rescuer provider's ability to determine the presence or absence of signs of life, the person should be immediately positioned supine and re-assessed.

The recovery position put the victim in lateral recumbent positioning with the arm nearest the first aid provider at right angle to the body and elbow bent with palm up and far knee flexed.

- If there is no breathing (or agonal gasp)

- Shout for help and ask the helper to Activate Emergency response system, call 911/997
- and start high quality CPR

2- High quality CPR (cardiopulmonary resuscitation)

Components of CPR:

- **C**:compressions
- **A**:airway
- **B**:breathing

Chest Compressions for Adults

Chest compressions are the most important component of high-quality CPR, during cardiac arrest, the heart stops pumping oxygenated blood to the brain and vital organs, and can cause irreversible damage in minutes.

Chest compression helps in blood flow out of the heart to reach brain and vital organs through arteries, and When pressure on the chest is released, blood is allowed to return to the heart, which may help in minimizing the damage and to stimulate the normal activity of the heart.

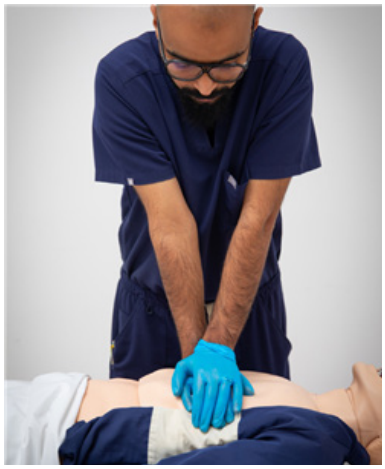
Agonal gasps

Agonal gasps are a sign of cardiac arrest which are uncontrollable, inadequate breathing patterns brought on by hypoxia, or low blood oxygen levels. It is probable that someone is dying since this breathing is abnormal. Due to the fight for oxygen, agonal breaths may be accompanied by some trembling or other muscular action. It sounds like heavy breathing and snoring, or inaudible.

To perform the compression in effective and correct way follow these steps for performing CPR compres- sions:

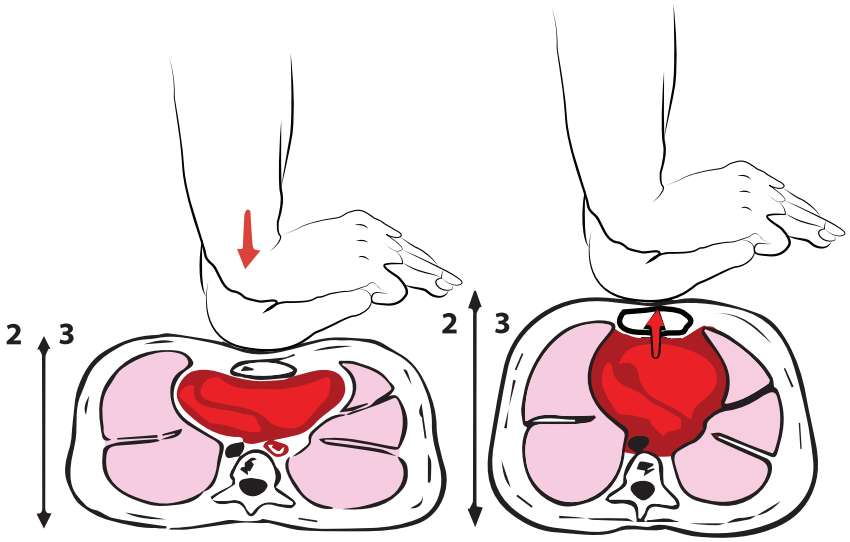
1. Put the victim on his or her back on a firm surface like floor or backboard.
2. Kneel at the victim›s side.
3. Place the lower palm (heel) of one hand over the center of the victim chest, between the two Nipples.

4. Place your other hand on top of the first hand and interlace your fingers.
5. Keep your elbows straight and position your shoulders directly above your hands in a straight line.
6. Push straight down on (compress) the chest at least 2 inches (5 centimeters) but no more than 2.4 inches (6 centimeters), push by Using your body weight.



7. Push fast at a rate of 100 to 120 compressions per minute

8. Allow the chest to recoil (return the chest to normal position) in between compressions. If you do not allow the chest to recoil, the heart will not fill completely, because less blood will be pumped out of the heart to brain and vital organs with the next compression.



9. Helper should start CPR within 10 seconds from recognizing cardiac arrest and try to mini- mize chest compression interruption when finishing 30 compressions (in 15-18 second)to give 2 breaths to less than 10 second to improve survival rate.

Airway: Open the airway

After performing 30 chest compressions, open the person's airway by using the head-tilt chin-lift maneu- ver by putting your palm on the person's forehead and gently tilt the head back. Then with the other hand, lift the chin forward to open the airway.

Jaw thrust is performed if there are suspected head injuries. It is performed by putting the index and middle fingers to push the posterior part of the lower jaw upwards while thumbs push down on the chin to open the mouth.

Breathing

In one-rescuer CPR, breaths should be provided by using any barrier device (a pocket mask) or fface shield, if available. pocket masks provide a barrier between the rescuer and the victim. Some masks are equipped with a one-way valve that allows the rescuer's breaths to enter the victim's airway, but prevents the victim's expired air from entering the rescuer's airway.

To provide breaths by using Pocket mask

1. positioning yourself at the victim's side will allow you to provide ventilations and compressions without moving from the victim's side.
2. put the mask on the victim's face. Masks are usually triangular in shape, and you will notice that the mask 's narrow end should be over the bridge of the victim's nose.
3. Seal the mask against the victim's face. To do this, take the hand that is closest to the top of the victim's head and place it along the edge of the mask with the thumb of your other hand, apply pressure along the bottom edge of the mask. Then place the remaining fingers of your second hand along the bony edge of the jaw and lift the jaw upwards. Open the airway by performing a head-tilt chin-lift procedure. While you lift the jaw, ensure that you are sealing the mask all the way around the outside edge of the mask to obtain a good seal against the victim's face.
4. Deliver air over 1 second, ensuring that the victim's chest rises but avoiding hyperventilation.
   - If the victim's chest does not rise, reposition the mask and try to get a better seal, open the airway and give the second breath, observe chest rises, then resume 30 compression in less than 10 seconds.
   - If the chest doesn't rise after a second breath, resume 30 chest compression repeats the cycles of 30 compression and 2 breaths for 5 times which is equal to 2 minutes then reassess again.

3- Automated external defibrillator (AED)

AED is a device that recognizes ventricular fibrillation and other dysrhythmias and delivers an electric shock, even there is different brands of AED but steps to use the same, and safe for anyone to use, as soon as an AED is available, turn it on and follow the voice prompts.

AED steps

1. Open the case and turn on the AED

2. Remove all clothing covering the chest. If necessary, wipe the chest if wet
3. Open the AED adult pads which is used for age 8 years and above
4. Place one pad on the upper right side of the chest and Place the other pad on the lower left side of the chest, a few inches below the left armpit

5. Plug the pad connector cable into the AED

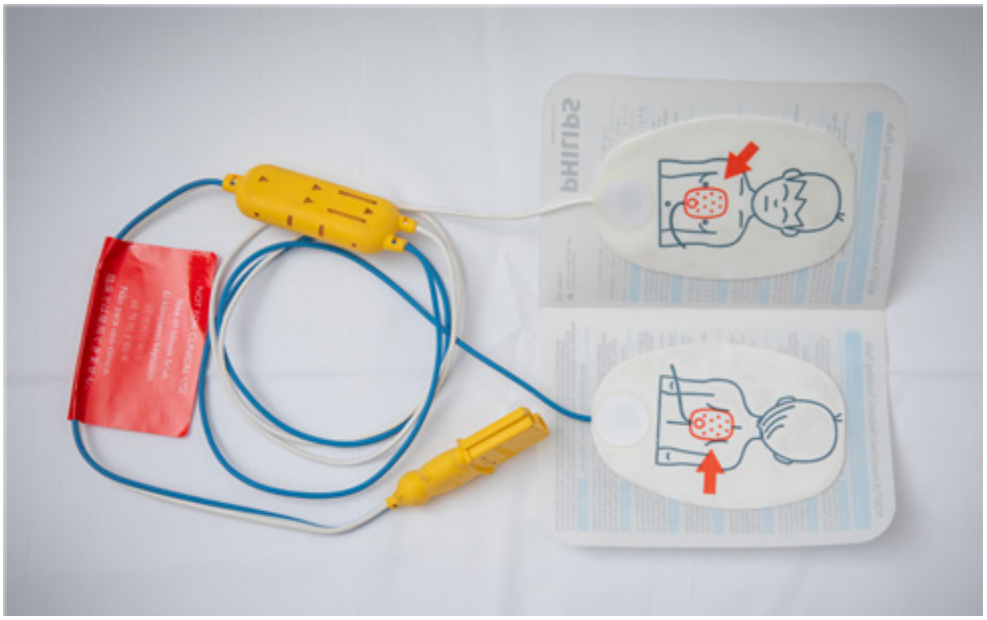
6. Make sure no one is touching the person to let AED analyze the heart rhythm
7. Say, "CLEAR!" in a loud voice

8. If shocked advised
   - Make sure no one is touching the person
   - Say, "CLEAR!" in a loud voice
   - Push the "shock" button to deliver the shock

9. After the AED delivers the shock, or if no shock is advised, immediately start CPR, beginning with compressions.

Special Situation for AED

- The victim has a hairy chest: use a razor to shave the areas covered by the AED pads. If a razor is not available, quickly pull off the pads to remove enough hair to allow a new set of pads to adhere to the victim's skin and press it to ensure good contact with skin.
- The victim is submerged in water: first pull the victim to a dry area, quickly dry the chest and use the AED.
- The victim has an implanted pacemaker: You will recognize it as a small lump under the skin on the chest, usually the upper chest.
- avoid placing the AED pad directly over it; pacemaker stimuli may degrade the accuracy of ECG rhythm analysis or the pacemaker may be damaged by defibrillator discharges; doing so may block delivery of the shock.
- The victim has a medication patch: Do not place an AED pad over the patch. If it won't delay delivery of a shock, remove the patch and wipe the skin before applying the AED pad.
- AED can be used on children and infants and should be used as early as possible for the best chance of improving the chance of survival.
- Pediatric pads should be used if the person is less than eight years old, Standard (adult) pads may be used if pediatric pads are not available. If using standard (adult) pads, do not let the pads touch each other or put one in front and one at the back of the child.



Child CPR

At the end of this chapter you will be able to learn:

- How to perform high-quality CPR for children.
- How to provide ventilations using Pocket mask.

When witnessing a child collapse or arriving at a child who has collapsed with unknown time or when the child has lost consciousness, you should follow the steps below.

1- Assessment

A. Check surrounding for hazard to ensure safety

Checking the surroundings for hazards should be done to ensure your safety first and to avoid further injuries for the victim.

B. Check the victim responsiveness

Gently shake or tap the victim's shoulders. Check to see whether the victim is moving or making sounds. shout, «Are you OK? ». **C. Check the victim breathing by observing chest rise.**

IF the victim is breathing:

- Check for life threatening injuries such as severe bleeding.
- Place the child in recovery position
- Activate EMS 911/997

IF the Victim is not breathing.

Witness collapse: ask the helper to Activate EMS then begin high quality CPR

Unwitnessed collapse: Begin high quality CPR for 5 cycles then call for help and Activate EMS

Only one rescuer is subject to the witness and unwitnessed collapse criteria.

2- High Quality CPR

Start immediate high-quality CPR by following the C-A-B sequence. C- Compressions.

A. Airway opening.

B. Breath administration.

Chest compression for a child has the same principals of the adult compressions with a few differences described in the figure below.

Breathing Check;

Chest rise and fall is the sign of breathing. Observe the chest for up and down movements which will indicate that the child is breathing.

Agonal gasps;

Agonal gasps are a sign of cardiac arrest which are uncontrollable, inadequate breathing patterns brought on by hypoxia, or low blood oxygen levels.

It is probable that someone is dying since this breathing is abnormal. Due to the fight for oxygen, agonal breaths may be accompanied by some trembling or other muscular action. It sounds like heavy breathing and snoring, or inaudible. The individual may even appear to be groaning.

Chest compressions;

Hand placement:

Place the heel of one hand on the lower half of the chest-bone (sternum) then place the other hand over the first hand if you choose to use the two hands technique. One hand technique could be used if the rescuer feels confident that achieving the required depth will be met.

Shoulders should always be vertically on the same line over the rescuer's hands. Lock elbows and make sure to use the shoulders and back to compress the child chest.

Chest Recoil:

Full chest wall recoil is strongly encouraged during cardiopulmonary resuscitation since insufficient chest wall recoil from leaning on the chest might further restrict venous blood return back to the heart and decrease cardiac output, which will lead to poor perfusion to the organs.

Depth:

Press down on the chest-bone (sternum) at least one-third of the chest›s diameter approximately 2in. /5cm

Compressions Rate:

100 to 120 chest compressions per minute. The rate should be done at a steady speed. Rescuers can maximize cardiac output and ensure adequate coronary perfusion pressure while still allowing for full chest recoil and the recommended depth compressions by controlling the rate to between 100 and 120 compressions per minute.

- Going more than 120 chest compression per minute, will not allow the heart to fill again with blood at the same time the rescuer will not be able to allow for a full chest recoil.
- Going Less than 100 chest compressions per minute, the brain, heart, and other essential organs are less likely to receive enough blood flow.
- Chest compressions must not pause for more than 10 seconds.

Breathing:

Assessing ventilation with a pocket mask.

1. Place the pocket mask with a one way valve on the victim's face. Put the mask's widest end over the victim›s chin and just below the bottom lip. The nose-shaped end should be placed over the victim's nose.

   Apply the mask on the victim's face and make sure the seal is tight using both hands, including the thumbs .

2. Then deliver each breath over one second. Make sure to pause between breaths to allow the victim to exhale and for the rescuer to take another breath.

Mouth To Mouth Breathing in Adults & Children

1. Open the airway by head tilt chin lift.
2. Using your thumb and finger of your hand on the forehand, pinch the nose of the victim.
3. Have a regular breath and tightly seal your lips around the victim's mouth so the air will not be leaking.
4. Give 1 breath over 1 second and look for a chest rise. If no chest rise re adjust the mask and re open the airway and give another breath.
5. With 2 unsuccessful attempts, return to chest compression.

A Single Rescuer CPR

A single rescuer should continue to provide 30 chest compressions to 2 rescue breaths until a second rescuer, or EMS arrives.

Between the chest compressions and rescue breaths the rescuer must not pause the chest compressions for more than 10 seconds. If the rescuer after 30 chest compressions tries to give two rescue breaths and the first breath was not effective, then tries to reopen the airway/ re-adjust the mask and the second breath is effective the rescuer should prompt back to resume chest compressions instead of giving a third rescue breath.

Infant CPR

At the end of this chapter, you will be able to learn

- How to assess an infant who has an impending cardiac or respiratory arrest.
- How to perform High quality CPR in infants.
- How to deliver breaths to an infant properly and effectively.

CPR in Infants

The term infant refers to the neonatal period and extends to the age of 1 year (0-1 year). Infant cardiac arrest is most likely a result of respiratory failure or airway obstruction. Majority of the babies require only breathing as their heart is not affected.

However, damage to the brain and other vital organs could occur after a few minutes of being short in O2 leading them to cardiac arrest.

Equipping yourself with the knowledge and skills of performing CPR could save an infant's life.

CPR Skills

1- Assessment

A. Safety of the scene

Look for any signs of danger from the surroundings. Make sure that the scene is safe.

B. Response

Assess for response by tapping the sole of their feet, and talk to them loudly.

C. Check Breathing

Check for breathing by scanning the chest for the rise and fall.

D. Activation

Witnessed – if you're alone and you witnessed the arrest you go and activate the EMS and get the AED.
Unwitnessed- complete 5 cycles of CPR approximately 2 minutes, then activate the EMS and get the AED.

2- High Quality CPR

Position- infant should be on a firm flat surface.

Location of chest compression should be at the center of the chest below the nipple line.

Technique- compression can be done either with 2 thumbs encircling or 2 finger chest compression

1. Two Thumbs Encircling- put the thumbs side by side at the center of the chest just below the nipple line, with the rest of the fingers encircling the chest and back for support.

2. Two fingers- put 2 fingers at the center of the chest. Fingers should remain in an upright position during compression to give proper depth.

- Ratio- for 1 rescuer you do it 30 compressions followed by 2 ventilations (30:2) for 2 rescuers 15 compressions followed by 2 ventilations (15:2).
- Rate- chest compression rate should be 100-120/min.

- Depth- firmly compress the chest to at least 1/3 of the AP diameter of the chest approximately one and a half inches or 4 cm, push hard and fast.
- Chest recoil- complete chest recoil should be done during compression to allow blood to
- flow into the heart. Interruptions during compression should be minimized for a better outcome.

Giving breaths

The predominant cause of cardiac arrest in infants is respiratory failure due to different respiratory problems. Respiratory failure is when the lungs can't get enough oxygen into the blood. Giving chest compressions alone may not be as effective as giving both compressions and breaths. So it is important that right after chest compression, the infant should be given breaths.

Before giving breaths, you must open the airway first. There are two techniques in opening the airway, head tilt chin lift or jaw thrust technique if there is suspected spinal injury.

opening airway technique

Open The Airway	Illustrated Image
Neutral Position Place your hand on the Fore- head and maintain a neutral position of the head .With your fingertips under the point of your infant's chin ,lift the chin .Avoid pushing on the soft tissues under the chin because this may block the airway.	
Jaw thrust kneel behind the infant's head ,Support the head in a neutral position ,head neck spine is aligned .Place the hand at each side of the face with your fingertips on the angle of the mandible .Gently lift the jaw to open the airway.	
Breaths -if the airway is open and Maintainable but the infant is not breathing ,begin rescue breathing 1 breath over 1 second	

Use of barrier device

- Pocket mask- seal the mask with your C technique of your one hand and place the thumb of your other hand at the bottom edge of the mask using your 2 fingers of your hand at the bottom of the mask, open the airway. press firmly the edges of the mask and ventilate the infant, giving 2 breaths (1 sec each) enough to see a chest rise.

Mouth to Mouth & Nose Technique

1. Open the airway by head tilt chin lift.
2. Place your mouth over the infant's nose and mouth with an airtight seal.
3. Give 1 breath over 1 second and look for a chest rise. If no chest rise re adjust the mask and
4. re open the airway and give the 2nd breath.
5. With 2 unsuccessful attempts, return to chest compression.

Relief Foreign Body Airway Obstruction (FBAO)

Choking of Adult, Infant and Children's more than 1 year

Learning Objectives:

At the end of this chapter you will be able to learn:

- How to Recognize signs and symptoms of FBAO (choking).
- How to perform abdominal thrust to relieve FBAO for adults.
- How to perform chest thrust to relieve FBAO for obese and pregnant women.
- How to perform correct steps to relieve FBAO for children more than 1 year.
- How to perform correct steps to relieve FBAO for infants less than 1 year.

FBAO happens when an object is stuck in the throat blocking the flow of air, the correct action for a choking person depends on the degree of airway obstruction, which person is responsive or not, and the age of the person.

Signs of FBAO (choking):

Degree of Obstruction	Persons Response	Rescuers Action
Partial Obstruction	Usually able to speak ,cry ,cough or breathe .	Stay with the person ,en- courage them to cough and call for help
Complete Obstruction	- Clutching the neck) universal sign of choking,(- Unable to cough or talk. - Difficulty breathing or no breathing may be cyanotic	- Use abdominal thrusts - Call for help - Begin CPR if the person becomes unresponsive with checking the object each time you open the airway to give breath ,if the object can be visualized in the mouth, the manual removal of the object considered , if not visualized, do not do blind finger sweep

The initial response to foreign body airway obstruction in a conscious individual should be to encourage coughing as this is a normal physiological response that may be effective and is unlikely to cause harm.

The sequence of interventions in individuals without an effective cough suggested in treatment recommendations seeks to balance the benefits of early removal of the FBAO with the potential harms of interventions, such as abdominal thrusts.

Abdominal Thrusts

To perform abdominal thrusts

1. Stand behind the responsive person. Wrap your arms around their waist under their ribcage.
2. Put the side of your fist above the person's navel in the middle of their belly and below the lower part of the sternum.

3. With your other hand, hold the first fist and press forcefully into the person's abdomen and up toward their chest.

4. Continue performing these thrusts until the obstruction is relieved or until the victim becomes unresponsive put him on a flat surface and start CPR to increase the intrathoracic pressure which helps in exploding the object outside the mouth and checking the object each time you open the airway to give breath, if the object can be visualized in the mouth ,the manual removal of the object considered , if not visualized ,do not do blind finger sweep.

If there is pregnant lady or obese man or if you can't get your arms around the stom- ach, give chest thrusts:

- Put your hands at the base of the breastbone, just above the joining of the lowest ribs.
- Press hard into the chest with a quick thrust.
- Repeat until the blockage is removed from the airway or become unresponsive.

- If become unreceptive start CPR with checking the object each time you open the airway to give breath, if the object can be visualized in the mouth, the manual removal of the object is considered, if not visualized, do not do blind finger sweep.

Figure 8.4 Chest thrust technique for pregnant lady

Infant choking

In a choking but responsive infant less than one-year-old, back slap and chest thrusts are used instead of abdominal thrusts.

1. Put the infant with their face down and their head lower than their chest; they should be resting on your forearm. Put your forearm on your thigh.
2. Support the infant's head and neck with your hand and be sure to avoid putting pressure on their throat.

3. Using the heel of your free hand, deliver five back blows between the infant's shoulder blades .

4. Using both hands and arms, turn the infant face up so they are now resting on your other arm; this arm should now be resting on your thigh.
5. Make sure the infant's head is lower than their chest.
6. Using the fingers of your free hand, provide up to five quick downward chest thrusts over the lower half of the breastbone.

7. If the obstruction is not relieved, turn the infant face down on your other forearm and repeat the process.
8. Continue doing these steps until the infant begins to breathe or becomes unresponsive.
9. If the victim becomes unresponsive, start CPR and observe the object each time you open the airway to give breaths, if the object can be visualized in the mouth, the manual removal of the object is considered, if not visualized, do not do blind finger sweep.

References

- International First aid, resuscitation, and education guidelines 2020 by International Federation of Red Cross and Red Crescent Societies (IFRC) . 2020 ILCOR Guidelines: The Latest Updates to First Aid
- Centers for Disease Control and Prevention. How to Prevent or Respond to a Snake Bite. (http://emergency.cdc.gov/disasters/snakebite.asp)
- World Health Organization. Neglected tropical diseases: Snakebite. (http://www.who.int/neglected_diseases/integrated_media_snakebite/en/).
- World Health Organization. Snakebite. (https://www.who.int/health-topics/snakebite#tab=tab_3).
- American red cross (https://www.redcross.ca/training-and-certification/first-aid-tips-and-resources/first-aid-tips/heat-related-emergencies)
- Centers for Disease Control and Prevention. How to Prevent or Respond to a Snake Bite. (http://emergency.cdc.gov/disasters/snakebite.asp)
- World Health Organization. Snakebite. (https://www.who.int/health-topics/snakebite#tab=tab_3).
- Chippaux, JP. Letter to the Editor: Snakebite envenomation turns again into a neglected tropical disease. Journal of Venomous Animals and Toxins including Tropical Diseases.
- Hifumi T, Sakai A, Kondo Y, Yamamoto A, Morine N, Ato M, et al. Venomous snake bites: clinical diagnosis and treatment. Journal of Intensive Care. 2015; 3(16).

NOTES

جمعية القلب السعودية

Saudi Heart Association

National Life Support Committee

HeartSaver First Aid CPR AED