CHAPTER 1: PRINCIPLES AND PRACTICE OF FIRST AID

Definition of first aid
1. First aid refers to the actions taken in response to someone who is injured or suddenly taken ill
2. A first aider is a person who takes this action

Aims of first aid
- Preserve life
- Prevent the condition from becoming worse
- Promote recovery

Responsibilities and duties of first aider
- Give first aid to the casualty
- Keep a record of all treatment given
- Maintain the first aid box
  - Replenish contents regularly
  - Ensure only first aid items are kept in the box

Responding to emergency
- Be calm in your approach
- Be aware of risks to yourself and others
- Build and maintain trust
- Give early treatment
- Call appropriate help
- Remember your own needs
First Aid Priorities
- Assess a situation quickly and calmly
- Protect yourself and casualty from danger
- Prevent cross contamination
- Provide comfort and reassure the casualties
- Give early treatment, most serious (life-threatening) first
- Arrange appropriate help:
  - Call 995
  - Transfer to the care of a healthcare professional; or home

Calling for ambulance
- Dial 995
- State
  - Your telephone number
  - The exact location of incident
  - Type and gravity if the emergency
  - Number, gender and age of casualties
  - Details of any hazards

Universal Precautions
- Wash your hands and wear disposable gloves
- Cover cuts and grazes with waterproof dressings
- Wear plastic apron and plastic glasses for eye protection
- Use a resuscitation mask (face shield or pocket mask) when giving rescue breaths
- Dispose all waste safely
- Do not touch a wound or the part of dressing that will touch a wound
- Do not breathe, cough or sneeze over the wound
- If you accidentally prick or cut your skin, or splash your eye, wash the area thoroughly and seek medical help immediately
CHAPTER 2: WOUNDS, BLEEDING AND SHOCK

Basic Anatomy and Physiology of the circulatory system

The heart and blood vessels

- The heart and blood vessels make up the circulatory system.
- They supply the body with blood which brings oxygen and nutrients to tissues and carries waste products away.

The heart pumps blood around the body and then to the lungs to pick up oxygen

The blood flows through a network of 3 types of blood vessels: arteries, veins and capillaries. Capillaries link arteries and veins within body tissues. Oxygen and nutrients pass from the blood into the tissues and waste products pass from the tissues into blood through them.

Composition of blood

- There are about 6 litres of blood in an average adult body (1L per 13kg body weight)
- Red blood cells carry the oxygen; white blood cells play a role to defend the body against infection; platelets help blood to clot.
Wound healing process
a) Platelets and other cells arrive at injured site
b) Platelets form a clot in the blood and blood clotting protein
c) Tissue-forming cells move in to start repair
d) A plug of fibrous tissues formed within the clot
e) The plug hardens forming a scab that drops off when the skin below is healed

TYPES OF BLEEDING

Bleeding (haemorrhage) is classified by the type of blood vessel that is damaged

Artery (carries oxygenated blood under high pressure)
   i) Profuse bleeding
   ii) Blood squirts out in time with heartbeat
   iii) Volume of circulating blood falls rapidly (Main artery)

Veins (carries deoxygenated blood under low pressure)
   i) Darker red
   ii) Less pressure than arterial blood
   iii) gush out profusely (large vein)

Capillary (occurs with any wound)
   i) Brisk initially, but blood loss is usually slight

MANAGEMENT OF BLEEDING FROM COMMON SITES

TYPES OF WOUNDS

a) Incision
   i) caused by a clean cut from a sharp edge like a razor
   ii) Bleeding may be profuse
   iii) Tendons or nerves may be damaged
b) Laceration
   i) Crushing or ripping forces may cause tears or laceration
   ii) Bleed less profusely but more tissue damage than incised wounds
   iii) High risk of infection

c) Abrasion (Graze)
   i) Top most layers of skin a scraped off leaving raw, tender area
   ii) Caused by sliding fall or friction burn
   iii) Embedded foreign particles may cause infection

d) Contusion (Bruise)
   i) A blunt blow ruptures capillaries beneath the skin
   ii) Blood leaks into the tissues
e) **Puncture**
   i) Can be caused by nail or needle
   ii) Small entry site but deep track if internal damage
   iii) High risk of infection

f) **Gunshot**
   i) Caused by bullet or missile driven into the body
   ii) Entry wound is small; exit wound large and ragged

g) **Stab wound**
   i) Can be caused by long or bladed instrument
   ii) Stab wounds to the risk have risk of injury to vital organs and internal bleeding
Cuts and Grazes
Bleeding is easily controlled by pressure and elevation
Seek medical help only if there is risk of infection

Treatment
1) If wound is dirty, clean under running water or use alcohol-free wipes
2) Dry the wound with gauze and cover with sterile gauze
3) Clean area around the wound with soap and water (wipe away from wound)
4) Pat dry
5) Remove wound covering and apply sterile dressing

Wound to palm
May cause profuse bleeding. If deep, tendons and nerves may be severed causing loss of feeling or finger movements

Treatment
1) Ask casualty to clench his fist over a sterile dressing or pad and elevate it
2) Bandage with his fingers clenched over the pad leaving the thumb free
3) Tie the knot over the fingers to maintain pressure
4) Support the arm in an elevation sling
5) Send the casualty to hospital

Bruising
Caused by bleeding into the skin or tissues beneath the skin

Treatment
1) Raise and support the injured part
2) Apply firm pressure to the bruise with cold compress for at least 10 minutes (Rest, Ice, Compression and Elevate technique, refer to page 22)
Foreign object in a wound
Remove loose foreign object e.g. glass pieces or grit from a wound. Pick them out with tweezers, if available or rinse off with cold water. **DO NOT** remove those firmly embedded.

**Treatment**
1) Control bleeding with pressure on both sides of the object and elevation
2) Cover the wound and object with a piece of gauze
3) build up padding (e.g. rolled bandages) sufficiently high on both sides of the object and bandage without pressing the object into the wound
4) If the object protrudes above the padding, bandage on the sides of the object

Scalp and head Wounds
**Treatments**
1) Replace any displaced flaps of skin on the wound
2) Cover the wound with a sterile dressing or pad
3) Apply firm pressure to control bleeding
4) Bandage to secure the pad and maintain pressure
5) Call 995 for ambulance if casualty feels faint or is in shock
6) If unconscious, do “ABC” check and perform CPR if needed

Impalement
**Treatment**
1) Call 995 for ambulance explaining the situation clearly
2) support the casualty’s body until the ambulance arrive
3) DO NOT allow the casualty to eat or drink
4) Do NOT attempt to lift the casualty off the object
Severe external bleeding

Treatment
1) Expose the wound
2) Apply direct pressure on the wound with a sterile dressing or clean pad and maintain it
3) Raise and support the injured limb
4) secure dressing with a firm bandage
5) treat for shock
6) If blood seeps through the dressing apply a second one over the first
7) If blood again seeps through, remove both dressing and apply a new one, ensuring the pressure is applied accurately at the point of bleeding
8) Call 995 for ambulance
9) Monitor vital signs (refer to page 69 and circulation beyond the bandage)

Amputation

Treatment
1) Control bleeding with direct pressure and elevation
2) Place sterile dressing or clean pad on the wound and secure it with a bandage
3) Treat for shock; monitor vital signs (refer to page 69)
4) Put severed part in a plastic bag, wrap the plastic bag in a container of crushed ice
   a. Mark container with the time and name of casualty and hand it to the ambulance personnel
   b. DO NOT allow the casualty to eat or drink

Crash injury

Two serious complication
i) Shock
ii) Crush syndrome

Treatment
- If crushed for less than 15 minutes
  o Control bleeding; treatment fractures and shock
- If crushed for more than 15 minutes or unable to move the cause of injury
  o Leave the casualty in position found
Abdominal Pain

Treatment
1) lie the casualty down and loosen tight clothing
2) cover the wound with a sterile dressing asking casualty to hold it firmly
3) raise and support his knees to ease strain on injury
4) call 995 for ambulance
5) Do not touch any protruding intestine
6) cover with clean plastic bag or film to prevent intestine surface from drying out
7) do not let casualty eat or drink
8) if unconscious, check for breathing
9) if breathing, turn him to recovery position while supporting abdomen

Internal bleeding
This may follow an injury or occur spontaneously as in bleeding from stomach ulcer. Most obvious sign is a discharge of blood from a body opening. **Main risk is SHOCK.** Treat as shock.

Recognition
- Signs and symptoms of shock
- Possible collapse and unconsciousness
- Bleeding from orifices
- “Pattern bruising” in cases of violent injury
- Pain
- History of recent injury or illness

**Possible signs of internal bleeding**

<table>
<thead>
<tr>
<th>Site</th>
<th>Appearance</th>
<th>Cause of blood loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth</td>
<td>Bright red, frothy, coughed up blood</td>
<td>Bleeding in lungs or Bleeding within digestive system</td>
</tr>
<tr>
<td>Body Part</td>
<td>Symptoms</td>
<td>Causes</td>
</tr>
<tr>
<td>-----------</td>
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<td>--------</td>
</tr>
<tr>
<td>Ear</td>
<td>Fresh, bright red blood or thin watery blood</td>
<td>Injury to inner or outer ear. Perforated eardrum</td>
</tr>
<tr>
<td>Nose</td>
<td>Thin, watery blood or Fresh bright red blood</td>
<td>Leakage of fluid from around the brain due to head injury</td>
</tr>
<tr>
<td>Anus</td>
<td>Fresh bright red blood or black, tarry, offensive smelling stool</td>
<td>Piles, injury to the anus or lower intestine or Disease or injury to the intestine</td>
</tr>
<tr>
<td>Urethra</td>
<td>Red or smoky appearance to urine, occasionally with clots</td>
<td>Bleeding from the bladder, kidneys or urethra</td>
</tr>
<tr>
<td>Vagina</td>
<td>Either fresh or dark blood</td>
<td>Menstruation; miscarriage; pregnancy; recent birth; assault</td>
</tr>
</tbody>
</table>

**Nosebleed**

**Treatment**
- Ask casualty to sit and tilt her head forward for blood to drain from nostrils
- Ask her to pinch the soft part of her nose for 10 minutes and breathe through her mouth
- Release after 10 minutes and if bleeding has not stopped, reapply the pressure
- When bleeding stops ask her not to blow her nose
- IF bleeding is severe or last for more than 30 minutes send casualty to hospital

**MANAGEMENT OF SHOCK**

**SHOCK**
A life threatening condition occurring when the circulatory system fails and vital organs, like the heart and brain are deprived of oxygen
Recognition
Initially
- Rapid pulse
- Pale, cold clammy skin sweating

As shock develops
- Rapid, shallow breathing
- Weak “thready” pulse
- Grey-blue skin (cyanosis)
- Weakness and dizziness
- Nausea, possibly vomiting
- Thirst

As the brain’s oxygen supply weakens
- Restlessness and aggressiveness
- Yawning and gasping for air
- Unconsciousness
- Finally, the heart will stop

Effects of Blood or fluid loss (blood volume 6 litres)

<table>
<thead>
<tr>
<th>Approximate volume lost</th>
<th>Effects on body</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 litre</td>
<td>Little or no effect</td>
</tr>
<tr>
<td>Up to 2 litre (⅓)</td>
<td>Pulse quickened; sweating</td>
</tr>
<tr>
<td>Over 2 litres (more than ⅓)</td>
<td>Pulse at the wrist may become undetectable. Casualty becomes unconscious, breathing and heart stop.</td>
</tr>
</tbody>
</table>

Treatment
- Treat the cause of shock, e.g. Severe bleeding, serious burns
- Raise and support legs above heart level
- Loosen tight clothing at neck, chest and waist
- Cover casualty’s body and legs with a blanket
- Call 995 for ambulance
- Monitor vital signs (refer to page 69)
- IF casualty becomes unconscious, do “ABC” check and perform if needed
- DO not allow casualty to eat or drink or warm him with any direct source of heat
MANAGEMENT OF BITES AND STINGS

Animal and human bites
- Bites from sharp teeth may cause puncture wounds and carry infection, risk of rabies or tetanus. A human bite has a risk, though small, of hepatitis or HIV/AIDS virus infection.

Treatment
- Wash the wound thoroughly with soap and water to minimize the risk of infection.
- Raise and support the wound; pat dry with gauze swipes.
- Cover the wound with sterile dressing.
- Send the casualty to the hospital.

If the wound is deep
- Control the bleeding by applying direct pressure and elevation.
- Cover the wound with sterile dressing and bandage firmly.
- Treat for shock.
- Call 995 for ambulance.

Insect sting

Recognition
- Pain, redness and swelling.
- May have allergic reaction (see anaphylaxis).
- Breathing difficulties.
- Swelling of face and neck, etc.

Treatment
- Reassure casualty.
- If sting is visible scrape it off with a plastic card of fingernail.
- Elevate affected part and apply cold compress for at least 10 minutes.
- Seek medical advice if pain and swelling persists.
- If he shows signs of allergic reaction, e.g. wheezing, call 995 for ambulance.
- Monitor vital signs (refer to page 69).
For stings in the mouth and throat, give ice or cold water to sip. Call 995 if swelling develops

Snake Bite
Recognition
- A pair of puncture marks
- Severe pain, redness, swelling
- nausea, vomiting
- disturbed vision
- increased salivation and sweating
- Laboured breathing, may stop altogether

Treatment
- Let casualty lie down with head and shoulders raised; reassure him
- Tell him to keep calm and be still
- Call 995 for ambulance
- Apply a pressure bandage over the bite
- Apply another pressure bandage from the bite up to the limb
- Immobilise the limb
- If he becomes unconscious, do “ABC” check and perform CPR if needed

DO NOT apply a tourniquet, slash the wound or try and suck out the venom

TYPES OF BANDAGES AVAILABLE

Roller Bandage (Three main Types)
- Open weave - holds for dressing in place
- Self-adhesive support for muscle/joint injuries
- Crepe-support for injured joints

Securing Roller Bandages
PRINCIPLES AND TECHNIQUES IN APPLYING BANDAGES

Rules for applying bandages
- Reassure the casualty; help him to a comfortable position
- Work from front; support injured part
- Pass bandages under the body through “natural holes”
- Apply bandages firmly
- Use reef knots; knots should not cause discomfort
- Expose fingers/toe, check circulation beyond bandage

Triangular bandages
Open triangular bandage

Tying Reef Knot
Secure your bandage with a reef knot. It will not slip, is easy to untie and is flat.

Untying a Reef Knot
1. Pull one end and adjacent part of the bandage until straightened
2. Hold the knot and pull the straightened end out through it.
DRESSING
Rules for using dressing
- Use disposable gloves
- Cover wound beyond edges
- Hold the dressing by the edge
- Put a dressing from top down; replace dressing that slips out of position
- If you have only one sterile dressing, use this piece to cover the wound directly
- If blood seeps through put another layer of dressing over the first; if it seeps again, remove all and apply a new one
- After treatment dispose the soiled items safety

Cold compresses
- Cold-pad
  - A pad soaked in cold water for at least 10 minutes
- Ice pack
  - Ice cubes in a plastic bag wrapped with clothes for 10 minutes or more

PRACTICAL ON BANDAGING OF WOUNDS

Applying a Sterile Wound Dressing

Applying roller bandage
Elbow and Knee Bandages

Check circulation beyond the bandage

Hand Bandage

Check circulation beyond the bandage

Palm Bandage

Check circulation beyond the bandage

Arm sling

It provides support for an injured arm on a casualty whose elbow can be bent.
Elevation sling
This sling supports the forearm and hand in a raised position. It can help control bleeding at the forearm or hand.

CHAPTER 3: FRACTURES & SOFT TISSUES INJURIES

At the end of the chapter, participants will achieve the following learning objectives:

- Basic skeleton structure
- Signs and symptoms of fractures, sprains, strains, dislocations
- Management of the common fractures: head, jaw, collarbone, upper limb (upper arm, lower arm, hands, fingers), lower limb (thighbone, kneecap, pelvis) and spine
- Management of soft tissue injuries & wounds
- Practical

BASIC SKELETON STRUCTURE
THE SKELETON
The body is built on a framework of bones (the skeleton). It supports the muscles, blood vessels and nerves and also protects important organs.
BONES, MUSCLES AND JOINTS

THE BONES
Bone is a living tissue containing calcium and phosphorus that make it hard, rigid and strong.

THE MUSCLES
- Muscles enable various parts of the body to move
- Skeletal muscles are attached to bones by tendons.
- Involuntary muscles operate the internal organs.

THE JOINTS
- A joint is where bones meet.
- The bone ends are joined by ligaments and protected by smooth cartilage.
A **FRACTURE** is a break or crack in a bone.

Fractures can also be **stable** or **unstable**.

**Recognition**
- Deformity, swelling and bruising
- Pain. Difficulty with movement.
- Shortening, bending or twisting of a limb.
- Coarse grating (crepitus) may be heard or felt.
- Signs of shock.
- Unnatural movement.
- A wound; bone ends may protrude.

**Treatment (Closed Fracture)**
- Support the joints above and below the injured site with your hands.
- Place padding around the injury for extra support.
- Call 995 for ambulance.
- For firmer support or if ambulance is delayed, immobilise the injured part to an unaffected part of the body. For upper limb immobilise against the trunk.
- For lower limb secure injured leg to the uninjured leg.
- Treat for shock.
- Monitor vital signs (refer to page 69)

Treatment (Open Fracture)
- Cover the wounds with a sterile dressing and pad.
- Secure with a bandage.
- Apply pressure around the injury to control any bleeding.
- Immobilise and treat as for a closed fracture.
- Tie know on the uninjured side.
- If a bone, protrudes, build up pads around it and bandage without pressing on it.
- Do not allow the casualty to eat or drink.
- Do not move the casualty until the injured part is secured unless there is immediate danger.

DISLOCATED JOINT
- Severe pain.
- Inability to move the joint.
- Swelling and bruising.
- Shortening, bending or deformity of the area.

Treatment
- Ask the casualty to keep still.
- For shoulder, support arm with a sling and immobilise with a broad bandage around the body for extra support.
- For leg, immobilise with broad bandages.
- Call 995 for ambulance.
- Treat for shock if necessary.
- Do not replace the bone into its socket.
- Do not allow casualty to eat or drink.

STRAINS AND SPRAINS
Muscles and tendons may be strained, ruptured or bruised.
- A STRAIN occurs when the muscle is overstretched.
A SPRAIN occurs when a ligament at or near a joint is torn.

Recognition
- Pain and tenderness.
- Difficulty in moving.
- Swelling and bruising.

Treatment
- **Rest** – Rest the injured part
- **Ice** – Apply ice pack or cold pad to the area
- **Compress** – Wrap area with soft padding and secure it with a support bandage
- **Elevate** – Elevate the injured part

If pain is severe or casualty is unable to use injured part, send him to hospital.

MANAGEMENT OF THE COMMON FRACTURES

Head Injury
All head injuries are potentially serious. Assume a casualty with head injury may have a neck (spinal) injury. Therefore take great care.

Advise casualty to seek medical advice if:
- Drowsiness, headache worsens
- Confusion/ strange behaviour, memory loss, vomiting episodes set in since the injury
- Has weakness in an arm or leg or speech difficulties
- Has visual problems
- Blood/ clear fluid leaks from nose or ear
- Has unusual breathing problems

Facial Injury

Recognition
There may be:
- Pain around affected area
- Difficulty speaking, chewing, swallowing, breathing
- Swelling, bruising, facial distortion and/or a black eye
- Clear fluid or watery blood from the ear or nose
- May have neck injury
Treatment
• Call 995 for ambulance
• Help casualty to sit down and ask him to spit out blood, displaced teeth or denture
• Apply a cold compress to the face
• Treat for shock and monitor vital signs
• Do not allow casualty to eat or drink
• Do not bandage around the lower part of the face or lower jaw in case he vomits or has breathing difficulties

If casualty loses consciousness:
• Open airway, check breathing and do CPR if needed.
• If he is breathing, put him in recovery position with injured side down.
• Put soft padding under his head.

Lower Jaw Injury
Recognition
• Pain; difficulty speaking, swallowing and moving the jaw
• Loose teeth; dribbling
• Swelling and bruising

Treatment
• Help casualty to sit with head forward. Ask him to spit it any loose teeth
• Give casualty a pad to hold and support the jaw
• Call 995 for ambulance

Collar Bone Injury
Usually the fracture is caused by an indirect force transmitted from an impact at the shoulder or along the arm

Recognition
• Pain and tenderness
• Swelling and deformity at shoulder
• Casualty may support at elbow and incline head to injured side

Treatment
• Help casualty to sit down
• Support the arm on the injured side with an elevation sling
- Place padding between arm and body
- Tie a broad bandage over the sling and body
- Call 995 for ambulance
- Do not let casualty eat or drink

**Hand and Finger Injuries**
Multiple fractures, usually caused by crashing injuries

**Treatment**
- Loosely cover the wound with sterile dressing
- Wrap the hand in soft non-fluffy padding
- Support the arm with an elevation sling
- Tie a broad bandage over the sling and body
- Call 995 for ambulance

**Upper Arm Injury**

**Recognition**
- Pain and tenderness
- Swelling, bruising, deformity

**Treatment**
- Place forearm horizontally and ask to support his elbow
- Support the arm in an arm sling
- Tie a broad bandage over the sling and body
- Call 995 for ambulance

**Forearm and Wrist Injuries**

**Recognition**
- Pain
- Swelling, bruising, deformity

**Treatment**
- Steady and support the forearm across the body
- Surround it with padding, e.g. a towel
- Support the arm in an arm sling
- Tie a broad bandage over the sling and body
- Call 995 for ambulance
Elbow Injury

Recognition
- Pain, tenderness
- Swelling, bruising, deformity
- Fixed elbow

Treatment
- If elbow can be bent treat as for upper arm injury
- If elbow cannot bend place padding around the elbow
- Secure the arm with broad bandage, avoiding the fractured site
- Call 995 for ambulance

Rib Injury

Recognition
- Swelling, bruising
- Pain at site of injury
- Shallow breathing
- A wound, sound of air being ‘sucked’ into chest cavity
- Paradoxical breathing
- Signs of internal bleeding and shock

Treatment
- Support the arm on injured side in a sling
- Call 995 for ambulance

If there is a penetrating chest wound:
- Sit casualty on the floor leaning towards injured side. Support with cushions
- Cover and seal the wound (see ‘Penetrating Chest Wound’ under ‘Respiratory Problems’)
- Place arm (injured side) in an elevation sling
- Call 995 for ambulance
- Monitor vital signs (level of response, breathing, pulse and body temperature)

If casualty loses consciousness:
- Open airway, check breathing
- If breathing, put in recovery position on his injured side
Hip and Thigh Injuries

Recognition
- Pain, inability to walk
- Signs of shock
- Leg shortening; knee and foot turning outwards

Treatment
- Help casualty to lie down
- Gently straighten his leg. Stop if this increases pain
- Call 995 for ambulance
- Support the leg at knee and ankle until ambulance arrives

If ambulance is delayed
- Immobilise by securing the injured leg to the uninjured
- Bring the sound leg alongside the injured
- Secure with bandages at the ankles and feet, knees, above and below fractured site
- Do not let the casualty eat or drink

Lower Leg Injury

Recognition
- Pain, inability to stand
- An open wound
- Swelling, bruising and deformity

Treatment
- Help casualty to lie down
- Steady and support his injured leg
- Treat any wound present
- Call 995 for ambulance
- Support the leg with hands above and below fractured site until ambulance arrives
If ambulance is delayed
- Immobilise by securing the injured leg to the uninjured
- Bring the sound leg alongside the injured
- Secure with bandages at the ankles and feet, knees, above and below fracture site
- Insert padding between the legs
- Tie knots on the uninjured side

Fractured Pelvis

Recognition
- Inability to stand
- Pain, tenderness in hip, groin, back regions, increasing with movement
- Difficulty, pain passing urine
- Signs of shock and internal bleeding

Treatment
- Help casualty to lie down with knees slightly bent and supported
- Call 995 for ambulance
- Immobilise the legs with bandages at the feet/ankles and knees
- Do not bandage the legs if this causes more pain

Knee Injury

Recognition
- Pain on moving the knee
- Swelling at the knee

Treatment
- Help casualty to lie down
- Put padding such as pillows under the knee to support it
- Wrap padding round the knee and bandage from mid-lower leg to mid-thigh
- Call 995 for ambulance
- Do not forcibly straighten the knee
- Do not allow casualty to eat or drink
Spinal Injury
The most serious risk is damage to the spinal cord causing loss of power/sensation below the injured area. If spinal cord is partly or completely severed damage may be permanent. Take care to avoid unnecessary movement of head, neck, and spine always.

A spinal injury is possible from the following:
- Falling from a height, falling awkwardly
- Diving into a pool and hitting the bottom
- Falling from horse/ motorbike
- Heavy object falling on the back
- Sudden deceleration
- Collapsed rugby scrum
- Injury to the head

Recognition
When vertebrae is damaged:
- Pain in the neck, back or injury site
- Step, irregularity or twist
- Tenderness in the skin

When spinal cord is damaged:
- Loss of control of limbs; movement weak or absent
- Loss of or abnormal sensations
- Loss of bladder/ bowel control
- Breathing difficulties

Treatment (Conscious Casualty)
- Reassure casualty, ask him not to move
- Call 995 for ambulance
- Kneel/ Lie behind casualty’s head; with elbows resting on the ground/ knee, grasp the sides of his head; do not cover the ears
- Steady and support the head in this neutral position(head, neck, spine are aligned)
- Ask helper to put rolled-up blanket, towels, etc on both sides of his head and neck
- Continue supporting him until ambulance arrives
- Ask helper to monitor vital signs
- Do not move casualty from the position found unless there is immediate danger

Treatment (Unconscious Casualty)
- Kneel/ Lie behind casualty’s head; with elbows resting on the ground/ knee, grasp the sides of his head
- Support the head so that the head, trunk and legs are in a straight line
- Call 995 for ambulance
- Open airway (do not tilt his neck), check breathing
- If breathing, continue to support his head and wait for ambulance
- If not breathing, start CPR
- If needed, turn casualty using the log-roll technique
- Monitor vital signs while waiting for ambulance

**Handling casualty with spinal injury**

**MANAGEMENT OF SOFT TISSUES INJURIES**

**Cramp**
A sudden painful spasm in one or more muscles. It can be relieved by stretching and massaging the affected muscles.

**Treatment**

**Cramp in the foot**
- Let casualty stand; rest his foot on your knee to stretch the muscles
- Massage the affected part
Cramp in the Calf Muscles
● Straighten casualty’s knee and support his foot
● Flex his foot towards his shin and massage his calf

Cramp in the Front of the Thigh
● Let casualty lie down; raise his leg and bend his knee
● Massage the affected part

Cramp in the Back of the Thigh
● Let casualty lie down; raise his leg and straighten his knee
● Massage the affected part
General Rules for Applying Body Splint
● Pass the bandages under the body’s natural hollows, if casualty is lying down.

CHAPTER 4: HANDLING & TRANSPORTATION OF THE INJURED

At the end of the chapter, participants will achieve the following learning objectives:
● Demonstration of transportation techniques (1 and 2-man transport techniques)
● Practical

CASUALTY HANDLING
Leave a casualty in the position in which you find him until medical help arrives. Move him only if he is in imminent danger, it is safe for you and you have the training and means to do so.

A casualty should be quickly moved if he is in imminent danger from:
● Drowning
● Fire
● Explosion or gunfire
● Collapsing building or structure
Assisting a Casualty Safely

- Select a relevant method
- Use a team
- Plan your move
- Prepare any equipment
- Use the correct technique
- Ensure the safety of all involved
- Explain to casualty; ask for cooperation
- Position close to casualty’s body
- Adopted a stable position
- Use the strongest muscles in your legs and arms; bend your knees

1- MAN TRANSPORT TECHNIQUE

Arm Drag

- Used as an alternative to the ankle drag
- Can result in back injury for first aider
- DO NOT use this method if there are shoulder, head or neck injuries

Cradle

- Used to carry a child or light casualty
- DO NOT use this method if there are neck or spine injuries

Human Crutch

- Used when a casualty has an injured leg or foot but is able to walk on the uninjured leg with your assistance
- If possible, give the casualty a walking aid for extra support
Piggy Back
  ● Used for conscious patients with lower limb injuries who are able to hand on with their arms

2-MAN TRANSPORT TECHNIQUE

Two-people Human Crutch →
  ● Used for a casualty who can support weight on one leg without making the injury worse

Two-handed seats →
  ● Used for any conscious casualty who can be carried in a sitting position, but needs support from both first aiders

Three-handed seats
  ● Used when one leg needs supporting.

Four-handed seats →
  ● Used when casualty is able to use one or both arms to help
Fore and Aft →
- Used when operating in a narrow area
- DO NOT use this method if the arms, shoulders, or ribs are injured

Carry Chairs →
- Used for conscious casualty

CHAPTER 5: CARDIO-PULMONARY RESUSCITATION (CPR)

At the end of the chapter, participants will achieve the following learning objectives:
- The Anatomy and Physiology of the Circulatory System
- Chain of Survival
- Principles of Resuscitation
- Universal Precautions
- Resuscitation Sequence and Techniques for one-man CPR
- Practical Sessions

THE CIRCULATORY SYSTEM
Heart and network of blood vessels that are together known as circulatory system work constantly to keep all parts of the body supplied with blood, which carries vital oxygen and nutrients.
System can fail for two main reasons:
- Severe bleeding and fluid loss.
- Age or disease.

**HEART ATTACK**
A heart attack is commonly caused by a sudden obstruction of blood supply to part of the heart muscle

**Recognition**
- Persistent vice-like central chest pain, spreading to the jaw and down the arms.
- Pain does not ease when casualty rests.
- Breathlessness; discomfort high in the abdomen like severe indigestion.
- Collapse without any warning.
- Suddenly faintness or dizziness.
- “Ashen” skin and blueness of lips.
- Rapid, weak, irregular pulse.
- Profuse sweating.
- “Air hunger” — gasping for air.

**Treatment**
- Put the casualty in a half-sitting position with his head and shoulders supported and knees bent.
- Call 995 for ambulance; inform that a heart attack is suspected.
- Monitor vital signs until ambulance arrives.
- If casualty loses consciousness do “ABC” check and perform CPR if needed.

**THE CHAIN OF SURVIVAL**
Any delay should be avoided as this can reduce the chance of survival.

PRINCIPLE OF RESUSCITATION

- **Early Access**: Recognise sudden cardiac arrest, immediately call ambulance 995 for EMS and get AED if it is available on site.

- **Early CPR**: Immediately start CPR to provide oxygen rich blood to the brain and heart. CPR cannot restart the heart; it can buy time until defibrillation is available or help arrives.

- **Early Defibrillation**: Defibrillation of the victim as soon as AED arrives. Time/speed is the crucial factor for the successful survival rate.

- **Early Advanced Care**: Trained healthcare providers to administer advanced lifesaving interventions.

Each link is closely dependent, crucial to increase the victim’s chance of survival.

**D R S A B C D**

**D** Danger: E.g. hostile environment, lighting, lethal gas, fire, explosion, building collapse, fast traffic

**R** Response: ‘Hello! Hello! Are you OK?’ No response

**S** Shout: Call Ambulance 995. Get an AED.

**A** Airway: ‘Head tilt-chin lift’. Remove foreign body if visible

**B** Breathing: Look, listen and feel. No breathing

**C** Chest Compression (starts CPR (30:2)

**D**

Get AED as soon as possible
Exclude AED danger, prepare chest
On, Attach, (Analyse), Shock ➔ CPR x 1-2 min. Analysis

**UNIVERSAL PRECAUTIONS**

- Use a one-way valve resuscitation mask during CPR.

- Wear gloves to reduce contact with blood, secretion and body fluid on the casualty’s mouth or face.
- Clean and disinfect the mask each use.

One Rescuer CPR for Adult Victim (Ratio = 30:2)

Perform 30 Chest Compressions
- **Compression** to the depth of at least 5 cm
- At the rate of **approximately 100 times per minute**
- The **counting**:
  1 & 2 & 3 & 4 & 5 &
  1 & 2 & 3 & 4 & 10 &
  1 & 2 & 3 & 4 & 15
  1 & 2 & 3 & 4 & 20
  1 & 2 & 3 & 4 & 25
  1 & 2 & 3 & 4 & 30
Perform 2 ventilations
- **Maintain** head tilt-chin lift
- **Pinch** the nose
- **Seal** victim’s mouth with yours
- Give 2 breaths of 400 to 600 ml of air
  (1 second per breath)
- **Look for rises and falls of chest wall**

Note: If unable/unwilling to ventilate for any reason, at least to do good quality chest compressions at the rate of 100 times per minute.

Recovery position if sign breathing is present
- Prevent tongue from falling backward & causing airway obstruction
- Help in drainage of saliva

When to stop CPR:
- When a doctor directs the resuscitation to cease or when the paramedics take over.
- When the person has been successfully resuscitated (return of spontaneous pulse and breathing)
CPR ALGORITHM

Check for DANGER
Any danger?
Yes
Make safe
No

Check for RESPONSE
Tap shoulder firmly. Ask loudly,
Hello! Hello! Are you Okay?
Any response?
Yes
No

Check for other injuries;
Recovery position

SHOUT
Help! Call Ambulance 995!
Get AED!

Open AIRWAY
Head tilt, Chin lift

Check for normal BREATHING
Look, listen & feel up to 10 sec.
Any breathing? (Gasping is considered not breathing)
Yes
No

Do 30 CHEST Compressions
Site: centre of chest, lower half of sternum
Depth: at least 5 cm.
Rate: at least 100 compressions / min.
Allow complete chest recoil.

Open Airway (head tilt, chin lift) & give 2 BREATHS
1 sec. per breath, till chest just rises;
Tidal volume: 400 – 600 ml
Allow exhalation between the breaths.

Continue CPR until:
• Casualty wakes up;
• AED arrives, analyzing heart rhythm;
• Help arrives, takes over.

If unable/unwilling to do mouth-to-mouth ventilation, do chest compression continuously at least 100/Minute.
CHAPTER 6: BREATHING DIFFICULTIES

At the end of the chapter, participants will achieve the following learning objectives:

▪ Anatomy and physiology of respiratory system
▪ Signs and symptoms
▪ Management of: choking, fumes inhalation, hyperventilation, asthma, respiratory arrest and drowning
▪ Practical on Heimlich Maneuver

ANATOMY AND PHYSIOLOGY OF RESPIRATORY SYSTEM

▪ This comprises the mouth, nose, windpipe, lungs and pulmonary blood vessels.
▪ When we breathe, air is drawn into the airway and lungs.
▪ In the lungs, oxygen passes from the alveoli (air sacs) into the pulmonary capillaries and carbon dioxide passes from the capillaries into the alveoli and is expelled as we exhale.

How Breathing Works
The breathing process consists of the actions of breathing in (inspiration) and breathing out (expiration).

▪ **Breathing in**: The chest cavity and lungs expand drawing air into the lungs.
▪ **Breathing out**: The chest cavity becomes smaller expelling air out of the lungs.
SIGNS AND SYMPTOMS

HYPOXIA

A condition arising when there is insufficient oxygen in the body tissues.

Some Causes

Insufficient O₂ is inspired air:

- Suffocation by smoke or gas; Changes in air pressure. Airway obstruction:

- Choking: Hanging; Strangulation; Asthma; Anaphylaxis; Swelling of the airway; External obstruction.

Others:

- Chest wall injury; Lung injury, infection; CO, cyanide poisoning; Paralysis of nerves.

Recognition

- Rapid breathing.
- Distressed breathing, gasping.
- Difficulty speaking.
- Grey-blue skin (cyanosis).
- Anxiety, restlessness.
- Headache, nausea, vomiting.
- Breathing may ceased.

MANAGEMENT

Choking (Conscious Casualty)

Recognition (Complete choking)

Casualty is unable to:

- Speak
- Breathe
- Cough

And quickly becomes unconscious.

Casualty clutches his neck with his hands. This is the Universal Distress Signal for choking.
Treatment

Mild obstruction, able to cough:

- Encourage breathing
- Encourage coughing

If casualty cannot cough (complete choking), perform

- Abdominal Thrust (Heimlich Maneuver) or
- Chest Thrust (Obese or pregnant).

Abdominal Thrust (Heimlich Maneuver)

- Ask the victim “Are you choking?”
- If the casualty nods his head, stand behind the casualty.
- Position one leg between the casualty’s legs.
- Wrap your arms around the casualty’s waist and make a fist with one hand.
- Place the thumb side of your fist against the casualty’s abdomen, at the midline, 2 fingers above the navel.
- Lean the casualty slightly forward and grasp the fist with the other hand.
- Apply 5 successive inward, upward thrusts into the casualty’s abdomen.
- Check if foreign body is expelled.
- Repeat until the foreign body is expelled or when the casualty becomes unconscious.

Chest Thrust (For obese or pregnant victim)

- Stand behind the casualty.
- Position one leg between the casualty’s legs.
- Place the arms under the casualty’s armpits to encircle the chest.
- Place the thumb-side of the fist on the middle of the casualty’s breastbone.
- Grasp the fist with the other hand and give 5 quick successive inward thrusts.
- Check if foreign body is expelled.
- Repeat until the foreign body is expelled or the casualty becomes unconscious.
Unconscious Casualty (Choking)

- Determine unresponsiveness by gently shaking or tapping casualty’s shoulders and shouting

- If no response, immediately shout

- Position the casualty on his back on a firm, flat surface (supine position).

- Open the Airway using the Head Tilt-Chin Lift Method.

- Check for Breathing

- If no breathing, perform Chest Thrust (Compress as in CPR)
• Carry out 30 compressions at the rate of approximately 100 times per minute.

• Check for foreign body in the mouth. If visible, remove it with a finger sweep.

• Repeat breathing check, if breathing is present, check for other injuries and turn the casualty to the recovery position.

Inhalation of Fumes
These may be smoke, gases (e.g. CO) or toxic vapors and inhaling them may be lethal.

Treatment
• Call 995 for ambulance. Remove casualty into fresh air and encourage him to breathe normally.
• Treat obvious injuries such as burns.
• Monitor vital signs till help arrives.
• If unconscious, open airway, do “ABC” check and perform CPR if needed.

Hyperventilation
Commonly due to acute anxiety and may accompany a panic attack. May occur in people who have recent emotional upset or history of panic attack. This causes increased loss of carbon dioxide from the blood leading to the symptoms that appear.
Recognition
- Unnatural fast breathing and pulse rate.
- Attention-seeking behavior, apprehension.
- Dizziness or faintness.
- Trembling, sweating, dry mouth; tingling and cramps in hands and feet and around the mouth.

Treatment
- Be firm but kind and reassuring; calm casualty down.
- Lead casualty to a quiet place to regain control of breathing more easily and quickly.
- Do not ask casualty to re-breathe own air from a paper bag to avoid risk of more serious illness.

Symptoms will subside as breathing returns to normal.

Asthma
In an attack the airways become narrowed making breathing difficult. Sometimes a trigger such as an allergy, a cold, a drug or tobacco smoke is recognized. Many sufferers have sudden attacks.

Recognition
- Difficulty breathing
- Wheezing.
- Coughing
- Distress and anxiety
- Difficulty speaking, whispers.
- Features of hypoxia.

Treatment
- Get casualty to use her reliever inhaler and breathe slowly and deeply.
- Sit casualty in a comfortable position; do not let her lie down.
- Call 995 for ambulance if:
  - The inhaler has no effect;
  - Casualty is getting worse;
  - Casualty is becoming exhausted;
  - Breathlessness makes talking difficulty;
  - If casualty is unconscious, open airway, check breathing and do CPR if needed.
**Respiratory Arrest**  
The airway is squeezed and airflow to the lungs is cut off.

**Recognition**
- A constricting article and marks around casualty’s neck.
- Rapid, difficult breathing, cyanosis.
- Impaired consciousness.
- Congestion of the face.

**Treatment**
- Quickly remove any constriction around the neck.
- If conscious, help casualty to lie down, supporting his head and neck.
- Call 995 for ambulance even if casualty appeared fully recovered.
- If unconscious, do “ABC” check and perform CPR if needed.

Do not move casualty unnecessarily in case of spinal injury.

**Drowning**  
Drowning can result in inhalation of water and consequent airway obstruction. Water entering the lungs causes irritation and the air passages may swell several hours later (secondary drowning).

**Treatment**
- After rescue let casualty lie down with head lower than the rest of the body with dry blanket.
- If fully conscious, give a warm drink.
- Call 995 for ambulance even if seemingly recovered.
- If unconscious, open airway, check for breathing and do CPR if needed.

**PRACTICAL**
- Heimlich Maneuver (Abdominal Thrusts)
- Chest Thrusts
- Unconscious Choking
CHAPTER 7: THE UNCONSCIOUS PATIENT

At the end of the chapter participants will achieve the following learning objectives:

- Causes and Management: Heat Disorders (including heat cramps, heat exhaustion and heat stroke), drowning, electric shock, overcome by gases, fainting, head injuries, fit, hysteria, stroke and diabetic emergencies
- Practical cases scenarios

THE NERVOUS SYSTEM

This is made up of:

- Central Nervous System (brain, spinal cord).
- Peripheral Nervous System (cranial and spinal nerves).
- Autonomic Nervous System (controls body function – digestion, breathing, etc.)

IMPAIRED CONSCIOUSNESS

This is the condition of a casualty who is anything less than fully conscious. Assess his conscious level by checking his response to stimuli (A V P U code)

- **A – Alert**: Eyes open? Responds to questions?
- **V – Voice**: Responds to voice? Answers simple questions and obeys commands?
- **P – Pain**: Opens his eyes or moves if pinched?
- **U – Unresponsive**: Unresponsive to any stimuli?
CAUSES AND MANAGEMENT

Heat Cramp
It occurs after vigorous physical exertion in very hot weather or under other conditions that cause heavy sweating and use up body fluids and salts.

Recognition
- Any cramp in the arm, leg, or abdominal wall
- Profuse sweating

Treatment
- Stop all activity and sit in a cool place
- Drink enough water to replace fluid loss
- Seek medical attention if the cramps do not subside in 1 hour
- Do not return to strenuous activity for a few hours after the cramps subside

Heat Exhaustion
This is caused by loss of salt and water from the body through excessive sweating and usually develops gradually.

Recognition
- Headache, dizziness, confusion.
- Loss of appetite, nausea.
- Sweating; pale, clammy skin.
- Cramps in arms, legs, or abdomen.
- Rapid, weakening pulse and breathing.

Treatment
- Get casualty to lie down with legs raised, in a cool, shady place.
- Give him plenty of water to drink (oral rehydration salts or isotonic drinks, if available).
- Monitor vital signs (refer to page 69).
- If condition worsens call 95 for ambulance.
- Otherwise advise him to seek medical help.
Heatstroke

This is caused by failure of the ‘thermostat’ in the brain, due to high fever, prolonged exposure to heat, use of drugs or following heat exhaustion when sweating ceases. The body becomes dangerously overheated.

Recognition

- Headache, dizziness, discomfort, restlessness, confusion.
- Hot, flushed, dry skin; body temperature > 40°C.
- Rapid worsening of level of response.
- Full, bounding pulse.

Treatment

- Move casualty to a cool place; help him sit down.
- Call 995 for ambulance.
- Remove outer clothing.
- Continually to cool the body until temperature drops to 38°C.
- Monitor vital signs (refer to page 69); if temperature rises again, repeat cooling.

Drowning

Drowning can result in inhalation of water and consequent airway obstruction. Water entering the lungs causes irritation and the air passages may swell several hours later (secondary drowning).

Treatment

- After the rescue let the casualty lie down with head lower than the rest of the body and cover with dry blanket.
- If fully conscious, give a warm drink.
- Call 995 for ambulance even if seemingly recovered.
- If unconscious, open airway, check for breathing and do CPR if needed.
ELECTRIC SHOCK

Human body is a good conductor of electricity. Direct contact with electrical current can be fatal. Electric shock may be minor; there still may be serious internal damage, especially to the heart, muscles or brain.

Electric current can cause injury in three main ways:
1) Cardiac arrest due to electrical effect on the heart.
2) Muscle, nerve and tissue destruction from a current passing through the body.
3) Thermal burns from contact with the electrical source.

Electrical Burn
Recognition
- Casualty may be unconscious.
- Full-thickness burns with swelling, scorching and charring.
- Burns at current exit and entry points.
- Signs of shock.

Treatment
- Ensure casualty’s contact with electrical source is broken before touching him.
- If unconscious, do ‘ABC’ check and perform CPR if needed.
- Call 995 for ambulance
- For the burns treat as in “Severe Burns and Scalds”.
- Treat for shock.

Overcome By Gases

Inhalation of hot air or gases.

Recognition
- Soot around the nose or mouth.
- Singeing of nasal hair.
- Redness, swelling or burning of the tongue.
- Damage to skin around the mouth.
- Hoarseness of voice.
- Breathing difficulties.
Treatment

- Call 995 for ambulance.
- Improve casualty’s air supply, e.g. Loosen clothing round the neck.
- Give him ice or cold water to sip.
- Reassure him.
- Monitor his vital (refer to page 69).
- If he becomes unconscious do the ‘ABC’ check and perform CPR if needed.

Fainting

Brief loss of consciousness due to temporary reduction of blood flow to the brain. May be a reaction to pain, exhaustion, lack of food, emotional stress or long physical inactivity.

Recognition

- Loss of consciousness causes casualty to fall.
- Slow pulse
- Pale cold skin and sweating

Treatment

- Advise casualty who feels faint to lie down.
- Raise the legs supporting the ankles on your shoulders; ensure plenty of fresh air.
- When recovered help casualty to sit up gradually. Repeat if he feels faint again.
- If consciousness is not regained quickly, open airway, check breathing and do CPR if needed; call 995 for ambulance.

HEAD AND NECK INJURIES

Head Injury

All head injuries are potentially serious. Assume a casualty with head injury may have a neck (spinal) injury. Therefore, take great care.

Advise casualty to seek medical advice if:

- Drowsiness, headache worsens.
- Confusion/strange behaviour, memory loss, vomiting episodes set in since injury.
- Has weakness in an arm or leg or speech difficulties.
- Has visual problems
● Blood/clear fluids leaks from nose or ear.
● Has unusual breathing problems.

Concussion
The brain can be “shaken by a blow to the head. This shaking is called concussion.

Recognition
● Brief period of impaired consciousness.
● Dizziness or nausea.
● Memory loss, confusion.
● Mild, generalized headache.

Treatment
● Check level of consciousness.
● Monitor vital signs (refer to page 69); watch out for deterioration of level of response.
● Advise casualty to go to the hospital if he develops a headache, vomiting, confusion, drowsiness or double vision.
● Call 995 for ambulance if he does not recover fully or his level of response worsens after initial recovery.

Cerebral Compression
This occurs when there is a build-up of pressure on the brain. It may develop immediately after a head injury or may appear a few hours or even days later.

Recognition
● Drowsiness; level of response worsens.
● History of recent head injury.
● Intense headache, noisy breathing.
● Slow, full and strong pulse.
● Unequal pupil size.
● Weakness or paralysis down one side of face or body.
● Change in behaviours, disoriented.
Treatment

- Call 995 for ambulance.
- Steady and support casualty’s head.
- Monitor vital signs (refer to page 69).
- Do not allow casualty to eat or drink.
- If he becomes unconscious, do the ‘ABC’ check. There may be a risk of spinal injury.

NECK INJURY (SPINAL INJURY)

The most serious risk is damage to the spinal cord causing loss of power/sensation below the injured area. If spinal cord is partly or completely severed damage may be permanent. Take care to avoid unnecessary movement of head, neck, spine always.

A spinal injury is possible from the following:

- Falling from s height; falling awkwardly.
- Diving into a pool and hitting the bottom.
- Falling from horse/motorbike
- Heavy object falling on the back.
- Sudden deceleration
- Collapsed rugby scrum
- Injury to the head

Recognition

When vertebrae are damaged:

- Pain in the neck, back or injury site.
- Step, irregularity or twist.
- Tenderness in the skin.

When spinal cord is damaged:

- Loss of control of limbs; movement weak or absent.
- Loss of or abnormal sensations.
- Loss of bladder/bowel control.
- Breathing difficulties.
Treatment (Conscious Casualty)

- Reassure casualty, ask him not to move.
- Call 995 for ambulance.
- Knell/lie behind casualty’s head; with elbows resting on the ground/knee, grasp the sides of his head; do not cover the ears.
- Steady and support the head in this neutral position (head, neck, spine are aligned).
- Ask helper to put rolled-up blanket, towels, etc. on both sides of his head and neck.
- Continue supporting him until ambulance arrives.
- Ask helper to monitor vital signs (refer to page 69).
- Do not move casualty from the position found unless there is immediate danger.

Treatment (Unconscious Casualty)

- Kneel/lie behind casualty’s head; with elbows resting on the ground/knee, grasp the sides of his head.
- Support the head so that the head, trunk and legs are in a straight line.
- Call 995 for ambulance.
- Open airway (do not tilt his neck), check breathing
- If breathing, continue to support his head and wait for ambulance.
- If not breathing, start CPR.
- If needed, turn casualty using the log-roll technique.
- Monitor vital signs (refer to page 69) while waiting for ambulance.

Handling casualty with spinal injury

Spinal Board.
Seizures In Adults
Epileptic seizures result from recurrent, major disturbances of brain activities.

Recognition
- Casualty suddenly loses consciousness.
- Becomes rigid, arching his back.
- Breathing becomes difficult; lips grey-blue; face and neck red and puffy.
- Convulsion starts; jaw clenched; noisy breathing; saliva appears at mouth, perhaps bloodstained.
- Loss of bladder or bowel control.
- Muscles relaxes; breathing becomes normal; consciousness returns within few minutes.
- He feels dazed or act strangely.

Treatment
- Make space for casualty; remove potentially dangerous objects; note time seizure started
- Protect his head with soft padding; loosen tight clothing at neck
- When fit stops, check breathing and put him in recovery position.
- Monitor vital signs (refer to page 69); note duration of seizure.

Caution
- Do not put anything in casualty’s mouth or try to restrain him during the seizure.
- Call 995 for ambulance if:
  o He is having repeated seizures or is his first seizure.
  o He is unaware of any reason for the seizure.
  o The seizure lasts more than 5 minutes or he is unconscious for more than 10 minutes.

HYSTERIA
An emotional outburst, common in young female which can happen to individual but at time involve several or group of people. Casualty can become drowsy or even extreme distress.

Recognition
- Palpitation
- Pins and needles or spasms in fingers or toes
- Rapid and shallow breathing – Over breathing
- Crying shouting and screaming – fits like behaviour or ‘act’ like unconscious
Treatment

- Remove casualty from disturbing situation
- Check for any physical injuries
- Observe the state of awareness
- Check vital signs (refer to page 69)
- Place casualty in comfortable position
- Reassure casualty with a calm, firm and friendly manner
- Instruct the casualty to breathe slowly
- Send casualty to hospital if symptoms do not subside or casualty sustain other injuries

Stroke

A stroke (brain attack) occurs when blood supply to the brain is disrupted. Majority of strokes are caused by a blood clot in the blood vessel blocking the flow of blood to the brain. Some are due to a ruptured blood vessel.

Recognition

- Weakness or numbness of ace, arm or leg on one or both sides of body.
- Mouth or eye droopy.
- Loss or blurring of vision.
- Speech difficulty.
- Confusion
- Severe headache, dizziness, unsteadiness.

Treatment

- Call 995 for ambulance.
- Help casualty to lie down.
- Monitor vital signs (refer to page 69)
- Do not let casualty eat or drink
- If casualty becomes unconscious, do the “ABC” check and perform CPR if needed.
DIABETES MELLITUS
A chronic condition in which the body fails to produce sufficient insulin to regulate the blood sugar level.

Hyperglycaemia (high blood sugar)
Recognition
- Warm dry skin
- Rapid pulse and breathing
- Sweet breath; excessive thirst
- Drowsiness, leading to unconsciousness

Hypoglycaemia (blood sugar level below normal)
Recognition
- History of diabetes
- Weakness, faintness, hunger
- Confusion, irrational behaviour
- Sweating; cold, clammy skin
- Rapid pulse; palpitations, muscle tremors
- Deteriorating level of response
- Diabetic identification, glucose gel, medication

Treatment
- Help casualty to take his own glucose gel or give sweet food or drink
- If he responds quickly, give more until he feels better
- Monitor until completely recovered
- If he does not respond or hyperglycaemia is suspected, call 995 for ambulance
- Monitor vital signs (level of response, breathing, pulse and body temperature)
- If he becomes unconscious, do ABC check.
CASE SCENARIOS
List the first aid actions for the following scenarios.
CHAPTER 8: BURN INJURIES

At the end of the chapter, participants will achieve the following learning objectives:

- Definition
- Anatomy of the Skin
- Signs & Symptoms and Management
- Assessment of the Severity of Burns
- Management of Burns
- Case Studies

DEFINITION
Burns
Caused by dry heat, extreme cold, corrosive substances, friction or radiation and sun’s rays

Scalds
Caused by wet heat from hot liquids and vapours

BURNS – TYPES OF BURN

<table>
<thead>
<tr>
<th>Types of burn</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Burn</td>
<td>Flames, hot objects, friction</td>
</tr>
<tr>
<td>Scald</td>
<td>Steam, hot liquids</td>
</tr>
<tr>
<td>Chemical Burn</td>
<td>Chemicals</td>
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<tr>
<td>Electrical Burn</td>
<td>Electric current, lightning</td>
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<tr>
<td>Radiation</td>
<td>Sunburn, UV light, X-Rays, Gamma rays</td>
</tr>
<tr>
<td>Cold Injury</td>
<td>Frostbite, freezing metals, liquefied gases</td>
</tr>
</tbody>
</table>
ANATOMY OF THE SKIN

The Skin

The skin protects the body from injury and infection and maintains the body temperature. It consists of an outer layer (epidermis) and an inner layer (dermis), lying on a layer of fatty tissue. Most of the structures such as blood vessels, nerves and hair roots are contained within the dermis.

Assessing a Burn

● Circumstances of occurrences
● Whether airway is affected
● Extent, location and depth

SIGNS AND SYMPTOMS AND MANAGEMENT

Electrical Burn

Recognition

● Casualty may be unconscious
● Full-thickness burns with swelling, scorching and charring.
● Burns at current exit and entry points
● Signs of shock

Treatment

● Ensure casualty’s contact with electrical source is broken before touching him
● If unconscious, do ABC check and perform CPR if needed
● Call 995 for ambulances
● For the burns treat as in “Severe Burns and Scalds”
● Treat for shock
Dry Burns

Recognition
- Possible of superficial, partial and/or full thickness burns
- Pain
- Difficulty in breathing
- Signs of shock

Treatment
- Flood the burn with plenty of cold water at least 10 minutes, or until pain is relieved. Do not overcool.
- Call 995 for ambulance
- Do not touch or interfere with the burn
- Remove rings, watches, belts, shoes burnt/smouldering clothing before swelling starts
- Cover burn area with plastic film (preferably) or sterile dressing
- Secure with a bandage or adhesive tape applied over the plastic
- Reassure casualty and treat for shock if needed
- Monitor vital signs (level of response, breathing, pulse and body temperature)

Precautions
- Do not remove anything sticking to the burn
- Do not burst any blisters
- Do not apply any ointment or lotion to the burnt area
- Do not use adhesive dressing or tape to the skin
- Do not cover a burn on the face
- Do not allow a casualty to eat or drink

Use of specialised dressings, sprays and gel to cool burns is not recommended.
Scalds

Recognition
- Possible of superficial, partial and/or full thickness burns.
- Pain.
- Difficulty in breathing.
- Signs of shock.

Treatment
- Flood the burn with cold water for at least 10 minutes or until pain is relieved.
- Remove jewellery, belt, watches or constricting clothing from burnt area.
- Cover the burn with plastic film or sterile dressing and bandage loosely.

Do not: Break blisters; use adhesive tape; apply ointments or lotions.

Chemical Burn

Recognition
- Evidence of chemicals in the vicinity.
- Intense, stinging pain.
- Discoloration, blistering, peeling.
- Swelling of affected area.

Do not attempt to neutralise acid and alkali burns unless trained to do so.

Treatment
- Ventilate the area.
- Put on protection equipment.
- Move the casualty if needed.
- Flood the burn with water for at least 20 minutes.
- Remove contamination clothing.
- Monitor vital signs (refer to page 69).
- Send casualty to hospital.
- If chemical is identified, convey information to hospital.
RADIATION BURNS

Recognition
Radiation burns are categorized in much the same way as any other type of burn, according to severity.

Treatment
● Same treatment as burn

SUNBURN

Recognition
● Reddened skin.
● Pain in burnt area.
● Blistering of affected skin later.

Treatment
● Move casualty out of the sun.
● Give frequent sips of cold water.
● Cool affected area with cold water or for extensive area soak in cold bath for 10 minutes.
● Calamine or after-sun lotion may be applied.
● If sunburn is severe, seek medical advice.

ASSESSMENT ON THE SEVERITY OF BURNS

BURNS – DEPTH OF BURNS
Burns are classified according to the depth of skin damaged.

Superficial burn (First Degree)
● Involves only the outermost layer of skin, the epidermis.
● Redness.
● Swelling.
● Tenderness.
Partial- thickness burn (Second Degree)
- Affects the epidermis and are very painful.
- Red and raw.
- Blisters due to fluid released from damaged tissues beneath

Full-thickness burn (Third Degree)
- All layers of the skin are affected.
- Damage to nerves, fat tissue, muscles and blood vessels.
- Pale, waxy or charred.

MANAGEMENT OF BURNS
Burns That Need Hospital Treatment
- All full-thickness burns.
- All burns involving the face, hands, feet or genital area.
- All burns extending round an arm or leg.
- All partial-thickness burns larger than 1% of body surface (size of casualty’s palm and fingers).
- All superficial burns larger than 5% of body surface (5 palm areas).
- Burns with a mix of varying depths.
- The casualty is a child.
CASE STUDIES
List the first aid actions for the following scenarios
CHAPTER 9: MANAGEMENT OF MEDICAL EMERGENCIES

At the end of the chapter, participants will achieve the following learning objectives:

- Primary Survey (DRABC)
- Secondary Survey (History, Monitor, Head to Toe Examination)
- Emergency Action Plan
- Records and Reporting System
- Case Scenarios

ASSESSING CASUALTY

Approach each casualty and assess using a methodical 2-stage system:

- First check and treat life-threatening conditions (Primary Survey)
- Then do a detailed assessment (Secondary Survey). Treat as appropriate.
Primary Survey (DRSABC)

- Look out for Danger

- Check casualty’s Response

- Open Airway

- Check for Breathing

- Circulation of Resuscitation (Signs of life)
  (If there is severe bleeding it must be treated)
Control Severe Bleeding

- Injuries that result in severe bleeding cause blood loss from the circulatory system so must be treated immediately

SECONDARY SURVEY

When life-threatening conditions are stabilised or absent, look for other injuries or conditions. Carry out a head-to-toe examination.

Find out:
- **History** – what actually happened, relevant medical history

- **Symptoms** – abnormal sensations the casualty feels, e.g. pain, nausea, giddiness.

- **Signs** – injuries or abnormal conditions the first aider detects, e.g. swelling, bleeding, pallor
Monitor vital signs for every 5 minutes until the arrival of ambulance or other medical personnel.

- Breathing – Normal breathing per minute (Adult: 12 – 18)
  Abnormal respiration is noisy or difficult
- Pulse – Normal pulse per minutes (Adult: 60-80)
  Assess the rate, rhythm and strength
- Response level – AVPU (Alert, Voice, Pain, Unconsciousness)

**EMERGENCY ACTION PLAN**

Effective first aid usually begins before any direct contact with the casualty.

- Control your feelings
- Take a moment to think
- Do not place yourself in danger
- Use your common sense
- Do not attempt too much alone
- Be aware of potential dangers such as gas or petrol

**FIRST AID PRIORITIES**

**Assess the situation**

- Observe what has happened quickly and calmly
- Look for dangers to yourself and to the casualty
- Never put yourself at risk

**Make the area safe**

- Protect the casualty from danger
- Be aware of your limitations

**Assess all casualties and give emergency first aid**

- Assess each casualty to determine treatment priorities, and treat those with life-threatening conditions first

**Communication System**

- Call for Ambulance 995 immediately, after the primary assessment
  - your telephone no.
  - the exact location of the incident
  - type and gravity of the emergency
  - number, gender and age of casualties
  - details of any hazards
Evacuation and Transportation Plan

Casualty Evacuation

Triage casualty by:

- **Priority of attention**
  - Unconsciousness casualties – Ensure airway is not blocked and there is breathing, place casualty in recovery position
  - Serious casualties – Respiratory or cardiovascular system injury; head injuries but conscious; fractures and wounds
  - Minor injuries – minor wounds

**Note:** If unable/ unwilling to ventilate for any reason, at least to do good quality chest compression at the rate of 100 times per minute.

- **Urgency for evacuation**
  - Urgent evacuation – All unconscious casualties, all casualties with chest, abdominal wounds, head injuries
  - Less urgent evacuation – Other wounds and fractures
  - Non-urgent evacuation – Walking injured, minor injuries

Transportation Plan

- Stretcher for spinal injury, multiple injuries, chest and abdominal wounds.
- One rescuer assisted evacuation
- Two or three rescuers assisted evacuation – for casualties who are unable to walk unsupported but are conscious.
- Alternatively, use a chair to evacuate the casualty.