



Virudhunagar Hindu Nadars' Senthikumara Nadar College

(An Autonomous Institution, Affiliated to Madurai Kamaraj University),

Virudhunagar - 626 001, Tamil Nadu, India., <https://vhnsnc.edu.in>

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YOUTH RED CROSS (YRC)

YRC PROGRAMME OFFICERS

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YRC பாடல்

இறைவா உன் அருளால் இருள் நீங்க செய்வாய். (2)

புவியில் நீ அருள் மழையை பொழியச் செய்வாய். (2)

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கதியிழந்தோர்க்கு கரங்கள் ஆகுவோம். (2)

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Part V – YRC

Total Hours: 120 per year

Credit: 1

Total Marks: 100 (Internal Only)

Question paper setting and paper valuation: Internal only

I Year	II Year	Final Mark (Cumulative of I year & II year)
Maximum Marks : 100 Minimum Pass Mark : 40	Maximum Marks : 100 Minimum Pass Mark : 40	Maximum Marks : 100 Minimum Pass Mark : 40

Examination Pattern

Duration : 2 Hrs

Max.Marks : 50

Section – A

Answer any **Four** Questions (out of 5)

[4 x 5 = 20 Marks]

Section – B

Answer any **Three** Questions (out of 5)

[3 x 10 = 30 Marks]

Mark Distribution for each year

	Maximum Mark	Minimum Pass Mark
Test	10	3 (30%)
Assignment	5	-
Practical	10	-
Attendance	75	(50% Attendance Should acquire)
Total	100	40 (40%)

Paper – I

Hours : 120

Credit : 1

Subject Code : U1YR2

Unit – I

Structure and Functions of Human Body – Skeleton – Bones – Joints – Heart and circulation.

Unit – II

General Principles of First Aid – First Aid – Definition – Scope and rules – First Aid Box.

Unit – III

Types of First Aid – Wounds and Hemorrhage – Burns and Scalds – Respiratory tract – Unconsciousness – Heart Attack – Fractures – Snakebites – Insects biting.

Unit – IV

Types of Knots – Bowline Knot – Running Bowline Knot – Reef Knot – Clove Hitch knot.

Unit – V

Emergency Services – Accidents – 100, 103 – Fire Service / Rescue Service – 101 – Ambulance service – 102, 108 – Emergency Accidents – 1099 – Emergency Helpline in National Highways – 1033 – Blood Bank Emergency Helpline – 1910 – Eye Bank Emergency Helpline – 1919.

Authors

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Unit I

STRUCTURE AND FUNCTIONS OF HUMAN BODY

Human body, the physical substance of the human organism, composed of living cells and extracellular materials and organized into tissues, organs, and systems.

An organ is an organization of several different kinds of tissues so arranged that together they can perform a special function. A system is an organization of varying numbers and kinds of organs so arranged that together they can perform complex functions for the body. Ten major systems include the skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and the reproductive system.

Human life process includes organization, metabolism, responsiveness, movements, reproduction, growth, differentiation, respiration, digestion, and excretion. All these processes work together, in fine-tuned balance, for the well-being of the individual and to maintain life.

Skeleton

Human skeleton serves as a framework for the body. This framework consists of many individual bones and cartilages. There also bands of fibrous connective tissue are there such as the ligaments and the tendons to intimate relationship with the parts of the skeleton.



The human skeleton consists of two principal subdivisions in which each have certain individual features. These are (1) the axial, comprising the vertebral column—the spine—and much of the skull, and (2) the appendicular, to which the pelvic (hip) and pectoral (shoulder) girdles and the bones and cartilages of the limbs belong.

The functions of the skeleton are of three different types: support, protection, and motion. Among these, support is the most primitive and the oldest; the axial part of the skeleton was the first to evolve. The vertebral column, corresponding to the notochord in lower organisms, is the main support of the trunk.

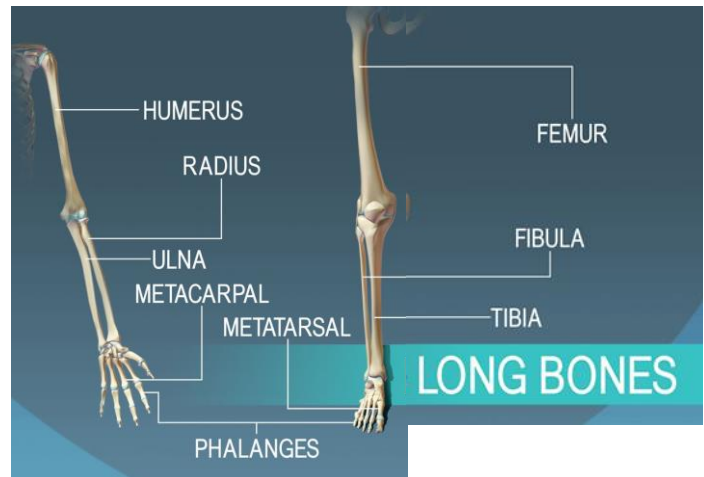
The central nervous system lies largely within the axial skeleton, the brain being well protected by the cranium and the spinal cord by the vertebral column, by means of the bony neural arches (the arches of bone that encircle the spinal cord) and the intervening ligaments.

Bones

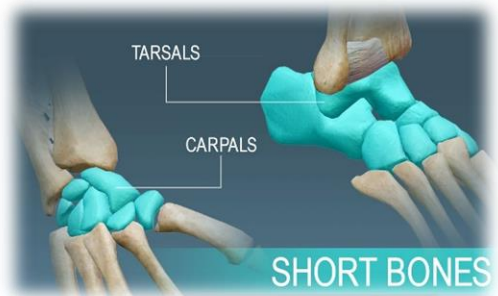
There are five types of bones in the skeleton: flat, long, short, irregular, and sesamoid. There are **flat bones** in the skull (occipital, parietal, frontal, nasal, lacrimal, and vomer), the thoracic cage (sternum and ribs), and the pelvis (ilium, ischium, and pubis). The function of

flat bones is to protect internal organs such as the brain, heart, and pelvic organs. They can also provide large areas of attachment for muscles.

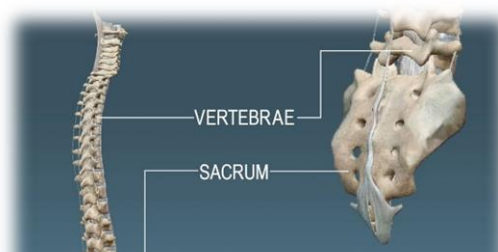
The **long bones** are longer than they are wide which includes the femur (the longest bone in the body) as well as relatively small bones in the fingers. Long bones function to support the weight of the body and facilitate movement. They are mostly located in the appendicular skeleton and include bones in the lower limbs and in the upper limbs.



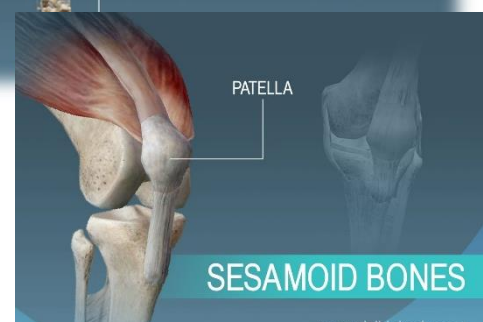
Short bones are wide and located in the wrist and ankle joints. Short bones provide stability and some movement. The carpals in the wrist and the tarsals in the ankles are examples of short bones.



Irregular bones vary in shape and structure and therefore do not fit into any other category (flat, short, long, or sesamoid). They often have a complex shape, which helps protect internal organs. For example, the vertebrae, irregular bones of the vertebral column, protect the spinal cord. The irregular bones of the pelvis (pubis, ilium, and ischium) protect organs in the pelvic cavity.



Sesamoid bones are bones embedded in tendons. These small, round bones are commonly found in the tendons of the hands, knees, and feet. Sesamoid bones function to protect tendons from stress and wear. The patella, commonly referred to as the kneecap, is an example of a sesamoid bone.



Joints: Joints are the areas of the body where two or more bones meet. Most joints are mobile, allowing the bones to move. Joints consist of the following:

Bones - The framework of body. bones are the primary structures that support the connecting tissue. For example, the knee joint consists of three bones such as the femur (thighbone), tibia (shin bone) and patella (kneecap).

Tendons - Tendons (a type of tough connective tissue) on each side of a joint that attach to the muscles that control movement of the joint.

Ligaments - Strong ligaments (tough, elastic bands of connective tissue) surround the joint to give support and limit the joint's movement.

Cartilage - A type of tissue that covers the surface of a bone at a joint. Cartilage helps reduce the friction of movement within a joint.

Meniscus - This is a curved part of cartilage in the knees and other joints.

Synovial membrane - A tissue called the synovial membrane lines the joint and seals it into a joint capsule. The synovial membrane secretes synovial fluid (a clear, sticky fluid) around the joint to lubricate it.

Bursas - Fluid-filled sacs, called bursas, between bones, ligaments, or other adjacent structures help cushion the friction in a joint.

Synovial fluid - A clear, sticky fluid secreted by the synovial membrane.

Types of joints

There are many types of joints including joints that do not move in adults, such as the suture joints in the skull. Joints that do not move are called fixed. Other joints may move a little, such as the vertebrae. Examples of mobile joints include the following:

Ball-and-socket joints - Ball-and-socket joints, such as the shoulder and hip joints, allow backward, forward, sideways, and rotating movements.

Hinge joints - Hinge joints, such as in the fingers, knees, elbows, and toes, allow only bending and straightening movements.

Pivot joints - Pivot joints, such as the neck joints, allow limited rotating movements.

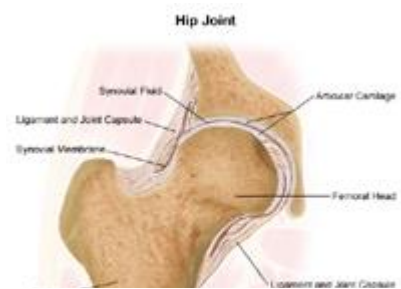


Illustration of the anatomy of the hip joint



Illustration of types of joints

Ellipsoidal joints - Ellipsoidal joints, such as the wrist joint, allow all types of movement except pivotal movements

Heart and Circulatory System

The heart is a pump, usually beating about 60 to 100 times per minute. With each heartbeat, the heart sends blood throughout our bodies, carrying oxygen to every cell. After delivering the oxygen, the blood returns to the heart. The heart then sends the blood to the lungs to pick up more oxygen.

The circulatory system is made up of blood vessels that carry blood away from and towards the heart. Arteries carry blood away from the heart and veins carry blood back to the heart. It carries oxygen, nutrients, and hormones to cells, and removes waste products, like carbon dioxide.

The heart has four chambers — two on top and two on bottom:

The two bottom chambers are the right ventricle and the left ventricle. These pump blood out of the heart. A wall called the interventricular septum is between the two ventricles.

The two top chambers are the right atrium and the left atrium. They receive the blood entering the heart. A wall called the interatrial septum is between the atria.

The atria are separated from the ventricles by the atrioventricular valves: The **tricuspid valve** separates the right atrium from the right ventricle. The **mitral valve** separates the left atrium from the left ventricle.

Two valves also separate the ventricles from the large blood vessels that carry blood leaving the heart:

The **pulmonic valve** is between the right ventricle and the pulmonary artery, which carries blood to the lungs. The **aortic valve** is between the left ventricle and the aorta, which carries blood to the body.

Parts of the Circulatory System

Two pathways come from the heart:

The **pulmonary circulation** is a short loop from the heart to the lungs and back again. The systemic circulation carries blood from the heart to all the other parts of the body and back again. In pulmonary circulation, the pulmonary artery is a big artery that comes from the heart. It splits into two main branches and brings blood from the heart to the lungs. At the lungs, the blood picks up oxygen and drops off carbon dioxide. The blood then returns to the heart through the pulmonary veins.

In **systemic circulation**, blood that returns to the heart has picked up lots of oxygen from the lungs. So, it can now go out to the body. The aorta is a big artery that leaves the heart

carrying this oxygenated blood. Branches off the aorta send blood to the muscles of the heart itself, as well as all other parts of the body.

At each body part, a network of tiny blood vessels called capillaries connects the very small artery branches to very small veins. The capillaries have very thin walls, and through them, nutrients and oxygen are delivered to the cells. Waste products are brought into the capillaries. Capillaries then lead into small veins. Small veins lead to larger and larger veins as the blood approaches the heart. Valves in the veins keep blood flowing in the correct direction.

How does the Heartbeat?

The heart gets messages from the body that tell it when to pump blood depending on a person's needs. For example, when we're sleeping, it pumps just enough to provide for the lower amounts of oxygen needed by our bodies at rest. But when we're exercising, the heart pumps faster so that our muscles get more oxygen and can work harder.

References:

1. <https://www.britannica.com/science/human-body>
2. <https://www.chop.edu/conditions-diseases/anatomy-joint>
3. <https://kidshealth.org/en/parents/heart.html#:~:text=The%20circulatory%20system%20is%20made,waste%20products%2C%20like%20carbon%20dioxide.>

Unit II

General Principles of First Aid

First aid is the first and immediate assistance given to any person with either a minor or serious illness or injury with care provided to preserve life, prevent the condition from worsening, or to promote recovery. First aid is generally performed by someone with basic medical training.

Definition

The meaning of FIRST AID is an emergency care or treatment given to an ill or injured person before regular medical aid can be obtained. It often consists of a one-time, short-term treatment and requires little technology or training to administer. It can include cleaning minor cuts, scrapes, or scratches; treating a minor burn; applying bandages and dressings.



General Principles of First Aid

Preserve Life

The first aim of first aid is to preserve life, which involves the key emergency practices to ensure that the casualty is not in any mortal danger. At this stage, the person should do a quick risk assessment to check for dangers to the injured person, yourself or bystanders which could cause the situation to escalate. If in doubt, do not attempt to apply first aid and immediately call for a medical professional.

Prevent Deterioration

Once followed all the steps, next priority is to prevent deterioration of the injured person's condition. Keeping a casualty still to avoid aggravating their injury, or from complicating any unseen issues, is crucial. This helps prevent to further injuries and clearing the area of any immediate dangers will help to do so.

Promote Recovery

Finally, there are steps should follow which will help lessen the amount of time taken for a casualty to recover from an accident and aid in minimising lasting damage and scarring. The prime example of this is applying cold water to a burn as soon as possible to lower the chance of long-term scarring and helps speed up the healing process.

Scope of First Aid

First aid sometimes referred to as EMERGENCY AID is the first skilled assistance given to a victim (sick or injured) on the occurrence of accident or sudden illness to preserve life, prevent further injury and relive suffering until qualified medical care is available.

The scope of first aid is to apply a consistent set of standards, and treatment, in a logical order. Victim assessment by a first aider is to identify injuries, treat, and transport victims.

The scope of first aid includes:

1	Diagnosis	<ul style="list-style-type: none">• The First aider should examine the causality to know the details of injuries and their nature.
2	Treatment	<ul style="list-style-type: none">• The diagnosis will give him an idea of the treatment to be given until the doctor takes charge.
3	Disposal	<ul style="list-style-type: none">• The next step is to send the causality to his house or to be hospitalized as the case may be in a suitable atmosphere.

Golden rules of First Aid

- Do the first thing first; this includes assessing the situation for any immediate danger, quickly and methodically without panicking, giving priority to the most urgent situation / condition.
- Remove the victim from the cause of injury or the cause of injury from the victim.
- Resuscitate the victim, if necessary and carry out general treatment of unconsciousness.
- Loosen all tight clothing or materials around the victim's neck waist, wrist, etc.
- Arrest bleeding, cover all wounds, burns or scalds and immobilize all fractures.
- Do not allow people to crowd a victim and do not move a victim unless you really have to (dangerous environment, risk of falling debris, explosion etc)
- Reassure the victim and get help as soon as possible
- Improvise all necessary materials, which are not readily available.
- Guide against or treat for shock
- Dispose/transport the victim properly

First Aid Box:

A first aid box comes in different shapes, sizes, and colours. The contents within the box could also differ depending on need.

The international standard for first aid kits is that they should be identified with the ISO graphical symbol for first aid.

First aid kit contents

- ❖ Torch – Battery powered.
- ❖ Sterile hand gloves – for use on cuts, wounds, abrasions etc.

- ❖ Antiseptic liquid – for use on cuts, wounds, abrasions, bites.
- ❖ Crepe Bandage – to cover sprains and/ or use on blunt injury of limbs/ joints.
- ❖ Triangular bandage
- ❖ Compressed roller bandage – For use on wound with gauze or in making sling and tie splints.
- ❖ Surgical cotton rolls – for cleaning e.g. clearing dirt, grime and debris with water/ antiseptic solution.
- ❖ Adhesive plaster/ tape – to hold bandage in place.
- ❖ Adhesive bandage – to use on cuts/ wounds over body parts that may not require use of large bandages (if needed hair should be shaved to prevent discomfort or further injury)
- ❖ Sterile Gauze – to cover cuts, wounds or abrasions for preventing infection.
- ❖ Eye Pads – Covering an injured.
- ❖ Sterilised paraffin Gauze – to use on burn or scald before covering it with any bandage.
- ❖ Silver sulfadiazine ointment – Used on burns and scalds.
- ❖ Mouth to mouth resuscitator – Used in assisting mouth to mouth breathing. An infection barrier for performing artificial respiration as part of CPR.
- ❖ Scissor – For cutting bandage, cloth, tape etc.
- ❖ ORS packets – Oral rehydration solution packets.
- ❖ Glucose powder – To be mixed with water as a drink for quick energy and/ or rehydration.
- ❖ Forceps – Can be used to hold sterile gauze or access areas that may not be easy to reach.
- ❖ Safety pins – For holding bandages or clothes in place.
- ❖ Splints - A strip of rigid material used for supporting and immobilizing a broken bone

References:

1. <https://www.indianredcross.org/fmr/Module2.pdf>
2. https://www.brainkart.com/article/First-Aid_35517/
3. https://www.brainkart.com/article/Golden-rules-of-first-aid_35518/

Unit III

TYPES OF FIRST AID

Wounds and Hemorrhage

Wounds are injuries that break the skin or other body tissues. They include cuts, scrapes, scratches, and punctured skin. They often happen because of an accident, but surgery, sutures, and stitches also cause wounds. Minor wounds usually aren't serious, but it is important to clean them. Serious and infected wounds may require first aid followed by a visit to the doctor. It also seek attention if the wound is deep, cannot close it yourself, cannot stop the bleeding or get the dirt out, or it does not heal.

Wounds are classified into two types namely open and closed wounds. Open wounds are those in which the protective body surface has been broken, permitting the entry of foreign material into the tissues. In closed wounds, by contrast, the damaged tissues are not exposed to the exterior, and the process of repair can take place without the interference that contamination brings, in greater or lesser degree.

Hemorrhage

Hemorrhage is bleeding from a damaged blood vessel. Many things can cause hemorrhage inside and outside the body. Types of hemorrhage range from minor, such as a bruise, to major, such as bleeding in the brain. Can't stop external bleeding or suspect internal bleeding, seek immediate medical attention.

Causes of hemorrhage

- Long term usage of Alcohol, drug or tobacco
- Blood clotting disorders
- Cancer
- Complications from medical procedures, such as surgery or childbirth.
- Damage to an internal organ.
- Hereditary (inherited) disorders, such as hemophilia and hereditary hemorrhagic telangiectasia.
- Injuries, such as cuts or puncture wounds, bone fracture or traumatic brain injury.
- Violence, such as a gunshot or knife wound, or physical abuse.
- Viruses that attack the blood vessels, such as viral hemorrhagic fever.

Burns and Scalds

Burns and scalds are damage to the skin usually caused by heat. Both are treated in the same way. A burn is caused by dry heat by an iron or fire, for example. A scald is caused by something wet, such as hot water or steam. Burns can be very painful and may cause:

- Red or peeling skin
- Blisters
- Swelling
- White or charred skin



The amount of pain you feel is not always related to how serious the burn is. Even a very serious burn may be relatively painless.

Treating burns and scalds

To treat a burn, follow the first aid advice below:

- Immediately get the person away from the heat source to stop the burning.
- Remove any clothing or jewellery that's near the burnt area of skin, including babies' nappies, but do not move anything that's stuck to the skin.
- Cool the burn with cool or lukewarm running water for 20 to 30 minutes – do not use ice, iced water, or any creams or greasy substances like butter.
- Make sure the person keeps warm by using a blanket, for example, but take care not to rub it against the burnt area.
- After cooling the burn, cover the burn by placing a layer of cling film over it – a clean plastic bag could also be used for burns on your hand.
- Use painkillers such as paracetamol or ibuprofen to treat any pain.
- Raise the affected area if possible – this helps to reduce swelling.
- if it's an acid or chemical burn, dial 999, carefully try to remove the chemical and any contaminated clothing, and rinse the affected area using as much clean water as possible.

Preventing burns and scalds

Many severe burns and scalds affect babies and young children. Examples of things can do to help reduce the likelihood of your child having a serious accident at home include:

- keeping the child out of the kitchen whenever possible.
- testing the temperature of bath water using your elbow before you put your baby or toddler in the bath.
- keeping matches, lighters and lit candles out of young children's sight and reach.
- keeping hot drinks well away from young children.

Respiratory tract

The respiratory tract is the subdivision of the respiratory system involved with the process of respiration. The respiratory tract is divided into the upper respiratory and lower respiratory. The upper respiratory tract includes the nose and nasal passages, paranasal sinuses, the pharynx, and the portion of the larynx above the vocal folds. The lower respiratory tract includes the portion of the larynx below the vocal folds, trachea, bronchi and bronchioles.

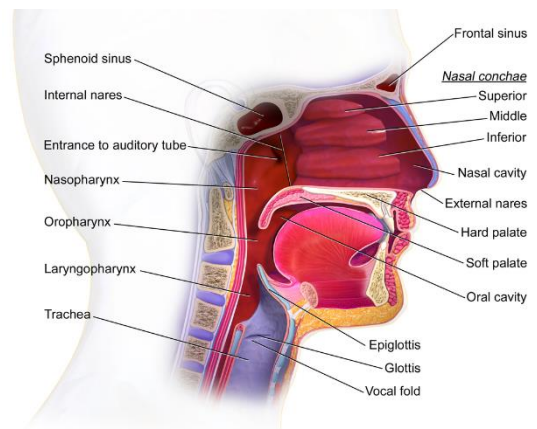
The respiratory tract can also be divided into a conducting zone and a respiratory zone, based on the distinction of transporting gases or exchanging them.

The **conducting zone** includes structures outside of the lungs: the nose, pharynx, larynx, and trachea, and structures inside the lungs: the bronchi, bronchioles, and terminal bronchioles. The conduction zone conducts air breathed in that is filtered, warmed, and moistened, into the lungs. It represents the 1st through the 16th division of the respiratory tract. The conducting zone is most of the respiratory tract that conducts gases into and out of the lungs but excludes the respiratory zone that exchanges gases. The conducting zone also functions to offer a low resistance pathway for airflow. It provides a major defense role in its filtering abilities.

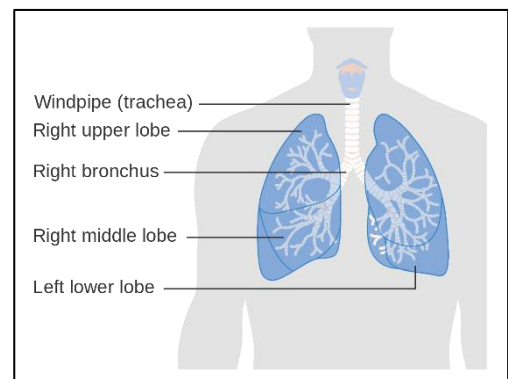
The **respiratory zone** includes the respiratory bronchioles, alveolar ducts, and alveoli, and is the site of oxygen and carbon dioxide exchange with the blood. The respiratory bronchioles and the alveolar ducts are responsible for 10% of the gas exchange. The alveoli are responsible for the other 90%.

Unconsciousness

Unconsciousness is the state in which a person is unable to respond to stimuli and appears to be asleep. They may be unconscious for a few seconds as in fainting or for longer period of time. People who become unconscious don't respond to loud sounds or shaking. They may even stop breathing or their pulse may become faint. Unconsciousness or any other sudden change in mental status must be treated as a medical emergency.



The Upper Respiratory System



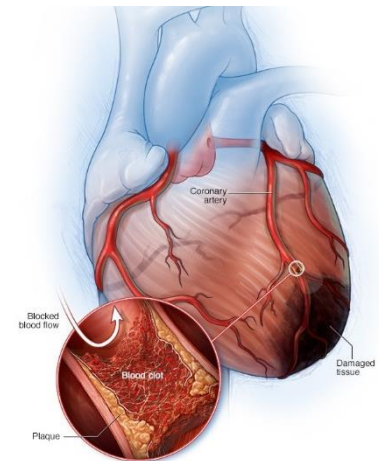
Symptoms that may indicate that unconsciousness is about to occur include:

- Sudden inability to respond
- Slurred speech
- Rapid heart rate
- Confusion
- Dizziness or Lightheadedness

Heart Attack

A heart attack occurs when the flow of blood to the heart is severely reduced or blocked. The blockage is usually due to a buildup of fat, cholesterol and other substances in the heart arteries. The fatty, cholesterol-containing deposits are called plaques. The process of plaque buildup is called atherosclerosis. Sometimes, a plaque can rupture and form a clot that blocks blood flow. A lack of blood flow can damage or destroy part of the heart muscle.

A heart attack is also called a myocardial infarction.



Symptoms

Symptoms of a heart attack vary. Some people have mild symptoms. Others have severe symptoms. Some people have no symptoms.

Common heart attack symptoms include:

- Chest pain that may feel like pressure, tightness, pain, squeezing or aching
- Pain or discomfort that spreads to the shoulder, arm, back, neck, jaw, teeth or sometimes the upper belly
- Cold sweat
- Fatigue
- Heartburn or indigestion
- Lightheadedness or sudden dizziness
- Nausea
- Shortness of breath

Women may have a typical symptom such as brief or sharp pain felt in the neck, arm or back. Sometimes, the first symptom sign of a heart attack is sudden cardiac arrest.

Recover after a heart attack

To recover from a heart attack, follow these steps:

Physical activity - Consult with your health care team about the things that each day in your life and work. The doctor may have given suggestions to limit the work, travel for some time after a heart attack.

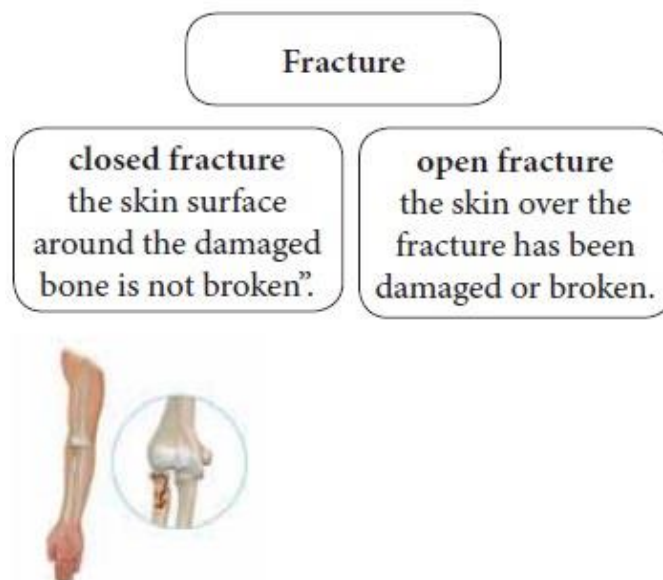
Lifestyle changes - Eating a healthier diet, increasing physical activity, quitting smoking, and managing stress. In addition to taking prescribed medicines can help improve your heart health and quality of life. Consult your health care team about attending a program called cardiac rehabilitation to help you make these lifestyle changes.

Cardiac rehabilitation - Cardiac rehabilitation is an important program for anyone recovering from a heart attack, heart failure, or other heart problem that required surgery or medical care. Cardiac rehab is a supervised program that includes,

- Physical activity
- Education about healthy living, including healthy eating, taking medicine as prescribed, and ways to help you quit smoking
- Counselling to find ways to relieve stress and improve mental health.

Fracture

A break or crack in a bone is called a fracture. A dislocation is where a bone has been displaced from its normal position at a joint. A fracture is when a bone has been broken.



Causes

Direct force: A bone may break at the point where a heavy blow is received.

Indirect force: a bone breaks away from the spot of application of force.

Types of Fracture



Simple fracture: This is the clean break or crack in the bone

Compound fracture: In this type of fracture the skin is torn by the broken bone which may protrude through the wound.

Greenstick fracture: Is a break that happens on one side of a bone.

Comminuted fracture: This type of fracture produces multiple fragments

Impacted fracture: This type of fracture the ends of the broken bone driven in to each other.

Symptoms

- ✓ Swelling.
- ✓ Pain at or near the site of injury.
- ✓ Difficulty moving.
- ✓ Movement in an unnatural direction.
- ✓ A limb that looks shorter, twisted or bent.
- ✓ A grating noise or feeling.
- ✓ Loss of strength.

The aims of first aid for the fractures are:

1. To prevent further damage
2. To reduce pain and shock
3. To make the patient feel comfortable
4. To get medical aid as soon as possible.

Do's

- ✓ Stop any bleeding.
- ✓ Immobilize the injured part.
- ✓ Apply ice pack wrapped in a towel.
- ✓ Treat for shock.

Don'ts

- ✖ Do not force anyone to use a painful body part.
- ✖ Do not straighten a misshapen bone.
- ✖ Do not place ice/cold pack directly on skin.
- ✖ Do not move victim if neck or spine injury is suspected, unless absolutely necessary.
- ✖ Do not move until injury has been immobilized.
- ✖ Do not remove shoes, boots, or clothes around a possible fracture.
- ✖ Splinting is unnecessary if victim can give the broken bone sufficient support and immobility.
- ✖ Do not splint a possible fractured bone if doing so causes pain.
- ✖ Do not Massage the affected area

Dislocation of Joints

A joint is where two bones join or connect. A dislocated joint happens when bones are partly or completely pulled out of their normal position. The most common joints that dislocate are the shoulder, knee, jaw, or joints in the thumbs or fingers.

Signs of Dislocated joints

The four signs of a dislocated joint are:

- Strong, sickening pain
- Not being able to move the joint
- Swelling and bruising around the joint
- Shortening, bending or deformity of the joint

First aid for dislocated joints

- ✓ Advise them to stay still and help them to support their dislocated joint in the most comfortable position.
- ✓ Stop the joint from moving using a bandage. For an arm injury, make a sling to support the arm. For a leg injury, use padding or broad-fold bandages.
- ✓ Apply an ice pack. Ice can ease swelling and pain in and around the joint.
- ✓ Once you have stopped the joint from moving, take or send the injured person to hospital.
- ✓ Keep checking their breathing, pulse and level of response. Check the circulation beyond the bandages every ten minutes and loosen if necessary.

Insect Bites

Bee, Wasp, Ant stings and other Insect bites.

- Remove the sting by scraping, never squeeze the site.
- Wash the area and apply antiseptic cream.
- Keep the sting site rested, elevated and cool.
- To relieve pain and swelling apply cold compress.
- Local swelling and irritation may last for several days.

Scorpions Bites

Scorpion stings can be very painful and the pain may persist for several hours. Local redness and numbness often occur. Some people are allergic to stings and can rapidly develop the serious condition of anaphylactic shock.

Symptoms and signs

- Itching, swelling
- Burning pain
- Increased sensation or numbness
- Lacrimation
- Salivation
- Nausea and vomiting
- Profuse sweating

Treatment

Apply a tourniquet proximal to the site of the sting and release it every 5 to 10 minutes.
Apply ice pack on the region to slow down the absorption of poison.

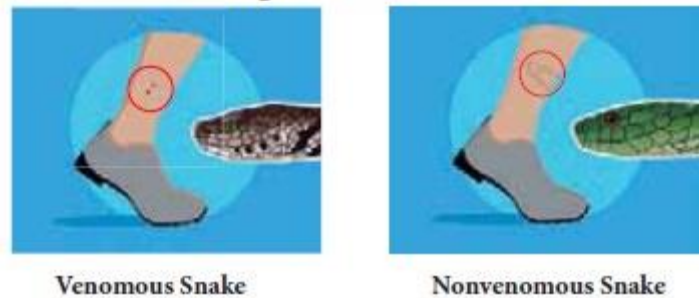
- Shift the patient to hospital
- Centipedes
- Local redness, itching and pain are common.
- Severe pain is sometimes experienced.
- Apply antiseptic to the bite site.

Snake bite

Bites from sharp pointed teeth cause deep puncture wounds that can carry germs far into the tissues. Snake bite results in punctured wounds caused by the fangs of a snake. Signs and symptoms of snake bite:

- A pair of puncture marks.
- Severe burning pain at the site of the bite
- Redness and swelling around the bite Nausea and vomiting
- Difficult in breathing and speech.
- Dimness of vision.
- Increased salivation and sweating.

Examples of Snakebites



- ✗ Do not wash, squeeze or puncture the bite site.
- ✗ Apply a pressure immobilization bandage.
- ✗ Keep the victim calm and still. Do not give food or alcohol.
- ✗ Do not allow the victim to walk.
- ✗ Bites to the head and body must be bandaged as firmly as possible.
- ✗ Do not attempt to catch or kill the snake.

Animal bites

One infection someone might get from an animal bite is rabies, which is a serious viral infection that attacks the brain and nervous system. If an infected animal bites a human, they will pass on the virus, through their saliva.

Tetanus (a bacterial infection) is also a potential risk after an animal bite.

Animal bites- First Aid Management

- ✓ Wash the wound from the bite thoroughly with soap and warm water as it can reduce the risk of infection from an animal bite.
- ✓ Raise and support the wound and then cover it with a sterile wound dressing.
- ✓ If the wound is large or deep, then treat for bleeding.
- ✓ If there's a risk of rabies, then you need to get them to hospital as fast as you can.
- ✓ If the bite is from another human, there's also a risk of getting hepatitis or HIV/ AIDS viruses.

References:

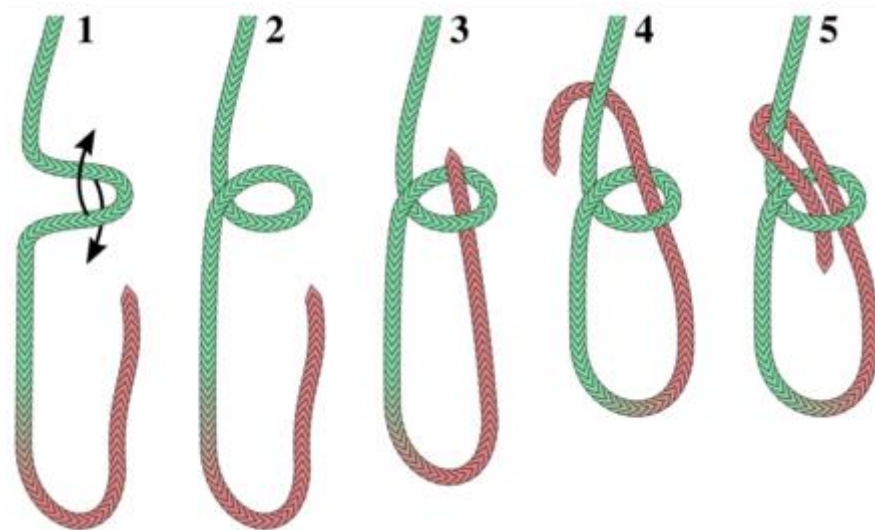
1. <https://www.healthline.com/health/surgical-wound#outlook>
2. <https://www.nhsinform.scot/illnesses-and-conditions/injuries/skin-injuries/burns-and-scalds>
3. https://en.wikipedia.org/wiki/Respiratory_tract
4. <https://my.clevelandclinic.org/health/diseases/15241-bone-fractures>
5. https://www.brainkart.com/article/First-Aid_35517/
6. https://www.brainkart.com/article/Insect-Bites_35523/

Unit IV

TYPES OF KNOTS

Bowline Knot

The bowline knot is recognized as one of the most versatile knots out there, and often referred to as the King of Knots. It is an easy knot to learn, and even after weight is applied, it is an easy knot to undo. Most commonly pronounced bo-lin, this knot likely dates back to a nautical start hundreds of years ago. There are some who suggest that Ancient Egyptians may have even used this knot.



The main purpose of the bowline is to create a fixed loop at the end of a rope. This knot can be tied around an object directly, or tied in advance so that the loop could be later secured over a pole or cleat. This knot holds up best if there is constant pressure pulling against the knot. The main problem that the bowline can have been working its way loose if the load of the knot is absent or constantly changing. While this may be a possibility, the bowline is still commonly used for mooring boats, rock-climbing, and even emergency rescue purposes when a harness is not available. When pressure is applied to the knot, it gets tighter, but the loop remains the same size, so there is no risk of the loop tightening and harming the victim. Because the knot tightens on itself, it is sometimes used in the equestrian world, and is even advised by the Federal Aviation Administration as the knot to tie down lightweight aircrafts.

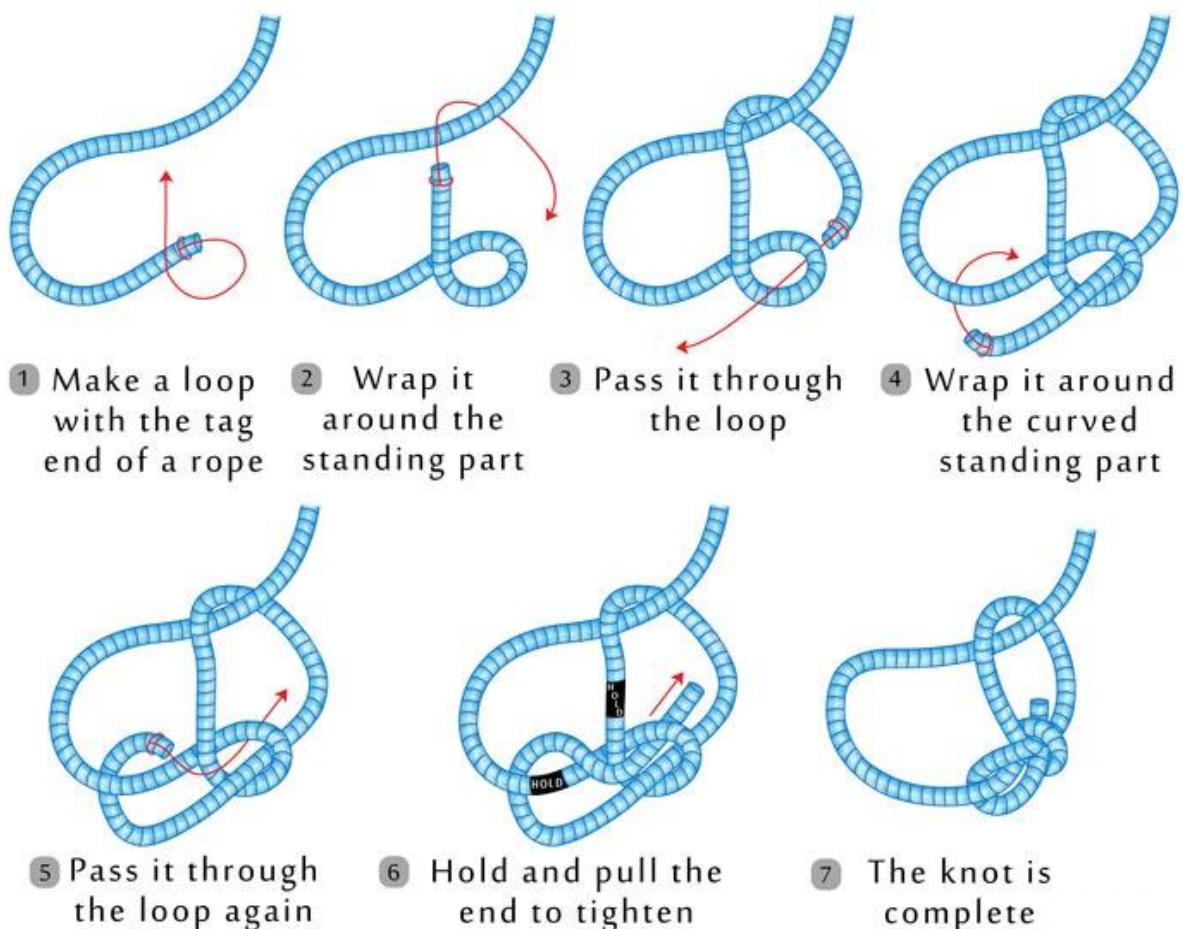
Bowline knots are easy to learn, and can even be tied with one hand after practice! To start though, one of the most popular devices for learning is to think of the rope as a rabbit and a hole. The rabbit will come out of the hole, go behind and around the tree, and back down the hole. First, a loop is made in the rope with your left hand, which will look like a number 6.

This is the standing line, which will stay in place. In your right hand, you will have the tail of the rope. The tail will come up through the loop and go under the standing line. Finally, the tail of the rope continues around the standing line and goes back through the loop. Then, just remember to pull it snug. Once the knot is completed, it should look like the rope is wearing a little life jacket.

Running Bowline Knot

The running bowline is a noose. It creates an adjustable loop that can be drawn up tight. The nice sliding knot can be tied around trees or posts. Based on the classic bowline knot, this one is very secure. It works well in rigging situations. It serves the purpose of retrieving objects by throwing a large loop of the knot around them and cinching it down by pulling the standing line.

Running Bowline Knot Instructions



Advantages

- It can be untied easily
- Doesn't close up on the standing end and bind it.

- Non-jamming release
- It retains a major portion of the line strength

Disadvantages

- If the tree branch or support is too high, it might be a challenge to throw the loop around it. Even if you manage to do it, retrieving the line might be a problem.

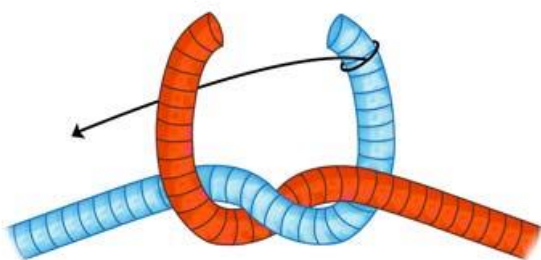
Uses

- To bind parcels.
- By arborists for tree climbing.
- It allows lowering or raising heavy objects.
- Hanging tree swings.
- Boating.

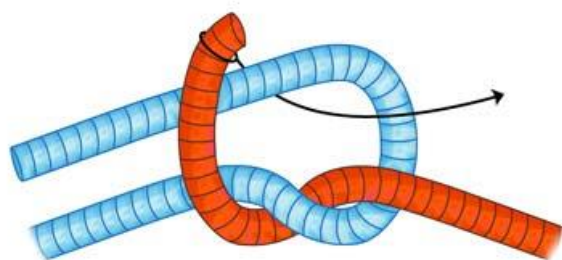
Square (Reef) Knot

The square knot can join 2 ropes of the same size. It is the first knot we learn to make with our shoelaces. It looks like a bow and is hugely unreliable. Its breaking strength is only 45% of the line strength. This leads surgeons to add an extra turn to the first half knot. The simple and ancient binding knot is also known by the names Hercules, Herakles, flat, and reef knots. It helps to secure a line or rope around an object. It creates unique designs of jewellery.

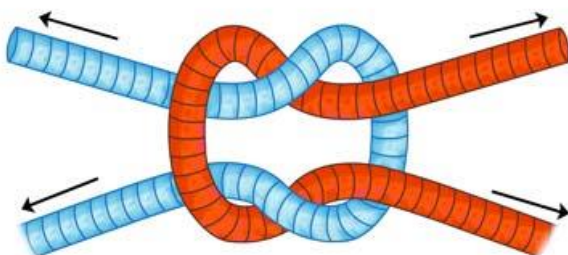
Square (Reef) Knot Instructions



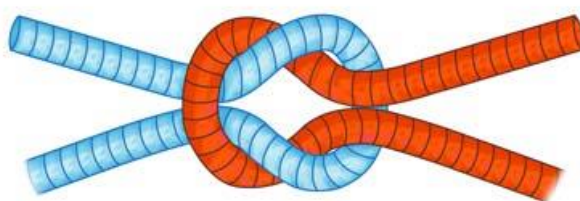
1 Cross the blue and red ends



2 Pass the red end through the blue loop



3 Pull the ends to tighten



4 The knot is complete

- After the knot is made, the tag ends should lie on the same side of the knot. If they don't, you might just have made the thief knot, a highly inferior version.
- A half hitch can be added at each end of the knot to dress and secure it.
- Since the friction of the 2 rope ends holds it together, it is not suited for nylon ropes.

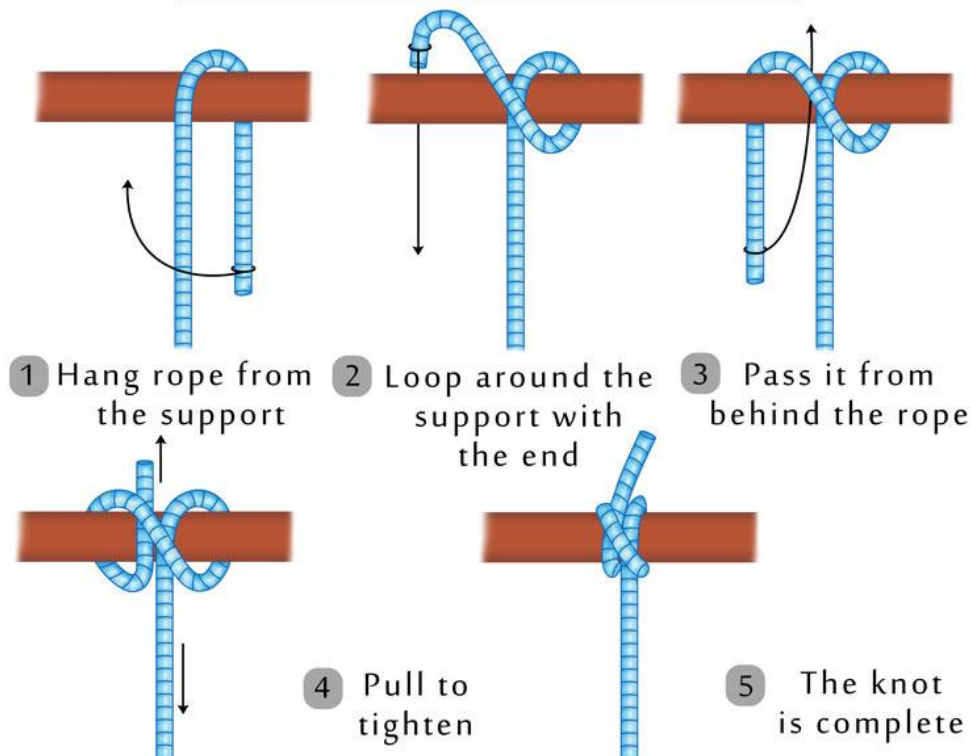
Uses

- Making friendship or other bracelets and necklaces of hemp, paracord, elastic or any other cord, embroidery floss, even leather. It can be used for adjustable closures and clasps in bracelets.
- In macramé patterns (some use an alternating square knot and square knot button pattern) for necklaces, chains, bracelets, sinnets, plant hangers.
- As a religious symbol on the award patch of the BSA adult Boy Scout uniforms. The Arrow of Light, the highest Cub Scouting award also bears this emblem. It is also used by girl scouts and in scout games.
- Tying neckerchiefs and neckerchief slides in navy uniforms, karate belts, baseball gloves, triangular bandages, webbing, handkerchiefs, bandanas.
- As a substitute for cargo straps.
- Making bows (ribbons are good for these) on dresses, etc.
- In surgical sutures, beadwork, electrical wire splice, logos and hair braids.
- Camping.
- Pioneering.
- Knitting.
- Joining crochet yarn.
- In magic tricks.
- Making no-sew fleece blankets, napkin rings, headbands.
- Securing things to a horse's saddle.
- In rappel seats, they are tied with overhand safeties.

Clove Hitch

It is considered to be one of the most important knots alongside the sheet bend and bowline. Also known as a double hitch, it is simply 2 back to back half hitches around a cylindrical object such as a tree, ax or a post. It causes an efficiency loss of approximately 40%. The quick release knot can also be tied with webbing. It can be an interesting forest school activity.

Clove Hitch Tutorial



Tips

- ✓ The direction of pull in the 4th step should be opposite to each other.
- ✓ On repeatedly weighting and non-weighting the knot, it may loosen and may creep up the open gate of a non-locking carabiner. Hence it should never be kept unattended and is to be used with a locking carabiner.
- ✓ Instead of the linear support you can have a ring.
- ✓ You can finish it with a half hitch stopper back around the standing part to prevent slipping.

Advantages

- ✓ Easy
- ✓ The rope on either side of the hitch can be adjusted without untying the knot
- ✓ Can be tied with one hand effectively shortening belay transitions
- ✓ Unties easily in Dyneema slings unlike the overhand knot
- ✓ Holds tight when 1 strand is weighted

Disadvantages

- Slipping & Binding
- Unreliable when tied to a rectangular or square post
- Thinner ropes, when heavily loaded may be difficult to untie

Uses

- ✓ Functions as a crossing knot.
- ✓ To start and finish a lashing such as the conventional square lashing in pioneering.
- ✓ For the master point in a fixed rock climbing anchor. Can also connect a personal anchor.
- ✓ By placing the knot on the spine of a carabiner you create a biner block that securely blocks against a rapid.
- ✓ In solo climbing (as it is safe for self-belaying on a biner) and for rappel transitions.
- ✓ Hoisting.
- ✓ In decorative macramé patterns (for eg. tying a square knot inside a clove hitch diamond).
- ✓ For tying bandages (arm slings) in case of injuries and for first aid.
- ✓ To tie a fender to a rail on a moving boat.
- ✓ In hammock hanging systems.
- ✓ To set up teepees.
- ✓ Tying upholstery springs.
- ✓ Aircraft wiring.

References:

1. <https://www.animatedknots.com/bowline-knot>
2. <https://www.101knots.com/clove-hitch.html>
3. <https://www.101knots.com/square-reef-knot.html>
4. <https://www.boatsafe.com/running-bowline-knot/>

Unit V

Emergency Services

Emergency services and rescue services are organizations that ensure public safety and health by addressing and resolving different emergencies. Services have one or more dedicated emergency telephone numbers reserved for critical emergency calls.



In many countries, one number is used for all of the emergency services (e.g. 911 in the Americas, 999 in the United Kingdom, 112 in continental Europe, 000 in Australia). In some countries, each emergency service has its own emergency number (e.g. 110 for police, 118 for coast guard, 119 for fire and medical in Japan; 110 for police, 119 for fire, 120 for medical in China). Calls made to emergency services to report emergencies are called calls for service.

Accidents – 100:

The Emergency Accident Relief Centre have been introduced in Tamil Nadu by the Relief Centres has been commenced contributing to increase in road accidents, 100 Emergency Accident Relief Centres have been established on all the important National and State Highways, to give first aid to the accident victims within the "golden hour" and to arrange for further treatment through the nearby referral hospitals as per victim's choice. Each centre has an ambulance to respond to the accident cases with essential drugs, paramedical staff and driver available round the clock making it convenient for public to access these centres through a toll free Phone number 1073.

Fire Service – 103 / Rescue Service - 101:

The Fire and Rescue Services play a very vital role in firefighting and fire prevention. Properties worth crores of rupees are saved each year from the ravages of fire and scores of people have been rescued from fires. Apart from firefighting, this department also undertakes rescue activities and has saved hundreds of people, marooned in floods, and caught in the debris of fallen buildings, road and rail accidents and other natural and man-made disasters.



Fire Fighting: General Public request the Departments Services by calling up on 101 and intimate the details of emergency.

Rescue Operations:

Fire department responds to Natural/Manmade Disaster like Cyclones, floods, drowning, Rail/Road/Aircraft accidents, Building Collapses, Chemicals, Biological and Nuclear Emergencies. This service is flushing out of stagnated water in submerged areas during heavy rains/Urban Flooding and respond to accidents/Emergencies and rescuing trapped people and animals.

**Ambulance Service-102:**

The 102 Free Ambulance Service is an emergency medical transport service also called National Ambulance Service (NAS). Under this service, all the ambulances are fitted with GPS system (for easy tracking) and other necessary medical equipment. This emergency transport service facilitates 24x7 free of cost service to pregnant women, newborn babies and their mothers as well under the Janani Suraksha Yojana and Janani Shishu Suraksha Karyakram. The ambulance service provides first aid to the patient and transport them to the nearest Community Health Centre or Government hospitals.

Emergency & Accidents Service – 108:

The 108 is an Emergency Medical Response Ambulance service whereas 102 is free of cost ambulance service for pregnant women and infants. Both the services work as a complement to each other while dealing with emergency and non-emergency situations.

108 was to bring all the three major emergency services such as police, fire, and ambulance services 100, 101 and 102 connectivity through one number. It is a collaboration between the government and the private organizations that are actively working in 18 states and 2 union territories.

Accidents – 1099:

This help line service reaches the site of accident as early as possible and to carry out first-aid and to provide emergency management at the site of accident. Also, quick and safe transportation of the patient to the nearest definitive care facility is provided. This service spread knowledge and awareness about first aid through demonstrations and training of public And to liaise and serve with other organizations such as POLICE, DFS and any other government agencies in times of disasters.

1033 Helpline for Road Users on National Highways:

Recognizing the importance of improving safe travel along National Highways and to help NHAI in taking preventive measures & improve maintenance of road and facilitate to serve the road users, NHAI has launched the Toll Free “1033” Helpline Number to provide 24x7x365 assistance to road users on NHAI’s tolled stretches in case of Emergency/Non-Emergency issues.

The 1033 Helpline provide multi-lingual support service to road users and integrated with the other highway operations facilities such as toll plaza Ambulance, Patrol Vehicle, Crane, etc. depending on the need. Non-emergency issues addressed include FASTag related complaints/queries, feedback about facilities / amenities available at the Toll Plazas and along the National Highways, road conditions, potholes, street light and toll charges related issues etc.

Blood Bank Emergency Help line 1910:

During emergencies, a patient can get blood from blood banks which is subject to availability of a particular blood group. In case required blood is available in a particular blood bank, the blood is given to the patient through a replacement donor who may be a friend or relative of the patient.

1910 help line is used by the people who are in critical situations from their relatives or friends.

Eye Bank Emergency Help line 1919:

Eye Bank Association of India Help us to help change someone's life by pledging your eyes, Gift them sight - give them life. 1919 help line is used by the people who are in critical situations from their relatives or friends.

References:

1. [https://en.wikipedia.org/wiki/102_\(ambulance_service\)](https://en.wikipedia.org/wiki/102_(ambulance_service))
2. <https://www.tnfrs.tn.gov.in/services/>



Virudhunagar Hindu Nadars' Senthikumara Nadar College
(Autonomous)

Reaccredited with 'A' Grade by NAAC

PART V - Internal Examination

YRC – II year

Subject : YRC

Sub.Code: U1YR1

Date : 24.03.2020

Max.Marks : 50

Duration : 2 Hrs

Time : 1.30 PM-3.30PM

Section A

Answer Any Four Questions:-

(4X5=20 Marks)

Answers not to exceed 2 pages.

1. What is First Aid?
முதலுதவி என்றால் என்ன?
2. What are the tools that are inside in First Aid Box?
முதலுதவி பெட்டியில் உள்ள கருவிகள் யாவை?
3. What are the treatments provided to Wounds and Hemorrhage?
காயங்கள் மற்றும் ரத்தக்கசிவுகளுக்கு வழங்கப்படும் சிகிச்சை என்ன?
4. Write the mechanism of Respiratory tract.
சுவாசக் குழாயின் செயல்முறைகள் எழுது.
5. Write the treatment provided for Fractures.
எலும்பு முறிவுகளுக்கு வழங்கப்படும் சிகிச்சை பற்றி எழுது.

Section B

Answer Any Three Questions :-

(3x10=30 Marks)

Answers not to exceed 4 pages.

6. Write about Structure of Human body and its functions.
மனித உடலின் அமைப்பு மற்றும் அதன் செயல்பாடுகள் பற்றி எழுது.
7. What are the treatment provided to Burns and Scalds?
தீக்காயங்கள் மற்றும் தீப்புண்ணிற்கு வழங்கப்படும் சிகிச்சைகள் என்ன?
8. How did you protect a person from Electric Shock?
மின்சார அதிர்ச்சியிலிருந்து ஒரு நபரை எவ்வாறு பாதுகாக்கலாம்?
9. How will you make the treatment for the person who drank Poison?
விஷம் குடித்த நபருக்கு நீங்கள் எவ்வாறு சிகிச்சை அளிப்பீர்கள்?
10. Explain different types of Transport.
பல்வேறு வகையான போக்குவரத்தை விளக்கு.