
	SEAFARERS TRAINING CENTER	M-BFA(I)-03
	ELEMENTARY FIRST AID	REV. 8 - 2018

SEAFARERS TRAINING CENTER INC



Elementary First Aid

***In accordance to International Convention
on Standards of Training, Certification and
Watchkeeping for Seafarers (STCW), 1978,
as amended.***

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AIMS:

This model course aims to provide the training for candidates to provide elementary first aid on board ship, in accordance with Section A-VI/1 of the STCW Convention 78', as amended.

OBJECTIVE:

This syllabus covers the requirements of the STCW Code, Chapter VI, Section A-VI/1, and Table A-VI/1-3. On meeting the minimum standard of competence in elementary first aid, a trainee will be competent to take immediate action upon encountering an accident or medical emergency until the arrival of a person with medical first aid skills or the person in charges of medical care on board.

ENTRY STANDARDS:

The course is open to all seafarers who care to serve on board sea-going merchant ships. There are no particular educational requirements.

COURSE CERTIFICATE:

On successful completion of the course and demonstration of competence, a document may be issued certifying that the holder has met the standards of competence specified in Table A-VI/1-3 of the STCW Convention 78', as amended.

COURSE INTAKE LIMITATIONS

The maximum number of trainees attending each session will depend on the availability of instructors, equipment and facilities available for conducting the training.

STAFF REQUIREMENT

The course should preferably be under the control of a qualified first aider assisted by other appropriately trained staff.

TRAINING FACILITIES AND EQUIPMENT

Ordinary classroom facilities and an overhead projector are required for the lectures. When making use of audiovisual material such as videos or slides, make sure the appropriate equipment is available. Smaller rooms for practical instruction, demonstration and application should be available.

BIBLIOGRAPHY

International Medical Guide for Ship 3rd Edition, pdf



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TIMETABLE

COURSE OUTLINE

Competence: Take immediate action upon encountering and accident or another medical emergency

COURSE OUTLINE	APROXIMATE TIME (HOURS)
Knowledge, understanding and proficiency	Lectures, demonstration and practical work
1. General principles	1.0
2. Body structure and functions	2.0
3. Positioning of casualty	1.5
4. The unconscious casualty	1.0
5. Resuscitation	2.0
6. Bleeding	1.5
7. Management of shock	1.0
8. Burns and scalds, and accidents caused by electricity	1.0
9. Rescue and transport of casualty	1.5
10. Other topics	2.0
11. Review and Assessment	0.5
12. Theoretical Exam	0.5
13. Practical Exam	0.5
TOTAL	16 hours


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COURSE TIMETABLE

PERIOD DAY	DAY 1	DAY 2
1st PERIOD	1. General Principles 2. Body structure and functions	6. Bleeding (continued) 7. Management of Shock
2nd PERIOD	2. Body structure and functions (continued) 3. Positioning of casualty	8. Burns and scalds 9. Rescue and transport of casualty
BREAK		
3rd PERIOD	3. Positioning of casualty (continued) 4. The Unconscious casualty 5. Resuscitation	9. Rescue and transport of casualty (continued) 10. Other Topic
4th PERIOD	5. Resuscitation (continued) 6. Bleeding	10. Other Topic (continued) 11. Review and Assessment Evaluation: Theoretical and practical

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MANUAL

CHAPTER 1: GENERAL PRINCIPLES


The International Agreement on Standards of Training, Certification and Watchkeeping for Seafarers was adopted in 1978. This Agreement did not enter into effect until 1984 due to a show acceptance process by member states at the Convention. By 1992, the Agreement had been ratified by many governments (Administrations). The member states at the convention quickly realized that a complete revision was necessary, and this was quickly accomplished. The Agreement was revised and signed on April 1995; this revision was called STCW-95.

The STCW Agreement revision was needed due to a great number of accidents that could be attributed to human factors, there was and still existed a vacuum as far as competency was concerned, partly because of the changes in crewmember supplies and the variable quality of education and training systems. Even though the latter included some good principles, it was not specific enough to be appropriately implemented. Mainly, it did not provide enough help for the implementation and control on the part of authorities. The STCW 95 Code establishes certain minimum requirements for all seafarers. The new requirements entered into effect on February 1st, 1997. The basic training requirements apply, specifically, to those who start after August 1st, 1998.

STCW Requisites:

Basic training applies to those crewmembers of vessels engaged in any function of that vessel as a fundamental part of the operations and with specifically assigned security and contamination prevention obligations. There are four basic training elements that include:

- a. Personal survival techniques**
- b. Fire prevention and firefighting**
- c. Basic first aid**
- d. Personal security and social responsibility**


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Course objective:

The purpose of the Basic First Aid Course is to train the participant with that which is established in STCW Convention 78', as amended. At the end of the course, the participant must:

- ✓ Place a victim in the proper posture.
- ✓ Apply artificial respiration techniques.
- ✓ Control hemorrhages.
- ✓ Adopt appropriate measures to treat states of shock.
- ✓ Take correct measures in case of burns, fractures and other injuries, including electric discharges.
- ✓ Rescue and transport a victim.
- ✓ Apply bandages and use first aid kit material.

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CHAPTER 2: BODY STRUCTURE AND FUNCTIONS

The sheer act of navigating and defying the nature of the seas may mean, in more than one instance, that we may have to solve different health-related problems, either our own or of the crew members quickly and effectively.

Due to the probability of cuts and wounds, it is advisable that crew members be vaccinated against tetanus. Furthermore, it is prudent for the Captain to have at hand a very brief medical history of the crew that shows the name, age, blood type, Rh factor, height, allergy precedents, heart problems or traumas, high or low blood pressure, epilepsy, diabetes and medication being taken.

The main causes for diseases and accidents can be prevented taking appropriate measures, reminding the crew to keep from solar over exposure, unnecessary cold, dress adequately, avoid damp clothing, think of upcoming maneuvers so reducing the risk of injuries and traumatisms. Likewise, avoid using rings, chains and watches during maneuvers because these can get caught somewhere, causing personal harm.


First aid aboard a ship has the disadvantage of not being administered by specialists at least physically and the care given is limited to the extent of the crew's training and the equipment available onboard.

Note for remember: before you provide First Aid to a victim, you must evaluate the area in order to prevent becoming a victim yourself; the evaluation of the scene of an accident can give us a hint about the type of injury or accident the victim has suffered.

2.1 Definition of first aid:

These are the immediate, adequate and provisional caring given to injured or sick people before being cared for by an aid center.

First aid objectives:

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- ✓ Preserve life
- ✓ A void physical or psychological complication.
- ✓ Assist recovery.
- ✓ Ensure the transfer of those injured to an aid center

2.2 General norms for providing first aid:


In face of an accident that requires first aid attention, as a helper you must remember the following norms:

- ✓ If you are sure about what you are going to do, act accordingly but if in doubt, it is better to do nothing because it is likely that the aid you provide will not be adequate and may contribute to worsen the injured.
- ✓ Stay calm to act with serenity and speed; this gives confidence to the injured and his companions. Furthermore, it contributes with the correct and timely execution of the techniques and procedures needed to provide a first aid. The life of the wounded depends on your attitude; avoid panic.
- ✓ Stay beside the victim; if alone, ask for the necessary help.
- ✓ Search the victim for injuries other than that which motivated the attention and that cannot be manifested by the victim or his companions.

Examples:

"A burnt person who simultaneously presents fractures which do not receive enough attention because the burn is more visible."

- ✓ Completely identify the victim, his companions and register the time when the injury occurred. Give clear and precise orders during first aid procedures.
- ✓ Inspect the scene of the accident and organize first aid efforts according to physical capacities and personal judgment.
- ✓ Do not fight the impossible.

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2.3 Procedure to provide first aid:


To provide first aid you must do the following:

- ✓ Organize a human chain with uninjured people; this not only eases your action but also allows for better breathing space for the injured.
- ✓ Ask among the people present to identify those who know first aid so they may help you. Pay immediate attention to the following, and in the order described, those who:
 - Bleed profusely
 - Do not present vital signs (apparent death)
 - Present severe burns
 - Present fracture symptoms
 - Have slight wounds
- ✓ Upon providing first aid you may need to transfer the injured to a nearby health center or hospital, if necessary.

2.4 General precautions to provide first aid:

In all first aid procedures you, as a helper, must do the following:

- ✓ Determine possible dangers at the scene of the accident and place the victim in a safe place.
- ✓ Communicate continually with the victim.
- ✓ Loosen the injurer's clothing and check whether respiratory tracks are obstructed or not.
- ✓ Avoid unnecessary movements; do not try to dress him.
- ✓ If the victim is conscious, ask him to move each extremity in his body in order to determine the sensibility and movement.
- ✓ Place the victim in a lateral position to avoid secretion accumulation that may obstruct respiratory tracks (vomit and mucus).
- ✓ Cover the injured to maintain body temperature.
- ✓ Provide emotional and physical security.

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- ✓ Do not force the injured to stand up or move if you suspect fractures; instead, it is necessary to immobilize him.
- ✓ Do not administer medicaments except analgesics, if necessary.
- ✓ Do not give liquids orally to people with altered states of conscience.
- ✓ Do not give liquor.
- ✓ Do not make comments about the injured health condition, especially if conscious.

2.5 Main functions of parts forming the body structure

Most people are familiar with the functions of the major organs in the human body, but cells are where the magic happens. Starting from a single cell, the human organism ends up with over 200 different kinds of cells. A cell is a membrane-enclosed compartment containing molecular machinery dedicated to carrying out metabolic reactions and maintaining the genetic material. Each kind of cell is specialized to carry out a task within the body. Some cells carry oxygen through our bloodstream (red blood cells); some contract and power our movements (muscle cells); and some process and transmit information about our environment and our bodies (brain cells). That is, of course, just to name a few.

These hardworking little cells end up organizing and grouping together to form the four tissue types in the body. A tissue is a specialized group of cells and their products that function together. The four tissue types in the human body are as follows: epithelial, muscle, nervous, and connective tissue. Epithelial tissue is great for building structures with walls and passageways and compartments. Muscle tissue has cells organized and coordinating together to contract and move. Nervous tissue consists of neurons linked together in vast networks for transmitting and receiving information. Finally, connective tissue provides much of the physical structures and supports within the body and includes materials like cartilage, fat, bone, and blood.


If you take some tissues and combine them into a larger structure that has a dedicated function, you have created an organ. You are probably familiar with organs - things like the heart, lungs, liver, and kidneys. We think of the heart as contracting and providing the force necessary to pump our blood. It is dedicated to that

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task. We don't expect that sometimes the kidneys will do the pumping, and sometimes the brain will do the pumping, and so on. We expect that the heart will carry out that function our entire lives.

If you take a collection of organs that are all geared towards accomplishing a specific larger function within the body, then you have an organ system. We have eleven of these, ranging from the digestive system to the immune system. If you think about the digestive system, the organs (mouth, liver, stomach, intestines, etc.) included in it each play a crucial but distinct role in digesting our food and allowing absorption of nutrients to fuel metabolism. Each organ individually would not be able to achieve that overarching task.

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CHAPTER 3: POSITIONING OF CASUALTY

3.1 Important aspects:

Investigate the state of consciousness through a complete examination of the victim in order to explore all physical signs and any changes in behavior that may occur. Usually, this is done after the helper has heard the case history and the person's symptoms.

The exam ought to be complete and careful, avoiding excessive and unnecessary manipulation that may worsen already-existing wounds or produce new ones. The examination method will depend on the circumstance in which it is undertaken.

The wounded should remain in the open the least possible amount of time; in fact, the examination can be done in such a way that most of the body remains covered during the process. It is dangerous to move a person without knowing the nature of his injuries.

When examining an injured person, one must be methodical and orderly.

The first step when examining any part of the body is the inspection. It consists of cautiously and carefully checking the part that is going to be examined before touching it. The initial inspection frequently uncovers alterations that would go unnoticed otherwise.

After the inspection the helper must carefully touch the affected part, paying special attention on bones. When the injured person is conscious the examination's main purpose is to discover sensitive parts; but for someone who is unconscious, the method is still useful since some bone irregularities can be discovered. We consider it pertinent to distinguish between the meanings of sign and symptom:



SIGN: What the helper observes on the injured person.

SYMPTOM: Those manifested by the injured person.



3.2 An approved way to turn an injured person:


3.2.1 Examination method:

After taking the vital signs (breathing, pulse, and pupil dilation) it is necessary to make a series of observations about the general aspect of the injured person.



3.2.1.1 Observing the Injured includes a series of elements amongst which we mention:

- ✓ **Posture:** immobile or restless, comfortable or uncomfortable, backwards or straight, injured legs, restless or tremulous hands.
- ✓ **Expression:** happy, anxious, gloomy, irritated, excited or indifferent, facial symmetry, swelling.

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- ✓ **Mood:** extroverted, friendly, hostile, impatient, nervous, worried.
- ✓ **Consciousness:** a wake, answers questions or unconscious.

3.2.1.2 Loosen tight clothing:

If it is necessary to open or remove the injured person's clothing for a better evaluation; do it, be careful to cut or open at the seams.

3.2.1.3 Individual exam of each body part:


Careful evaluation includes the individual examination of each part of the body. It is usual to start at the head and proceed downwards. If there is some sign of probable wound localization, attention may be fixed on the suspicious part. Thus, torn clothing, bloody pants and other similar clues may show probable wounds. Anyway, we recommend methodically examining the injured person, top-down, in the following order:

✓ **Face:**

- **Eyes:** raise and carefully inspect the eyelids. The size of the pupils, their reaction to light and the state of the reflexes must be considered.
- **Nose:** Bleeding or the exit of a clear liquid through each one of the nasal passages can be a grave sign which suggests a cranial base fracture.
- **Ears:** The emission of blood or a clear liquid (cephalo-rachidean liquid) can be discovered analogously.
- **Mouth:** Coloration, spots or burns could suggest intoxications. It is necessary to completely open the mouth and examine it carefully.

The breath's odor can sometimes indicate the cause:

- **Gasoline:** Intoxication with hydrocarbons.
- **Alcohol:** Liquor ingestion.
- **Bitter almonds:** Cyanide poisoning.

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- **Garlic or onion:** Intoxication with organic phosphates or gunpowder.

When a hemorrhage is observed it is necessary to find its source, e.g., a torn cheek or gum. When examining the mouth, false teeth must be removed to avoid breathing obstructions if these move around the mouth.

The aspect and characteristics of vomit can lead us to a diagnostic:

- ✓ **Abundant:** Intoxication with arsenic.
- ✓ **With hemorrhage:** Intoxication with caustics, anticoagulants, aspirin, and alcohol or serpent venom.
- ✓ **In cotton balls:** Acute lead poisoning.
- ✓ **Phosphorescent:** Intoxication with white phosphorus.
 - **Head:** After inspection, cranial bones must be gently touched, looking for traumas.
 - **Thorax:** While examining the Thorax, direct your attention towards the bones, their symmetry, and their deformity. When touching the ribs, the First aid must start examination as close as possible to the vertebrae and continue gradually exploring towards the front until reaching the sternum. A voiding moving the injured person, a careful revision of the vertebrae should be done, touching it along its length.
 - **Abdomen:** Adequately inspect this zone, edemas, masses, wounds or exposure of guts, while locating painful places which will specifically tell us of compromised organs.



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- **Pelvis:** Pelvis examination should be performed in a similar manner to that of the ribs. It is easy to see whether clothing is humid, which can be due to involuntary urination.
- **Extremities:** each bone in these zones must be examined, making existing wounds evident. If there are no signs of fracture, it is convenient to check joints for dislocations.

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CHAPTER 4: THE UNCONSCIOUS CASUALTY

We always have to think of the possibility of several injuries from one accident, which is why we have stressed on a complete routine exam, for both conscious and unconscious persons. Due to the pain's intensity and the shock's graveness, an injured person may not know he has other injuries which are less painful.

"Omitting a complete exam could lead to undetected injuries"

4.1 Signs and hazards of unconsciousness:

The interview should mainly focus on signs and symptoms that, at that time, cause the most discomfort to the injured person, for example:

- ✓ Pain is described indicating the place, irradiation, intensity, duration. The relationship between the pain and the relief, worsening or unleashing with bodily functions, exercise and rest must be accounted for. Consciousness must be evaluated and are better noted in a descriptive manner instead of using terms with different meanings.
- ✓ **Verbal response:** Does not speak, sounds are not understandable; language is confused or is normal.
- ✓ **Opening of the eyes:** Does not open the eyes, only opens them when feeling pain or when spoken to, or opens them spontaneously.
- ✓ **Motor response:** There are no movements, there are abnormal flections or extension movements, movements are oriented, obeys orders.

The three previous parameters allow us to check, at a given time, is supposedly all right or are deteriorating with time. Emotional reactions must be dealt with most care, trying to make the conscious injured person understand the nature of his injuries, what procedures will be performed, what is the status of his companions, what happened to his belongings, where will they be transferred to, how will his relatives be informed, etc.; with the purpose of getting greater cooperation on his part. Consequently, logic handling of the data obtained during the examination of an injured person is the base for proper treatment.



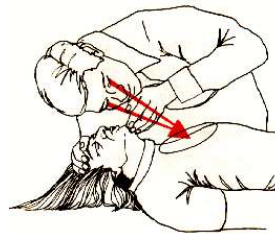
4.2 Appropriate measures for vital signs:

Vital signs are those signs and reactions that a live human being presents which reveal his organism's basic functioning. The vital signs are: breathing, pulse, pupil reflex, temperature, blood pressure. When providing first aid, it is important to evaluate the organisms functioning and detect those alterations that are frequent in case of accidents; therefore, it is necessary to control breathing and pulse. The evaluation of temperature and blood pressure is performed at a clinical level since almost never do we have the equipment to measure these two vital signs. The control of respiration and pulse, in addition to being necessary to determine changes that may occur as a consequence of the accident, orient health personnel to start definitive treatment.

✓ **Respiration:**

It is the gaseous exchange between the organism and the atmosphere. Respiration has two phases: inhalation and exhalation. During inhalation oxygen from the atmosphere is introduced into the lungs and during exhalation carbon dioxide is eliminated. In addition to the respiratory apparatus' organs, during respiration thorax muscle contractions and rib movements also intervene. Therefore, in case of injuries at this level, it is indispensable to control this vital sign.

- Normal respiration values



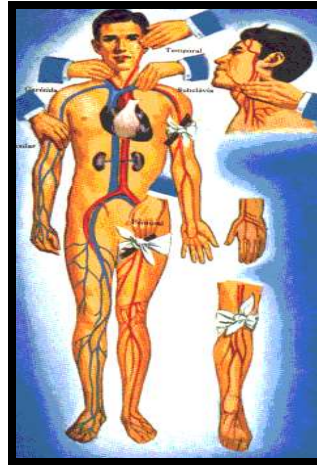
Babies	30 to 40 respiration per minute
Toddlers up to 6 years of age	26 to 30 respiration per minute
Adults	16 to 20 respiration per minute
Elderly	Less than 16 respiration per minute



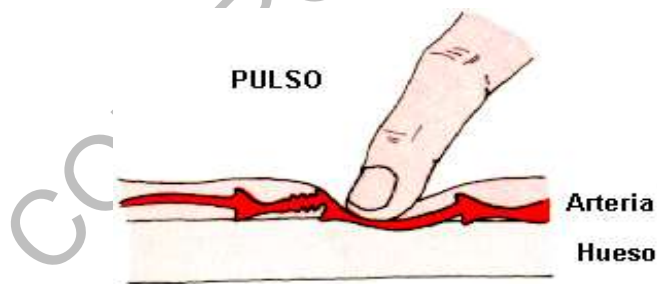
- Procedure to control respiration in order to control respiration, you must count respiratory movements, taking inhalation and exhalation as a single respiration. Lay the injured person down; in case of vomit, with the head sideways. Loosen clothing. Start respiratory control observing the thorax and the abdomen after taking the pulse, so the injured person does not notice, thus avoiding changes in the respiratory rhythm. Count respirations per minute. Write down the number to verify changes.
- ✓ **Pulse:**

It is the rhythmic expansion of an artery, produced by the passing of blood pumped by the heart. Pulse is controlled to determine the heart's functioning. Pulse changes when the heart-pumped blood volume reduces or when artery elasticity changes; taking the pulse is a quick and easy way to evaluate the status of an injured person.
- ✓ **Normal pulse values:** Normal pulse varies according to different factors, age being the most important.

Babies	130 to 140 respiration per minute
children	80 to 100 respiration per minute
Adults	72 to 80 respiration per minute
Elderly	60 respiration less pulses per minute
- ✓ **Places to take the pulse:** The pulse can be taken at any superficial artery that can be compressed against a bone.



- ✓ **Places to take the pulse:** The places where the pulse may be taken are: at the temple (temporal), the neck (carotidal), the internal part of the arm (humeral), the wrist (radial), internal part of the elbow (cubital), the groin (femoral), the top of the feet (pedio), the baby's left nipple (apical). In first aid, the most frequent spots are the radial and the carotidal.



- ✓ **Recommendations to take the pulse:** Feel the artery with your index, middle and ring fingers. Do not feel with your thumb because this finger's pulse is more perceptible and may be confused with the patient's pulse. Do not apply excessive pressure because you will not be able to feel it properly. Control pulse in a minute using a watch with second band. Write down the value to check for changes.



- ✓ **How to take carotid pulse:** It is the easiest to locate and the one with most intensity. To locate it, do the following: locate the Adam's apple, slide your fingers towards the side of the trachea; gently press to feel the pulse, count the pulse per minute.



- ✓ **How to take the radial pulse:** This pulse is the most accessible, but sometimes during accidents it becomes imperceptible. Feel the radial artery, which is located at the wrist, immediately above the thumb's base. Place your fingers over the artery and press gently. Count the pulses in a minute.

- ✓ **Pupil Reflex:**

Normally, pupils contract when stimulated by light. If both pupils are greater than normal (dilated), the injury or illness can indicate shock, severe hemorrhage, heat exhaustion, or drugs. If both pupils are smaller than normal (contracted), the cause can be sunstroke or drug use. If both pupils do not have the same size, suspect head injury or paralysis.





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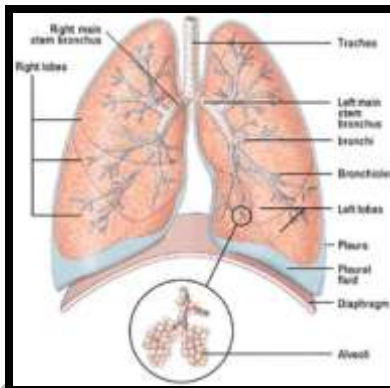
- ✓ **How to take pupil reflex:** If you have a small lantern, light the eye and observe how the pupil contracts. If you do not have one, quickly open the upper eyelid and look for the same reaction. If one or both pupils do not contract, suspect grave neurological damage.

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CHAPTER 5: RESUSCITATION

It is the sudden and simultaneous interruption of respiration and heart functioning due to the existing relationship between respiratory and circulatory systems. Respiratory arrest can occur while the heart continues functioning, but cardiac arrest overcome in few minutes, when immediate first aid is not provided. Also, a cardiac arrest can initiate, in which case, respiratory arrest occurs simultaneously. In first aid, it is important to determine whether a respiratory arrest or cardio respiratory arrest has taken place in order to execute the appropriate resuscitation maneuver.



5.1 Causes for respiratory arrest and its manifestations:

Causes

- Drowning
- Foreign bodies in respiratory tracks. (food, vomit, mucus, blood)
- Sunstroke or freezing
- Burns
- Inhalation of irritant vapors or gases.
- Throat inflammation
- Throat obstruction due to fallen tongue.
- Choking
- Lack of oxygen (mines, wells, wardrobes)



- Alcohol intoxication
- Excessive doses of medicines
- Electric shock
- Traumatism
- Shock
- Cardiac arrest

Manifestations:

- Lack of respiration
- Cyanosis on lips and nails
- Loss of consciousness
- Fast and weak pulse

5.2 Causes of cardio-respiratory arrest and its manifestations:**Causes:**

- Cardiac arrest
- Profound hypothermia
- Shock
- Cranio-encephalic traumatism
- Electrocutation
- Severe hemorrhages
- Dehydration
- Respiratory arrest

Manifestations:

- Lack of pulse and respiration
- Pale skin and sometimes cyanotic, especially lips and nails.
- Loss of consciousness
- Partially dilated pupil; within 2 or 3 minutes dilation is total and there is no reaction to light.



5.3 Cardio-pulmonary resuscitation C.P.R.:

Upon finding and unconscious person, you must immediately proceed as follows:

- Try awakening the person with soft movements or calling. Are you O.K?
- If the person does not wake up, lay the victim on his back and ask for help.
- If you do not know resuscitation procedures remain with the victim until someone how does comes, watching that the victim's respiratory tracks are clear.

• Medical Assistance is available via 2182khz or on VHF Channel 16.

CPR - CARDIO PULMONARY RESUSCITATION

This information is published for those who have had training in opr and should not be used by an untrained person except in the gravest emergency where no skilled help is available

• CHECK FOR DANGER • STAY WITH THE PERSON • CALL FOR HELP AND START RESUSCITATION

1 AIRWAY

- Quickly turn person on side
- Remove foreign material from mouth
- Place neck and jaw in correct positions
- Listen for breathing
- Watch for chest movement



2 BREATHING

- If not breathing**
- Quickly turn person on back
 - Open Airway
 - Start mouth to mouth or mouth to nose
 - 5 full ventilations in ten seconds
 - Check neck pulse
 - If pulse is present, resuscitation at a rate of 15 per minute (one every 4 seconds)
- check the circulation after 1 minute and then every 2 minutes
 - If breathing returns - place the person on side - keep the airway clear



3 AIRWAY

- Check neck pulse
- If absent**
- Begin external cardiac compression
- Place the heel of one hand on the lower half of the sternum
- Lock the other hand to the first by grasping wrist or interlocking fingers



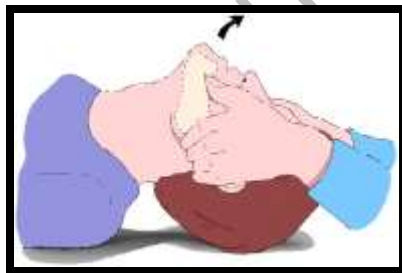
**5.4 Hyperextension - procedure to open respiratory tracks or hyperextension:**

To avoid irreparable brain damage, it is necessary for the helper to know the basic principles of life support, which are the ABCs of resuscitation:

- Open respiratory tracks.
- Restore respiration.
- Restore blood circulation.

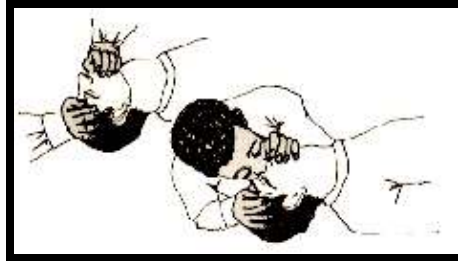
5.5 If the victim does not breath, the helper must follow these steps:

- Confirm that the victim is lying down on his back and open the respiratory track by extending the head towards the back (Hyperextension).
- Clean his mouth.
- Extract secretions, vomit and foreign bodies; frequently this method is enough for the victim to recover respiration.
- Listen and observe during 5 seconds whether the victim breathes. If he does not, incline the head backwards and give him two complete blows, one after the other.

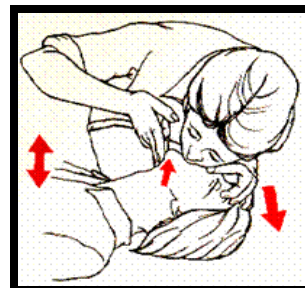
**5.6 Lifesaving Respiration:**

After the procedure described above, direct your attention to the thorax and observe if it rises slightly or near your cheek to the patient's mouth to feel if warm air comes out, which corresponds to his respiration.

- If he does not respond, incline the head again and give two more blows.
- If respiration cannot be achieved, you can deduce that the victim may have a foreign body in the throat, and then solve this problem.



- Check for respiration again.
- Keeping the head inclined backwards and the respiratory track clear give a complete blow. After a minute, take the pulse again. Continue giving complete blows every five seconds if it is an adult and every three seconds if it is a child or baby.
- With an average of 12 respirations for adults, 20 for children and 30 to 40 for babies.
- These steps keep air flowing into the victim's lungs.
- If there is pulse and no respiration, continue giving lifesaving respiration until it is reestablished or medical assistance is obtained and do not start chest compressions because it is unnecessary and dangerous if the victim's heart is beating.
- If respiration is re-established and the victim has pulse, keep aerial tracks clear and permanently observe the respiration.
- If the victim has neither pulse nor respiration start resuscitation maneuvers.
- See the following figures.





5.7 Resuscitation with Cardiac Massage:

It is a combination of respirations with external cardiac massage. When the heart does not function normally blood does not circulate, the supply of oxygen to all the cells of the body diminishes. This frequently happens during a heart attack or a cardio-respiratory arrest.

A simple way to determine whether the Heart is functioning is by evaluating the pulse. If the person has no pulse it is necessary to restart circulation by chest compression practicing cardio-pulmonary resuscitation, which has two purposes.

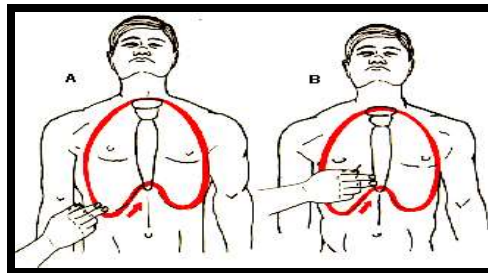
- Keep lungs full of oxygen when respiration has stopped.
- Keep blood circulating in order to carry oxygen to the brain, heart and other parts of the body.

Procedure:

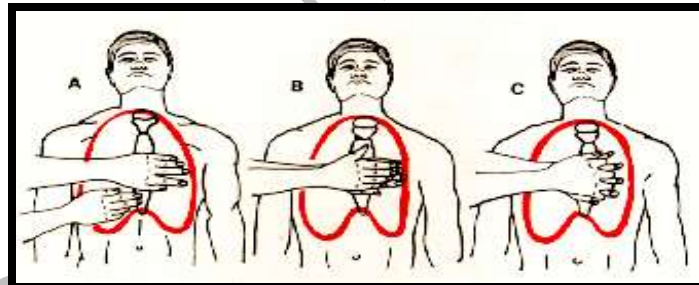
- Observe if the victim breathes during five seconds.
- Check carotid pulse on adults or those older than one year. For babies, locate brachial pulse.
- Observe the victim top to bottom to find possible hemorrhages.
- If the victim does not breath and has no pulse, execute the following procedure considering that before you start massaging you must make sure there actually is a lack of pulse for it is dangerous to do compressions when the victim still has circulation.
- To avoid this, evaluate the pulse during 10 seconds before determining that the victim is under cardiac arrest.



- Locate the rib cage and then find the lower point of the sternum, measure two fingers above. External Cardiac Compression. On the adult, place one hand with the heel of the palm and the fingers pointing upwards at the located spot and interlace the fingers of both hands. For a child, use only one hand. For a baby, only use your index and middle fingers in the middle of the chest, between the nipples.



- Compress the chest and with softness, repeat the procedure as explained later on.

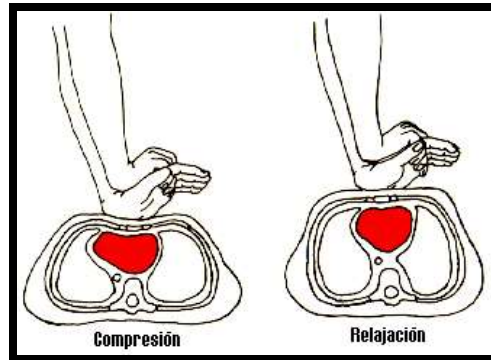


- Do not remove your hands from the victim's chest.





- This procedure ejects blood from the heart.




5.8 Cardio-pulmonary resuscitation with one helper:

- 15 thoracic compressions are performed for 2 ventilations and proceed at this rhythm to repeat the cycle. (The massage's speed is from 80 to 100 compressions per minute).
- For babies and children older than one year 5 compressions and a blow are performed and you continue like that successively until the victim recovers blood circulation and respiration and or until medical assistance arrives.
- In case pulse is re-established spontaneously suspend the cardiac massage maneuvers and continue with those for respiration and repeat the procedure until you deliver the victim to an aid center.
- If, during transfer, the victim recovers the pulse and the respiration place him in a secure lateral position and remain alert to vital signs.

5.9 Cardio-pulmonary resuscitation with two helpers:

- The one in charge of the blow's places himself by the victim's head and the other places himself or herself on the opposite side, near the thorax, with the purpose of changing positions in ease of fatigue.
- The one in charge of the blows starts with two respirations, checks the respiration and pulse; if not present, the other helper starts with 5 chest compressions, while this procedure is performed the

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other helper counts aloud "and one, and two, and three, and four, and five" keeping the rhythm. Upon completing the five compressions the other helper gives a blow and the maneuver continues in cycles of five compressions and one blow.

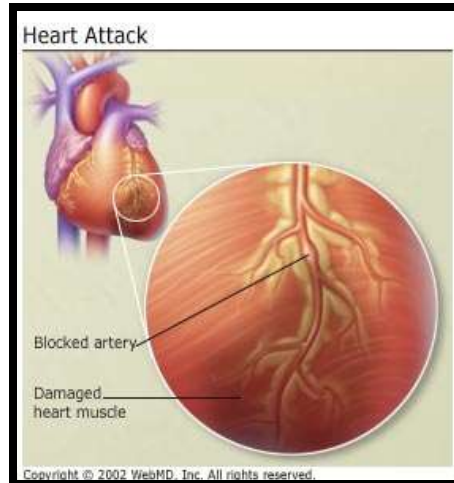
- The helper that gives the blows periodically checks the effectiveness of the chest compressions and checks the pulse while the other helper is doing the compressions. If the person has pulse, he verifies the respiration, if the person does not breath lifesaving respiration is continued controlling the pulse every minute.
- If the helpers want to change positions due to fatigue, keep in mind the following procedure:
 - **From compressions to blows:** The helper that gives the compressions says: "and change, and two, and three, and four, and five". When completing the compression cycle both helpers change positions quickly.
 - **From blows to compressions:** The helper that gives the blows when done says change and quickly moves placing the hands waiting to give the compressions.

Important Aspects:

Frequently in unconscious patients, the tongue obstructs the superior air passages, which easily leads to cardio-respiratory arrest. In most cases the mere act of clearing the air passages allows resuming ventilation and prevents cardiac arrest. Do not give cardiac massage not artificial respiration if the person is not totally lacking these vital Signs.

5.10 Cardiac Attack – Infarct:

A cardiac attack is an injury to one of the parts of the heart where one or more blood vessels feat supply blood to the heart is blocked. When this happens, blood does not circulate and cells begin to die. Then the heart can stop pumping blood altogether, producing a cardiac arrest. A cardiac arrest victim whose heart still beats has greater opportunities of survival fan one who is under cardiac arrest, if first aid is quickly provided.



Infarct risk factors:

- Hereditary
- Gender
- The risk increases with age
- Stress due to nervous tension
- Smoking cigarettes
- Hypertension
- Obesity
- High cholesterol
- Diabetes
- Lack of exercise
- High uric acid

Signals:

- Byte-type pain.
- Uncomfortable pressure.
- Strong oppressive sensation, suddenly appearing in the center of the chest or the mouth of the stomach.




- Pain irradiated to the arms, shoulders, neck and jaw on the left side.
- General discomfort, sweating weakness.
- Fast and weak pulse.
- Paleness or cyanosis.
- Nausea.
- Difficulty breathing.

First Aid:

- Absolute rest, no movements should be allowed, not even to walk, since this effort would produce more work for the heart.
- Ask the patient to sit or lean in a comfortable position, generally semi seated. Loosen tight clothing.
- Calm the victim and act swiftly, transfer the patient as soon as possible to an aid center where adequate attention will be dispensed.
- Control vital signs during transfer and, if they fail, initiate C.P.R. maneuvers.



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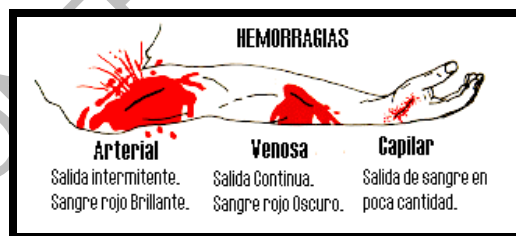
CHAPTER 6: BLEEDING

These are the most common problems in first aid care. These injuries can cause grave damage, incapacity or death.

The manifestations of an infection at the place of an injury are: inflammation, reddening, pain, heat (to the touch) in the zone and pus drainage. Grave infections provoke fever, general malaise, despondency, somnolence, lack of appetite, nausea and, depending on the type of microorganism that causes the infection, other manifestations. There is a grave infection called tetanus which can be acquired through an injury in soft tissue. Infection manifestations can show up within hours or days after the injury occurs.

6.1 Hazards of Bleeding:

Blood circulates through the interior of blood vessels (arteries, veins and capillaries), which transport it throughout the body. When one of these blood vessels breaks, blood comes from the interior, thus originating a hemorrhage.



Any loss of blood must be controlled as soon as possible. In case of hemorrhages, the organism puts to work its mechanisms to control it, adding the blood platelets around the injured vessel and forming a clot which plugs the vessel, preventing blood exit. Attention must be immediate because, within minutes, blood loss can be total, causing shock and death.

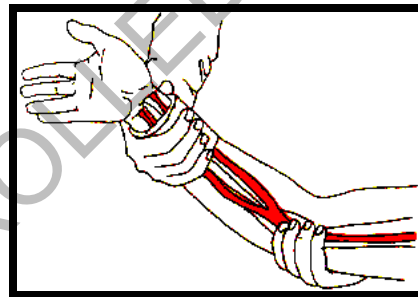


6.2 Basic measures to limit bleeding:

✓ **External hemorrhage:**

Occurs when blood exits through a wound. Divided in:

- **Capillary or superficial hemorrhage:** Only compromises superficial blood vessels that irrigate the skin; is scant and can be easily controlled.
- **Venous hemorrhage:** Veins carry blood from the organs to the heart; they are characterized by their dark red blood color and continuous exit, scant or abundant.
- **Arterial hemorrhage:** Arteries carry blood from the heart to other organs and the rest of the body; they are characterized by their bright red color, their abundant and intermittent exit, coinciding with each pulsation.

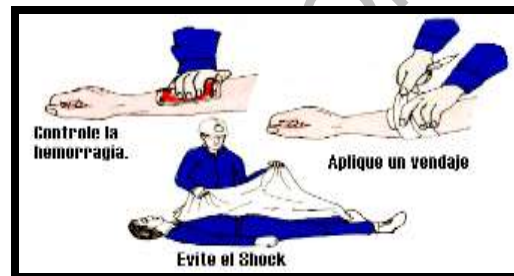


- **External hemorrhage control:** Lay the victim down. Put on disposable latex gloves. Uncover the place of the injury to evaluate the type of hemorrhage since this is not always visible; it may be hidden by the victim's clothes or position. To identify the type of hemorrhage, dry the wound with a clean cloth or gauze. If conscious, give the victim oral serum or water to drink. To control the hemorrhage, follow these steps (in this order, if possible):
 - **Direct Pressure:** apply over the wound a compressor clean cloth putting on strong pressure. If a compressor cloth is not unavailable, you can do it directly with your hands, as long as you do not have any wounds in your hands or are protected with gloves.

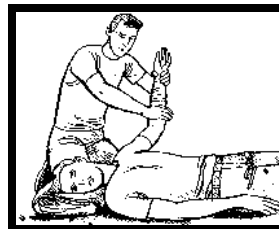


The majority of hemorrhages can be controlled with direct pressure. Direct pressure with the hand can be substituted with a pressure bandage, when wounds are too big or when you have to attend other victims.

This technique is generally used simultaneously with elevation of the affected part except when you suspect backbone injury or fractures, (you must immobilize before raising the extremity).



- **Elevation:** Elevation of the injured part diminishes blood pressure at the place of the injury and reduces the hemorrhage. If the wound is located in a lower or upper member, raise it above Heart level. Cover the dressings with a roll bandage. If bleeding continues place additional dressings without removing the initial bandage.



- **Direct pressure on the artery:** This consists of pressing the fingertips on an artery against an underlying bone. It is used when you have not been able to control a hemorrhage by direct pressure and elevating the extremity or in cases



where the previous methods can't be used (open fractures). This technique reduces irrigation of the entire member not just the wound, as is the case with direct pressure. When using the pressure point one must simultaneously make direct pressure over the wound and elevation. To control hemorrhages on upper or lower members do the following:

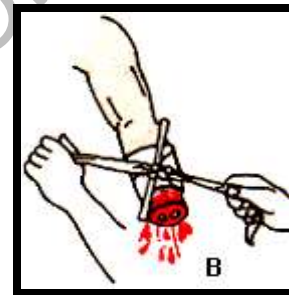
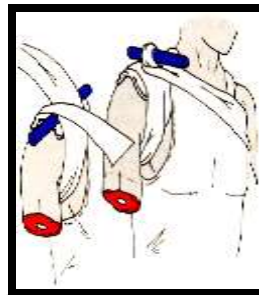
- **On upper members:** Pressure is exerted on the brachial artery, internal face of the mid third of the arm. This pressure diminishes blood in the arm, forearm and hand. To apply pressure, place the palm of your hand below the victim's arm, feel the artery and press it against the bone.
- **On lower members:** Pressure is exerted on the groin over the femora artery. This pressure diminishes the hemorrhage on the thigh, leg and foot. Place the base of your hand's palm in the mid part of the groin's crease. If hemorrhaging stops after three minutes of pressure, slowly release the direct pressure point. If it continues, exert pressure on the artery again. Wash your hands after the attention.



- **Tourniquet:** It must be used as a last resort due to the grave consequences its usage brings and is reserved only for those cases where the hemorrhage is so severe that the three previous methods have failed, such as an amputation, where it must be the first step towards effective hemorrhage control (the




patient's life is threatened). Use a folded triangular bandage or a cloth bandage, at least 4 cm wide. (Do not use thin bandages, cords or wires). Place the bandage four fingers above the wound. Make two turns around the arm or the leg. Make a simple knot at the bandage's end. Place a short and strong stick. Make two more knots over the stick. Slowly turn the stick until the hemorrhage is controlled. Loosen once every 7 minutes. Transfer the victim immediately to an aid center.



✓ **Internal Hemorrhage:**

That whereby the blood does not flow to the body's exterior, but stays within, generally accumulating under the skin or within an organic cavity, being this the gravest case. Internal hemorrhages include grave injuries that can cause shock, cardiac arrest or pulmonary failure. They may be provoked by crushing, punctures, torn organs and blood vessels and fractures. Whatever type of hemorrhage produces reduction in circulating blood, which the organism tries to maintain, especially in the most vital organs such as: heart, brain and lungs.

- **Signs of internal hemorrhages:** Very sensitive or rigid abdomen, bruises on different body parts. Loss of blood through the rectum or vagina. V omits with blood. Closed fractures. Shock manifestations.
- **Attention of internal hemorrhages:** If the victim presents symptoms of internal hemorrhage or you suspect the strength of what caused the injury has enough to

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provoke one, transfer the victim as soon as possible. Control respiration and pulse every 5 minutes. Cover the victim. Do not give anything to drink.

✓ **Hemorrhages in specific parts of the body:**

- **Face and skull:**

Cover with a clean gauze or cloth. If you do not suspect there is a fracture, exert direct pressure until the hemorrhage stops.

▪ **Nose:**

- Sit the victim down.
- The sitting position reduces bleeding risk for head and nose.
- Incline the head forward to avoid swallowing blood and provoking vomit.
- Press on the nose's partition (above the nasal graves) with your index finger and thumb. This allows the obstruction of the main artery that irrigates the nose.
- If bleeding continues, plug with gauze wetted in distilled or steamed water.
- Apply compress cold water or ice on the forehead and (wrapped in a gauze towel or compress).
- Do not expose to the sun. Do not allow the patient to blow the nose because bleeding will increase. Remit to an aid center.





▪ **Dental:**

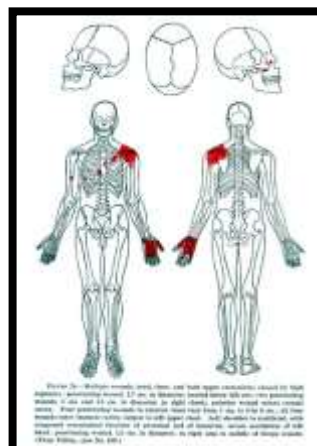
- Plug the hole in the bleeding gum with gauze wetted in oxygenated water (diluted) and ask him to bite strongly.
- Do not allow the patient to make gargles with any type of solution, much less with warm water. Do not give alcoholic beverages to drink.
- Do not allow the introduction of elements on the alveolus such as ash, salt, coffee, etc. remit the patient to a dentist.


▪ **Female Genital Hemorrhage:**

This type of hemorrhage is frequent in cases of menstrual irregularities, abortion or post labor. Place the patient in horizontal position and calm her; cover her to keep her from getting cold. If you do not have hygienic towels use dressings or gauze. Control vital signs continually. If conscious, give her oral serum. Do not give alcoholic beverages. Quickly send her to an aid center, keeping her in a horizontal position.

6.3 Wounds:

These are injuries that produce loss of integrity of soft tissues; caused by external agents such as a knife or internal agents such as a fractured bone. They can be open or closed, light or complex. The main are: pain, hemorrhage, damage or destruction of soft tissues.



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6.3.1. Classification of wounds:

- ✓ **Open wounds:** In this type of wounds separation of soft tissues can be observed. These are the most susceptible to contamination.
- ✓ **Closed wounds:** Those where soft tissue separations cannot be observed, generally caused by blows; the hemorrhage accumulates under the skin (bruise), in cavities or viscera. Must be treated quickly because they can compromise an organ's function or blood circulation.
- ✓ **Simple wounds:** Wounds that affect the skin, without damaging important organs.
- ✓ **Complex wounds:** Long and deep wounds with abundant hemorrhage; generally, there are injured muscles, tendons, nerves, blood vessels, internal organs and visceral perforation may or may not occur.




6.3.2. Classification according to the element that cause them:

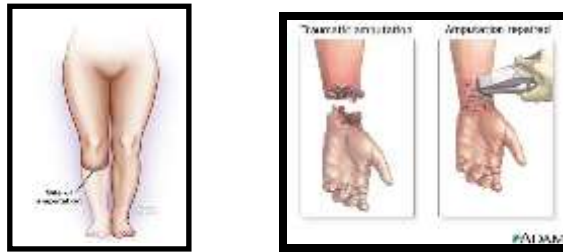
- ✓ **Cutting or incisive wounds:** Produced by sharp objects such as cans, glasses, knives, which may sever muscles, tendons and nerves. The wound's edges are clean and linear; hemorrhage may be scarce, moderate or abundant, depending on the location, number and caliber of the severed blood vessels.

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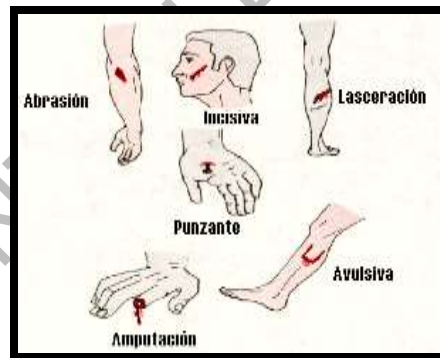
- ✓ **Sharp wounds:** Produced by pointed objects such as nails, needles, fishing hooks or snake bites. The injury is painful, hemorrhage is scarce and the entry orifices are slightly noticeable; it is considered to be the most dangerous because it can be deep, it may have perforated viscera and provoke internal hemorrhage. The risk of infection is greater because there is no cleansing action by the blood that flows to the exterior. Tetanus is one of the complications of this type of wounds.
- ✓ **Sharpe wounds:** Produced by sharp pointed objects such as scissors, daggers, knives or fractured bones.
- ✓ **Partied wounds:** Produced by objects with serrated edges (saws or cans). There is tear tissue and the wound's edges are irregular.
- ✓ **Firearm wounds:** Produced by projectiles; generally, the entry orifice is small, round, clean while the exit orifice is bigger; the hemorrhage depends on the injured blood vessel; there may be fractures or visceral perforation, depending on the injury' s location.
- ✓ **Scratches, excoriations or abrasions:** Produced by friction or scrape of the skin on hard surfaces. There is loss of the skin's most superficial layer, heat, and scarce hemorrhage. Frequently, they get infected.
- ✓ **Avulsivas wounds:** Those where tissues separate and tear off from the victim's body. A cutting or lacerated wound can become avulsivas. Bleeding is abundant. For example: dog bite.
- ✓ **Bruise wounds:** Produced by hard objects. There is pain and bruises; these wounds occur due to bone resistance to the blow, injuring soft tissues.

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- ✓ **Bruises:** These are closed wounds caused by blows. They appear as bruises.
- ✓ **Amputation:** It is the total or partial extirpation of an extremity.




- ✓ **Crush:** When body parts are trapped by heavy objects. They can include bone fractures, external organ injuries and, at times, abundant internal and external hemorrhage.



6.3.3. Care of wounds:

- ✓ **Slight wounds:** place the victim in a comfortable position and ask him about the cause for the injury. Wash your hands and put on the latex gloves, avoid touching the wound with your fingers. Remove clothing from the wound. Dry the wound touching it with gauze, inside and at the ends. Only use the gauze once. Never use cotton, handkerchiefs or paper napkins, these take off specks and may cause infections. Wash the wound with abundant water and iodized soap. Apply iodized antiseptic. Cover the injury with a

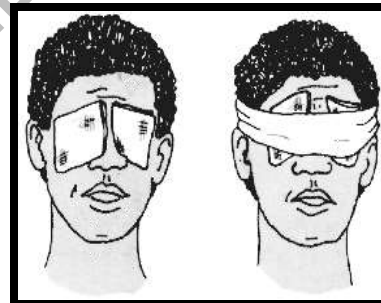
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bandage, gauze, dressing, cloths, hold it with sticking plaster or bandage if necessary. Do not apply salt, coffee, dung, spider webs, for these cause infections on the wound and tetanus may appear. Do not apply medicines (powdered or antibiotics cream) because allergies may appear. Wash your hands after providing the aid.


- ✓ **Bruise wounds and bruises:** raise the injured part. Apply cold cloth or an ice bag; wrap the affected area with a towel to reduce hemorrhaging and swelling.
- ✓ **Wounds produced by fishing hooks:** To remove the hook you must know its direction and curvature. If it bleeds, dry the wound with gauze. If the hook is nailed in an area of thin tissue (ear Pavilion, nasal wing, lip, skin between the fingers), do the following: Push the nail through the skin following the hook's curvature, until the tip comes out at the other side. With pliers, cut the hook's tip and remove it in the direction opposite that at which it entered. You can also cut it at the posterior part of the tip, near the skin, and remove it where the tip came out. If you do not have instruments to cut the hook, it is best that a doctor removes the hook.
- ✓ **Lacerated or avulsivas wounds:** In many cases, tom tissue can be joined again at an aid center; therefore: irrigate the tissues with saline solution; do not try to wash the wound. If possible, rejoin tom tissues. Cover the wound with dressing or cloth. If bleeding, apply direct pressure on the wound with a bandage and raise the affected member. If the wound continues bleeding, do not remove the bandage and make direct pressure on the artery that irrigates the injured area. Apply cold locally (ice bag wrapped in a towel) over the area.
- ✓ **In case of crushing:** Ask for help and retire the weight as quick as possible. Write the hour of the rescue and the duration of the crushing. Control the serious hemorrhages and cover the wounds, immobilize the fractures if exists. Put cold cloths or ice bags involved in a towel. Of attention to shock.



- ✓ **Wounds in the face or crane:** Generally, these wounds bleed a lot because of the irrigation of this area. Sometimes the sunken bones can be observed through the exit of liquid, hemorrhage trough the ears and nose. The injured can manifest double vision, present vomit or face paralysis. In front these kinds of wounds you must do the following: Lie down the victim and tranquilize her. Clean softly the wound with gauze or a humid fabric. Cover with dressing, cloth or clean fabric, without applying pressure because it can be a fracture with a depressed bone. Mobilize the victim as slowly as possible because the cranium wounds are frequently associated with neck and cranium fractures and that's why it is necessary to do the immobilization before the translocation. In eyes injuries, cover with a cardboard cone or with a plastic reject table glass the injures eye, apply a bandage that cover both eyes. Take the victim to health organization fast.




- ✓ **Thorax wounds:** hemorrhages with bubbles, whistling sound trough whilst the victim is breathing, pain, coughing, expectoration and difficulties in breathing because there is to pulmonary injury. With these kinds of injuries, it's necessary to sweep the wound with a clean fabric or gauze. If the wound is big and there is no whistle sound cover it with a gaze or clean fabric quickly at the moment of the respiration, tie with sticking plaster or with a bandage. Try to do it as hermetically possible to avoid the entrance of air. If you don't have clean fabric or gauze uses the hand to cover the wound. Don't introduce any kind of material through the wound.

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- If it's a small wound and presents suction in the thorax, cover the wound with a big sterilize dressing; tie the dressing with sticking plaster around the borders, less one that must stay untie to allow the exit of the air during the exhalation. Put the victim in a lateral position over the affected side to avoid a complication of the other lung. If the injured can't take being in that position or presents difficulties for breathing give him an almost sitting position helped with a support, pillow or other elements to make easier the respiration. Take the victim to the medical center.
- **Abdominal wounds:** can be intestine perforation with spill of the content, hemorrhages and the victim can enter in shock. In these cases, do the following: Lay down the victim over himself with the legs flexed, putting pillows under his knees. Don't raise his head because the abdominal muscles tensions and increases the pain. Don't give anything to eat or drink. If there are visceral spilling, don't try to put them in because the abdominal cavity can be contaminated producing an infection. Cover the wound with clean fabric, cloth or humid gauze with salad solution or fresh water. Tie it with a bandage in the shape of a tie, avoid make pressure. Don't use small gauzes because they can stay inside the cavity.
- **Wounds with stuck elements:** Put the victim in a comfortable position. Don't retire the element that causes the wound because an abundant hemorrhage can be produced. Immobilize the element with a bandage for avoiding the movement causing another injures.

6.3.4. Recommendation for the transport of the amputated members:

Watch the amputated part with salt solution and wrap it in gauze or in a clean fabric humid with salt solution. Place the amputated parts in a plastic bag. Then put them in another bag with ice. Be careful that the amputated member is protected in a plastic bag to avoid contamination.

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CHAPTER 7: MANAGEMENT OF SHOCK

7.1 Main factors causing shock

We define shock as the set of signs and symptoms resulting from the lack of diminishing of blood in tissues originated by the loss of blood volume or the rise of the capacity of the vessels (loss of blood pressure). This implies the lack of tissue oxygenation whereby, if not acted upon quickly, can cause death to the injured person. There are several types of shock, depending on the greater or lesser blood volume.


Is produced by a detention of blood circulation or by the increase of blood vessel capacity, which originates a pressure loss or reduction needed irrigate tissues with oxygen. **Examples:**

- ✓ **Septic shock**, produced by an infection due to wounds.
- ✓ **Anaphylactic shock**, produced by allergies (medications, bites...)
- ✓ **Neurogenic shock**, produced by pain (traumatism in general)
- ✓ **Toxic shock**, produced by intoxications (alcohol)

7.2 Signs of shock

Observation of skin color:

- ✓ **Cyanosis (bluish or violet coloration):** observed in severe hemorrhages, intoxications, breathing obstructions.
- ✓ **Paleness:** in anemia, hemorrhages, emotions, cold.
- ✓ **Reddish:** (intense red color) in acute intoxications by atropine or barbiturates, intense corporal efforts, feverish diseases, chronic alcoholism, anger.
- ✓ **Note:** In case an injured person has dark skin, change in color can be observed on the lips, mouth or eyelids internal surface.
- ✓ Some mucus coloration can give us an idea of the problems the injured person may have, thus:
 - **Black or dark brown:** sulfuric acid intoxication.
 - **Yellow:** citric or nitric acid intoxication.
 - **Soapy white:** intoxication with caustic soda.

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- **Gray:** lead or mercury intoxication.

7.3 First aid in case of shock:

Action regarding a shock ought to be oriented to treat, primarily, the cause for which it has occurred, evidently whenever possible. Nevertheless, you will always act in the following way:

- ✓ **Control vital signs.** In case of cardio-respiratory arrest, one must start the basic vital support protocol.
- ✓ Treat injuries, if possible.
- ✓ Loosen everything that impedes normal blood circulation.
- ✓ Place the injured person so his feet are higher than his head, whenever possible.
- ✓ Avoid corporal heat loss.
- ✓ Urgently evacuate the victim, always controlling vital signs, since there is a tendency for shock to worsen and produce entry into a state of comma.

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CHAPTER 8: BURNS AND SCALDS, AND ACCIDENTS CAUSED BY ELECTRICITY

Burns are a specific type of soft tissue injury produced by physical, chemical or electric agents or radiations. A severe burn can put life in danger and requires immediate medical attention. The severity of the burn depends on the temperature of the medium that caused it and the duration of the exposure of the victim to it. The severity of the burn is also determined by its location on the body, its size, as well as the victim's age and physical condition.

8.1 Causes of burns:

- **Physical agents:** Hot solids; boiling liquids; cold solids (exposure at very low temperatures).
- **Chemical agents:** Gasoline and, in general, petroleum byproducts. Acids (hydrochloric or sulfuric). Bases (caustic soda, lime or carbide).
- **Electric Agents:** Electric discharges at different voltages, radioactive agents.

8.2 Severe Burns:


Burns that make respiration difficult, those that cover more than one part of the body; burns on the head, neck, hands, feet and genitals are considered severe. Burns on a child or elder. Extensive or deep burns. Burns caused by chemical substances, explosions or electricity. Severe burns can be deadly; therefore, they require the earliest possible medical attention.

8.3 Signs of burns:

Burns can be of: first, second or third degree, according to the injured skin layers and deep tissues (muscles, nerves and blood vessels).

✓ **First degree burns:**

A burn that injures the superficial layer of the skin is considered as a first degree burn. This type of burn is generally caused by extended exposure to the sun or instant exposure to another form of

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heat (iron, hot liquids). Symptoms: skin reddening; dry skin, intense burning-type pain; moderate inflammation; great sensitivity at the injury's location.

✓ **Second degree burns:**

Burns where the superficial and intermediate skin layers are injured.

- **Symptoms:** blister formation, intense pain, inflammation of the affected area.

✓ **Third degree burns:**

Burns where all skin layers are compromised; affect tissues which are located beneath the skin, such as blood vessels, tendons, nerves, muscles and can even injure the bone. This type of burn is produced by prolonged contact with hot elements, caustics or by electricity.

- **Symptoms:** characterized by dry skin. Stiff skin. There is no pain due to destruction of nervous terminations. Always require medical attention, even if the injury is not extensive.

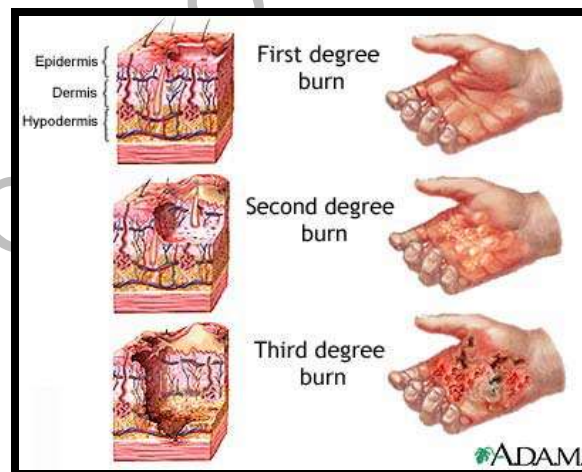


Figure: Types of burns.

8.4 General care of burns:

Calm the victim and relatives. Evaluate the burn's type and severity. Carefully remove rings, watch, bracelet, belt or tight clothing that press the injured zone before it begins to inflame.

- ✓ Do not break blisters, to avoid infections and greater traumatism.



- ✓ Cool down the burnt area for several minutes; apply saline solution or cold water (not freezing).
- ✓ Do not use ice, nor pomades or ointments; these may delay medical treatment.
- ✓ Cover the burnt area with a dressing or a cloth soaked in saline solution or clean cold-water and hold it with a bandage to avoid infection.
- ✓ Do not apply pressure against the burn.
- ✓ If the burn is on hands or feet place gauze between the fingers before placing the bandage.
- ✓ Administrate an analgesic, if necessary, to reduce the pain.
- ✓ Administrate abundant liquids orally, as long as the victim is conscious; whenever possible, give oral serum.
- ✓ If burns are on the face or neck place a pillow or cushion below the shoulders and control vital signs, cover burns on the face with sterile gauze or clean cloth, making openings for the eyes, nose and mouth.
- ✓ Take the victim to and aid center.

8.5 Specific burns:


- ✓ **Burns due to vapor inhalation:** When vapors are inhaled burns in respiratory tracks are generally produced. In this case:
 - Remove the victim from the scene of the accident.
 - Cover facial burns with clean gauze or cloth opening wholes for eyes, nose and mouth.
 - If there is no respiration, begin first aid respiration.
 - If the victim has no pulse, begin cardio pulmonary resuscitation.
 - Immediately transfer the victim to an aid center.
- ✓ **Burns due to fire:** If the person is running, stop him. Put out the fire on the victim. Cover him with a blanket or similar, being careful not to burn yourself. You can also extinguish the fire using water, sand or earth. Do not do it with a fire extinguisher; its content is highly toxic. If the hair has caught



on the cover the face very quickly to suffocate the fire and remove the blanket immediately to prevent toxic gas inhalation. Once the fire is out, loosen and remove the clothing that is not adhered to the injuries. Apply physiologic saline solution over the burn. Cover the burn with a cloth or a dressing, and then fix it loosely with a bandage.

- ✓ **How to rescue victims when a fire occurs:** If smoke and gases accumulate, do the following: Open the door with your foot, placing yourself to one side to avoid burns or asphyxiation by the flames or gases coming from the precinct. To enter the precinct crawl on the floor, previously covering your mouth and nose with a wet handkerchief and, whenever possible, carry another one to protect the victim. Withdraw the victim by dragging him to avoid further smoke and gases inhalation, since these accumulate at the upper part of the precinct. Place the victim in a safe place. Evaluate the condition and injuries and provide the appropriate first aid.
- ✓ **Burns with chemicals:** Wash with plenty of water the burnt area (eyes, skin or mucus) for no less than 30 minutes. Cover the burn with a clean cloth to avoid infections. Transfer the victim to an aid center.
- ✓ **Burns due to electricity:**

Electric burns may occur anywhere. Contact with any electric source can make electricity travel through a person's body causing severe injuries, incapacity or death. Electric burns are almost always of third degree, with an entry point and one or more exit points, where carbonized or exploded areas can be observed. They generally do not bleed and are painless. Most importantly, consider those internal injuries that may occur, such as respiratory arrest, cardio-respiratory arrest or shock produced by the passing of current between entry and exit points. Electricity in high tension cables can jump or form an area of up to 18 meters and kill a person. Therefore, do not get near the victim unless you have been officially informed that electric current has been stopped. Electric devices and low-tension cables produce injuries of lesser intensity. Before giving first aid, interrupt contact, cutting the current off from the main conduction in case it is accessible. If you


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cannot interrupt electric flow, do the following: stand on a dry wooden or rubber surface. Remove the victim from the electric source with a wooden or plastic object because these do not conduct electricity. Do not touch the victim with your hands because you will receive the electric discharge. Evaluate respiration and pulse; if not present, give cardiopulmonary resuscitation. Cover the injured area or areas with a clean and dry dressing or cloth. Transfer to an aid center as quickly as possible.

✓ **Burns due to freezing:**

Low temperatures produce burns or injuries on the skin, very much like heat does, especially in places like: feet, hands, nose or ears. If there is freezing you should do the following:

- Remove the victim from the place.
- Loosen clothing to facilitate blood circulation.
- If feet are frozen, do not allow the victim to walk. Gradually raise the temperature at the injured parts using warm water (360 to 370°C), being careful not to apply direct heat over the frozen part.
- Keep the area humid until the area warms up again. To warm nose and ears, cover them with your hands.
- If the victim is conscious, have him drink warm sweet beverages. Do not give alcoholic beverages. Shelter them as good as possible. Do not use heaters.
- Raise the affected part to reduce inflammation and pain.
- Do not apply creams or other medicines. Do not massage the affected area.
- If there are blisters, do not burst them.
- After the victim has warmed up, bandage the area with sterile dressing; place gauze between the fingers before bandaging.

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CHAPTER 9: RESCUE AND TRANSPORT OF CASUALTY

The unnecessary transfer of the victims of an accident or the serious patients is very dangerous. "Transport them safely ". When transferring a victim or a serious patient, you must try and guarantee that any injuries will not increase, nor new injuries will be caused to the patient or that unnecessary movement or inadequate transport can complicate the recovery. It is better to administer attention at the site of the accident, unless there exists an imminent danger to the life of the victim or the helper such as a fire, explosion danger or collapses of a building. Once a decision has been made to transfer the victim, consider the security of the victim like your own. Also consider your own capabilities, as well as the presence of other people who can help you.

9.1 Methods to lift a person with applies appropriate transportation, uses and hazards:

✓ Pull:

This method is used when it is necessary to remove a victim from the area of the danger, to a distance of no more than 10 meters and the helper is alone. This method should not be used when the land is unequal or irregular (stones, glasses, and stairs). Place the arms of the victim in a crossed position on his/her thorax. Put yourself behind the head and put your arms below the shoulders thus sustaining the neck and the head. Drag the injured person along the floor. If the victim has a coat or jacket, undo and pull backwards so that the head rests on the clothing. Drag along the floor by holding the ends of the clothing (coat, jacket or shirt).

If in an enclosed space and there is gas accumulation or smoke, do the following: If the injured is conscious and cannot mobilize himself, kneel down and tell him you are to pass your arms around his neck, interlacing the hands. If he is unconscious, fasten his hands with a bandage up to the wrists then carry out the same procedure. If the victim is very big you can use the drag method by the feet, but make sure that the victim does not have a head injury or that you are pulling across unequal or irregular land.



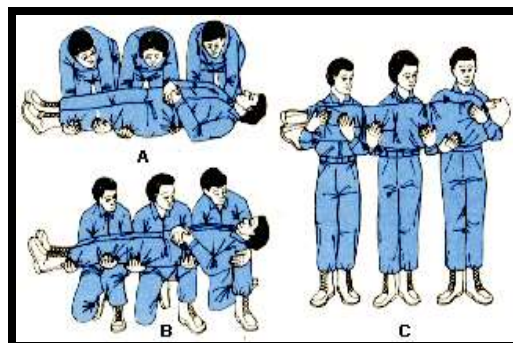
✓ **Loading of arms:**

When the victim is of low weight. Pass an arm below the thighs of the victim. Put the other arm around the trunk, over the waist and lift the victim.



✓ **With the help of a quilt or blanket:**

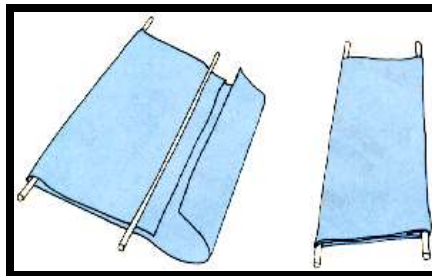
In order to raise an injured person with the help of a quilt or blanket you will need 3 to 5 helpers. This method is used when there is no stretcher available and the distance to cross is short. However, this must not be used if injured person is suspected to have spinal injuries. To place the quilt or the blanket doubled in accordance to the size of the victim. Two helpers are kneeled next to the victim and they hold him each side (one of the helpers maintains the hips and the legs, the other the back and the head); the third one approaches the blanket or quilt and pushes it in such a way that it is near the back. Place the victim laid down on his back and prepare to lift him.



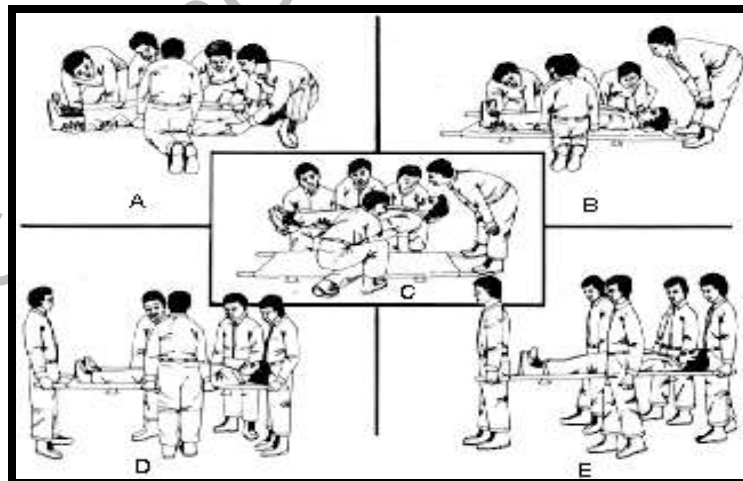


✓ **Stretcher:**

Four helpers are placed kneeling each side: Two in the superior part, they take the cover or blanket or to the height of the shoulders and the waist and the legs, and fifth behind the head. Haul the ends of the blanket to avoid it from coiling underneath the body.




Coil the edges of the blanket or cover surrounding the body of the victim. Then to a verbal order, lift up and walk slowly of each side, initiating the march with the foot that is closest to the feet of the injured.



Kinds of stretchers:

The types of stretchers:

- **Canvas:** stretchers to transport victims who do not present/ display serious injury
- Rigid Stretchers to transport injure of the column; these are of wood, metallic or acrylic.

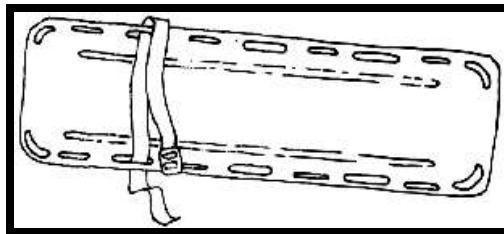
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- Stretchers with strap holes to transport injured of the column.
- Stretcher for the transport of injured in operations in helicopters.

✓ **Transport in chair:**

The chair can be used when the person is conscious and does not have severe injuries, especially if it is necessary to lower or to climb stairs. Be sure, the way is free of obstacles, in order to avoid the helpers from slipping. To use this method of transport, 2 helpers are needed. Verify that the chair is strong. Sit the victim in the chair. If he cannot sit without aid, do the following:

Cross the legs of the victim, a helper kneels to the side of the injurer's head. Put a hand under the nape of the neck, the other hand under the scapula. In a single movement pull the injured person, against him and maintain him by a leg. Place an arm below the armpit of the victim taking the hand near the wrist. With the other hand take similarly the other arm and cross them, supporting the head against the helper, maintain the trunk of the victim between your arms. Lift up with the back straight, taking the strain with the legs, while the other helper maintains the legs of the victim. And, to a verbal order, lift up simultaneously and place the victim in the chair. Assure him when in the chair; incline the chair backwards, so that the back of the victim stays against back of the chair. To a verbal order, lift the chair simultaneously and walk slowly.



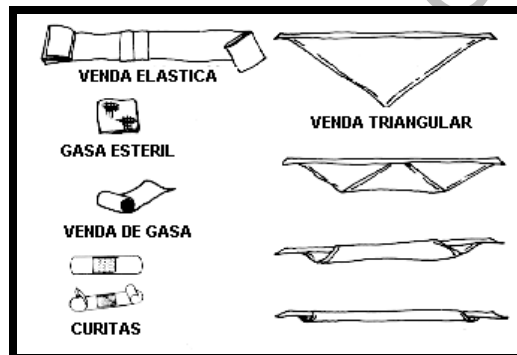


CHAPTER 10: OTHER TOPICS

10.1 Bandaging:

The bandages are the ties made with strips of linen cloth or other materials with the purpose of wrap an extremity or another injured part of the human body. The bandages are used to support dressings, to fix splints and articulations.

Are the tires; they have differences in size and in the material quality. The most used are the followings: bandage with border of gauze, bandage of skin gauze, muslin gauze bandage, and elastic bandage. Some kinds of bandages are:

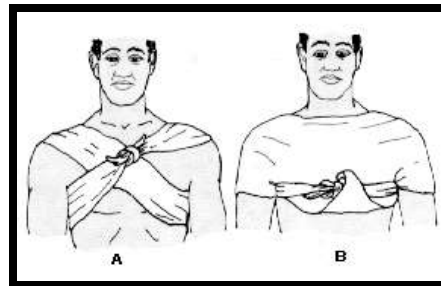


- ✓ **Bandage roll:** they exist in different materials like cotton, elastic, semi elastic and other ones like the plaster bandage. A narrow bandage is used for wrap a hand or the wrist, medium for an arm or ankle, and a wide one for a leg.

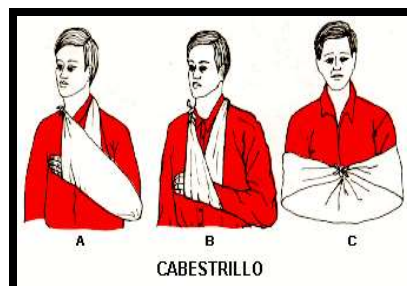




- ✓ **Bandage Triangular:** triangular bandage: Its shape is of triangle generally is made of resistant fabric and its side can be varied in concordance to the place were going to be used. The triangular bandage has multiple uses, with it can be made bandages in different parts of the body, using it as a sling, folded or extended.



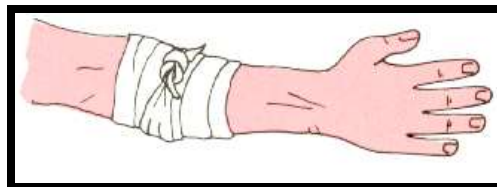
- ✓ **Slings:** Can be used to hold the hand or the arm in cases of injuries, bumps, fractures, sprains and luxation.
 - **Procedure:** Put the forearm of the victim slightly oblique, the arm must stay higher than the elbow of the victim. Go behind the victim and put him the extended triangular bandage. Take the inferior part of the bandage to the shoulder of the injured arm. Tie both extremes of the bandage with a knot to a side of the neck (the injured side) never over the spine. Let the finger uncovered to control the color and the temperature.



- ✓ **The rubber bandages:** are small adhesive bandages.



- ✓ **The dressings:** are small pillows usually full of gauze and absorbent cotton putted directly over the wound. They are different ways of applying the bandages the most common are:
- **Circular bandage:** it is used to fix the initial and the final extremes of an immobilization or to entirely fix a dressing, also to initiate or end a bandage, to hold dressings in the front, superior and inferior members and to control hemorrhages.
 - **Spiral bandage:** their use generally in extremity, in this case the bandage covers the 2/3 of the previous turn and its situated oblique to the edge of the extremity. Employ an elastic or semi-elastic bandage because it can be adapted to the area which is going to be bandaged its use is to hold gauzes, dressings or rods in the arm, forearm, hand, thigh and leg. Begin the bandage always at the most distant part away from the heart and in direction of the vein circulation. Avoid bandaging the articulations in extension because it is difficult to get movement when it is completed. If it's possible avoid covering the fingers of the hands and toes on the feet as an articulation.
 - **Spiral bandage or with folds:** its use for the forearm or leg. Begin with two circular turns to fix the bandage. Direct the bandage upward like a spiral. Put the thumb over the bandage, fold it and direct it down and behind. Round the limb and repeat the maneuver, finish the bandage with two circular turns.

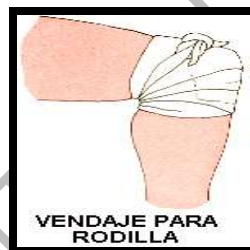


- **Figure eight bandage or turtle:** it's used in the articulations (ankle, knee, shoulder, elbow and wrist) because it allows the victim to have some mobility. Put the articulation slightly flexed and make a circular round with the bandage between the articulations.

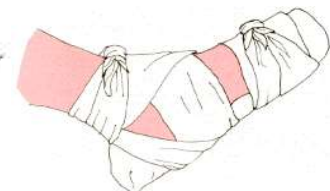


Direct the bandage in an alternative way to the up side and then down side in a way that the bandage always passes and crosses over at the center of the articulation.

- ✓ **Recurrent turn:** It is used for finger tops, hands or amputation stumps. After fixing the bandage with a circular turn the roll is taken to the extreme part of the finger or stump and its folded back. The fold is made and turned to the distal part. Finally, it is fixed with a circular turn.
- ✓ **Bandage for elbow or knee:** With the semi flexed articulation make two circ1e turns in the center of the articulation, then continue crossing in a figure of eight, alternating over the arm and forearm or the leg and the thigh. In this kind of bandage, you must be careful not to totally immobilize the articulation.

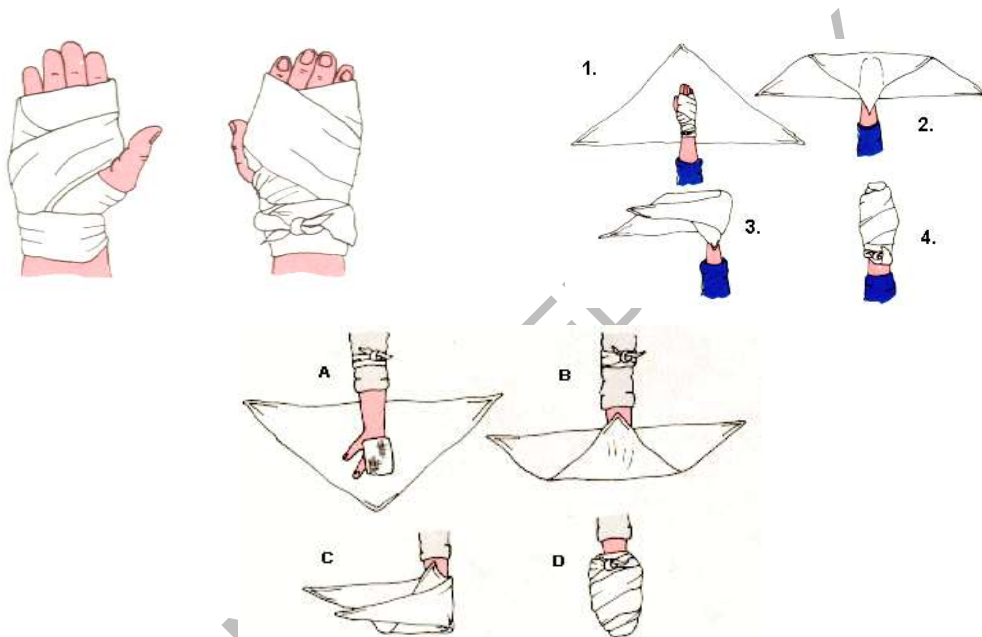


- ✓ **Bandage for the ankle or toe:** begin with two circulars in the ankle level. Proceed to effectuate several rounds to alternatively cover the foot and ankle, remounting the distal to the proximal part and finish with two circular turns at the uppermost part of the ankle and the tie the bandage.

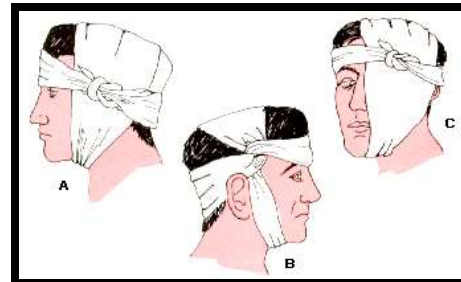




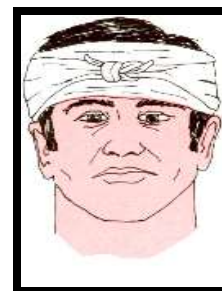
- ✓ **Bandage for hand and fingers:** Begin making the bandage with two circle turns at the level of the wrist. Take the bandage to the finger and make two recurrent turns that are fixed with two turns at the level of the fingers. To complete the dressing follow with several spirals in a figure of eight between the finger and the wrist and finally finish with two turns and tie at the level of the wrist.



- ✓ **Bandage for the foot:** it's known as slipper. It must not be applied too tightly because if the toes are covered it's impossible to control the blood circulation. Begin with the heel giving two turns following the shape of the foot, when you reach the toes, direct the bandage down under the toes so that the bandage is at the level of the instep. From this point the bandage is taken to the heel where it is wrapped around before going again to the toes. In this way the bandage ascends through the foot in figure 8 turns. Finish with two circle turns at the level of the ankle.
- ✓ **Eye bandage:** give two turns at the level of the forehead holding the superior border of the dressing. Descend the bandage down to the injured eye, covering the ear on the same side as it is applied. Repeat this maneuver as many times as is needed to cover at all the injured eye.



- ✓ **Head bandage or capelin:** to make the dressing, it is best to have two bandages. Begin with a turn around the head in a horizontal plane. Put the proximal side of the other bandage level with the forehead and direct the bandage back following the center line of the cranium until finding the level of the other bandage, make a circular turn again with the other bandage. Do this in a way so that the first end of the bandage stays trapped the same as the bandage that was previously slid back. In this way the recurrent turns with the bandage are fixed with circular turns with the second bandage.



- ✓ **Tie shape bandage:** fold the top to the base of the bandage; go for the half in the same direction according to the required width. Is used to bandage the wrist, hand, knee and foot.

10.2 Enclosed spaces

Generally speaking, a confined space is a fully or partially enclosed space that:

- ✓ is not primarily designed or intended for continuous human occupancy




- ✓ has limited or restricted entrance or exit, or a configuration that can complicate first aid, rescue, evacuation, or other emergency response activities
- ✓ Can represent a risk for the for the health and safety of anyone who enters, due to one or more of the following factors:
 - its design, construction, location or atmosphere
 - the materials or substances in it
 - work activities being carried out in it, or the
 - mechanical, process and safety hazards present

Confined spaces can be below or above ground. Confined spaces can be found in almost any workplace. A confined space, despite its name, is not necessarily small. Examples of confined spaces include silos, vats, hoppers, utility vaults, tanks, water supply towers, sewers, pipes, access shafts, truck or rail tank cars, aircraft wings, boilers, manholes, pump stations, digesters, manure pits and storage bins. Ditches and trenches may also be a confined space when access or egress is limited. Barges, shipping containers and fish holds are also considered as possible confined spaces.

All hazards found in a regular workspace can also be found in a confined space. However, they can be even more hazardous in a confined space than in a regular worksite.

Hazards in confined spaces can include:

- ✓ Poor air quality: There may be an insufficient amount of oxygen for the worker to breathe. The atmosphere might contain a poisonous substance that could make the worker ill or even cause the worker to lose consciousness. Natural ventilation alone will often not be sufficient to maintain breathable quality air.
- ✓ Hazards from asphyxiants – Simple asphyxiants are gases which can become so concentrated that they displace oxygen in the air (normally about 21 percent). Low oxygen levels (19.5 percent or less) can cause symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upset, and fatigue. As less oxygen becomes available, nausea and vomiting, collapse, convulsions, coma


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and death can occur. Unconsciousness or death could result within minutes following exposure to a simple asphyxiant. Asphyxiants include argon, nitrogen, or carbon monoxide.

- ✓ Chemical exposures due to skin contact or ingestion as well as inhalation of 'bad' air.
- ✓ Fire hazard: There may be an explosive/flammable atmosphere due to flammable liquids and gases and combustible dusts which if ignited would lead to fire or explosion.
- ✓ Process-related hazards such as residual chemicals, release of contents of a supply line.
- ✓ Physical hazards – noise, heat/cold, radiation, vibration, electrical, and inadequate lighting.
- ✓ Safety hazards such as moving parts of equipment, structural hazards, engulfment, entanglement, slips, falls.
- ✓ Vehicular and pedestrian traffic.
- ✓ Shifting or collapse of bulk material.
- ✓ Barrier failure resulting in a flood or release of free-flowing solid or liquid.
- ✓ Visibility (e.g., smoke particles in air).
- ✓ Biological hazards – viruses, bacteria from fecal matter and sludge, fungi, or moulds.

Many other situations or hazards may be present in a confined space. Be sure that all hazards are controlled, for example:

- ✓ Any liquids or free-flowing solids should be removed from the confined space to eliminate the risk of drowning or suffocation.
- ✓ All pipes should be physically disconnected or isolation blanks bolted in place. Closing valves is not sufficient.
- ✓ Use two blocking valves, with an open vent or bleed valve between the blocking valves when isolating pipelines or similar conveyances to prevent entry of materials and hazardous contaminants.
- ✓ A barrier is present to prevent any liquids or free-flowing solids from entering the confined space.
- ✓ The opening for entry into and exit from the confined space must be large enough to allow the passage of a person using protective equipment.

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10.3 Infectious diseases

Infectious diseases are disorders caused by organisms — such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful, but under certain conditions, some organisms may cause disease. Some infectious diseases can be passed from person to person.

Signs and symptoms vary depending on the organism causing the infection, but often include fever and fatigue. Mild infections may respond to rest and home remedies, while some life-threatening infections may require hospitalization.

Causes


Infectious diseases can be caused by:

- ✓ **Bacteria.** These one-cell organisms are responsible for illnesses such as strep throat, urinary tract infections and tuberculosis.
- ✓ **Viruses.** Even smaller than bacteria, viruses cause a multitude of diseases — ranging from the common cold to AIDS.
- ✓ **Fungi.** Many skin diseases, such as ringworm and athlete's foot, are caused by fungi. Other types of fungi can infect your lungs or nervous system.
- ✓ **Parasites.** Malaria is caused by a tiny parasite that is transmitted by a mosquito bite. Other parasites may be transmitted to humans from animal feces.

Direct contact

An easy way to catch most infectious diseases is by coming in contact with a person or animal who has the infection. Three ways infectious diseases can be spread through direct contact are:

- ✓ **Person to person.** A common way for infectious diseases to spread is through the direct transfer of bacteria, viruses or other germs from one person to another. This can occur when an individual with the bacterium or virus touches, kisses, or coughs or sneezes on someone who isn't infected.

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These germs can also spread through the exchange of body fluids from sexual contact. The person who passes the germ may have no symptoms of the disease, but may simply be a carrier.

- ✓ **Animal to person.** Being bitten or scratched by an infected animal — even a pet — can make you sick and, in extreme circumstances, can be fatal. Handling animal waste can be hazardous, too. For example, you can acquire a toxoplasmosis infection by scooping your cat's litter box.
- ✓ **Mother to unborn child.** A pregnant woman may pass germs that cause infectious diseases to her unborn baby. Some germs can pass through the placenta. Germs in the vagina can be transmitted to the baby during birth.

Prevention

Infectious agents can enter your body through:

- ✓ Skin contact or injuries
- ✓ Inhalation of airborne germs
- ✓ Ingestion of contaminated food or water
- ✓ Tick or mosquito bites
- ✓ Sexual contact

Follow these tips to decrease your risk of infecting yourself or others:

- ✓ **Wash your hands.** This is especially important before and after preparing food, before eating, and after using the toilet. And try not to touch your eyes, nose or mouth with your hands, as that's a common way germs enter the body.
- ✓ **Get vaccinated.** Immunization can drastically reduce your chances of contracting many diseases. Make sure to keep up to date on your recommended vaccinations, as well as your children's.
- ✓ **Stay home when ill.** Don't go to work if you are vomiting, have diarrhea or have a fever. Don't send your child to school if he or she has these signs and symptoms, either.



- ✓ **Prepare food safely.** Keep counters and other kitchen surfaces clean when preparing meals. Cook foods to the proper temperature using a food thermometer to check for doneness. For ground meats, that means at least 160 F (71 C); for poultry, 165 F (74 C); and for most other meat, at least 145 F (63 C).
In addition, promptly refrigerate leftovers — don't let cooked foods remain at room temperature for extended periods of time.
- ✓ **Practice safe sex.** Always use condoms if you or your partner has a history of sexually transmitted infections or high-risk behavior.
- ✓ **Don't share personal items.** Use your own toothbrush, comb and razor. Avoid sharing drinking glasses or dining utensils.
- ✓ **Travel wisely.** If you're traveling out of the country, talk to your doctor about any special vaccinations — such as yellow fever, cholera, hepatitis A or B, or typhoid fever — you may need.

10.4 Personal health and hygiene

Good personal hygiene habits include:

- ✓ **washing the body often.** If possible, everybody should have a shower or a bath every day. However, there may be times when this is not possible, for example, when people are out camping or there is a shortage of water.
If this happens, a swim or a wash all over the body with a wet sponge or cloth will do.
- ✓ Cleaning the teeth at least once a day. Brushing the teeth after each meal is the best way of making sure that gum disease and tooth decay are avoided. It is very important to clean teeth after breakfast and immediately before going to bed.
- ✓ Washing the hair with soap or shampoo at least once a week.
- ✓ Washing hands with soap after going to the toilet.
- ✓ Washing hands with soap before preparing and/or eating food. During normal daily activities, such as working and playing, disease causing germs may get onto the hands and under the nails. If the germs are not washed off before preparing food or eating, they may get onto the food.



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- ✓ Changing into clean clothes. Dirty clothes should be washed with laundry soap before wearing them again.
- ✓ Hanging clothes in the sun to dry. The sun's rays will kill some disease-causing germs and parasites.
- ✓ Turning away from other people and covering the nose and mouth with a tissue or the hand when coughing or sneezing. If this is not done, droplets of liquid containing germs from the nose and mouth will be spread in the air and other people can breathe them in, or the droplets can get onto food.

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