A Practical Approach To Training

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A Practical Approach to First Aid

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Standard First Aid

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A Practical Approach to First Aid

Preface

Each year thousands of people are injured or killed in accidents on the job, in the home, and in the community. The purpose of this booklet is to provide you, the first aider, with basic first aid knowledge and skills that better prepare you to deal with accidents both on and off the job.

Changes reflected in this book represent current recommended policies and procedures for dealing with emergencies which require first aid. All Cardio-Pulmonary Resuscitation information and skills reflect the newest guidelines that have been published by the International Liaison Committee on Resuscitation (ILCOR) and adopted by various international training agencies.

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INTRODUCTION TO FIRST AID

First aid is the immediate care given to a person who is injured or ill. Sudden illness or injury can often cause irreversible damage or death to the casualty unless proper care is initiated as soon as possible. First aid includes recognizing life-threatening conditions and acting to sustain life or further injury, to ease pain and discomfort, and to treat for shock until advanced medical aid arrives.

Until a casualty is transported to a medical facility, urgent treatment for life-threatening situations is the responsibility of everyone. Learning to give proper emergency care is as simple as completing a recognized course of instruction in First Aid .

First aid does not replace the skill of a physician, but it provides the casualty with emergency assistance until a physician can be seen. Even minor injuries should be reported and examined by a physician.

The principal aims of first aid are as follows

- ✓ Care for life-threatening injuries or illnesses
- ✓ Protect the casualty from further injury and complications
- ✓ Ease the casualty's pain and discomfort to conserve their strength and promote healing
- ✓ Arrange to transport the casualty to a medical facility

Experience and statistics have shown that first aid training, saves lives, promotes safety, and reduces accidents. First Aid ers are able to recognize unsafe situations and correct them, take charge of an emergency, keep calm while under pressure, and organize others to do likewise. Winning the confidence of casualties and bystanders is a matter of demonstrating competence and using well-selected words of encouragement.

IMPORTANCE OF FIRST AID

People should be trained to care properly for injuries to themselves and others at home, at work, or in the community. This training knowledge should impress the employee of the need for personal safety. Since even trivial injuries are potentially serious, everyone should know the proper steps to prevent complications. In certain cases, only a person who is nearby and has first aid training can prevent a fatality.

During the first few minutes following an injury, the injured person has a better chance of

receiving proper care if there are a number of people trained in first aid. All trained people should be able to give effective assistance until the injured person receives professional medical care.

Experience has shown, employers who train all personnel in first aid will notice a substantial drop in workplace accidents. These first aid classes, where workers, supervisors, and officials meet and learn on a common basis develop a spirit of mutual protection and regard for everyone's well being. An individual trained in first aid is someone who provides a valuable service to other workers.

Don't Just Call for Help. Be The Help!!

LEGAL RESPONSIBILITIES

A large barrier to rescuers coming to the aid of casualties is the fear of being sued if they are unsuccessful when using their first aid skills. Can you be sued for applying first aid? Simply the answer is NO, provided that you performed the skills to the best of your ability and did not abandon the casualty.

In Canada you are covered by *Good Samaritan Legislation*. All provinces have enacted this kind of Legislation or have Precedent Laws to protect First Aid ers. To stay protected under this legislation, it is important that as a First Aider:

1. You must do more good, than harm
2. You have no legal duty to render assistance unless you are:
    a. A witness.
    b. involved.
    c. first on the scene.
    d. ordered to by a peace officer.
3. Once you start to render assistance, you must continue unless:
    a. You are relieved by qualified help.
    b. You become too exhausted.
    c. it is unsafe for you to continue.
    d. You revive the casualty.
4. Voluntarily provide your services.
5. Provide reasonable care in performing what they have been trained to do.

To provide first aid is a conscious decision of the rescuer. Once that decision has been made and the first aider commences to treat a casualty, they are bound by the law to provide the best treatment they can provide. If you are not feeling confident in your first aid knowledge and/or skills, do not be afraid to stop and help. If nobody stops, it is certain the casualty will be worse than if you stop and provide even the smallest amount of first aid. Do not abandon the casualty. The law does provide for remedies if a person does stop at the scene of an incident and then abruptly leaves the scene prior to the arrival of advanced help or Emergency Medical Services.

The law does not expect you to put your own life at risk. Should you review the scene and, in your judgment, determine the scene to be unsafe, do not progress, but wait for the arrival of E.M.S.

Your desire to help a casualty is not the only factor involved with treating a casualty. The conscious casualty has the right to refuse your help, even if you think they would greatly benefit from your help. Adult casualties (those over the age of majority), have the right to refuse treatment. Parents or legal guardians must provide consent to the first aider in order to treat casualties under the age of majority. If the adult casualty is unconscious, or for children under the age of majority with no parent or guardian present, the first aider has “Implied Consent” when it comes to treating these people. In other words, if the casualty is unable to respond to

you, you can provide them with necessary medical treatment.

Just because you have received training in first aid, does that make it mandatory for you to stop at the scene of every emergency you encounter? The answer again is NO. There are no laws that make it mandatory for you to stop at an emergency. It is the hope that by completing a first aid program, you will have the confidence and the ability to provide even the smallest amount of assistance to those who are injured or ill.

Occupational Health and Safety Legislation and First Aid

Occupational Health and Safety legislation mandate that all worksites must adhere to a variety of rules and regulations all designed to protect workers. Provincial governments have established regulations and legislation for first aid coverage and training in their jurisdiction. The Canada Labour Code covers those work places that fall under federal jurisdiction.

Regardless of whether it is a Provincial or Federal worksite, workplaces are legislatively required to have a designated person who is adequately trained and competent to be the first aider. This person is required to provide emergency treatment to a co-worker who is injured or suddenly ill.

The required first aid coverage for a workplace is found within these legislation and regulations, and is based on some or all of the following:

- The potential risks of injury – Low, Medium or High
- The number of workers on a shift
- The distance from medical care based on travel time, which could be a hospital, clinic, EMS response, etc.

Compliance with these regulations, will require the employer to have more than one person on each shift trained in first aid to account for any time away from the jobsite that the designated first aid provider might have such as vacations, illness, and breaks.

Along with competent trained first aiders, every workplace in Canada is required to have a fully stocked first aid kit. The size and contents of the first aid kit also found within the applicable regulations. As these are requirements of all provinces and territories, for the most current information regarding these requirements, refer to your provincial or territorial regulations in your area.

Your Job and First Aid

As a competent designated first aider on your jobsite, you have a duty to provide reasonable care based on your level of training. You are protected as a first aider on your worksite, by a number of sections of legislation. Under the Canada Labour Code, Section 126(3):

“No employee is personally liable for anything done or omitted to be done in good faith by the employee when the employee is assisting the employer, as requested by the employer, in

providing first-aid or in carrying out any other emergency measures."

This section specifically covers those worksites that are under Federal jurisdiction. For those worksites under provincial or territorial jurisdiction, refer to those regulations in your specific area.

Protecting the First Aider

A hazard is anything that poses a risk of injury or death to anyone on a worksite. First Aiders must be particularly vigilant of all hazards including those that are obvious like the mechanism of injury to the casualty, to those that are not as obvious, such as the possible risk of infection to the first aider from the casualty. These hazards could be placed in the following categories:

- Initial factors or the mechanism of injury – those items that directly caused the injury—Is the vehicle still running? Has the ladder been secured? Could others be hurt?
- Secondary factors - those things that are happening around the scene that could cause harm to the rescuers if left uncontrolled – Has traffic control measures been put in place? What about crowd control?
- Tertiary factors – those items that create a hazard as part of the rescue. Are you using the appropriate PPE? Do we require additional help to lift or transport the casualty?

If the hazards are ones that can only be controlled by those with specific specialized training, for instance, fires, poisonous gases, etc., then it would be appropriate for the first aider to obtain these resources to execute the rescue and not put themselves into harms way.

If the hazards can be controlled by the first aider, remember to keep basic principles such as know your limits when lifting, get assistance, light the area up, secure loose objects, and access appropriate information such as Safety Data Sheets (SDS's) when dealing with chemical hazards. Remember, you are responsible for your safety.

Preventing Possible Infection

First aid treatment requires a first aider to come in close contact with a casualty. This contact could result in possible infection to the first aider and subsequent passing on of that infection to others including co-workers, family and the public. The means of passing on these infections fall into the following categories;

Airborne Pathogens

Simply by breathing in the exhaled air of the casualty could result in the first aider becoming ill. Some of these could include:

TB – Tuberculosis, is caused by bacteria that spread through the air when a person with contagious TB coughs, sneezes, sings, or talks. TB usually affects the lungs, but can also affect other parts of the body like glands, bones, joints, kidneys, the brain, and reproductive organs.

Influenza, commonly known as the flu, is an infectious disease caused by an influenza virus. Symptoms can be mild to severe. The most common symptoms include: high fever, runny nose, sore throat, muscle and joint pain, headache, coughing, and feeling tired. Influenza lowers the body's ability to fight other infections. It can lead to bacterial infections, such as pneumonia, and even death especially in the elderly, children (6 to 59 months), pregnant women, indigenous people, and people with chronic medical conditions.

Meningitis is an inflammation of the membranes (meninges) surrounding your brain and spinal cord. The swelling from meningitis typically triggers symptoms such as headache, fever and a stiff neck. Bacterial meningitis is very serious and can be deadly. Death can occur in as little as a few hours. Most people recover from meningitis. However, permanent disabilities (such as brain damage, hearing loss, and learning disabilities) can result from the infection.

Blood-borne and Bodily Fluid Pathogens

These exposures happen when there is unprotected contact with the casualty's blood or bodily fluids such as vomitus, urine or feces. Diseases that could be contracted by first aiders having contact with these fluids include:

• Human immunodeficiency virus (HIV) is a virus that attacks the immune system, the body's natural defence system. Both the virus and the infection it causes are called HIV. HIV may not cause symptoms early on. People who do have symptoms may mistake them for the flu.

• Hepatitis B or HBV is a viral disease that can cause severe infection and damage to the liver. HBV can be transmitted through blood, semen, or other body fluids during sex or injection drug use. Some infected people may have no symptoms for several years, but are still contagious. HBV can be prevented by obtaining the available vaccine.

• Hepatitis C is caused by the hepatitis C virus. It causes few symptoms, so most of those who have contracted Hepatitis C don't know they are infected. The virus spreads through an infected person's blood or body fluids and there is currently no preventive vaccine.

Cuts or Punctures Through the Skin

Like Blood Borne Pathogens, you could become infected if a sharp object, contaminated with infected blood, punctures or cuts through your skin. Ensuring you **ALWAYS** wear gloves when dealing with a casualty, regardless of the injury, or when coming in contact with objects that have been contaminated with blood or bodily fluids.

Personal Protective Equipment

Personal Protective Equipment (PPE) is generally referred to any clothing and equipment used to protect a worker. For the average worker this would include hard hats, safety gloves, eye protection, coveralls, etc. Specifically, for the first aider, these are items that would minimize the risks of health hazards to the first aider during the course of treating a casualty. These items would include gloves usually made of nitrile or vinyl, barrier devices to provide respirations during rescue breathing or CPR such as pocket mask or face shield, eye protection such as safety glasses or shields and clothing.

For your safety and the safety of others;

- **ALWAYS** protect yourself by ensuring that the area you will be performing first aid will be safe. If this is not possible, get the proper resources and call for help.

- **ALWAYS** wear gloves when you might come in contact with any bodily fluids or anything that could have come in contact with bodily fluids. If you tear a glove, wash your hands as soon as possible, and put on a new pair. Dispose of contaminated gloves by sealing them in a plastic bag and double-bagging them.

- **ALWAYS** use a barrier device like a pocket mask or face shield when providing rescue breathing or CPR on someone you do not know or have concerns about infection.

- **ALWAYS** wash your any areas of your body that may have come into contact with a casualty. Use hot, soapy water and friction, an anti-septic solution such as wipes from the first aid kit, or a fresh mixture of 1-part bleach to 10 parts water. This same solution can be used to clean up spills and to sanitize equipment by allowing it to soak in the bleach and water solution for 20 minutes. Contact with contaminants that may have entered through a puncture wound or cut must be looked at by a medical professional.

- **ALWAYS** clean-up the area and equipment used. Hard surfaces need to be cleaned and disinfected. Linens or clothing must be laundered. Properly dispose of any items that cannot be laundered.

- **ALWAYS** follow the manufacturer's guidelines for proper cleaning and sanitizing of reusable first aid items like scissors, splints or stretchers. This may include wiping off any bodily fluids and sanitized in a 10% bleach solution for at least 10 minutes, then rinsed

and dried. Disposables like gloves and face shields should be double bagging with other contaminated articles or handed to EMS for appropriate disposal.

Sharps

Sharp objects such as hypodermic needles, auto inject needles, knives, or broken glass that have the potential of having been contaminated by bodily fluids need to be appropriately disposed of for the safety of the first aider and others. Broken glass for instance should be properly swept up and placed into a cardboard box and disposed of in a trash can.

Hypodermic and auto inject needles should be disposed of in a ***sharps*** container. ***Sharps Containers*** are specialized plastic containers designed to prevent accidental needle sticks to medical treatment providers. Typically, these are used in hospitals, ambulances and clinics. Hypodermic needles or auto inject needles should be handled by the barrel or outer casing. Never dispose of these into general garbage containers or attempt to recap them before disposing into a sharps container.

CHAPTER 1 CASUALTY ASSESSMENT

Objectives

After reading this chapter, you should be able to

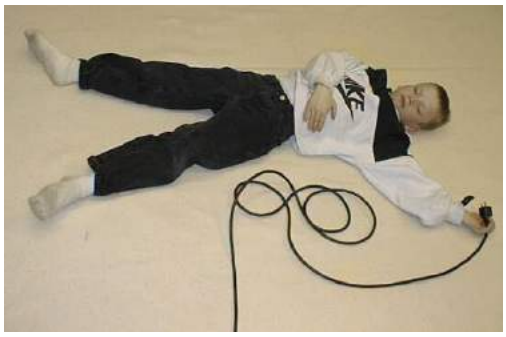
1. Define what the acronym DR EMS CABB stands for
2. Explain how the emergency medical services (EMS) system works
3. Describe your role as a bystander in the EMS system
4. List what information to give the EMS dispatcher when calling for help
5. Describe the decision-making process for a Multiple Casualty Incident
6. Define the key terms for this chapter

After reading this chapter and completing the activities, you should be able to

1. Decide what to do in an example of an emergency situation in which someone may need to be moved
2. Confidently Review a situation and identify the possible risks to a rescuer
3. Identify how to Extricate a casualty
4. List at least four situations in which an emergency move of a casualty is necessary
5. Describe at least four guidelines you should follow when moving someone
6. Describe how to perform a walking assist and a two-person seat carry
7. Describe the reaching assist method of rescuing a near-drowning casualty
8. Assess a casualty for Responsiveness
9. Adequately open an Airway
10. Check a pulse on adults, children and infants
11. Check for life threatening bleeding and shock
12. Describe the steps for a thorough Secondary Assessment , including taking a history, vital signs and physical assessment
13. Describe how to properly use and dispose of soiled barrier devices

CASUALTY ASSESSMENT

WHEN A PERSON IS INJURED



First Aid ers should identify themselves and take charge within their own limitation. The First Aider should direct others briefly and clearly as to exactly what they should do. To determine the extent of the injuries information should be gathered from:

- What relatives or bystanders tell you
- What you are able to observe about the scene
- What the casualty tells you (if conscious)
- What you observe about the casualty

CASUALTY ASSESSMENT - PRIMARY SURVEY

Several conditions are considered life threatening, but three in particular require immediate action:

☑ Respiratory arrest ☑ Circulatory failure ☑ Severe bleeding

All of these can set off a chain of events that will lead to death. Death may occur in a few minutes if an attempt is not made to help the casualty in these situations. Before caring for lesser injuries, the first aider should perform the Primary Survey to correct the following life-threatening conditions:

C - Check circulation (pulse) (C.P.R. if necessary)

A - Open the Airway

B - Breathing (restore if necessary)

B - Treat dangerous Bleeding

The single most important skill in first aid is the performance of a thorough Primary Survey. It is from this survey, where those injuries that require immediate attention would be discovered. All trained pre-hospital response persons, from the Emergency First Aid er through to the Emergency Room physician utilize this same skill.

DANGERS

Although the emphasis is on casualty care, keep in mind the most important person to consider at the scene of any accident or incident is YOU, the rescuer. Therefore, the first thing you must assess is the risks or danger to yourself, the casualty, and any bystanders. Take the time to fully REVIEW the ENTIRE scene from all sides since risks to you can be lurking in those areas that you cannot see or have not checked. It is easy to be distracted by individuals who are injured and in pain. Include in your survey of the scene the aspects of controlling traffic, from other vehicles and bystanders. Stabilize any items that may topple while you are working on the casualty. Be aware of those who want to observe the scene and are paying less attention to other activities. On worksites these hazards can be compounded by the fact that workers may be engaged in hazardous work. As a worksite first aider you must be aware of chemical spills, moving equipment, electrical wires, poisonous gases, and other workers, that could cause further injury to you or your casualty.

Find all the casualties that may be involved. Those casualties who may not have been seat belted into the vehicle may have been thrown from the vehicle. Even if the doors of the vehicle are closed, it is possible that a casualty will have been thrown from the vehicle. Look for clues that may indicate other people may have been involved such as children 's lunch boxes, schoolbooks, briefcases, etc. Vehicles that are found on their side can be blocked from rolling back onto its wheels by using a spare tire to stabilize it. Pieces of wood or metal found around the scene can also be used for this purpose. This is important since the vehicle may shift while you are attempting to provide necessary care to the casualties.

Vehicles rarely explode as seen in the movies but it is possible that spilled fuel can be easily ignited by a variety of sources. Therefore, one of the first jobs of the first aider is to turn off the ignition to all the vehicles involved in the motor vehicle accident.

If you suspect the casualty may have sustained a spinal injury, tell the casualty not to move and stabilize their head and neck. Their movements might cause further damage to the spinal cord, risking paralysis and/or death. It is important to allow EMS to do the packaging and transport of a casualty who has such an injury since they have the specialized equipment and skill to move them without causing further injury.

Keep in mind the other risks to you, the first aider, such as disease transmission by bodily fluids. All first aiders must consider the risks and utilize appropriate barrier devices. Every workplace first aid kit must contain protective gloves and resuscitation barrier devices for use by and for the protection of every first aider.

BARRIER DEVICES

The first rule of first aid is to “Protect Yourself”. A barrier device is meant to reduce the risks associated with the performance of first aid skills. There are many types of devices designed to

eliminate the contact between the rescuer and the casualty. These devices include a pocket mask and rubber gloves.

The most common reason for using the barrier device is to reduce the risk of contracting a communicable disease such as Hepatitis, AIDS, Herpes, etc. through blood to blood contact or through saliva to saliva contact. Most devices are single use only and once contaminated must be disposed of by ensuring that a bystander will not accidentally come in contact with the contaminated device. This can be accomplished by turning the gloves inside out and tying the wrist end of the soiled gloves. Place these and the pocket mask inside another plastic bag. Soiled items may be disposed of by dropping at a local hospital or clinic.

RESPONSIVENESS

Once you have made the scene safe, approach the casualty within their line of sight and talk to the casualty. Kneeling at their side, tap the casualty gently on the shoulder. Place your hand that is closest to the casualty's head on their forehead to prevent them from moving if they have sustained a spinal injury. Talk into both of the casualty's ears. Ask the casualty, “Are you OK?” Take note of the level of consciousness for the casualty and note the quality of their breathing. If the casualty is conscious or semi-conscious, ask the casualty, “How is your breathing?”

EMS

If the casualty is unconscious, immediately activate the Emergency Medical Services (E.M.S.) system and have an ambulance report to the location of the accident or incident. Specifically point to a bystander and direct them to call the emergency response number in your area and have them come back.. For example you might say; "You in the yellow sweater, get an ambulance, dial 9-1-1, and tell them there is an unconscious casualty at this location and report back to me to tell me you have called. Are you going?" If there is not a bystander present and a phone is within a couple of minute’s distance, place the casualty into the recovery position and activate E.M.S. yourself. Be prepared to provide them with information such as the location you are at, the number of injured casualties, and the nature of the call and the telephone number you are calling from. There is no charge for calling from a pay phone or a cellular telephone. Payment for the ambulance is the responsibility of the casualty, not the rescuer. Please note, most extended medical insurance plans do provide coverage of this service.

CIRCULATION/ AIRWAY/ BREATHING

Simultaneously, feel for the pulse and check for breathing. While checking the pulse, scan the chest and look for chest rise and fall. Take at least 5 seconds but not more than 10 seconds to see if these are present. When breathing is present, it is guaranteed that the casualty will also have a pulse present. However, if breathing is not present, then the pulse will cease shortly after. There are several pulse points that we will use in first aid.

Adult/Child

The easiest pulse to establish in an adult or child casualty is the carotid (on the neck) pulse. This pulse point is found by locating the casualty's Adam's Apple and sliding downward to the point between the trachea and the large muscle structure of neck and gently pressing inward with two or three fingertips. DO NOT use your thumb to feel for a pulse. It contains an artery, which produces a pulse of its' own that may be confused with the casualty's.

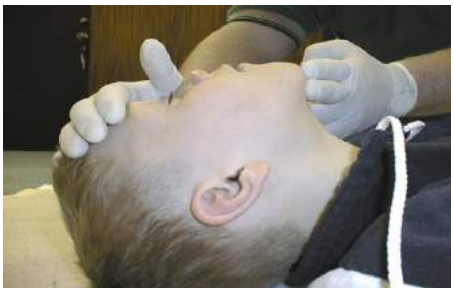
Infant

To check the pulse of an infant, use the brachial pulse located on the inside of the upper arm, halfway between the elbow and underarm. We check here rather than the carotid pulse because the infant has a soft trachea and compressing it would create an obstruction.

The final pulse point we utilize in first aid is that of the radial pulse. This is the same pulse point your physician might check to determine your pulse rate during an annual physical. We will use this pulse point to gather information regarding pulse rates and strength during a Secondary Survey.

PULSE WITH NO BREATHING

To establish an adequate airway in the unconscious adult or child, use the Head-Tilt/Chin-Lift method. The most common cause of obstruction in the airway of an unconscious person is the tongue. The tongue is a muscle; it will relax and fall against the back of the airway, not allowing the flow of air to the lungs. If the casualty is not breathing, you must open the airway.



The rescuer first places their hand that is closest to the casualty's head on the casualty's forehead. At the same time, the rescuer must place two fingers from their other hand, under the bony structure of the chin and rotates the head backward by pushing down on the forehead and lifting upward with the fingers on the chin. This will pull the tongue from the back of the airway allowing air to pass into the lungs.

Infants - from the age of birth to one, pose a unique problem. Infants are still in the developmental phase of life and consequently their trachea or windpipe is quite soft. If the rescuer were to tilt an infant's head as far back as an adult or child, the trachea would in fact kink similarly to a garden hose when you try to stop the flow of water out of the hose. The rescuer would create an obstruction simply by tilting the head back too far. For infants , we use the "Sniffing Position" to obtain an adequate airway. This is a modification of the Head Tilt/Chin Lift method where the rescuer will only move the head back to a position where it looks like the infant is sniffing the air.

If a spinal injury is suspected, then the preferred method of opening the airway is known as the Modified Jaw Thrust Maneuver. In fact this technique may dislocate the casualty's jaw, but the alternative would be to inflict more damage upon the injured cervical spine area. Always remember to consider the LIFE over the condition of LIMBS. In this technique, the head is NOT rotated backwards but is instead kept in the neutral position. As the rescuer you will kneel beside the casualty at their underarm level, facing the casualty's head and position, your body at a forty-five degree angle to their head. Once in position, place the tips of the index and middle finger behind the angle of the jaw, located behind the earlobes, and the thumbs of both hands on the cheekbones below the eyes . Pulling the tongue from the back of the airway is accomplished by pushing towards the ground with the thumbs and lifting their lower jaw upward with the fingers.

Breathing is one of the body's most basic functions. It is so basic that we are instinctively programmed to breathe without having to think about it. The average adult will breathe about 12 – 20 times every minute, and the average child and infant, between 20 - 30 times per minute. This action provides the necessary oxygen to sustain life to every cell of the body including the most sensitive of these located in the brain. Without adequate oxygenation, irreversible brain damage will occur in as little as four to six minutes. Therefore, we need an open airway to ensure the passage of oxygen into the lungs thus providing adequate oxygenation to the brain.

With the airway in an open position, check for breathing by looking, listening and feeling for breathing.

Remember, take at least 5 seconds, but not more than 10 seconds to establish whether there is or is not a pulse and/or breathing. These actions will be addressed in upcoming chapters.

BLEEDING

The loss of blood and vital fluids can create life-threatening circumstances in a short period. As a rescuer, you must physically check for any life-threatening bleeding that may be occurring. Blood carries oxygen and nutrients to all parts of the body. Through the loss of fluid, the body may go into a deep level of shock and deprive the tissues of the body the necessary oxygen and nutrients. Certain types of clothing, such as dark color, may actually absorb large quantities of blood yet mask any signs indicating that bleeding may be present. The rescuer must feel the casualty's clothing and areas of the body where blood may drip off and pool. These would be areas such as, behind the neck , lower back, knees and ankles.

Controlling or stopping bleeding will be addressed in upcoming chapters.

CASUALTY ASSESSMENT - SECONDARY SURVEY

After caring for life threatening injuries, obtain information about the casualty and the incident, and assess the casualty for other injuries. The Secondary Survey is a three-step process that first gathers some verbal information, (History), important body measurements (Vital Signs), and lastly the physical check for non-life-threatening injuries (Head to Toe Assessment).

EFFECTIVE COMMUNICATION

As the first aider, you must effectively obtain information from or relay to many individuals. Your interactions with – the casualty, bystanders, family members, other first aiders, EMS, and other rescue personnel must be organized and direct.
Effective communication skills help you to better identify and direct the casualty's condition, and subsequent treatment along with assisting those who will take over care from you.
The elements of effective communication include:

- Be professional – tell the casualty what you are doing, why, if it will be painful, etc.
- **NOT** diagnosing the casualty's condition. You are not a doctor.
- Terminology - Medical Jargon is unnecessary. Keep things simple.
- Be honest. Don't lie to the casualty or provide false hope. It's ok to say "I don't know'"
- Stay calm. Remember this is not your emergency, help is available.
- Be respectful and maintain the casualty's confidentiality.

- Ask and refer to the casualty by name
- Pay attention – focus on the casualty
- Eye contact – get yourself to their level
- Watch your body language – don't give the appearance of being threatening or aggressive

BARRIERS TO COMMUNICATION

Even when we employ all the elements for effective communication, there can be certain barriers that make our communications difficult. These elements include;

- Understanding and Language – they may not understand the specific words you are using, or may not speak the same language as you.
- Impairment – they may have a hearing, speech, or visual impairment
- Environment – environments that are noisy, hot, cold, etc. can make communication very difficult
- Cultural –cultural beliefs or actions, for instance eye contact, social space, etc. may impact communication
- Technical – communication devices (cell phones, radios) may be out of range, don't work, interference

As a first aider, you may need to employ many diverse means of communication to overcome these barriers in order for you to gather the information you need to treat the casualty of obtain further help.

HISTORY

Gather as much information about the incident, the injuries, and the casualty as you can. To help the rescuer ask the proper questions, think of the word SAMPLE; standing for:

Signs & Symptoms –Where does it hurts and describe what it feels like.
Allergies – Do you have any allergies?
Medications – are you on any medication? Have you taken any medication?
Past Medical History – have you ever been sick or injured before?
Last Meal/Bathroom – When did you last eat? Go to the bathroom?
Events – Describe how this happened.

Document any information that the casualty gives you. This will ensure that they get the appropriate treatment from E.M.S. and the hospital. Be professional. Try to refer to the casualty by name. Show respects by addressing the casualty by their surname i.e.: "Are you allergic to anything, Mr. Franklin?" Have the casualty answer as many questions as they can on their own. Try to discourage others from answering for the casualty. With children , try to gain their confidence by being friendly. Focus in on their injured area last during your assessment.

Interview bystanders or witnesses to the incident. They may provide you with further insight into the mechanism of injury, other injuries, and treatment that may have been attempted prior to your arrival.

MEDICATION ADMINISTRATION

Contained within the legislation regarding workplace first aiders there are identified specific obligations regarding the administration of medications. Some provinces will allow you to assist the casualty in administering their own medication and prohibit you from providing or administering over the counter medication. In order for you to have the most current information, it is important for you to specifically consult these specific regulations for your area.

If you are assisting the casualty to take their own medication, the “5 Rights of Medication Administration” is a commonly used memory tool to assist you to properly assist or administer these medications, The first aider should check the label of the medication container and ensure the following “5-rights”. Using the acronym TRAMP will help you remember these.

- Right **T**ime – based on the casualty’s condition, is this the right time to take this medication?
- Right **R**oute – what is the proper route of administration (By orally, inhaled, etc.)?
- Right **A**mount – what is the prescribed amount to take?
- Right **M**edication – is this the right medication for this situation?
- Right **P**erson – is the name of the casualty on the medication?

In addition, it is critical that these items are properly documented and passed onto those medical personnel who provide continuing care.

VITAL SIGNS

The responses by the body to injury or illness can give the rescuer some information on how the casualty is responding to treatment as well as indicate other hidden injuries. There are 4 diagnostic signs to measure.

1. Pulse
2. Respiration
3. Skin
4. Consciousness

The first set of vital signs that the rescuer observes is known as "Baseline Vital Signs", and as the name implies, it provides a benchmark or baseline to measure the changes that may occur in subsequent vital signs.

PULSE

The initial pulse that was taken during the Primary Survey (the carotid pulse for the adult or child and brachial pulse for the infant) was to determine if the casualty simply has a pulse. During the Secondary Survey, the radial pulse is used since it provides the rescuer with the necessary information and also provides a comfort level for the casualty. Count the pulse beats for fifteen seconds. Take this number and multiply it by four to determine the number of beats per minute. Normal pulse rates for the average adult is approximately 60 - 100 beats per minute, children 80 – 120 beats per minute and infants 100 – 140 beats per minute. Along with the number of beats, a description of the quality of the pulse is necessary. Using the words, strong or weak, and regular or irregular, in combination will provide E.M.S. with an understandable description of the pulse. For example, the casualty may have a pulse rate of eighty beats per minute with a description of being weak and regular.

RESPIRATIONS

The same information is recorded for respirations as the pulse, the number of breaths per minute (count for fifteen seconds and multiply by four), as well as the description of the quality of the breaths. Normal rates for breathing are approximately 12 – 20 times per minute for adults and approximately 20 – 30 times per minute for infants and children. One respiration is the inspiration and expiration phase of breathing. The tricky part is to obtain a true reading for the respirations. The rescuer can fool the casualty when taking the radial pulse by resting the arm of the casualty across their diaphragm (abdominal region) and count the number of inhalations and exhalations. In this manner, the rescuer can take the pulse for fifteen seconds then count the respirations for the next fifteen seconds. The casualty assumes the rescuer is still assessing the pulse and a true reading of respirations is obtained and recorded.

SKIN

Changes in skin color can identify a lack of circulation and/or oxygen to the skin. Skin color can range from pale, ashen to red, or flushed. These changes in skin color are much more obvious in the Caucasian casualty as opposed to the Non-Caucasian. For the African-American casualty or the Asian casualty, the rescuer can assess skin color by checking the membrane area for a change in color. Specifically, by checking the inside of the lower lip or the underside of the eyelids, the rescuer will notice a distinct change in color.

Temperature of the skin is important as well. It is not critical to get an exact temperature reading on a casualty, so the use of a thermometer is unnecessary. Temperature tells the rescuer what is happening to the metabolism of the casualty. Place the backside of your hand against the forehead of the casualty; it will either be hot, normal or cold. If you're unsure, feel your own forehead to give yourself a gauge.

CONSCIOUSNESS

A First Aid er is concerned with knowing whether the casualty is; conscious and alert, has some response either verbally or painfully, or unconscious. **AVPU** is a good acronym to help remember and assess the levels of consciousness. **ALERT** casualties are found conscious and having full knowledge of their situation and able to communicate this to the rescuer. **VERBAL** casualties only open their eyes when they are spoken to. When you are not talking to them, their eyes close. They may also be slightly confused about their situation. **PAIN** responsive casualties only respond to painful stimuli by flinching or retracting from a source, but will still remain unconscious and unable to verbalize a response. **UNRESPONSIVE** casualties do not respond to any type of stimuli.

PHYSICAL ASSESSMENT

If the casualty is conscious, explain what you are going to do before you perform the head-to-toe survey. The Physical Assessment or Head-to-Toe Examination is to check carefully for any additional unseen injuries that can cause serious complications. When performing the head to toe examination, remember to look, listen and feel for injuries; compare one side to the other to see if there are differences; and obtain additional information by asking the casualty about their symptoms. The priorities for providing first aid are determined by treating those injuries that are likely to become life threatening. This assessment is conducted by examining for the following:

Head	Without moving the head , check for blood in the hair, scalp lacerations, and contusions. Gently feel for possible bone fragments or depressions in the skull. Loss of fluid or bleeding from the ears and nose is an indication of possible skull fracture and/or spinal injury. Note any changes to the pupils when their eyes open and are subjected to light. Do you note any unusual odour to their breath or emanating from their body.
Neck	Examine for neck injury - tenderness, deformity, medical identification necklace, etc. Spine fractures , especially in the neck area may accompany head injuries. Gently feel and look for any abnormalities. If a spinal injury is suspected, stop the secondary survey until the head can be stabilized. Follow these same precautions for any suspected spinal injury.
Chest	Check the chest for cuts, impaled objects, fractures, and penetrating (sucking) wounds by observing chest movement. When the sides are not rising together or one side is not moving at all, there may be lung and rib damage.
Abdomen	Gently feel the abdominal area for cuts, penetrations, & impaled objects, observing for spasms and tenderness.
Lower Back	Feel for deformity and tenderness.
Pelvis	Check for grating, tenderness, bony protrusions, and depressions in the pelvic area.
Genital	Check for any obvious injury.

Region	
Lower Extremities	Check for discoloration, swelling, tenderness, and deformities, are sometimes, present with fractures and dislocations. Paralysis in the legs indicates a fractured back.
Upper Extremities	Check for discoloration, swelling, tenderness, and deformities, are sometimes, present with fractures and dislocations. Paralysis in the arms and legs indicates a fractured neck. Check for a medical ID bracelet.
Back Surfaces	Injuries underneath the casualty are often overlooked. Examine for bony protrusions, bleeding, and obvious injuries.
Medical Information	Finally, check for any medical identification the casualty may have. This would include things like a Medic Alert Tag, SOS Talisman tags, and Life Alert tags attached to the watchstrap, or perhaps, a medical identification card in their wallet or purse. When checking the wallet or purse, it would be prudent to have a witness present.

ONGOING CASUALTY CARE

Once all life threatening and non-life-threatening injuries have been cared for, we must provide ongoing casualty care. This care consists of continuing to monitor the casualty's airway, breathing, circulation and vital signs; when possible record the casualty's condition and first aid given; remain with the casualty until medical arrives and takes over care from you; and ensure you provide a detailed report to advanced medical aid.

HANDOVER REPORT

The handover of a casualty, essentially the passing on of medical care from one care giver to another, is a very important process in the management of a person whom is sick or injured. Importantly a succinct and informative story or handover must be given to allow continuing casualty management to both maximize care but to also ensure mistakes aren't made. Whenever paramedics attend a scene, they will always want to do their own assessments to ensure that nothing is missed, which may mean asking the same questions of the casualty that you just did. Even though the paramedics may not look directly at you while you are providing this handoff information, they are certainly listening and working concurrently with the casualty.

One of the easiest handover acronyms is **AMIST**.

A – Age and name of the casualty,
M – Mechanism of injury or how it happened or what has been happening
I – Injuries, illness or complaints
S – Sign and symptoms – pulse rate, breathing rate, skin colour etc
T – Treatment and what you have done.

An example might be something like this;

A - This is John, he is 70 years old
M - He was in line at the post office, when he felt dizzy and faint, then collapsed to the ground but states did not pass out.
I - He complains of some pain to his upper left leg and feels sick.
S - He has a pulse rate of 100, feels cool to touch and a breathing rate of 20.
T - We have kept him lying on the ground and monitored him as well as called his wife to let her know what is happening.

The above would be a good start to give a succinct snap shot of what has occurred so far. If more information has been gathered, such as allergies, medical history etc, then these can be added.
One last note, even when casualties are handed over at hospital the same cycle of questioning will occur by the doctors and nurses all in an effort to make sure that every bit of helpful information is sought – it happens every time there is change of medical personnel.

MASS CASUALTY INCIDENTS (MCI) AND TRIAGE

The term MASS CASUALTY usually congers images of a plane crash, bus incident or any tragedy, which involves several people. A strict definition for a Mass Casualty Incident would be anytime there are more casualties than there are rescuers to deal with the situation. Therefore, a single motor vehicle accident which might involve two casualties and you are the lone first aider to deal with this situation is, by the strictest definition, a mass casualty incident. When coming upon this type of situation, always remember to review the scene and make it safe for yourself, bystanders and the casualties. By prioritizing the casualties with life-threatening injuries over those that have minor injuries you will effectively utilize your skills and save the greatest number of casualties. Always remember that you are only one rescuer and can only do so much. There is a great possibility that you will not save everyone who is hurt.

Exercise

You have encountered a two-vehicle head on collision on a desolate road. It is 2:00am and there are no lights on the highway except for the lights from the vehicles. You are alone, have a well-stocked first aid kit, no cellular phone or means of communication. The nearest town to you is approximately twenty kilometers away. In the darkness, you can make out four casualties. A quick review of the situation provides you with the following information: The area is relatively safe. The four casualties have the following injuries:

Casualty #1 A 24-year-old female driving car #1. Unconscious, not breathing but she does have a pulse.

Casualty #2 A 2-year-old female who is the passenger in car #1. Unconscious, not breathing & does not have pulse.

Casualty #3 A 65-year-old male driving car #2. Unconscious, is breathing and has a pulse. You can see that he is bleeding badly from his left lower leg.

Casualty #4 A 64-year-old female passenger in car #2. Lying outside the second vehicle approximately 30 meters from accident site. She is conscious, breathing and has a pulse. Screaming loudly that she cannot move or feel her arms or legs.

Given this information, arrange the casualties in order of who would receive treatment for their injuries first, second, third and last?	Casualty #1	Casualty #2	Casualty #3	Casualty #4

Mass Casualty – Answer

In order to help you prioritize; use the first four letters of the alphabet to establish the basic categories for casualties.

A - *Airway And/or Breathing Problems* are always considered the first priority because of the time for irreversible brain damage to occur. In this situation, we may only have a few minutes to establish an open airway and restore breathing.

B – Bleedin gis the second concern because this is the vital fluid required to transport oxygen and nutrients to all the cells.

C - Consciousness/Fractures are the third priority because these take a little more time and are not immediately life threatening.

D - Dead/Minor Wounds are last due to the amount of time that it will take to complete a successful rescue. It is important to note that as a first aider; you cannot determine death of a casualty. Determination of death is the exclusive right of a physician. However, we recognize there are in fact two types of death. These being Biological Death (also referred to as cell death or brain death) and Clinical Death (no breathing and no pulse). As a first aider, you may be able to observe Clinical Death and attempt to resuscitate the casualty using C.P.R. Biological Death however, involves far more advance skills, which you do not possess.

Based on the 4 basic categories for casualties ***A B C D***, the correct answer would be as follows:

1st	Casualty #1	4th	Casualty #2	2nd	Casualty #3	3rd	Casualty #4

CHAPTER 2 AIRWAY MANAGEMENT

Objectives

After reading this chapter, you should be able to

1. Have an understanding of the Anatomy and Physiology of the Respiratory System
2. List the causes of Respiratory Arrest
3. Understand the principles of Artificial Resuscitation
4. List the methods of Artificial Resuscitation
5. Define the complications of Artificial Resuscitation
6. Understand the theory for removing a foreign body obstruction in a Conscious and unresponsive Adult Child, or Infant
7. Recognize the signs and symptoms of a Choking Adult , Child or Infant

After reading this chapter and completing the activities, you should be able to

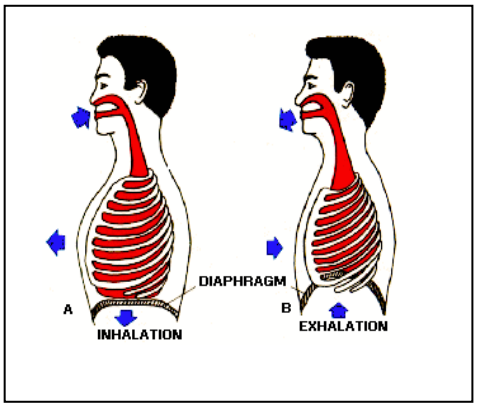
1. Perform the techniques for Artificial Resuscitation for an Adult , Child or Infant
2. Perform the techniques for removing a foreign body obstruction from a Conscious Adult Child or Infant
3. Perform the techniques for removing a foreign body obstruction from an unconscious Adult , Child or Infant
4. Perform the techniques for removing a foreign body obstruction from yourself when alone
5. Perform the techniques for Artificial Resuscitation with a pocket mask on an unconscious Adult , Child or Infant

AIRWAY MANAGEMENT

Airway and breathing emergencies pose the greatest threat to life. The human body is an amazing piece of machinery. It can sustain life for several weeks without food, a few days without water, but only a scant few minutes without oxygen. Irreversible brain death can occur in as little as 4 – 6 minutes in the average person. Extenuating circumstances may be able to prolong or shorten this time. As a rescuer, you must be prepared to help sustain a casualty's breathing by breathing for them.

The air that you are inhaling right now contains specific quantities of various gases. On average, we breathe in approximately 78% nitrogen, 21% oxygen, and about 1% of trace gases such as hydrogen, helium, argon, etc. The air we breathe out, contains 78% nitrogen (we have no use for nitrogen), 16% oxygen, 5% carbon dioxide, and 1% of the trace gases as mentioned earlier. Therefore, we only utilize approximately 5% of the oxygen we inhale and turn that into carbon dioxide.

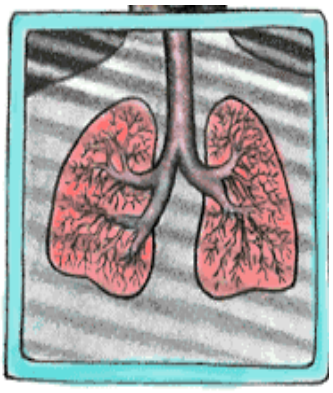
RESPIRATORY SYSTEM



Knowledge of the respiratory system and the organs concerned with respiration will greatly aid in understanding artificial ventilation.

During respiration, when air is taken into the lungs (inhalation) and forced out (exhalation), the air passes through the nose, throat, and windpipe. The air is warmed and moistened in the nose. The moist hairs and mucous membrane of the nose filter out much of the dust in inhaled air.

The throat is a continuation of the nose and mouth. At its lower end are two openings, one in front of the other. The opening in front, the ***trachea*** or windpipe leads to the lungs. The ***esophagus*** or food pipe is situated behind the trachea and leads to the stomach.



At the top of the windpipe is a flap, the ***epiglottis***, which closes over the windpipe during swallowing to keep food or liquid from entering it. When a person is unconscious, the flap may fail to respond; therefore, no solids or liquids should be given by mouth, since they may enter the windpipe and lungs and cause suffocation or serious complications. If an unconscious person is lying on his/her back, the tongue is apt to fall against the back of the throat and interfere with air reaching the lungs. Sometimes it may block the throat entirely. When a person is unconscious or breathing with difficulty, the head-tilt/chin-lift maneuver should be used to open the airway. Use the Modified Jaw Thrust Maneuver for a casualty with possible neck or spinal injuries.

The windpipe extends into the chest cavity where it divides into the two bronchial tubes, one going to each lung. Within the lungs, the bronchial tubes branch out like limbs of a tree, until they become very small.

After subdividing into very small branches, the bronchial tubes end in a group of air cells (alveoli) resembling a very small bunch of grapes. Around each of the air cells, which have very thin walls, is a fine network of small blood vessels or capillaries. The blood in these capillaries releases carbon dioxide, other waste matter, and the by-products of tissue activity from all over the body through the thin air-cell walls, and in exchange takes on a supply of oxygen from the air breathed into the air cells. The discarded carbon dioxide and waste matter leave the air cells in the exhaled air.

Breathing is an act, which usually is automatic, and one over which a person exerts only a certain degree of control. The amount of air breathed and frequency of breathing vary according to whether the person is at rest or engaged in work or exercise. At rest, a healthy adult breathes about 15 times a minute and takes in 60 to 75 cubic centimeters of air per breath. Each breath moves about one-half liter (500 cc or one pint) of air. During strenuous work, the breathing rate and amount inhaled may increase several times.

Causes of Respiratory Arrest

Breathing may stop as a result of a variety of serious accidents. The most common causes of respiratory arrest are overdoses of narcotics, electric shock, drowning, suffocation, poisonous gases, head injuries, and heart problems.

ELECTRIC SHOCK

The chance of accidental contact with electrical current is a common hazard. Any electric current may be dangerous. Electricity can cause paralysis of the nerve centers that control breathing and stop or alter the regular beat of the heart.

The symptoms of electric shock are sudden loss of consciousness, impairment or absence of respiration and/or circulation, weak pulse, and sometimes burn. If breathing is present, it is frequently so weak and shallow that it cannot be detected.

If the casualty is free from contact with the electric current, begin first aid at once. If the casualty is still in contact with the current, shut off the power the move the casualty. Start artificial ventilation or C.P.R. at once, if necessary.

DROWNING

A casualty of drowning should be removed from the water as quickly as possible. Begin artificial ventilation immediately without taking the time to remove water, which may be in the respiratory tract.

Drowning is a form of suffocation. The supply of air to the lungs has been cut off completely by water or spasm of the larynx. This cutoff does not create an immediate lack of oxygen in the body. There is a small reserve in the air cells of the lungs, in the blood and in some of the tissue that can sustain life for up to six minutes or longer at low temperatures. Because this reserve is exhausted relatively quickly, it is important to start artificial ventilation as soon as possible.

SUFFOCATION

Symptoms of suffocation in an unconscious person are: The lips, fingernails, and ear lobes become blue or darker in color, the pulse becomes rapid and weak, breathing stops, and the pupils of the eyes become dilated. The cause may be a blocked windpipe preventing air from getting into the lungs. Artificial ventilation is of no value until the blockage is removed.

DANGEROUS GASES

Several noxious or toxic gases encountered in the mining, metallurgical, petroleum, and allied industries, as well as in everyday life, can cause asphyxiation. These gases include hydrogen sulfide, carbon monoxide, sulfur dioxide, and oxides of nitrogen, ammonia, hydrogen cyanide, and cyanogen compounds. Persons should be aware of the early warning signs of exposure so gases may be detected before asphyxiation occurs. Headache, nausea, and tearing of the eyes are the three most common symptoms of the presence of dangerous gases. Rescuers should

take care to protect themselves. Unless the surrounding air is good, take the casualty to fresh air immediately and begin artificial ventilation at once.

Nontoxic gases also cause suffocation by displacing oxygen. This includes carbon dioxide, nitrogen and methane.

Principles of Artificial Ventilation

Artificial ventilation is the process for causing air flow into and from the lungs when natural breathing has ceased or when it is very irregular or inadequate.

When breathing has ceased, the body's oxygen supply is cut off and the brain cells start to die within four to six minutes. This process may result in irreversible brain damage and if breathing is not restored, death will occur. In some cases the heart may continue to beat and circulate blood for a short period after a person stops breathing. If artificial ventilation is started within a short time after respiratory arrest, the casualty has a good chance for survival.

Certain general principles must always be kept in mind when administering artificial ventilation by any method:

- ✓ Time is of prime importance, every second counts.
- ✓ Do not take time to move the casualty unless the accident site is hazardous.
- ✓ Do not delay ventilation to loosen the casualty's clothing or warm the casualty. These are secondary in importance to getting air into the casualty's lungs.
- ✓ Perform head-tilt/chin-lift method for opening airway, which will bring the tongue forward.
- ✓ Remove any visible foreign objects from the mouth.
- ✓ Maintain a steady, constant rhythm while giving artificial ventilation. Be sure to look for rise and fall of the chest and look, listen, and feel for return air. If none, look for upper airway obstruction.
- ✓ Continue artificial ventilation until one of the following occurs:
  - Spontaneous breathing resumes
  - A qualified person relieves you
  - A physician pronounces the casualty dead
  - You are exhausted and physically unable to continue
- ✓ Once the casualty recovers, constantly monitor the casualty's condition because breathing may stop again.

Methods of Artificial Ventilation

DANGERS

Ensure that all the hazards to you, bystanders, and the casualty have been taken care of before approaching the casualty. Remember that you cannot help someone if you become a casualty.

Move the casualties only if necessary. Use proper moving mechanics so that you do not injure yourself or cause further injury to the casualty. Many of the first aid skills can be completed with the casualty in the position they are found.

RESPONSIVENESS

Assess the casualty for consciousness by tapping or gently shaking at the shoulders and asking, "Are you OK?" Simultaneously check for a pulse and if the casualty is breathing. If the casualty is unconscious, not breathing normally or you feel the need for Emergency Medical Services, activate E.M.S. by having a bystander or you dial the emergency services telephone number in the area that you are in.

LOOK for the chest to rise and fall,

LISTEN for abnormal breath sounds or gasps

If a pulse is not definitely detected, immediately start C.P.R. beginning with chest compression. If a pulse is definitely detected, and the casualty is still not breathing or not breathing normally, open the airway and immediately begin artificial ventilation.

MOUTH-TO-MOUTH VENTILATION

Mouth-to-mouth ventilation is by far the most effective means of artificial ventilation.

a) Kneel at the casualty's side with knee nearest the head opposite the casualty's shoulders.

b) Use the head-tilt/chin-lift maneuver (if no spinal injury exists) to open airway.

c) Pinch the nose closed. Inhale a normal breath and place your mouth over the casualty's mouth (over mouth and nose with infants and small children) making sure to make a tight seal. Give two normal breaths (each breath should be given over 1 second and allowing the casualty to exhale) into the air passage watching for the chestto rise after each breath.

d) Keep the casualty's head extended at all times.

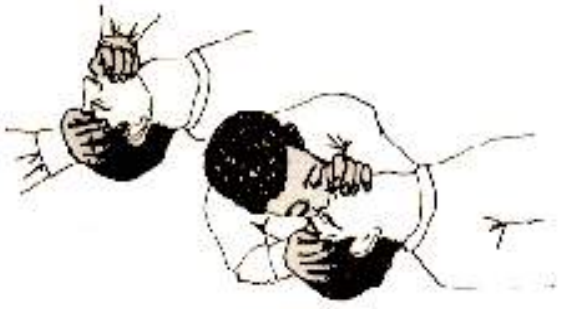
e) Feel and listen for the return flow of air, and look for fall of the casualty's chest.

f) Repeat this procedure giving one breath 12 times per minute for an adult, 20 times per minute for a small child, and an infant (giving gentle puffs of air from the mouth).

g) Monitor the pulse every 2 minutes and immediately begin CPR if you definitely do not feel one.

MOUTH-TO-NOSE VENTILATION

In certain cases, mouth-to-nose ventilation may be required. The mouth-to-nose technique is similar to mouth-to-mouth except that pushing the lower jaw against the upper jaw seals the lips and air is forced into the casualty by way of the nose.

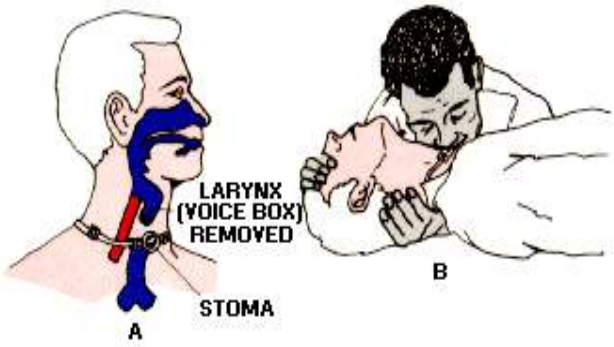


MOUTH-TO-MOUTH AND NOSE VENTILATION

Infants - those from the age of birth to one, pose a unique problem. Infants are still in the developmental phase in life and consequently their trachea or windpipe is quite soft. For infants , we use the “Sniffing Position” to obtain an adequate airway. Artificial ventilation is achieved by providing the infant with puffs of air, once every 3 seconds

Mouth-to-Stoma Ventilation

Persons who have undergone a laryngectomy (surgical removal of the larynx) have a permanent stoma (opening) that connects the trachea directly to the skin. The stoma is recognized as an opening at the front base of the neck . When such an individual requires rescue breathing, direct mouth-to-stoma ventilation is performed. The assessment for breathing is done at the base of the neck, where the stoma is located. The rescuer's mouth is sealed around the stoma, and air is blown into it until the chest rises. The casualty exhales through the stoma when the rescuer's mouth is removed from the stoma.



Other persons may have a temporary tracheostomy tube in the trachea. To ventilate these individuals, the rescuer must seal the casualty's mouth and nose with their hand, as the rescuer blows into the tracheostomy tube.

Perform artificial ventilation at the same rate and rhythm as a normal casualty.

OXYGEN IN-LET BARRIER DEVICE MASKS

Barrier device type masks provide protection for the rescuer while performing rescue breathing and should be used whenever the rescuer is providing rescue breaths. Many types of masks have been outfitted with an oxygen in-let port so that supplemental oxygen can be administered while performing rescue breathing.

The advantages of using this device are that it is easy to;

- teach and learn how to use it,
- eliminates direct contact with the casualty,
- make a seal,
- provide an adequate volume of air.

The disadvantages are that it is limited in its use to an unconscious casualty.

BAG-VALVE-MASK

This type of oxygen delivery device is used to provide rescue breathing through positive pressure ventilations. When used with oxygen, it provides a high percentage of 90 – 100%, through the mask with the addition of a reservoir bag that is attached to it. The oxygen regulator should be set to a flow rate of 10 - 15 liters per minute.

The advantages are that;

- the concentration of oxygen is significantly higher,
- it is also an excellent barrier device.

The disadvantages are that;

- it is difficult for one rescuer to obtain and hold an adequate seal,
- it takes more training to become proficient in its use,
- gastric distention may occur.

GASTRIC DISTENTION

A common complication that can arise when doing artificial resuscitation or cardiopulmonary resuscitation is that of gastric distention. This can occur when the rescuer puts in more air than the capacity of the casualty's lungs and the excess air goes into the stomach. This will cause pressure on the diaphragm, which will not allow the lungs to fully expand, and increases the likelihood of the casualty vomiting and aspirating the vomitus causing a foreign body obstruction.

To reduce distention,

1) Reposition the casualty's head to provide a better airway.
2) Limit ventilation force and volume.
3) If vomiting occurs, turn the casualty on his/her side
4) Do not press on the stomach.

OBSTRUCTED AIRWAY

Foreign Body Airway Obstruction – *Choking* - is a very common occurrence. An obstruction in the airway can result in unconsciousness and respiratory arrest. There are many factors, which can cause the airway to become partially or fully obstructed such as gum, tobacco, or loose dentures.

The international sign of distress for a person who is choking is one or both hands held up to the throat. A casualty, who is truly choking, will not have the ability to cough, speak in full sentences, or breathe. If you recognize that a casualty is having difficulties clearing their airway, stop the person from progressing, make eye contact and simply ask; “Are you choking?” and “Can I help?”

RESPONSIVE ADULT/CHILD

Determine if airway obstruction is partial or complete - -

Ask the casualty, “Are you choking? Can I help?”

If partial obstruction with good air exchange

Encourage casualty to cough.

If there is no air exchange

Rescuers should perform a combination of 5 back blows between the shoulder blades and 5 abdominal thrusts until the object is dislodged or the casualty becomes unconscious. Stand to the side of the casualty and forcefully hit them between the shoulder blades 5 times, using the heel of your hand, and then move behind the casualty and place your arms around the casualty's waist placing a fist just above the navel.

Holding your fist with your other hand, Pull back in a “J” strokes motion, inward and upwardly up to 5 times. Do this sequence as many times as necessary to dislodge the object

To gauge the amount of pressure required to dislodge the object, take into account the physical build of the casualty. Obviously with small children , less force would be required in

comparison to an adult.

CASUALTY ALONE - CONSCIOUS

The casualty who is alone, may use his/her own fist, as described previously, or bend over the back of a chair and exert downward pressure.

CHEST THRUST - OBESE OR PREGNANT

The chest thrust is another method of applying the manual thrust when removing an obstruction from the airway. Use this method on a pregnant casualty or when the rescuer is unable to wrap his/her arms around the casualty's waist, as in gross obesity.

When the conscious casualty is standing or sitting

Rescuers should perform a combination of 5 back blows between the shoulder blades and 5 chest thrusts until the object is dislodged, or the pregnant or obese casualty becomes unconscious. Stand to the side of the casualty and forcefully hit them between the shoulder blades 5 times, using the heel of your hand, and then position yourself behind him/her and slide your arms under his/her armpits, so that you encircle the chest.

Make a fist with one hand and place the thumb side of this fist on the lower half of the casualty's sternum. Make contact with the midline of the sternum, above the lower tip of the sternum. Grasp the fist with your other hand and pull with a 5 quick backward thrusts. Repeat this sequence until the obstruction is expelled or the casualty becomes unconscious.

OBSTRUCTED AIRWAY-UNCONSCIOUS CASUALTY

When you attempt to give artificial ventilation and you feel resistance (the air not getting in), the casualty's airway is probably obstructed. The most common cause of airway obstruction in an unconscious person is the tongue falling back into the airway, which can be corrected by using the head-tilt/chin-lift maneuver and re-attempt to ventilate.

When a foreign body obstructs the airway, the obstruction must be cleared or ventilation will be ineffective.

UNRESPONSIVE ADULT OBSTRUCTED AIRWAY

The rescuer encounters an unconscious casualty and no one had witnessed the reason for the unconsciousness. During the performance of the Primary Survey, the rescuer finds the airway to be blocked and must dislodge the object before continuing with the Primary Survey sequence.

DANGERS

Survey the scene for any risks to the rescuer, bystanders or casualty

RESPONSIVENESS

- **Ask "Are you Ok?"**

If the casualty is unresponsive

- **Activate E.M.S. system**

.

- **Simultaneously check pulse and for normal breathing for not more than 10 seconds.**

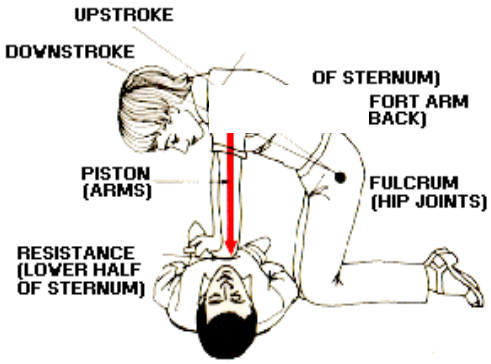
If the casualty is not breathing or not breathing normally and if a pulse is definitely felt

- **Open the airway, pinch the nose and attempt to ventilate**

If the airway feels obstructed

- **Reposition the head and attempt to ventilate again**

If the air still does not enter the lungs



- **Attempt 30 Chest compressions a minimum of 5 cm but not more than 6 cm (at least 2 inches in depth), by placing one hand on top of the other between the nipples on the lower half of the breastbone**

- **Visually inspect the mouth and sweep any foreign objects found in the mouth – <u>NEVER</u> do a blind finger sweep.**

- **Attempt to ventilate again, if the airway is still obstructed, reposition the airway, and continue the sequence.**

- **When you are able to get two breaths into the casualty's lungs, recheck for a pulse at the carotid artery and if you do not definitely feel one, continue with CPR**

UNRESPONSIVE CHILD - OBSTRUCTED AIRWAY - DANGERS

Survey the scene for any risks to the rescuer, bystanders or casualty

RESPONSIVENESS

- **Ask "Are you Ok?"**

If the casualty is unresponsive

- **Activate E.M.S. system**
-
- **Simultaneously check pulse and for normal breathing for not more than 10 seconds.**

If the casualty is not breathing or not breathing normally and if a pulse is definitely felt

- **Open the airway, pinch the nose and attempt to ventilate**

If the airway feels obstructed

- **Reposition the head and attempt to ventilate again**

Apply the chest compression method to remove an obstruction

- **Kneel close to the casualty.**
- **Place the heel of one or two hands at about the nipple line.**
- **With your shoulder directly over your hand, exert a downward compression. Keep the elbow straight by locking it. Compress the breastbone at least 1/3 the depth of the chest.**
- **Do 30 chest compressions.**
- **Open and visually inspect the mouth. If the object is not visible then you can't reach it. Only do a finger sweep to an unconscious casualty if you can actually see the foreign object.**
- **Attempt artificial ventilation.**
- **Repeat the procedure until obstruction is cleared.**

RESPONSIVE INFANT

Infants cannot indicate that they are choking. A choking infant will be cyanotic or have a bluish coloration to their skin, lips, nostrils and earlobes. The eyes will open wide and there may be thrashing of the arms and legs. You may be hear a high pitched wheezing or "crowing" noise as the air escapes out of the lungs, up the windpipe and around the object.

If the infant is choking

- **Support the head and neck by grasping the infant's face around the chin area**
- **Place the infant's body along the length of the arm and hold the infant face down with the head kept lower than the rest of the body. This will allow gravity to aid in dislodging the object.**
- **Deliver five sharp back blows in a downward direction, between the infant's shoulder blades**

- **Sandwich the infant between your forearms as you turn the infant face up.**
- **With the head lower than the body, place 2 fingers on the breastbone slightly below the nipples and deliver five chest thrusts in a downward motion, at least 1/3 the depth of the chest.**
- **Continue to repeat the back blows and chests thrusts until effective or for 2 minutes.**
- **If the infant is still choking after 2 minutes of back blows and chest thrusts, immediately activate E.M.S. and continue until the infant becomes unresponsive.**

UNRESPONSIVE INFANT OBSTRUCTED AIRWAY

If the infant is found unconscious, the skill is similar to the above. The main difference is to remember that the infant is found unconscious and we progress through the Primary Survey to discover that an obstruction is found.

DANGERS

Survey the scene for any risks to the rescuer, bystanders or casualty

RESPONSIVENESS

- **Tap the infant's foot; ask "Are you Ok?"**
-

If the infant is unresponsive and a bystander is present

- **Activate E.M.S. system.**

If no bystander is present

- **Perform 2 minutes of the skill and activate E.M.S. yourself**

If the infant is not breathing or not breathing normally

CHECK THE PULSE AND BREATHING

- **Check for a pulse at the Brachial Artery for no more than 10 seconds and if a pulse is definitely felt**

- And no breathing, open the airway and attempt to ventilate

If the airway feels obstructed

- Reposition the head and attempt to ventilate again

Apply the chest compression method to remove an obstruction

- **Do 30 chest compressions. Deliver the chest compressions in a downward motion, at least 1/3 the depth of the chest.**
-
- **Open and visually inspect the mouth. If the object is not visible then you can't reach it. Only do a finger sweep to an unconscious infant if you can actually see the foreign object.**
-
- **Attempt to ventilate by sealing over both the mouth and nose and provide puffs of air**
-

Repeat the procedure until the obstruction is cleared

Respiratory Emergencies

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

COPD is an umbrella term used to describe progressive lung diseases including emphysema, chronic bronchitis, and non-reversible asthma. This disease is characterized by increasing breathlessness.

COPD is a progressive and currently incurable disease, but with the right diagnosis and treatment, there are many things casualties do to manage your COPD and breathe better. People can live for many years with COPD and enjoy life. If the casualty, who has a history of COPD, is experiencing difficulty in breathing, call EMS. If they have medication, you can assist them in taking their medication.

ASTHMA

Asthma is a breathing condition where the tubing in the lungs; the bronchi, bronchioles and alveoli, become blocked with mucous when they constrict.

Asthmatic Attacks result from a *trigger,* such as perfume, dust, smoke, pollen, etc., that causes these tubes to constrict down. Typically, the asthmatic will present with a wheezing or crowing sound when breathing. This is a result of the asthmatic attempting to force air from the lungs in order to bring in the next breath. Other signs and symptoms will be shortness of breath, use of accessory muscles to attempt to pull in more air and a bluish tinge to the skin (cyanosis).

Treatment for this condition by a first aider is limited to assisting the casualty to self-administer their medication. Assist the casualty with no more than 3 doses of their medication over 10 minutes. Should relief not occur after the third dose, activate E.M.S. immediately and be prepared to initiate artificial ventilation.

Here are the steps to correctly use your inhaler:

- Remove the cap and hold the inhaler upright.
- If your doctor recommends, use a spacer (a hollow, plastic chamber) to filter the medicine between the inhaler and your mouth. The chamber protects your throat from irritation from the medicine.
- Stand or sit up straight.
- Shake the inhaler for 5 to 10 seconds
- Tilt your head back slightly and breathe out all the way.
- Put the inhaler in your mouth.
- Press down on the inhaler quickly to release the medicine as you start to breathe in slowly.
- Breathe in slowly for 3 to 5 seconds.
- Hold your breath for 10 seconds to allow medicine to go deeply into your lungs.
- Breathe out slowly.
- Repeat puffs as directed by your doctor. Wait 1 minute before taking the second puff.

Some inhalers also recommend rinsing your mouth out with water and gargling and spit out the water after use.

CHAPTER 3 CARDIOPULMONARY RESUSCITATION (C.P.R.)

Objectives

After reading this chapter, you should be able to

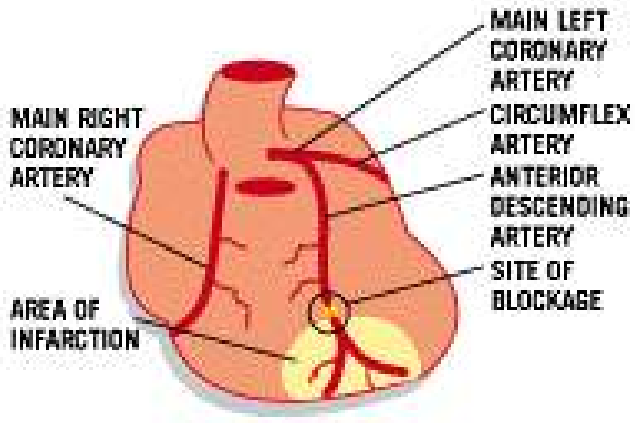
1. Have an understanding of the Anatomy and Physiology of the Cardio-Pulmonary System
2. List the causes of Cardiac Arrest
3. Recognize the signs and symptoms and describe first aid treatment for Angina Pectoris, Heart Attack and Cardiac Arrest
4. Identify the signs & symptoms and describe the first aid treatment for Stroke and Transient Ischemic Attack
5. Understand the principles of C.P.R
6. Define the complications of C.P.R.
7. Understand the theory for performing C.P.R. on an Adult, Child, or Infant
8. Recognize the conditions for terminating C.P.R

After reading this chapter and completing the activities, you should be able to

1. Perform the techniques for One Rescuer C.P.R. for an adult, child and infant
2. Perform the techniques for 2 Rescuer C.P.R. for an adult, child and infant
3. Perform the techniques for using an AED for an adult, child and infant

CARDIOPULMONARY RESUSCITATION (C.P.R.)

THE HEART



The central pump or heart is a muscle, which beats an average of seventy-two times per minute for the average adult. It must continue this pace every minute of the day, every day of your life. This means, your heart beats 4,320 times per hour, 103,680 times per day, 725,760 times per week, 3,774,320 times per year, for every year of your life. This beating or pulse can be found at several points on the body. The easiest pulse point to find is the carotid pulse. To find this pulse point, locate the Adam's Apple and slide your fingers toward the center of the side of the neck and gently, yet firmly, press into the groove made by the largest muscle of the neck and the trachea or windpipe. Use two or three fingertips, not the thumb to find a pulse, as your thumb has a pulse of it's own that can be mistaken for the pulse of the casualty. Another pulse point used in first aid is the brachial pulse, which is located halfway between the underarm and elbow on the inside of an infant's arm. Infants have a build up of fatty tissue at the neck and the pliability of the trachea means it is possible to interfere with breathing if too much pressure is applied to a carotid pulse of the infant. The last pulse point used by first aiders is the radial pulse, which is located on the thumb side of the wrist. This pulse point is used in during a Secondary Survey to gather further information about the casualty's condition to be passed onto E.M.S.

Cardiopulmonary Resuscitation – **C.P.R.** involves the use of artificial ventilation -- *mouth-to-mouth breathing* -- and external heart compression -- *rhythmic pressure on the breastbone*. These techniques must be learned through training and supervised practice. Incorrect application of external heart compressions may result in complications such as damage to internal organs, fracture of ribs or sternum, or separation of cartilage from ribs. Rib fractures may occur when compressions are being correctly performed but this is not an indication to stop compression. Application of cardiopulmonary resuscitation when not required could result in cardiac arrest, so never practice these skills on another person. When C.P.R. is properly applied, the likelihood of complications is minimal and acceptable in comparison with the alternative -- death.

SUDDEN DEATH

Sudden death is the immediate and unexpected cessation of respiration and functional circulation. The term "sudden death" is synonymous with cardiopulmonary arrest or heart-lung arrest. In the definition, the terms "sudden and unexpected" are extremely important. The death of a person with an organic disease such as cancer, or who is under treatment for a chronic heart condition and has gradual but progressive loss of heart function, cannot be correctly classified as "sudden death." Cardiac arrest, when the heart stops pumping blood, may occur suddenly and unexpectedly for any number of reasons.

- ✓ Heart attack
- ✓ Electric shock
- ✓ Asphyxiation
- ✓ Severe injury
- ✓ Suffocation
- ✓ Choking
- ✓ Drowning
- ✓ Allergic reaction

A person is considered clinically dead the moment the heart stops beating and breathing ceases. However, the vital centers of the central nervous system within the brain may remain viable for four to six minutes more. Irreversible brain damage begins to occur to human brain cells somewhere between four and six minutes after oxygen has been excluded. This condition is referred to as biological death. Resuscitation in the treatment of sudden death depends upon this grace period of four to six minutes. After that period, although the heart might yet be restarted, the chance of return to a normal functional existence is lessened. In sudden death, start C.P.R. even if the four-to-six minute mark has been passed. However, the urgency of reestablishing the oxygenation system of the body, that is, ventilation and circulation, within the four-to-six minute grace period cannot be overemphasized.

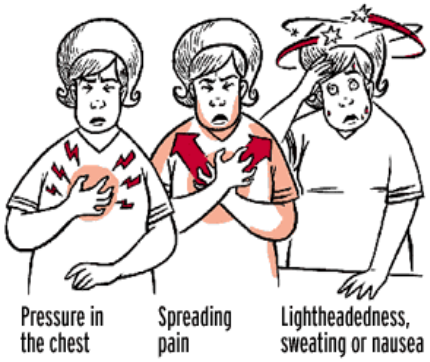
CARDIOVASCULAR OR HEART DISEASE

Cardiovascular disease, also known as CVD, is a group of conditions that affect the heart (cardio) or the blood vessels (vascular). CVD is considered the major cause of death and disability in Canadians over the age of 45. It is a result of fatty materials that build up on the inside walls of the arteries. As these arteries narrow, the heart has to work much harder to push blood and oxygen through the body.

Heart Disease is when the coronary arteries, the blood vessels that feed the Heart itself, becomes narrowed or blocked by this build up of fatty deposits. The Heart, like any other muscle, must have a constant supply of oxygen and nutrients. When there is a blockage in one of these arteries, a heart attack occurs and the heart muscle will be permanently damaged unless the person gets medical attention quickly.

Angina Pectoris, is when the coronary arteries are narrowed down and part of the heart muscle is starved of oxygen and nutrients. The signs and symptoms of Angina look like a heart attack; however, they are usually brought on by physical or emotional stress and are relieved by rest. No permanent damage occurs since the area of the heart that is affected is still being fed, but it is not being fed enough to do the full job.

A stroke occurs when a blood clot, a build up of fatty deposits, or a rupture of a blood vessel interrupts flow of blood to the brain. A stroke may cause a feeling of weakness or loss of function to part of the body depending on the affected part of the brain. A mini-stroke or T.I.A. (Transient Ischemic Attack) may present with the same signs and symptoms of a stroke, however, these signs and symptoms usually dissipate quickly. T.I.A.'s are a warning that a major stroke may occur.



HEART ATTACK AND ANGINA PECTORIS

Diseases of the heart and blood vessels are the leading cause of death in North America. Over 540,000 people die annually from heart attack s. Of these, approximately 350,000 die outside the hospital within the first two hours of the arrest.

Recognition of the early warning signs is extremely important. The following are the early warning signs of an impending Heart Attack or Angina attack

- ✓ Uncomfortable pressure, squeezing, fullness, or dull pain in the center of the chest lasting for more than 2 minutes This sensation may radiate to the neck , shoulder, arms, back, or jaw
- ✓ Sweating
- ✓ Nausea and vomiting
- ✓ Shortness of breath
- ✓ Feeling of weakness
- ✓ Pale and sick looking
- ✓ Cyanotic or pallor and cool, clammy skin
- ✓ Fear, anxiety
- ✓ DENIAL

A person need not exhibit all these symptoms to have a heart attack or angina attack. These symptoms may come and go and sometimes the casualty attributes these symptoms to other causes such as indigestion.

Treatment for both these conditions is limited to activation of E.M.S., gathering a casualty history and treating the casualty for shock . Administration of medications is forbidden for a first responder. You may assist a casualty with their prescribed angina medication of nitroglycerin, limiting the total number of dosages to no more than 3 within a 10-minute span. They must self-administer their medication. For any casualty experiencing chest discomfort assist them with taking ASA or Aspirin. Have them chew and then swallow two 80mg low-dose or baby ASA or one regular ASA tablet of 325mg. Ensure you take a thorough history of any allergies, recent gastro-intestinal bleeding, or other medications the casualty may have taken in the last few days. Some medications may complicate the casualty's condition – such as Nitrates. Activate E.M.S. immediately for any individual who has chest discomfort.

C.P.R. is never required for the conscious casualty who is experiencing a Heart Attack or Angina Attack.

STROKE /TRANSIENT ISCHEMIC ATTACK S (T.I.A.)

A stroke occurs when a blood clot, a build up of fatty deposits, or a rupture of a blood vessel interrupts flow of blood to the brain. A stroke may cause a feeling of weakness or loss of function to part of the body depending on the affected part of the brain. A Transient Ischemic Attack (T.I.A.), also known as a Mini-Stroke , occurs in casualties intermittently or is Transient (comes and goes). It may present with the same signs and symptoms of a stroke; however, these signs and symptoms usually dissipate quickly. This often leads rescuers to believe that the casualty has nothing wrong with them. It is imperative that a physician determines if a T.I.A. has occurred and the proper course of action for the casualty. T.I.A.'s should ***NEVER*** be ignored or dismissed. T.I.A.'s are a warning that a major stroke may occur.

The effects of a stroke on the brain can be temporary or permanent, and range from slight to severe. There are several different types of strokes. Some of these are

- ✓ Cerebral thrombosis - a blockage of the cerebral artery by a clot, which forms inside the artery
- ✓ Cerebral hemorrhage - when a diseased artery in the brain ruptures & floods the surrounding tissue with blood
- ✓ Cerebral embolism - when a wandering blood clot (embolus) carried in the blood stream becomes lodged in one of the cerebral blood vessels.

Use FAST to remember and recognize the following signs and symptoms of TIA/Stroke:

F: Face drooping. Ask the person to smile, and see if one side is drooping. One side of the face may also be numb, and the smile may appear uneven.

A: Arm weakness. Ask the person to raise both arms. Is there weakness or numbness on one side? One arm drifting downward is a sign of one-sided arm weakness.

S: Speech difficulty. People having a stroke may slur their words or have trouble speaking at all. Speech may be incomprehensible. Ask the person to repeat a simple sentence and look for any speech abnormality.

T: Time to call 911! If a person shows any of the symptoms above, even if the symptoms went away, call 911 and get the person to a hospital immediately.

SIGNS AND SYMPTOMS

- ✓ sudden weakness, numbness, or paralysis of the face, arm and/or leg
- ✓ fear, anxiety
- ✓ double or blurred vision which lasts for a short time
- ✓ temporary loss of balance or dizziness
- ✓ nausea and/or vomiting
- ✓ uncontrolled drooling
- ✓ pupils that are unequal in size and may not react to light
- ✓ pallor and cool, clammy skin
- ✓ unexplained headaches or a change in the pattern of headaches
- ✓ shortness of breath
- ✓ The casualty may have a decreased level of consciousness or be totally unconscious
- ✓ Respirations are usually slow with a snoring sound caused by the tongue falling back into the airway
- ✓ Pupils are unequal in size
- ✓ The casualty loses the ability to speak, or the casualty's speech is slurred

FIRST AID TREATMENT

- Maintain an open airway
- Keep the tongue or saliva from blocking the air passage
- Do not give the casualty anything by mouth
- Keep the casualty lying down with the head & shoulders raised to alleviate some of the pressure on the brain
- If the casualty is unconscious, place the casualty on the affected side to allow fluids to drain
- Do not move the casualty any more than necessary
- Keep the casualty quiet and calm
- Reassure the casualty, who may be quite anxious or nervous
- Obtain medical care as soon as possible

CHAIN OF SURVIVAL

The ability to recognize the signs and symptoms of a heart attack and knowing what to do can mean the difference between saving a life, being disabled and death.

The number one cause of death in Canada is Cardiovascular Disease, and yet is easily preventable. Unfortunately, almost half the individuals who suffer a heart attack die suddenly before being seen by a medical professional and many others suffer permanent disability. The chance of survival for these individuals increases the sooner the Chain of Survival is initiated.

Overall, the Chain of Survival lays out the steps to be taken to reduce the risk of cardiac arrest before it occurs, and to respond appropriately if it does occur. A chain is only as strong as its weakest link. Each part of the chain is critical to the survival of a heart attack casualty. The chance of survival is decreased if any of the links are weak or missing.

These links are simply, Health Choices, Early Recognition, Early Access, Early CPR , Early Defibrillation, Early Advanced Care and Early Rehabilitation.

LINK 1: HEALTHY CHOICES

Making healthy lifestyle choices reduces the risk of suffering a heart attack.

Healthy lifestyle includes: being smoke-free, eating a healthy low-fat diet, being physically active, knowing your blood pressure, and taking time to relax and enjoy life.

RISK FACTORS

Certain factors have been identified as increasing an individual's risk of some form of cardiovascular disease. Some factors a person has no control over, such as sex, race, age, and heredity. However, people can do a tremendous amount to improve their physical condition and reduce the chance of cardiovascular disease.

There are greater risks for developing cardiovascular disease, heart attack s or strokes, if you.

* Smoke
* have high blood cholesterol
* are overweight
* are male
* have family history of heart disease
* have high blood pressure
* lead an inactive lifestyle
* are highly stressed
* are over 40
* have diabetes or family history of diabetes

BE HEART SMART

Some of the risk factors cannot be changed, such as age, sex or family history, while others such as smoking, high blood pressure; high blood cholesterol; physical inactivity and stress are in your control. To change those factors you are having difficulty with; consult your doctor or other health practitioners for help. While children usually have healthy cardiovascular systems, you should learn to reduce their risk for CVD by making healthy choices in their eating and living habits.

By recognizing the risk, and choosing a healthier lifestyle, you can make a substantial difference for you and your family.

BE SMOKE FREE

If you smoke, ask you doctor, pharmacist or other health practitioner about programs and aids to help you stop smoking. When you stop smoking your risk of cardiovascular disease drops rapidly. After a few years it is almost as low as if you had never smoked. It's never too late to quit.

Research has shown that smoking and second-hand smoke increases the risk of serious health problems, including heart disease. The risk of heart attack and stroke is more than twice that of non-smokers.

KNOW YOUR BLOOD PRESSURE

High blood pressure makes the heart work harder to force the blood through the blood vessels. The symptoms or warning signs of high blood pressure are not noticeable and often it goes by undetected. It can occur at any age, even in children .

The greatest risk for high blood pressure is a person who is overweight and/or smokes. It is possible to maintain a healthy blood pressure or to lower it, if the cause is an improper diet. By using less salt, exercising regularly, and having your blood pressure checked regularly, you could reduce your risks.

EAT A HEALTHY DIET

A healthy diet includes a variety of foods. You should eat less fat and meat and increase your intake of fruit, grain and vegetable. Reducing the amount of fat in the foods you and your loved ones eat will help to reduce your risk of heart attack and stroke. Follow the suggestions as outlined in Canada's Food Guide to Healthy Eating. Eating a well balance diet promotes good health.

HAVE AN ACTIVE LIFESTYLE

Small changes can have great result… brisk walking instead of driving to do your errands; climbing stairs instead of using the elevator; parking at the far end of the parking lot instead of waiting for a spot right by the door. Regular physical activity can help maintain a healthy blood pressure, lower blood cholesterol levels, maintain a healthy body weight, reduces tension and stress and help the heart become stronger and more efficient by lowering the resting heart rate.

TAKE TIME TO RELAX

Stress is a part of life. It is important to learn what causes stress for you and your family. Try to adapt, avoid or modify stressful situations. Stress may be sudden and severe (as when a close family member dies) or it may be an ongoing everyday situations. It can make you feel angry, frustrated and unhappy. It can lead to physical symptoms like headaches or an upset stomach. When stress becomes unmanageable it becomes a risk factor for heart disease. If you find you are unable to cope with the stress, community resources such as your doctor, pharmacist or other health practitioners have information about programs and aids to help.

LINK 2: EARLY RECOGNITION

Although not all heart disease can be prevented, it is vital that the warning signs of an impending heart attack be recognized early.

Some of the more common warning signs include: mild or severe pain in the chest which may radiate to the neck, jaw, shoulders, arms and back; difficulty in breathing, pallor; sweating, general feeling of weakness; nausea and/or vomiting, a feeling of indigestion; fear, anxiety, and denial.

The most common delays to accessing appropriate treatment include: denial of symptoms, lack of recognition of symptoms, and not knowing what action to take.

LINK 3: EARLY ACCESS

Once bystanders recognize the emergency, by calling 911 or the local emergency number, the Emergency Medical Services System is activated.

Access to proper medical help, as quickly as possible, is essential for those individuals experiencing the signs and symptoms of a heart attack.

Delays can occur when the warning signs of a heart attack are not recognized and when a universal access number (i.e. 911) system is not in place.

LINK 4: EARLY CPR

CPR must be started immediately when cardiac arrest is recognized.

CPR keeps much needed oxygenated, blood flowing to the heart and brain, until normal circulation can be restored. Early CPR provides the most beneficial opportunity of survival when initiated within the first few minutes of cardiac arrest.

Delays are encountered when witnesses or bystanders are not trained in CPR and do not know how to respond to the emergency.

LINK 5: EARLY DEFIBRILLATION

Defibrillation is used to restore the heart to its normal, spontaneous rhythm by a controlled electrical shock.

Early defibrillation has shown to provide the greatest chance of survival of heart attack patients.

Success of the resuscitation attempt is determined by the speed with which defibrillation is performed.

LINK 6: EARLY ADVANCED CARE

Trained health care professionals using drugs and equipment provide advanced life support measures.

This advanced care may be provided at the scene and/or at the hospital.

LINK 7: EARLY REHABILITATION

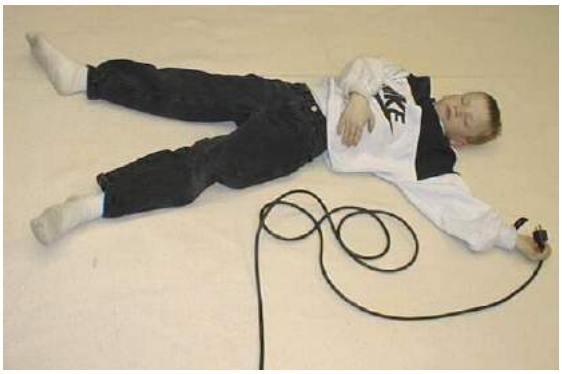
A second heart attack can be prevented through healthy lifestyle choices.

Returning to a productive life in the community may require help.

The Chain of Survival is also applicable to the prevention and treatment of stroke. The links of the chain that apply to stroke care are: Healthy Choices; Early Recognition; Early Access; Early Advanced Care; and Early Rehabilitation.

The links for Early CPR and Early Defibrillation are only performed on casualties in cardiac arrest.

ADULT C.P.R ONE RESCUER



The C.P.R. procedures should be learned and practiced on a training mannequin under the guidance of a qualified instructor. The step-by-step procedure for cardiopulmonary resuscitation is as follows:

DANGERS

- **Survey the scene for any risks to the rescuer, bystanders or casualty.**
- **To perform C.P.R. properly, the casualty must be on a firm flat surface such as a floor**

RESPONSIVENESS

- **Ask the casualty "Are you Ok?" talking into both ears**

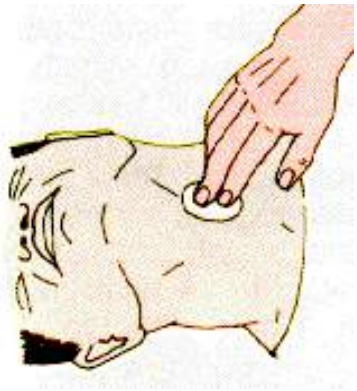
If the casualty is unresponsive

- **Activate E.M.S. by sending a bystander or activating it yourself**

CHECK THE PULSE AND BREATHING

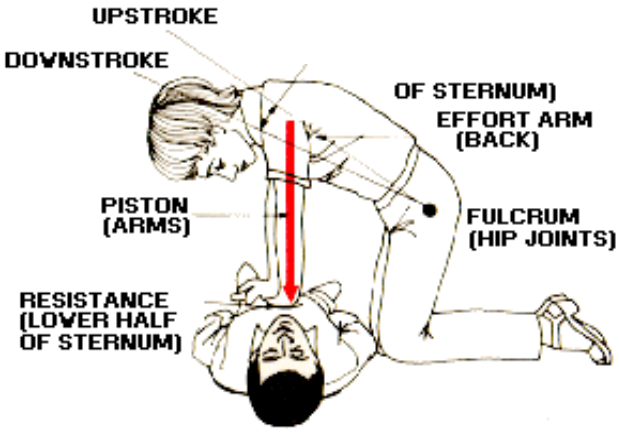
Check for a pulse at the carotid artery

- **Simultaneously, observe for normal breathing by looking at chest rise and fall and listening for abnormal breath sounds or gasps.**
- **Check for at least 5, but not more than 10 seconds**
- **If the casualty does not have a pulse, is not breathing or not breathing normally**
- **Begin C.P.R**



Place the heel of one hand in the center of the chest between the nipples. Place your other hand on top of the first and interlace the fingers. Pull the fingers upward so that the heel of the hand is resting on the breastbone.

C.P.R. for an adult is a series of 30 Chest Compressions and 2 Ventilations for 5 cycles or 2 minutes



- **The depth of compressions will be a minimum of 5 cm but not more than 6 cm in depth**
- **The rate of compressions is at least 100 but not more than 120 times per minute.**
- **The compressions should squeeze the heart between the sternum and spine to pump blood through the body**
- **Release the pressure, allowing for full chest recoil, so the heart can adequately refill with blood**

- **Keep the heel of your hand in contact with the casualty's chest at all times**
- **Make compressions down and up in a smooth manner.**

At the end of 5 Cycles

- **Stop and check for pulse and breathing.**

Should a pulse not occur, begin C.P.R. again rechecking the pulse every 2 minutes or 5 cycles

If spontaneous pulse begins

- **Recheck breathing and commence artificial respiration if necessary**

If both pulse and respiration are regained

- **Place the casualty in the Recovery Position and treat for shock while awaiting the arrival of E.M.S.**

Never interrupt C.P.R. for more than FIVE (5) seconds, except to check the carotid pulse or to move the casualty.

ADULT C.P.R. - TWO RESCUERS

This skill is performed at the same depth and rate of compressions as One Rescuer C.P.R. except that one rescuer will breathe for the casualty and the other will compress the chest – switching positions every 2 minutes or 5 cycles of 30 chest compressions and 2 ventilations.

CHILD C.P.R. ONE RESCUER

Some procedures and rates differ when the casualty is a child. Between one and puberty, the casualty is considered a child. The size of the casualty can also be an important factor. Use the following procedures when giving C.P.R. to a child,

DANGERS

- **Survey the scene for any risks to the rescuer, bystanders or casualty.**
- **To perform C.P.R. properly, the casualty must be on a firm flat surface such as a floor**

RESPONSIVENESS

- **Ask the casualty "Are you Ok?" talking into both ears.**
-

If the casualty is unresponsive

- **Activate E.M.S. by sending a bystander or activating it yourself**

CHECK THE PULSE AND BREATHING

Check for a pulse at the carotid artery

- **Check the pulse at least 5 – 10 seconds**
- **If a pulse is definitely not felt and no breathing**

- Place the heel of one or two hands in the center of the chest between the nipples.
- **The heel of the hand that is closest to the casualty's head is placed on the forehead in order to keep the airway open.**
  - **The series will consist of completing 5 cycles of 30 compressions and 2 ventilations before stopping again for a pulse check.**
  - **The depth of compressions will be at least 1/3 the depth of the chest**
  - **The rate of compressions is at least 100 but not more than 120 times per minute**

When the series is complete or 2 minutes of time has elapsed

- **The rescuer will recheck the pulse for spontaneous pulse and respiration**

Should a pulse not occur, begin C.P.R. again rechecking the pulse every 2 minutes.

If spontaneous pulse begins

- **Recheck breathing and commence artificial respiration if necessary**

If both pulse and respiration are regained

- **Place the casualty in the Recovery Position and treat for shock while awaiting the arrival of E.M.S.**

Infant C.P.R - One Rescuer

DANGERS

Survey the scene for any risks to the rescuer, bystanders or casualty

RESPONSIVENESS

- **Tap the infant's foot; ask "Are you Ok?"**

If the infant is unresponsive and a bystander is present

- **Activate E.M.S. system.**

If no bystander is present

- **Perform 2 minutes of the skill and activate E.M.S. yourself**

CHECK THE PULSE AND BREATHING

- **Check for a pulse at the Brachial Artery for 5 - 10 seconds and**
- **If a pulse is not definitely felt and no breathing**
- **Immediately begin 30 chest compressions. Deliver the chest compressions in a downward motion, at least 1/3 the depth of the chest.**
- **The rate of compressions is over 100 but not more than 120 times per minute**
- **When the series is complete or 2 minutes of time has elapsed, the rescuer will recheck the pulse for spontaneous pulse and respiration**

Should a pulse not occur, continue C.P.R. again rechecking the pulse and breathing every 2 minutes.

If spontaneous pulse begins

- **Recheck breathing and commence artificial respiration if necessary**

If both pulse and respiration are regained

- **Keep the casualty comfortable, supported and treat for shock until the arrival of E.M.S**

Infant/Child C.P.R - Two Rescuer

Infant/Child 2 Rescuer C.P.R. is performed slightly different than 1-Rescuer. The ratio of compressions to ventilation changes for the standard 30:2 to 15 to 2 with rescuers switching positions every 10 cycles or 2 minutes.

An alternate hand position for infants may also be used of placing 2 thumbs – side by side – in the middle of the chest with the hands wrapped to the back of the infant. Compressions are performed with both thumbs simultaneously.

Complications of C.P.R.

The complications of C.P.R. can range from breaking ribs, puncturing a lung, vomiting, foreign body airway obstruction, laceration of the internal organs, etc. Be aware that these complications can happen, but ultimately, the casualty is already dead. Anything you do will not make the casualty any deader than they already are. The worst thing that can happen from this rescue situation then is that the casualty remains dead.

Transportation of the Casualty

Do not interrupt C.P.R. for more than 5 seconds unless necessary. However, when C.P.R. is being performed and the casualty must be moved for safety or transportation reasons do not interrupt C.P.R. for more than 30 seconds.

When moving a casualty up or down a stairway, provide casualty with effective C.P.R. before interruption. Move the casualty as quickly as possible and resume C.P.R. at next level.

Termination of C.P.R.

Under normal circumstances C.P.R. may be terminated under one of four conditions

- ✓ The casualty is revived.
- ✓ Another person trained in C.P.R. relieves you.
- ✓ The person performing C.P.R. becomes exhausted and cannot continue.
- ✓ A doctor pronounces the casualty dead.

The Reality of C.P.R.

The person who initiates emergency heart-lung resuscitation has two responsibilities, to apply C.P.R. to keep the clinically dead casualty biologically alive and ensure the casualty receives proper medical care. Good quality C.P.R. provides the casualty with the greatest chance of surviving. It is important for a rescuer to achieve a specific mind set when performing any level of C.P.R. Since the casualty, that we are performing C.P.R. on, has no breathing and no pulse, they would be considered, Clinically Dead. Therefore, the worst possible outcome from doing C.P.R. is that the casualty will remain dead.

Introduction to Automated External Defibrillators (AEDs)

The Automated External Defibrillator is a device that enhances the resuscitative efforts of rescuers prior to the arrival of EMS professionals. The placement and use of AEDs is becoming widespread where the public works or plays. Combined with early C.P.R., the early intervention with these devices saves lives. The purpose of the machine is to provide shocks to restore the heart's normal rhythm along with effective pumping action.

The AED is applied to the chest of a casualty who is not breathing and has no pulse by means of a cable and adhesive pads. When the power is turned on, the computer chips in the AED evaluate the heart's electrical activity. The AED will only indicate that a shock is advised, if the AED recognizes a cardiac rhythm that should be shocked. If there is any other heart rhythm, the AED will advise that no shock is need and will not allow the machine to charge and shock. Some AEDs charge automatically, while others you need to press a button to charge the machine. The shock is delivered when a separate "SHOCK" button is pressed.

PUBLICLY ACCESSIBLE DEFIBRILLATION (PAD)

Publicly Accessible Defibrillation (PAD) is an active community based response program. The idea is to place AEDs, accessible by anyone, where people frequent and to train lay rescuers in the use of the AEDs. This type of program will allow lay rescuers to defibrillate casualties prior to the arrival of EMS. The benefit of this level of readiness will increase survival rates of those afflicted with sudden cardiac arrest (SCA) dramatically.

IMPLEMENTING A PAD PROGRAM

Any organization wishing to implement a PAD program can purchase an AED through many retailers. Flatline Response Inc. or your Instructor can help you find a source. In many provinces, physician authorization is required prior to placing an AED in service at any organization.

AED and the Good Samaritan Laws

Most provinces have laws to protect rescuers from liability when an AED is used in an attempt to save a life. While the laws may vary from province to province, the spirit of the law is to allow those who help in life-threatening situations to do so without fear of legal repercussions. Check with your medical director, province Emergency Medical Services office or ask your Instructor for more information.

The Chain of Survival illustrates the ideal sequence of events that should occur immediately following the recognition of an injury or the onset of sudden illness. The survival and recovery of the casualty may depend on proper application of this sequence of events. The goal is to provide rapid medical care to the casualty, by a bystander who provides first aid, before the arrival of EMS professionals who will transport the casualty to a medical care facility.

RATIONALE FOR EARLY DEFIBRILLATION

The heart's electrical impulse starts at the sino-atrial (S-A) node and travels down to the atrio-ventricular (A-V) node, followed by regular contractions. When the heart's electrical system malfunctions and stops beating this is referred to as Sudden Cardiac Arrest (SCA).

The most common electrical system disturbance is ventricular fibrillation or VF. In VF, the heart's electrical impulses fire randomly, causing it to quiver without any organized rhythm. Therefore, the casualty will not have a pulse.

The purpose of an AED is to stop the fibrillation and allow the heart to return to a normal rhythm of its own.

HOW IS AN AED USED?

If a casualty is found unresponsive, with no signs of breathing and circulation, TURN THE AED ON. Once the AED is "ON," it will perform a self-test and then prompt the rescuer to the next step.

Single use electrode pads and cables are affixed to the casualty's bare chest. The cables are then connected to the AED through a "one-way" connection port. Some models have the cables pre-connected to the AED, thus saving a step. Once the electrode pads are properly connected, the AED will advise the rescuer that it is analyzing the casualty's rhythm.

During this phase, **DO NOT TOUCH OR MOVE THE CASUALTY** and advise any other bystanders to **"STAND CLEAR"**, while the AED analyzes the heart's rhythm. This allows the machine to take multiple "looks" at the casualty's rhythm without any interference from an outside source.

SHOCK ADVISED

If the AED recognizes VF or VT, it will audibly inform the rescuer that **"SHOCK ADVISED"** and begin to charge. When the AED is ready to shock, the SHOCK BUTTON will flash and the AED will advise the rescuer to **"PRESS TO SHOCK"**.

For the safety of the rescuer and bystanders, the rescuer must look around the casualty and make ensure that no one is in contact or too close to the casualty. Prior to delivering the shock, the rescuer must say out loud

"Stand clear. I'm clear. You're clear. We're all clear. Shocking now" or similar words.

Only then can the rescuer push the shock button. After the shock, the AED will prompt the rescuer to immediately begin CPR . CPR should be performed for two minutes or 5 cycles of 30 compressions and 2 ventilations. After two minutes, the AED will again analyze the casualty's heart rhythm and prompt the rescuer for an additional shock if required. **DO NOT TOUCH OR MOVE THE CASUALTY** while the AED is analyzing the rhythm.

NO SHOCK ADVISED

After the AED has analyzed the rhythm, if the casualty is not in VF or VT, the AED will state, **"NO SHOCK ADVISED – BEGIN C.P.R."**. CPR should be performed for two minutes or 5 cycles of 30 compressions and 2 ventilations. After two minutes, the AED will again analyze the casualty's heart rhythm and prompt the rescuer for an additional shock or C.P.R., if required.

INTEGRATION OF CPR AND AED

When rescuers respond to an emergency situation, they must assess the scene for safety and assess the casualty's level of consciousness. If the casualty is found unconscious for any reason, EMS must be activated. If the rescuers have determined this to be a cardiac emergency, and they have an AED, then the rescuer must immediately set up the AED. If the rescuer is not carrying an AED, it must be determined if an AED is present or nearby. **In situations where more than one rescuer is present, CPR (if necessary) can be started, while the other rescuer sets up the AED.**

THE USE OF AEDS FOR INFANTS & CHILDREN

There are certain AEDs that may be used for infants & children with no signs of circulation present. Remember to always follow the AED manufacturer's guidelines for the application, use and maintenance of the AED. The arrhythmia detection algorithm used in the device should demonstrate high specificity for pediatric shockable rhythms, for instance, the device will not recommend a shock for non-shockable rhythms.

When a single rescuer responds to an infant or a child, without signs of circulation present, the provision of two minutes of CPR is still recommended before any other action such as activating EMS or attaching the AED.

Signs of Circulation	NO Signs of Circulation	NO Signs of Circulation
NO Breathing	AED Not Present	AED Present
Give rescue breaths. ADULT: 1 breath every 5 sec. CHILD: 1 breath every 3 sec. Continue until help arrives & takes over care.	Start CPR.	Turn on AED and perform CPR until AED is ready. Follow AED sequence.

CPR /AED QUICK REFERENCE CHART

	ADULT	CHILD Ages 1 – Puberty	INFANT Ages 0 - 1
C= Circulation Check for Signs of Circulation	If there is no normal breathing, coughing, movement or pulse, provide **ratio of 30 chest compressions to 2 breaths** (Rate: 100 compressions per minute). If AED is present, go to **D** (next step)	If there is no breathing, coughing, movement or pulse, provide **ratio of 30 chest compressions to 2 breaths** (Rate: 100 compressions per minute). If AED is present, go to **D** (next step).	If there is no breathing, coughing, movement or pulse, provide **ratio of 30 chest compressions to 2 breaths** (Rate: at least 100 compressions per minute.

A=Airway Open Airway	- head tilt/chin lift - if neck or spinal injury suspected, jaw thrust without head tilt	- head tilt/chin lift - if neck or spinal injury suspected, jaw thrust without head tilt	- "sniffing position" - if neck or spinal injury suspected, jaw thrust without head tilt
B=Breathing	Give 2 breaths (approx. 1 second in length) until chest rises.	Give 2 small breaths (approx. 1 second in length) until chest rises.	Give 2 puffs (approx. 1 second in length) until chest rises.
D= Defibrillate	Power on the AED. Stop CPR. Remove clothing from chest. Attach electrode pads to the chest. Listen to and follow AED voice prompts.	Power on the AED. Stop CPR. Remove clothing from chest and back. Roll child to side. Using age-appropriate electrode pads, place one pad on back between the shoulder blades. Place the other pad on chest between nipples. Listen to and follow AED voice prompts.	Power on the AED. Stop CPR. Remove clothing from chest and back. Roll infant to side. Using age-appropriate electrode pads, place one pad on back between the shoulder blades. Place the other pad on chest between nipples. Listen to and follow AED voice prompts.

Single Rescuer with an AED

If you are alone when responding and have immediate access to an AED:

1. Assess the casualty for responsiveness.
2. Activate EMS (if casualty is unresponsive).
3. If no pulse or signs of circulation are present, attach the AED and follow prompts.
4. Attend to the CABs

RETURN OF SPONTANEOUS CIRCULATION (ROSC)

If circulation returns, check for breathing. If casualty is not breathing adequately, provide rescue breaths (approximately 1 breath every 5 seconds for an adult and 1 breath every 3 seconds for an infant or child).

If breathing is present, roll the casualty into the recovery position, leaving the AED pads on the casualty.

SPECIAL SITUATIONS

Excessive Chest Hair If the casualty has excessive chest hair, quickly dry shave the area recommended for pad placement. After you shave the area, wipe it clean before affixing the pad. If no razors are available, press firmly down on pads to get adequate skin contact. If you have extra pads, press firmly down on initial pad and then rip away to pull hair out. Then place new pad in its place.

Water If the incident is near water, be sure casualty is not lying in the water. Quickly move the casualty to a dry location before the shock can be delivered. Although it has never been reported to have happened, it is theoretically possible; a shock delivered to casualty could be conducted through the water to the rescuers. If the casualty has water on chest area, the possibility exists that the current may arc between pads and bypass the heart. Be sure to dry chest area prior to placement of pads.

Medical Patches Do not place AED patches directly over any type of medical patch. Patches may block the delivery of necessary energy. Always remove patches and quickly clean area.

Implanted Medical Device Rescuers should look at chest for an implanted medical device. Usually a visible scar will be seen over a lump on the upper chest or abdominal region. Do not place the pad on the implant. Place pad at least 2.5cm (1 inch) to the side or below the implant.

AED MAINTENANCE

Due diligence requires that the AEDs are regularly checked and a maintenance program in place. Although AED malfunctions are rare, a regular check of the device can reduce the chances of a malfunction. Be familiar with the device that you have. Always keep spare electrode pads, extra batteries, two shaving razors, alcohol wipes and a towel with the AED.

It is recommended that you use a checklist to avoid missing important information. This written report of your maintenance check should be kept on file for verification purposes.

Training Recommendations Initial training will consist of:

- An explanation of AED
- Overview of local EMS systems including 911 access
- Recognition of unresponsive casualties and casualties in cardiac arrest
- Review of equipment operation and maintenance
- Discussion of treatment possibilities
- Hands-on practice utilizing skills and local protocols

Periodic training will consist of:

- Review of any recent actual cases
- Recognition of unresponsive casualties and casualties in cardiac arrest
- Review of equipment operation and maintenance
- Discussion of treatment possibilities
- Scenario practice utilizing skills and local protocols

Periodic refresher training should be accomplished at regular intervals. Routine examination and testing of the AED unit will aid the rescuer in familiarization with the unit.

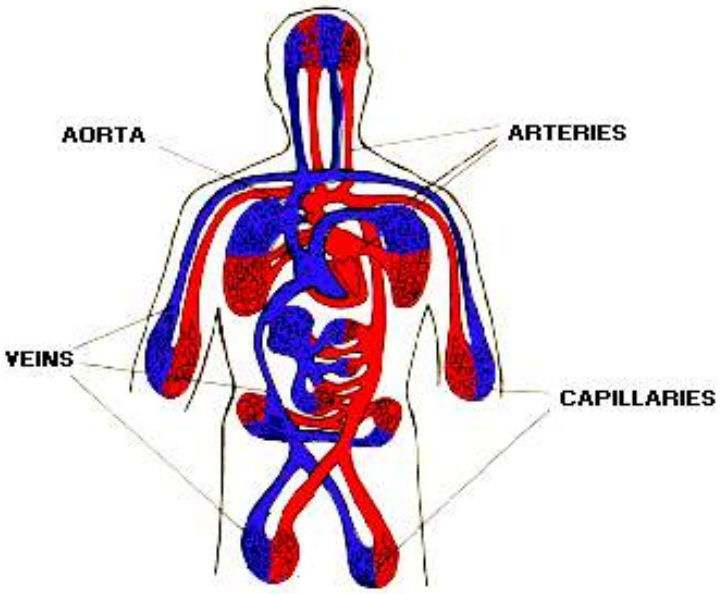
CHAPTER 4 CONTROL OF BLEEDING

Objectives

After reading this chapter, you should be able to

1. Have an understanding of the Anatomy and Physiology of the Circulatory System
2. List the types of hemorrhaging
3. Recognize the signs and symptoms and describe the treatment for Internal Bleeding
4. Recognize the signs and symptoms of External Bleeding
5. List the types of wounds that would involve external bleeding
6. Define who are “Bleeders”

CONTROL OF BLEEDING - Circulatory System



The Circulatory System is comprised of four major components:

- ✓ Arteries
- ✓ Veins
- ✓ Capillaries
- ✓ Heart

Blood, the vital body fluid being circulated, containing many specialized cells: red blood cells or hemoglobin, platelets, white cells, hormones, enzymes and nutrients and plasma.

PLASMA	The major component of blood, and is responsible for the transportation of nutrients hormones and enzymes to all the cells in the body It also transports waste products resulting from tissue activity to the organs for excretion
PLATELETS	Responsible for the clotting of the blood where injuries happen
HEMOGLOBIN	Cells are used for the transportation of oxygen and give color to the blood

One-twelfth to One-fifteenth of the body weight is blood. A person weighing 150 pounds will have approximately 10 to 12 pints of blood. If the tissues do not receive blood, they will die from lack of oxygen. The loss of two pints of blood, 8 to 10 percent of the body's blood, by an adult usually is serious. The loss of three pints may be fatal if it occurs over a short time, one to two hours. The loss of 4 pints or more will require blood transfusions to prevent death. At certain points in the body, fatal hemorrhages may occur in a very short time. The cutting of the two principal blood vessels in the neck , the arms or the thighs may cause hemorrhage that will prove fatal in one to three minutes or even less. Rupture of the main blood vessels of the chest and abdomen may prove fatal in less than thirty seconds.

The loss of blood causes a state of physical shock . This occurs because there is insufficient blood flowing through the tissues of the body to provide food and oxygen. All processes of the body are affected. When a person is in shock, vital body functions will slow. If the conditions causing shock are not reversed, death may occur.

BLOOD VESSELS

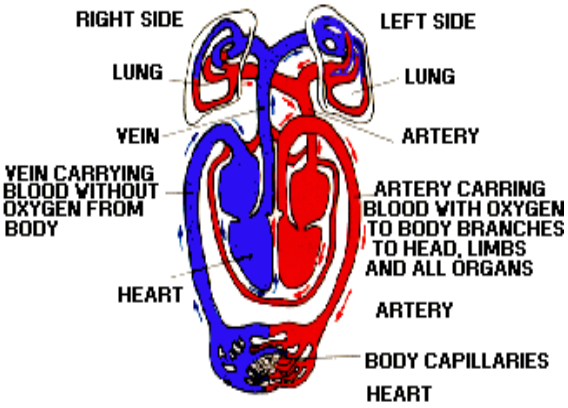
The vessels in the body are subjected to pressure on each of the heartbeats.

The three types of vessels in our body are:

Arteries, the vessels that carry blood away from the heart, are subjected to the most pressure**.**

Veins, the vessels that carry blood to the heart, are under low pressure.

Capillaries, the microscopic vessels responsible for feeding nutrients and oxygen to the cells and removing wastes from the cells are under the least pressure.



Oxygenated blood is carried from the heart by a large artery called the aorta. Smaller arteries branch off from this large artery, and those arteries in turn branch off into still smaller arteries. These arteries divide and subdivide until they become very small, ending in threadlike vessels known as capillaries, which extend into all the organs and tissues.

After the blood has furnished the necessary nourishment and oxygen to the tissues and organs of the body, it takes on waste products, particularly carbon dioxide. The blood returns to the heart by a different system of blood vessels known as veins. The veins are connected with the arteries through the capillaries.

Very small veins join, forming larger veins, which in turn join until the very largest veins return the blood to the heart. Blood passing through the kidneys is cleared of waste products. When the blood from the body reaches the heart, carbon dioxide and other waste products contained in the blood must be eliminated and the oxygen needed by the body is replaced. The heart pumps the blood delivered to it by the veins into the lungs, where it flows through another network of capillaries.

There, the carbon dioxide and other waste products are exchanged for oxygen through the delicate walls of air cells. Thus, the blood is oxygenated and ready to return to the heart, which recirculates it throughout the body. The time taken for the blood to make one complete circulation of the body through miles and miles of blood vessels is approximately 75 seconds in an adult at rest.

HEMORRHAGING OR BLEEDING

Hemorrhaging or bleeding is a flow of blood from an artery, vein, or capillary. There are two types of bleeding in first aid, Internal bleeding and External bleeding.

INTERNAL BLEEDING

We can subdivide Internal Bleeding into two subcategories - ***Concealed*** and ***Visible***.

CONCEALED	VISIBLE
Presents with indications of bleeding or fluids building up in an area yet blood is not physically seen or touched. In other words you cannot actual see blood.	Presents with blood and/or fluids, such as plasma or cerebro-spinal fluid, exiting from the natural body opening. Along with several signs and symptoms of shock, you would see blood/fluids flowing from the ears, nose, mouth, anus, or genitals
Signs And Symptoms	
CONCEALED	VISIBLE
Pale, cold, clammy skin Profuse sweating, Nausea and vomiting Lightheadedness, dizziness, confusion Restlessness, unable to obtain a comfortable position Eyes dull, vision clouded, and pupils dilated Severe thirst, dry mouth Shortness of breath, air-hunger Rapid, weak pulse General feeling of weakness Swelling at injury site Muscle guarding Pain at injury site Bruising at injury site	Pale, cold, clammy skin Profuse sweating, Nausea and vomiting Lightheadedness, dizziness, confusion Restlessness, unable to obtain a comfortable position Eyes dull, vision clouded, and dilated pupils Severe thirst, dry mouth Shortness of breath, air-hunger Rapid, weak pulse General feeling of weakness Bleeding from natural openings

FIRST AID TREATMENT

Immediately activate E.M.S.

Maintain an open airway

Treat the casualty for any life threatening injuries and shock

- **It is important to not give anything by mouth as this may complicate the necessary treatment by advanced help.**

For visible internal bleeding ,

- **Do not stop the flow of blood and/or fluids from the natural opening. Cover the opening with a clean, preferably sterile, dressing in order to catch the fluids and not allow debris into body**
-

EXTERNAL BLEEDING

An open wound is any break in the skin. When the skin is unbroken, it affords protection from most bacteria or germs. However, germs may enter through even a small break in the skin, and an infection may develop. Any open wound should receive prompt medical attention. If germs have been carried into an open wound by the object causing the break in the skin, the flow of blood will sometimes wash out the germs; but, as will be explained later, some types of wounds do not bleed freely.

Breaks in the skin range from pin punctures or scratches to extensive cuts, tears, or gashes. An open wound may be the only surface evidence of a more serious injury such as a fracture, particularly in the case of head injuries involving fracture of the skull.

The types of wounds that may involve external bleeding are:

ABRASIONS	Wounds that are usually superficial but can be extremely painful and may involve large surface areas. Abrasions are caused by rubbing or scraping, seldom deep, leaving a raw surface with minor bleeding. The bleeding in most abrasions is from the capillaries. Abrasions are easily infected due to the top layer of skin being removed leaving the underlying skin exposed.
GUNSHOT WOUNDS	Special considerations with this type of wound is there may actually be two wounds - one entry, one exit. It is important to note that these wounds may not be found across from each other. It is possible for bullets to ricochet off bones and exit higher, lower, sideways or on the same side of the entry wound. Since a weapon is involved, your safety as a first aider is critical. Review the risks in this situation and if you think your life might be at risk, DO NOT enter the scene, instead activate and wait for E.M.S. and police assistance.
CRUSH INJURY	This type of injury usually involves the fracture of the small bones in the hands and feet. When the area is crushed, the flesh is forced through the skin, which tears under the pressure applied to the area.
CONTUSIONS	A bruise.
LACERATION	The most common type of open wound involving bleeding. Lacerated wounds are those with rough or jagged edges. The flesh has been torn or mashed by blunt instruments, machinery, or rough edges such as a jagged piece of metal.

	Because the blood vessels are torn or mashed, these wounds may not bleed as freely as incised wounds. The ragged and torn tissues, with the foreign matter that is often forced or ground into the wound make it difficult to determine the extent of the damage. The danger of infection is great in lacerations.
INCISED	A straight edged cut. Wounds produced by a sharp cutting edge, such as a knife or razor. The edges of such wounds are smooth without bruising or tearing. If such a wound is deep, large blood vessels and nerves may be severed. Incised wounds bleed freely, and are often difficult to control.
PUNCTURE	A small diameter, deep, penetrating wound. Puncture wound s are produced by pointed objects such as needles, splinters, nails, or pieces of wire passing through the skin and damaging tissues in its path. The small number of blood vessels cut sometimes prevents free bleeding. The danger of infection in puncture wounds is great due to this poor drainage. There are two types of puncture wounds. A penetrating puncture wound causes injured tissues and blood vessels whether it is shallow or deep. A perforating puncture wound has an entrance and exit wound. The object causing the injury passes through the body and out to create an exit wound that in many cases is more serious than the entrance wound.
	It is strongly advised to use protective rubber gloves when dealing with any casualty to reduce the risk of becoming contaminated by the blood or body fluids of the casualty. Should rubber gloves not be available, the rescuer should improvise with plastic bags, plastic wrap or by placing a dressing into their hand and then placing it over the wound. If the wound contains an imbedded or protruding object, do not remove it unless a higher priority will be compromised. Higher priorities would be considered airway, breathing or risks to the casualty. For example, if the object could compromise the airway or breathing such as a pencil through the cheek, we would remove it or if a casualty was impaled on an object and in a position of danger, we would remove them from the danger.
AMPUTATIONS	An amputation involves the extremities. When an amputation occurs, the fingers, toes, hands, feet, or limbs are completely cut through or torn off which causes jagged skin and exposed bones. Bleeding may be excessive or the force that amputates a limb may close off torn vessels, limiting the amount of bleeding. A clean-cut amputation seals off vessels and minimizes bleeding. A torn amputation usually bleeds heavily.
AVULSIONS	An avulsion is an injury that tears a whole piece of skin and tissue loose or leaves it hanging as a flap. This type of wound usually results when tissue is forcibly separated or torn from the casualty's body. There is great danger of infection and bleeding. Body parts that have been wholly or partly torn off may sometimes be successfully reattached by a surgeon.

BLEEDING FROM AN ARTERY

An artery has been severed when bright red blood spurts from a wound. The blood in the arteries comes directly from the heart, and spurts at each contraction. Having received a fresh supply of oxygen, the blood is bright red.

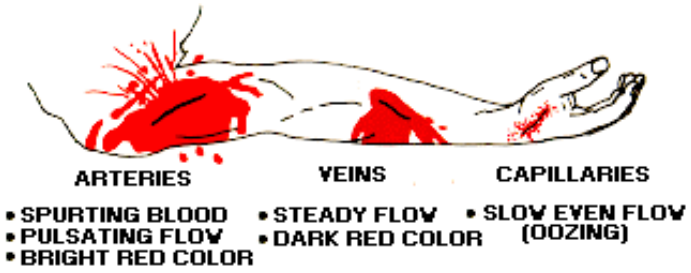
BLEEDING FROM A VEIN

When dark red blood flows from a wound in a steady stream, a vein has been cut. The blood, having given up its oxygen and received carbon dioxide and waste products in return is dark red.

BLEEDING FROM CAPILLARIES

Blood from cut capillaries ooze.

There is usually no cause for alarm because relatively little blood is lost. Usually direct pressure with a compress applied over the wound will cause the formation of a clot. When large skin surface is involved, the threat of infection may be more serious than the loss of blood.



"BLEEDERS"

Some conditions such as hemophilia, medications, etc. do not allow normal clotting to occur. Some persons may bleed to death even from the slightest wounds. This free bleeding may be internal as well as external. This condition warrants close observation for shock . In addition to applying compress bandages or gauze, rush the person to the nearest hospital where medical treatment can be quickly administered.

Methods of Controlling Bleeding

Controlling bleeding is usually very simple. Most external bleeding can be controlled by putting the casualty at rest, elevating the injured area above the heart and applying direct pressure to the open wound. Direct pressure permits normal blood clotting to occur.

In cases of severe bleeding, the first aider may be upset by the appearance of the wound and the emotional state of the casualty. Remember that a small amount of blood appears as a lot of blood. It is important for the first aider to keep calm and do what is necessary for the casualty.

When it is necessary to control bleeding, use the following methods:

- Put the casualty at rest. Have them lie down if possible
- Elevate the injury above the heart
- Direct pressure on the wound with sterile bandage, if possible.

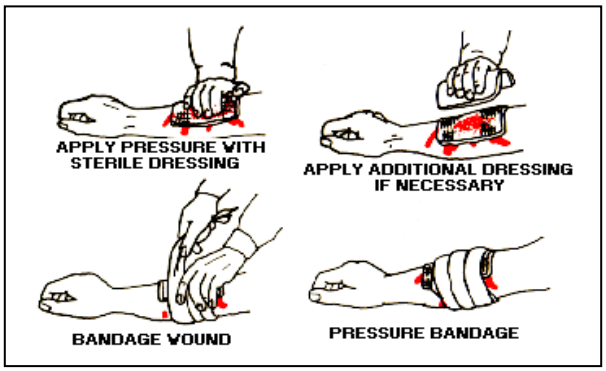
REST

Putting the casualty at rest will lower their pulse rate and decrease their blood pressure allowing the body to begin the healing process.

ELEVATION

Elevating the bleeding part of the body above the level of the heart will slow the flow of blood and speed clotting. Use elevation with direct pressure when there are no fractures or fractures have been splinted and it will cause no pain or aggravation to the injury.

DIRECT PRESSURE



The best all around method of controlling bleeding is applying pressure directly to the wound. This is best done by placing gauze or the cleanest material available against the bleeding point and applying firm pressure with the hand until a cover bandage is applied. The cover bandage should be applied firmly, covering the edges of the dressing, and the knot should be tied over the wound unless otherwise indicated. The bandage supplies direct pressure and should not be removed until the casualty is examined by a physician. When air splints or pressure bandages are available, they may be used over the heavy layer of gauze to supply direct pressure.

If bleeding continues after the bandage has been put on, this indicates that not enough pressure has been applied. Use the hand to put more pressure on the wound over the bandage, or apply a second bandage. Do not remove original dressing. Either method should control the bleeding. In severe bleeding, if gauze or other suitable material is not available, the bare hand should be used to apply direct pressure immediately. This will control most bleeding. After tying the bandage, check for adequate circulation at the points below the bandage.

Pushing on the skin and checking for capillary refill can do this. The following are examples of the bandaging techniques that could be used for various body areas.

TOURNIQUET

Tourniquets are a **LAST** resort technique for control of bleeding. This is only to be used when all other techniques have been exhausted and without applying a tourniquet, the casualty will die. The tourniquet should be used in conjunction with pressure.

Once you have determined the source, cut, tear, or otherwise remove any clothing near the wound. Apply direct pressure to the wound to control the bleeding. If the bleeding fails to slow or stop when pressure is applied, you will need to find (or fasten) a tourniquet.

If the injured person is conscious and alert, tell them that you will be applying a tourniquet to their injury. The tourniquet needs to be applied to bare skin. Unfortunately, the process of applying a tourniquet may be extremely painful, and the person is likely already in a great deal of pain. Let the person know that applying the tourniquet will hurt but that it may save the limb, if not their life.

Position the cloth, towel, or other material to be used for the tourniquet on the limb approximately 5 centimeters (2 inches) above the injury and never at a joint. You will want to position the tourniquet at the part of the limb that is closest to the heart.

Use a common square knot (like tying your shoelaces, but without making a bow) to tie the tourniquet around the limb.

You will need a stick or other item strong enough to act as a

windlass. A windlass is a lever that can be used to twist the tourniquet tighter. Anything can be used as a windlass, as long as it is strong enough to hold the tourniquet and can be secured in place. Consider using pens or pencils, sticks, or spoons.

Place your windlass on the knot you've made, then tie the loose ends of the tourniquet around it using another square knot.

Begin twisting the windlass to increase the pressure. Keep an eye on the bleeding and make note of when it begins to slow. Continue turning the windlass until all the bleeding has stopped or is significantly reduced.

Once the bleeding has slowed or stopped, secure the windlass by tying one or both ends to the injured person's arm or leg.

Tourniquets can only be applied for certain periods of time—no longer than two hours. Therefore, it will be very important for first responders and medical staff who treat the injury to know when you applied the tourniquet.
If possible, mark a "T" with the date and time you placed the tourniquet on the person's forehead or another area highly visible to emergency personnel.

IMPALED OR PROTRUDING OBJECTS

To control the bleeding in the case of an impaled or protruding object, indirect pressure is used. First apply pressure with the hands around the object and then apply a ring pad or wads of padding around the object. Wrapping one end of a narrow bandage around your hand once or twice is how a ring pad is started. Taking this loop off your hand, begin to feed the longest end of the bandage through the ring, padding it up until the entire bandage is used up. Tuck the end under one of the previous wraps you made.

General First Aid for Open Wounds

The chief duties of a first aider in caring for an open wound are to stop bleeding and to prevent germs from entering the wound. If germs do not enter, there will be much less chance of infection and the wound will heal quickly.

- Carefully cut or tear the clothing so that the injury may be seen.
- If loose foreign particles are around the wound, wipe them away with clean material. Always wipe away from the wound, not toward it.
- Do not attempt to remove an object impaled in the wound. Serious bleeding and other damage may occur if the object is removed. Stabilize the object with a bulky dressing.
- Do not touch the wound with your hands, clothing, or anything that is not clean, if possible.
- Place a sterile bandage compress or gauze (when available) over the wound and tie in place.
- All dressings should be wide enough to completely cover the wound and the area around it.
- Protect compresses or gauze dressings with a cover bandage made from a cravat or triangular bandage. Place outer dressings on all open wounds except for wounds of the eye, nose, chin, finger and toe, or compound fractures of the hand and foot when splints are applied. Use either a cravat bandage or triangular bandage to cover the entire dressing.
- Unless otherwise specified, tie the knots of the bandage compress and outer dressing over the wound on top of the compress pad to help in checking the bleeding. However, when an open fracture is involved, tie away from wound.
- Keep casualty quiet and lying still. Any movement will increase circulation that could restart bleeding.
- Reassure the casualty to ease emotional reaction.
- Treat for shock .

CHAPTER 5 WOUNDS AND DRESSINGS

Objectives

After reading this chapter, you should be able to

1. Understand the general principles of bandaging
2. List the types of slings used in First Aid
3. Understand the steps involved in treating a bleeding injury on any part of the body
4. List the steps in caring for an amputation

After reading this chapter and completing the activities, you should be able to

1. Apply proper bandaging for the wounds involving External Bleeding
2. Perform the proper treatment for a partial or full amputation
3. Apply a Sling

Wounds and Dressings

Principles of Bandaging

Bandage wounds snugly, but not too tightly. Too tight a bandage may damage surrounding tissue or interfere with the blood supply especially if swelling occurs. A bandage tied too loosely may slip off the wound.

In bandaging the arms or the legs, leave the tips of the fingers or toes uncovered where possible so any interference with circulation can be detected.

If the casualty complains that the bandage is too tight, loosen it and make it comfortable but snug. Unless otherwise specified, all knots should be tied over open wounds to help control bleeding.

If bandages become saturated with blood, apply additional bandages or dressings. Do not remove original dressing.

SLINGS

Slings are used to support and limit the movement of an injured limb . In an emergency they may be improvised from belts, neckties, scarves, or similar articles. Bandages should be used if available.

TRIANGULAR BANDAGE SLING - ARM SLING

This specific sling is used when the arm (defined as the area from the wrist to the shoulder joint but not including the shoulder joint) sustains an injury. Both the slings in first aid will begin in the same fashion. The rescuer will hold the longest side of the triangular bandage (the base) in one hand and the point of the bandage (the apex of the triangle opposite the base) in the other hand.

Tie a triangular bandage sling as follows

- Place one end of the base of an open triangular bandage over the shoulder of the uninjured side and behind the neck to the injured side.
- Allow the bandage to hang down in front of the chest so that the apex will be behind the elbow of the injured arm.
- Bend the arm at the elbow with hand slightly elevated.
- Bring the forearm across the chest and over the bandage.
- Carry the lower end of the bandage over the shoulder on the injured side and tie at the injured side of the neck , being sure the knot is at the side of the neck.
- Twist the apex of the bandage, and tuck it in at the elbow.
- The hand should be supported with the fingertips exposed, whenever possible, to permit detection of interference with circulation



CRAVAT BANDAGE SLING - TUBULAR SLING

This bandage is used where there are injuries to the hand, collarbone, shoulder joint or chest .

Tie a cravat bandage sling as follows

- Bend the arm at the elbow with hand at the uninjured shoulder.


- Place one end of the bandage over the hand and shoulder of the uninjured side.

- Allow the bandage to hang down in front of the chest .

- Tuck the lower end of the bandage under the injured arm from the hand to the elbow.
- Gather the bandage up and twist a couple of times
- Bring the bandage around the back and tie at the uninjured side of neck

Dressing for Wounds and Bleeding

HEAD & NECK

The following dressings are recommended for covering wounds.

NOSEBLEEDS

Nosebleeds are more often annoying than life threatening. Bleeding from the nose (not related to a head injury) is quite common when the casualty suffers from high blood pressure, the air is very dry or from scratches inside the nostrils. This bleeding if not brought under control can interfere with the airway.

First aid for nosebleeds

- Keep the casualty quietly seated, leaning forward if possible.
- Gently pinch the nostrils closed where the nose turns from bone to cartilage for at least 10 minutes.
- Apply cold compresses to the casualty's nose and face.
- If the person is conscious, it may be helpful to apply pressure beneath the nostril above lip.
- Instruct casualty not to blow his/her nose for several hours after the bleeding has stopped, or clots could be dislodged and start the bleeding again.
- Nosebleeds that cannot be controlled through these measures may signal a disease, such as high blood pressure. The casualty should see a physician. Anyone who suffers a nosebleed after an injury should be examined for possible facial fractures .

- If a fractured skull is suspected as the cause of a nosebleed, do not attempt to stop the bleeding. To do so might increase the pressure on the brain. Treat the casualty for a fractured skull.

SCALP, TEMPLE, EAR, OR FACE

If the injury is to the side of the head , use the same bandaging techniques we would use for a pressure bandage. If the injury involves the face, a butterfly bandage can be used to keep the edges of the wound together.

To dress open wounds for the scalp, temple, ears, or face

- "V" cut the center dressing of a Band-Aid on either side to make a butterfly bandage
- Apply the butterfly bandage by securing one adhesive side of the bandage to the skin, pulling toward the cut
- Bring the edges of the wound together and secure the other adhesive side of the bandage to the skin
- Cover the entire area with a rectangular Band-Aid to protect against debris

Eye Injuries

Only a doctor should remove objects embedded in the eye. Such objects must be protected from accidental movement or removal until the casualty receives medical attention.

- Cover only the injured eye, as this will reduce the anxiety the casualty will have
- Encircle the eye with gauze dressing or other suitable material.
- Position a cup or cone over the embedded object. The object should not touch the top or sides of the cup. It may be necessary to make a hole in the bottom of the cup if the object is longer than the cup.
- Hold the cup and dressing in place with a bandage compress or roller
- Never leave the casualty alone, as the casualty may panic. Treat for shock and reassure the casualty.
- Stabilize the head with sandbags or large pads and always transport the casualty on his/her back.
- Ensure that the casualty does not tamper with the dressing or embedded object.
- This procedure should also be used for lacerations and other injuries to the eyeball

EXTRUDED EYEBALL

After a serious injury, the eyeball may be knocked out of the socket. No attempt should be made to put the eye back into the socket.

- Cover the eye with a moist dressing and a protective cup without applying pressure to the eye
- A bandage compress or roller bandage should be applied
- Transport the casualty face up with the head immobilized

EYELIDS AND SOFT TISSUE SURROUNDING THE EYE

For all injuries to and around the upper or lower lid of the eye, use a sterile bandage compress as follows:

- Place the center of a bandage compress over the injured eye.
- Carry the end on the injured side below the ear to the back of the head .
- Carry the other end across the eyebrow on the opposite side.
- Cross the ends below the bony prominence on the back of the head .
- Bring both ends around the head - pull it tightly enough to provide pressure on the dressing over injured eye
- Tie the ends above the uninjured eye

WELDER'S FLASH AND SNOW BLINDNESS

A flash burn and snow blindness result in painful inflammation of the clear tissue that covers the front of the eye, known as the cornea. A flash burn occurs when you are exposed to bright ultraviolet (UV) light. It can be caused by all types of UV light, but welding torches are the most common source. That's why it is sometimes called 'welder's flash' or 'arc eye.' Snow Blindness is due to exposure to UV sunlight as it is reflected off the snow surface.Flash burns and snow blindness are like a sunburn in the eye and can affect both your eyes. Your cornea can repair itself in one to two days. However, if the flash burn is not treated, an infection may start which may lead to some loss of vision.

You can receive a flash burn after being exposed to UV light such as:

- welding torch
- direct sunlight
- reflection of the sun off water or snow
- sunlamp in a tanning salon
- some types of lamps, such as halogen or a photographer's flood lamp.

The symptoms include:

- pain or itching of the eyes that may be mild to very severe, usually starting a few hours after the incident
- the feeling of having something in your eye.
- bloodshot eyes
- light sensitivity
- watery eyes
- blurred vision

Diagnosis to confirm that this is a flash burn requires an eye examination by a qualified ophthalmologist.

Treatment for flash burns may include: Covering the eyes with cool, moist dressing to alleviate the discomfort. The casualty will require transport to the ophthalmologist to be properly assessed and provided treatment. Prevention is best.

Mouth

Teeth that have been knocked out can result in bleeding from the empty socket.

To Control Bleeding From The Socket

- Have the casualty bite down on a rolled-up piece of gauze
- The tooth can be replaced if it is stored correctly
- Treating it like any other amputated part will suffice
- Teeth also contain calcium. Therefore, the extracted tooth can be stored in a small quantity of milk
- Casualties should be brought to an Emergency Dental clinic in order to restore the tooth

Ears

Bleeding from the ears is quite unusual. If the bleeding is a result of a head , neck or spinal injury, treat for those injuries as well. If the bleeding is due to lacerations to the ear, ear canal or amputations of the ear then use the principles for control of bleeding.

- Apply direct pressure,
- Have the casualty rest
- Treat the casualty for shock

An amputation of the external ear will be treated like all other amputations.

Neck or Throat

This type of injury may be life threatening depending on the depth of the injury. Your carotid arteries, which feed the brain, are found on either side of your neck along with the jugular veins, the vessels responsible for bringing the used blood from the brain to the heart.

- If an injury that occurs to these vessels
- Apply gentle pressure with a dressing
- When the bleeding has been controlled, secure the dressing using plastic wrap
- This will allow you to monitor the dressing and provides an airtight seal, which does not allow any air to enter the bleeding vessels. Air can easily be drawn into these large diameter vessels causing an air bubble to be trapped in the heart or make it's way to the brain causing cardiac arrest or stroke.

To Bandage A Wound On The Neck Or Throat

- Apply the pad of a sterile compress to the wound.
- Place the center of cravat bandage over the compress.
- Pass the ends of the cravat bandage around the neck , cross them, bring them around the neck again, and tie loosely.
- Wrap Plastic over the bandaging to prevent air from entering the wound
- Use hand pressure over the wound for control of excessive bleeding.

Lacerations

LACERATION TO AN ARM, FOREARM, WRIST OR LEG

- Place the dressing over the wound

  If it becomes blood soaked, do not remove it, as this will disturb the clotting. Place another dressing on top of the previous dressing and continue to apply pressure until the bleeding is controlled.

- Using a broad bandage, or suitable substitute
- Place the center of the bandage over the wound
- Cover the dressings ensuring that the edges of the dressings are covered as well
- Continue to wrap the bandage around the limb until the entire bandage is used up

- Tie the ends of the bandage together with the knot situated over the wound
- Check for circulation below the bandage by using capillary refill and raise the injured limb
- Put the arm into a sling
- If it is the leg that is injured, have the casualty lie down and raise the leg 15 – 30 cm (6 – 12 inches) off the ground

VERTICAL LACERATION TO THE PALM OF THE HAND

Any laceration to a flexible area must be held and bandaged so that the edges of the wound can come as close together as possible. This will promote quicker healing and less scarring of the wound.

If the laceration is vertically in the palm of the hand

- Keep the hand held open with the fingers curled lengthwise
- Place the dressing in the palm of the hand and have the casualty hold it in place with their thumb
- This will help the keep the edges of the wound together as well.
- Using some roller gauze, simply start at the fingertips and wrap the hand to the point just past the wrist and tape or

tie in place

- Make sure if you are tying that the knot is on the backside of the wrist

If you tie over the front side of the wrist, you risk cutting off the circulation in the two arteries found in the wrist.

If you do not have roller gauze, use a broad bandage or suitable substitute, by placing the center of the bandage slightly diagonally across the back of the hand and wrap directly around the fingers and directly around the wrist.

- Use up as much of the bandage as you can by continuing to wrap it around the hand
- Tie your knot over the injury and place into a tubular sling
- Check the fingertips for capillary refill to ensure you have not cut off the circulation

HORIZONTAL LACERATION TO THE PALM OF THE HAND

A horizontal cut to the palm of the hand, often referred to as a *"Bagel Cut"* in the United States, must also be bandaged so that the edges of the wound can be held together.

- Have the casualty grasp a wad of dressings into the form of a fist
- By grasping firmly, this will provide a great deal of direct pressure
- Using roller gauze, anchor the bandage around the wrist with a couple of wraps
- Bring the roller gauze across the back of the fist, over top of the fingers and diagonally across the front of the fist
- On the next wrap, alternate the diagonal wrap across the front side of the fist
- Cover all of the fingers, leaving the thumb exposed to check for circulation
- If using a broad bandage or suitable substitute
- Have the casualty hold out their fist in fingers up position
- Place the center of the bandage over the front side of the wrist, just like you would see a

waiter in a restaurant holding a towel over their arm

- Bring both ends of the bandage diagonally across the back to the fist and then diagonally across the fingers
- Cover all the fingers but leave the thumb out in order to check for capillary refill
- Try to tie the knot over the wound in order to maximize the pressure of the bandage
- Place the bandaged hand into a tubular sling

To Dress A Wound Of The Palm Or Back Of The Hand

- Apply the pad of a compress over the wound.
- Place the center of a cravat bandage over the pad.
- Cross the ends at the opposite side of the hand.
- Pass one end around the little finger side of the hand.
- Pass the other end between the thumb and forefinger, taking the ends to the wrist.
- Cross the ends and continue around the wrist, crossing at the back of the wrist.
- Cross again at the inside of the wrist.
- Tie at the back of the wrist.
- Place the forearm and hand in a triangular bandage sling.

Finger and End of Finger

Fingers pose a unique problem in bandaging due to their proximity to each other and their flexibility. Specially designed bandages called Tublinette have been designed to make this job easier. Tublinette needs a special applicator as well as practice in applying it to the casualty.

- Place the correct size of Tublinette on the applicator
- Along the length of the finger, place a short length of Tublinette
- Push the applicator over the finger and twist the applicator a couple of times to anchor the Tublinette at the base of the finger
- Slowly turn the applicator as you pull it up towards the top of the finger
- Twist the Tublinette and applicator a couple of times at the top of the finger and repeat the process
- Secure the Tublinette by cutting it and taping it to the finger

Remember that these injuries are not life threatening and if the casualty is able, simply have them continue to apply pressure by holding the dressing in place

- Bandage this area simply by using some small roller gauze or tape the dressings in place

- Tell the casualty not to flex or move the area as this will break the clotting and promote further bleeding

To Dress A Wound Of The Finger

- Apply the pad of a small compress over the wound.
- A small adhesive compress may be used instead of a bandage compress for a wound of the finger or a wound on the end of the finger. A bent finger should be dressed bent and not fully extended.
- If more than one finger is injured, cover with an open triangular bandage as for extensive wounds of the hand.

Sucking Chest Wound (Pneumothorax)

Penetration of the chest wall and through the sac that surrounds the lungs, *Pleural Sac,* can allow outside air to enter the lungs through the puncture. This wound needs to be treated like all other bleeding emergencies.

- Have the casualty place their hand over the wound until you can adequately bandage the area
- Place a dressing, over the wound and hold in place to control the bleeding
- Ensure you DO NOT seal the wound with your hand or allow it to become occlusive and seal the wound.
- Place the casualty in a semi-sitting position and lean them slightly toward the injured side to permit for any drainage and allowing good lung to expand

To Tie A Bandage For The Back, Chest , Abdomen , Or Side

- Cover with a proper size cravat bandage by placing the center of the bandage on the side nearest the injury.
- Take the ends across the back and abdomen or chest and tie on the opposite side.
- Transport to medical facility immediately.

Eviscerated Organs

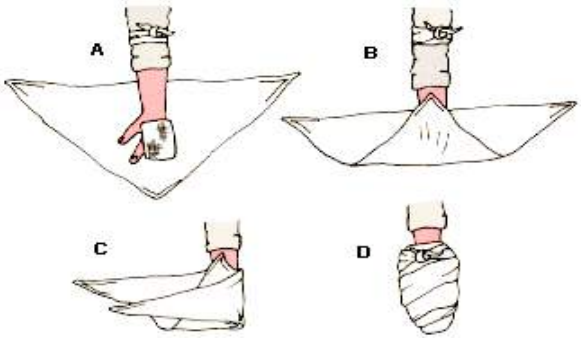
Lacerations to the abdomen can be deep enough to allow the internal organs to be forced out of the abdominal cavity. This injury must be treated with the utmost care.

Do not handle the internal organs with your hands. If you must move the organs, cover your hands with a barrier device or apply the dressing in your hand first then to the internal organ. Try to keep the organs on the abdominal region for warmth.

- Cover the internal organs with a sterile dressing and moisten the dressing so it does not stick to the organs
- Cover this with a plastic wrap or plastic bag and secure the dressing in place with tape, a triangular bandage or strips of cloth
- Keep the organs warm by covering with some tinfoil (shiny side next to the wound) or a blanket
- Ease the pressure on the abdominal muscles by having the casualty bend their knees. Place some bulky padding under the knees for support
- Place the casualty on his/her back with something under the knees to help relax the abdominal muscles.
- Treat the casualty for shock

AMPUTATIONS

Amputation of a limb poses some difficulties for a rescuer. It is important that the amputated portion be found and transported to the hospital with the casualty. Treating this injury is no different than treating any other bleeding wound, use direct pressure over the severed end, rest and elevation.



For partial amputation, where the limb is still partially attached to the body, realign the limb and bandage in place. Medical advances in microsurgery have made it possible to reattach limbs with great success.

Proper handling and care of the amputated portion is critical to achieve successful reattachment.

Wrap the amputated portion in a clean (preferably sterile) dressing and place in a plastic bag

Keep the amputated portion cool by placing this bag inside a second bag containing some ice and water or a cold pack

Identify the amputated portion by putting a label on the bag identifying the casualty, time and date of the injury

When an arm has been torn from the body at the socket there is profuse bleeding from the larger blood vessels that are severed; therefore, care must be prompt.

FIRST AID TREATMENT

- Pack the wound with gauze
  - **If there is no gauze at hand, do not wait, place your hand over the wound and apply direct pressure until bleeding slows or stops**
- Release the vessels and push the sterile gauze firmly into the wound.
- Place the center of a cravat bandage over the pad, carrying the ends across the chest and back.
- Tie under the opposite armpit over a pad.
-

OTHER AMPUTATIONS

To care for the casualty of an amputation

- Control hemorrhage by applying digital pressure with your hand
- Dress the end of the stump with gauze.
- Place the stump in the center of a triangular bandage with the base against the inside of the extremity.
- Carry the apex over the stump and up on the outside of the extremity.
- Cross the ends on the outside of the extremity.
- Bring the ends around the limb and cross them under the limb.
- Bring the ends to the front of the limb and tie.
- Fold the apex over the knot and tuck it under.

In cases of avulsions and amputations of extremities, collect the separated parts. Label what the parts are along with the name of the casualty. Place them in a plastic bag, then in a separate bag of iced water (do not immerse the parts in water directly). Transport to the medical facility with the casualty.

Closed Wounds

Closed wounds are injuries where the skin is not broken, but damage occurs to underlying tissues. These injuries may result in internal bleeding from damage to internal organs, muscles, and other tissues. Closed wounds are classified as follows:

- ✓ Bruises
- ✓ Ruptures or Hernias

BRUISES

An object striking the body or the body encountering a hard object, for example in a fall or a bump causes bruises. The skin is not broken, but the soft tissues beneath the skin are damaged. Small blood vessels are ruptured, causing blood to seep into surrounding tissues. This produces swelling. The injured area appears red at first, then darkens to blue or purple. When large blood vessels have been ruptured or large amounts of underlying tissue have been damaged, a lump may develop as a result of the blood collecting within the damaged tissue. This lump is called a hematoma or blood tumor. The symptoms of a bruise are as follows:

Immediate pain	Rapid discoloration
Swelling	Later pain or pressure on movement

FIRST AID TREATMENT

- Limit swelling and reduce pain, apply an ice bag, a cloth wrung out in cold water, or a chemical cold pack.
- Elevate the injured area and place at complete rest.
- Check for fractures and other possible injuries.
- Treat for shock .
- Severe bruises should have the care of a doctor.

RUPTURES OR HERNIAS

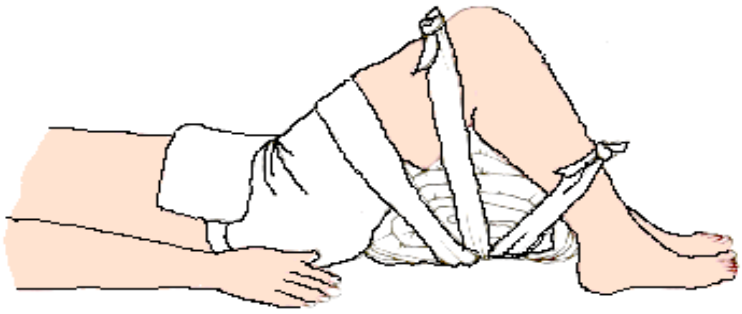
The most common form of rupture or hernia is a protrusion of a portion of an internal organ through the wall of the abdomen . Most ruptures occur in or just above the groin, but they may occur at other places over the abdomen. Ruptures result from a combination of weakness of the tissues and muscular strain.

SIGNS AND SYMPTOMS

- ✓ Sharp, stinging pain
- ✓ Feeling of something giving away at the site of the rupture
- ✓ Swelling
- ✓ Possible nausea and vomiting

FIRST AID TREATMENT

- Place the casualty on his/her back with the knees well drawn up.
- Place a blanket or similar padding under the knees.
- Place the center of a cravat under the padding; bring the ends above the knees and tie.
- Place the center of two cravat bandages tied together at the ends on the outside of the thighs and pass the ends around the thighs, cross under the blanket, bring the ends around the legs just above the ankles and tie.



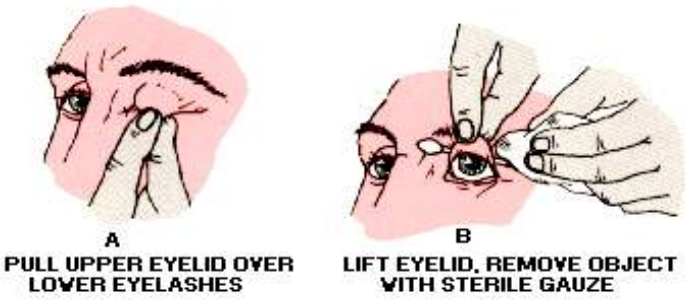
- Never attempt to force the protrusion back into the cavity.
- Place cold application to injured area.
- Cover with a blanket.
- The casualty should be transported lying down with the knees drawn up.

FOREIGN BODIES IN THE EYE

Foreign bodies, particles of dirt, coal dust, or fine pieces of metal frequently enter the eye and lodge there. If not removed, they can cause discomfort, inflammation and possibly, infection.

Through an increased flow of tears, nature limits the possibility of harm by dislodging many of these substances. Do not let the casualty rub the eye. Rubbing may scratch the delicate eye tissues or force sharp objects into the tissues. This makes removal of the object difficult. The first aider should not attempt to remove foreign bodies. It is always much safer to send the person to a physician.

FIRST AID TREATMENT



- Pull upper eyelid over the lower eyelashes.
- Lift eyelid and remove object with sterile gauze.
- The first aid for a foreign body on the eye that is not on the cornea or imbedded is as follows
- Flush the eye with clean water, if available, for 15 minutes. If necessary, hold the eyelids apart.

> Often a foreign body lodged under the upper eyelid can be removed by drawing the upper lid down over the lower lid. As the upper lid returns to its normal position, the under surfaces will be drawn over the lashes of the lower lid and the foreign body removed by the wiping action of the eyelashes.

A foreign body on the surface of the eye may also be removed by grasping the eyelashes of the upper lid and turning the lid over a cotton swab or similar object. The particle may then be carefully removed from the eyelid with the corner of a piece of sterile gauze.

If a foreign body becomes lodged in the eyeball, do not attempt to disturb it, as it may be forced deeper into the eye and result in further damage. Place a compress over the injured eye. Keep the casualty calm and get medical help.

FOREIGN BODIES IN THE EAR

Small insects, pieces of rock, or other material may become lodged in the ear. Children sometimes put other objects, such as kernels of corn, peas, buttons or seeds in their ears. Such objects as seeds absorb moisture and swell in the ear, making their removal difficult and often causing inflammation.

FIRST AID TREATMENT

Do not insert pins, matchsticks, or pieces of other objects in the ear to dislodge foreign bodies because this may damage the tissue lining of the ear or perforate the eardrum.

In the case of insects, turn the head to the side and put several drops of warm olive oil, mineral oil, or baby oil in the ear. Then let the oil run out and the drowned insect may come out. (Do not try to flush out object with water.)

Consult a physician if a foreign body cannot be removed.

FOREIGN BODIES IN NOSE

Foreign bodies in the nose usually can be removed without difficulty, but occasionally the services of a physician are required.

FIRST AID TREATMENT

- Have the casualty gently blow their nose into a handkerchief. This will usually dislodge a foreign body in the nose.
- Do not blow the nose violently or with one nostril held shut.
- Do not attempt to dislodge the foreign body with a hairpin or similar object. This method may damage tissues of the nasal cavity or push the foreign body into an inaccessible place.

FOREIGN BODIES IN THE THROAT, ESOPHAGUS OR STOMACH

Foreign bodies such as pins, coins, nails, and other objects are sometimes swallowed accidentally. Except for pins, nails, or other sharp objects, foreign objects that are swallowed usually cause no great harm.

FIRST AID TREATMENT

- Do not give anything to induce vomiting or bowel movement
- Consult a physician immediately.

CHAPTER 6 SHOCK

Objectives

After reading this chapter, you should be able to

1. Have an understanding of the Anatomy and Physiology of the Nervous System
2. Define the term Shock
3. List the types of Shock
4. Understand the causes of different kinds of Shock
5. Understand the treatment for shock
6. Explain the first aid steps to treating anaphylactic shock

After reading this chapter and completing the activities, you should be able to

1. Properly treat a casualty for shock
2. Perform treatment for casualty who feels faint
3. Perform the Recovery Position

Shock

The term "shock " has a number of meanings. In this chapter, "shock" means the failure of blood to circulate throughout the body, which may result from a variety of causes.

The main types of shock include:

- Cardiogenic shock (due to heart problems)
- Hypovolemic shock (caused by too little blood volume)
- Anaphylactic shock (caused by allergic reaction)
- Septic shock (due to infections)
- Neurogenic shock (caused by damage to the nervous system)

Nervous System

The nervous system consists of the brain, spinal cord, sensory organs, and all of the nerves that connect these organs with the rest of the body. Together, these organs are responsible for the control of the body and communication among its parts.

CENTRAL NERVOUS SYSTEM

The brain and spinal cord together form the central nervous system, or CNS. The CNS acts as the control center of the body by providing its processing, memory, and regulation systems. The CNS takes in all of the conscious and subconscious sensory information from the body's sensory receptors to stay aware of the body's internal and external conditions. Using this sensory information, it makes decisions about both conscious and subconscious actions to take to maintain the body's well-being and ensure its survival. The CNS is also responsible for the higher functions of the nervous system such as language, creativity, expression, emotions, and personality. The brain is the seat of consciousness and determines who we are as individuals.

PERIPHERAL NERVOUS SYSTEM

The peripheral nervous system or PNS includes all of the parts of the nervous system outside of the brain and spinal cord. These parts include all of the nerves from the brain, spinal nerves, and sensory receptors.

FUNCTIONS OF THE NERVOUS SYSTEM

The nervous system has 3 main functions:

Sensory Integration Motor

The sensory function involves collecting information from sensory receptors which monitor the body's internal and external conditions. These signals are then passed on to the central nervous system for further processing.
The process of integration is the processing of the sensory signals that are passed into the CNS. These signals are evaluated, compared, used for decision making, discarded or committed to memory as deemed appropriate.
Motor response happens when signals are carried from the CNS stimulating the muscle tissue that moves a part of the body in response to some type of stimulation. Injury to any of these parts of the nervous system can be quite debilitating if not treated properly.

CAUSES OF SHOCK

The state of shock may develop rapidly or it may be delayed until hours after the event that causes it. Shock occurs somewhat after every injury. It may be so slight as not to be noticed; or so serious that it results in death where the injuries received ordinarily would not prove fatal. Some of the causes may be a result of;

- ✓ Severe or extensive injuries
- ✓ Severe pain
- ✓ Loss of blood
- ✓ Severe burns
- ✓ Electrical shock
- ✓ Poisoning inhaled, ingested, or injected
- ✓ Substance abuse
- ✓ Emotional stress
- ✓ Allergic reactions
- ✓ Certain illnesses
- ✓ Exposures to extremes of heat and cold

SIGNS AND SYMPTOMS

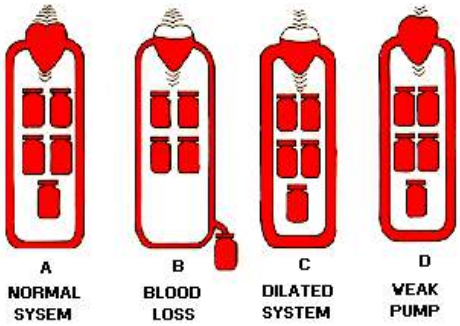
- ✓ Paleness in light skinned individuals
- ✓ gazed look
- ✓ Ashen (grayish) in dark skinned individuals
- ✓ Nausea and vomiting
- ✓ Cyanosis (late stages of shock)
- ✓ Thirst
- ✓ Weak, rapid pulse
- ✓ Cold, clammy skin
- ✓ Shallow, irregular, labored breathing
- ✓ Pupils dilated
- ✓ Eyes dull and lackluster

Some of the reactions known to take place within the body in cases of shock bear directly on the symptoms presented. The most important reaction that occurs in shock is a decided drop in normal blood flow, as the involuntary nervous system loses control over the small blood vessels in the abdominal cavity. This is one of the reasons the casualty is nauseous.

As a large amount of blood fills the dilated vessels within the body, decreased circulation near the surface causes the skin to become pale, cold, and clammy. Other areas suffer as a result of the drop in circulation; the eyes are dull and lackluster and pupils may be dilated.
As the body attempts to fill the dilated blood vessels, less blood returns to the heart for recirculation. To overcome the decreased volume and still send blood to all parts of the body, the heart pumps faster but pumps a much lower quantity of blood per beat. Therefore, the pulse is rapid and weak.

The brain suffers from this decreased blood supply and does not function normally; the casualty's powers of reasoning, thinking, and expression are dulled. The casualty may exhibit the following:

- Weak and helpless feeling
- Anxiety
- Disorientation or confusion
- Unconsciousness (late stages of shock)



FIRST AID TREATMENT

While life threatening, shock is reversible if recognized quickly and treated effectively. Always maintain an open airway and ensure adequate breathing and control bleeding.

- ✓ Keep the casualty lying down, if possible
- ✓ Make sure that the head is at least level with the body
- ✓ It may be necessary to raise the head and shoulders if a person is suffering from a head injury, sunstroke, heart attack , stroke, or shortness of breath due to a chest or throat injury
- ✓ Provide the casualty with plenty of fresh air.
- ✓ Loosen any tight clothing: neck , chest , and waist, in order to make breathing and circulation easier.

- ✓ Handle the casualty as gently as possible and minimize movement.
- ✓ Keep the casualty warm and dry by wrapping in blankets, clothing, sleeping bag, or other available material

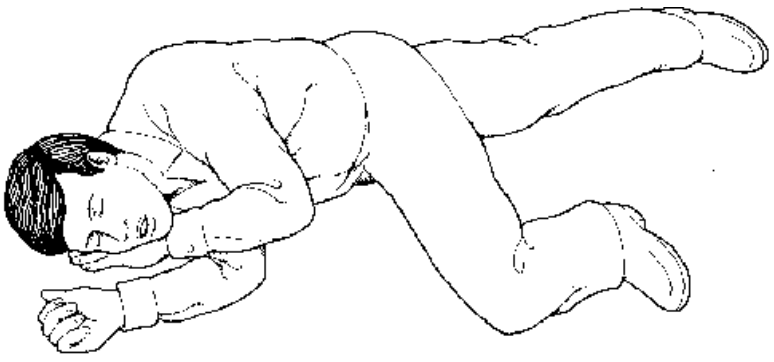
These coverings should be placed under as well as over the casualty to reduce the loss of body heat

The objective is to maintain as near normal body temperature as possible, not to add heat.

Do not give the casualty anything by mouth.

RECOVERY POSITION

The recovery position is the correct position in which to place a casualty who is breathing, while waiting for help to arrive. Do not put a person in the recovery position if you suspect that he has a spinal injury or severe fractures .



- ✓ With the casualty on his back, kneel beside him
- ✓ Remove glasses, and loosen his shirt, belt and pants
- ✓ Straighten both legs
- ✓ Place the arm nearest to you above the casualty's head ,
- ✓ Bring the far arm across his chest placing the back of the hand against the cheek

- ✓ Cross the outside leg over the near leg at the ankles
- ✓ Support the casualty's head with one hand and roll the casualty towards you by grasping the far hip and pulling until the casualty is on their side, with their head resting on the back of their hand
- ✓ Pull the top knee to a right angle position
- ✓ Open the airway and monitor the casualty's breathing and pulse regularly

Allergies

Approximately one out of six North Americans has one or more significant allergies, and suffers one or more varied symptoms that can be difficult to diagnose. Consequently, many allergy disorders go undiagnosed and untreated.

An allergic reaction can occur almost anywhere in your body. The symptoms of the reaction often occur at the site of the reaction. Hence, the sneezing and stuffy nose; the stomach cramps of food allergy; and the itching rash of poison ivy. At other times, however, the symptoms may occur in a separate part of the body. Food allergies and sensitivities are known to cause migraine headaches, and can trigger asthma. Allergic reactions to insect stings can cause hives, dizziness, and other symptoms.

Stated simply, "allergy" is an individual's sensitivity to a foreign substance that is usually harmless. This substance, called an allergen or antigen, is introduced to your immune system by different routes; such as ingestion, inhalation, injection, or by touch. Allergies can occur at any point in an individual's lifetime. Once an allergic individual's immune system has identified an antigen, it sets to work producing antibodies to defend itself. When a substance, for instance oak pollen, is introduced into the system, the antibodies specific for oak pollen combine with the pollen to form an "antigen-antibody complex." The antibody binds to the surface of the cells, which then release histamine.

Histamine, and related substances, causes allergic symptoms to occur. This is a vastly simplified explanation of allergic reaction and, there are many, many chemicals that become part of the allergy chain.

It may be impossible to remove certain allergy-provokers from one's environment, and limiting exposure will - at best - reduce symptoms. Sometimes there is no better option than a medication to provide symptomatic relief. Antihistamines, decongestants, bronchodilators, cortisone, and other drugs are prescribed as appropriate. . Under no circumstances should you provide, dispense, or administer any medication.

In some cases, the allergic reaction can be life threatening, also known as ***Anaphylactic Shock*** , and as a first aider, you must be aware that dangers can exist with these types of allergic reactions and be ready to provide the necessary first aid to assist the casualty.

ANAPHYLACTIC SHOCK

Anaphylactic shock is given special emphasis due to its life-threatening nature and the fact that it requires rapid treatment. It occurs when a person contacts something to which he/she is extremely allergic. People who are subject to anaphylactic shock should carry emergency medical identification at all times.

A person can contact substances that can cause anaphylactic shock by eating fish or shellfish, nuts, berries, or oral drugs such as penicillin. Insect stings (yellow jackets, wasps, hornets, etc.) or injected drugs can cause a violent reaction, as well as inhaled substances such as dust or pollen.

Sensitivity reactions can occur within a few seconds after contact with the substance. Death can result within minutes of contact.

SIGNS AND SYMPTOMS

- Itching or burning skin
- Hives covering a large area
- Swelling of the tongue and face
- Severe difficulty in breathing
- Tightening or pain in the chest
- Weak pulse
- Dizziness
- Convulsion
- Coma

FIRST AID TREATMENT

- Anaphylactic shock is an emergency that requires medication to counteract the allergic reaction known as an Epipen.
- If the casualty carries any medication to counteract the allergy, help the casualty take the medicine

> Only inject the casualty with the medication, if they are physically unable to administer
> the medication to themselves.

- Arrange for transportation to a medical facility as quickly as possible because anaphylactic shock can be fatal in less than 15 minutes
- If symptoms persist despite assisting the casualty with their auto-injector, seek medical advice before helping with an additional dose. In unusual situations, when medical advice is not available, a second dose may be given.
- Notify the hospital as to what caused the reaction, if known

- Maintain an open airway
- If necessary, provide artificial ventilation and C.P.R.
- Treat for physical shock

Fainting

Fainting is a temporary loss of consciousness due to an inadequate supply of oxygen to the brain and is a mild form of shock . The sight of blood, exhaustion, weakness, heat, or strong emotions such as fright or joy, etc may cause fainting . Some people faint more easily than others do.

SIGNS AND SYMPTOMS

- ✓ The casualty may feel weak and dizzy, and may see spots.
- ✓ The face becomes pale and the lips blue in both light and dark-skinned people.
- ✓ The forehead is covered with cold perspiration.
- ✓ The pulse is rapid and weak.
- ✓ The breathing is shallow.

FIRST AID TREATMENT

- Have the casualty lie down
- If the casualty is unconscious for any length of time, something may be seriously wrong. Arrange for transportation to a medical facility.
- Treat the casualty for physical shock
- Maintain an open airway.
- Do not give stimulants.

CHAPTER 7 MEDICAL EMERGENCIES

Objectives

After reading this chapter, you should be able to

1. Identify 3 signs and symptoms of a Diabetic Crisis
2. Describe the first aid treatment for a casualty having a Diabetic Crisis
3. Identify the basic types of seizures for those having Epilepsy
4. Describe the first aid treatment for any type of Seizure
5. Identify the signs and symptoms of Asthma
6. Describe the first aid treatment for Asthma
7. Identify the signs and symptom of impending Childbirth
8. Describe the first aid procedures for assisting the mother in Emergency Childbirth

After reading this chapter and completing the activities, you should be able to

1. Properly treat a casualty in diabetic crises, asthma attacks or seizure

MEDICAL EMERGENCIES

Diabetic Emergencies

Body and brain cells need many different types of nourishment, one of which is sugar. The circulatory system carries sugar and transfers it to the cells with the aid of a chemical substance called insulin. The pancreas located in the abdominal cavity, manufactures insulin. When the insulin production and sugar are in balance, the body functions normally. An individual suffering from an imbalance in the production of insulin is said to have diabetes mellitus. As a result of this imbalance, the body is adversely affected. However, a great many diabetics lead healthy, normal lives through a program of a balanced diet and medication. When the diabetic's condition is not controlled, certain disorders may occur. The major adverse reactions to insulin imbalance are diabetic coma and insulin shock .

DIABETIC COMA

Diabetic coma is a result of an inadequate insulin supply. This imbalance is generally due to a diabetic not taking the proper medication; a diabetic ingesting more sugar than the insulin can accommodate; a person contracting an infection which affects insulin production; or a person vomiting or sustaining fluid loss.

SIGNS AND SYMPTOMS

- ✓ Warm and dry skin
- ✓ Rapid and labored breathing
- ✓ Excessive urination
- ✓ Nausea and vomiting
- ✓ Abdominal pain
- ✓ A state of confusion and disorientation that is similar to drunkenness
- ✓ Sunken eyes
- ✓ Rapid and weak pulse
- ✓ Extreme thirst
- ✓ Sickly sweet odor of acetone similar to nail polish remover or spoiled fruit on the breath
- ✓ Eventually a coma state, thus the term diabetic coma

FIRST AID TREATMENT

- Watch for vomiting.
- Maintain an open airway
- Treat the casualty for shock
- Transport the casualty to a medical facility as quickly as possible

INSULIN SHOCK

Insulin shock results when there is a shortage of sugar relative to the amount of insulin in the body. The prime reasons for the condition are that the casualty has not eaten, so that not enough sugar has been taken in; the casualty has taken too much insulin; or the casualty has over exercised, thus burning sugar too fast.

SIGNS AND SYMPTOMS

- ✓ The casualty experiences a personality change in the early stages
- ✓ Headache
- ✓ Rapid, weak pulse
- ✓ Cold, clammy skin
- ✓ Normal or shallow respiration
- ✓ Casualties may become confused and/or combative
- ✓ Profuse perspiration
- ✓ Dizziness
- ✓ Eventually convulsions and unconsciousness

✓

FIRST AID TREATMENT

If the casualty is conscious, sugar can be administered in the form of orange juice, a candy bar, soft drinks, or several packets of sugar mixed with orange juice. Don't worry about the amount of sugar given to the casualty, as the doctor will balance the need for sugar against insulin production when the casualty arrives at the hospital
If the casualty is unconscious, do not place anything in their mouth. Treat for shock
The casualty should be transported to a medical facility for continuing care as quickly as possible

If you cannot distinguish between a casualty with insulin shock and a casualty progressing into diabetic coma, give sugar to the casualty. Giving sugar to a casualty with too much blood sugar doesn't make any significant difference to casualty outcome, but giving sugar to a casualty in insulin shock can save a life

Epileptic Seizures

Epilepsy is a neurological disorder, usually of unknown origin, resulting in recurring seizures. There are many categories for seizures, however, for first aid purposes they are simply categorized as **Localized** and **Generalized** seizures. Localized seizures appear less intense in body movements, whereas, the Generalized seizures can appear quite violent. Regardless of the type of seizure, the treatment is the same.

SIGNS AND SYMPTOMS

LOCALIZED SEIZURES

- ✓ Only partial loss of consciousness, if any, occurs
- ✓ The casualty remains aware of what is going on nearby
- ✓ The casualty may experience minor convulsive movements of the eyes or extremities.

GENERALIZED SEIZURES

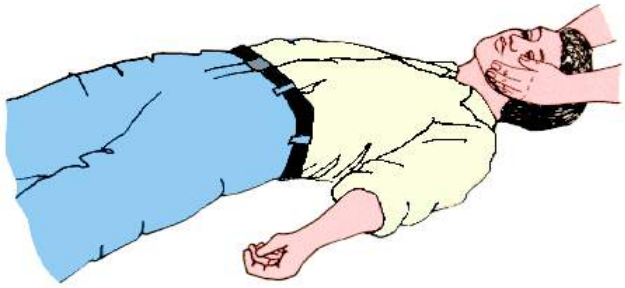
- ✓ The casualty may have a premonition or aura before the attack occurs
- ✓ Loss of consciousness occurs.
- ✓ The casualty's body becomes rigid, and then convulsions occur
- ✓ During the seizure the casualty may lose bowel and bladder control
- ✓ The face is usually pale before the seizure and becomes cyanotic (bluish) during the seizure.
- ✓ Severe spasms of the jaw muscles sometimes occur, causing the tongue to be bitten.
- ✓ Breathing may be loud and labored with a peculiar hissing sound or it may stop altogether during the seizure
- ✓ The casualty may froth at the mouth
- ✓ The seizure only lasts for a few minutes. The casualty usually will be unconscious for a period of time after the seizure
- ✓ After the seizure the casualty will usually be very tired and sleepy.
- ✓ If the casualty does not regain consciousness after the seizure and begins to experience more convulsions , the patient is in a more critical situation.

FIRST AID TREATMENT

- Perform a scene survey
- Call out for assistance and have bystander wait for your directions
- The casualty should be kept calm
- Do not restrain the casualty
- Protect the casualty from injury by moving objects that could cause harm
- Do not place anything in the casualty's mouth during the seizure.

When the seizure is over, do the following

- Maintain an open airway
- Allow the casualty to rest
- Protect the casualty from stress or embarrassment
- Activate E.M.S. if the casualty:
  - Remains Unconscious



- Has no history of seizure activity
- Has recurring seizures
- Has sustained an injury
- If the casualty is unknown to you

EMERGENCY CHILD BIRTH

Childbirth is a natural, normal process. Seldom will a first responder be call upon to assist a mother in the delivery of her infant. In those rare instances when you may be called upon, keep in mind that cleanliness and privacy are important to the successful birth of the infant.

The questions to ask the mother regarding the birth of the infant are as follows

- ✓ Is this your first child?
- ✓ How far apart are the contractions?
- ✓ When is your due date?
- ✓ Has your "water" (amniotic sac) broken?

Generally, if this is the mother's first child, the labor process will be longer than the birth of subsequent children . If the contractions are approximately five minutes apart, you will have time to arrange for E.M.S. However, if this is not the mother's first child, and/or she is less than five minutes apart in the contractions, emergency childbirth is likely and you should prepare for the birth of the infant.

SIGNS AND SYMPTOMS

- ✓ The mother is experiencing regular contractions
- ✓ She is close to her due date
- ✓ The amniotic sac has ruptured
- ✓ The mother may feel the urge to push or to have a bowel movement
- ✓ There may be lower back or abdominal pain on contraction
- ✓ There may be a discharge of blood and amniotic fluid from the vagina.

FIRST AID

- The stages of childbirth are Crowning, Birth of the Infant, and Birth of the Placenta

CROWNING

- It will be necessary to examine the mother. Move her to a private location and have her lie on her back with knees raised

- Raise the buttocks slightly by placing a folded sheet under the mother's hips and a clean towel beneath the vaginal opening
- Drape a sheet over her knees, and remove the mother's undergarments to examine the vagina
- There may be bulging of the vagina and/or you may see the top of the infant's head

BIRTH OF THE INFANT

- Ensure that you have thoroughly washed your hands and have put on a pair of latex gloves if available
- Spread the fingers open and place on the infant's head with some gentle pressure
- Instruct the mother to bear down on the contractions and rest in between contractions
- There may be some tearing of the perineum (the section of skin between the vagina and anus). Try to control the descent of the infant's head to prevent this
- The infant's head will pass through the vagina and will be face down
- The infant's head will turn to one side facing the mother's thigh
- Start clearing the infant's airway by using a bulb syringe or wiping the inside of the infant's mouth with a piece of gauze
- The upper shoulder will pass through the vagina as the infant's head drops down slightly
- The lower shoulder will pass through the vagina as the infant's head raises
- At this point the infant will be expelled from the mother. It will be very slippery. Have a firm hold by moving your other hand under its back and buttocks regions
- You may notice a large amount of fluid discharging from the mother. Be assured this is a natural occurrence
- The infant will be coated in a white, thick substance known as Vernix. This coating is necessary to maintain the infant's body temperature and to provide lubrication during the birthing process. DO NOT WASH THE INFANT
- Examine the infant and ensure that it is breathing on its own. You may be able to stimulate the infant to breathe by patting it on the back or flicking the soles of the feet
- If there is no breathing, it may be necessary to perform artificial respiration or C.P.R
- Wrap the infant in warm towels or blankets and place on the mother's abdomen facing away from the mother

BIRTH OF THE PLACENTA

The birth of the placenta may take up to 20 minutes

The mother may feel the urge to push. Encourage her to do so

Once the mother has passed the placenta, examine it to ensure that it is intact and there is nothing additional attached to it

Place the placenta in a plastic bag in order for it to be transported to the hospital

Using strips of sterile cloth, tie the umbilical cord off at two points. The first is measures from the infant at a point approximately 15 to 20 cms (six to eight inches) away from the infant
Measure approximately 5 cms (two inches) from this tie toward the infant and tie off the second strip of cloth

Leave the cutting of the cord to E.M.S

- Treat both the mother and infant for shock
- Arrange for transportation to the nearest medical facility
- Massaging the uterus above the pubic bone will encourage the uterus to contract and slow the bleeding from the vagina
- If the mother has chosen to breast feed, encourage her to do so as this will release hormones that will also encourage the uterus to contract
- If complications arise during the birthing process, contact E.M.S. immediately

MISCARRIAGE

Although complications with childbirth are not frequent, occasionally problems may occur. Should spontaneous vaginal bleeding occur prior to the fetus coming to full term, this could indicate a miscarriage or spontaneous abortion. As the first aider, do not examine the vaginal area. Provide reassurance, treat the casualty for shock, contact E.M.S. and maintain ongoing casualty care. If any tissue has been expelled, place into a plastic bag and give to Emergency Medical Services.

BREECH BIRTH

Should the infant present with anything other than the head, we would term this as Breech birth. Normal birth cannot occur if the infant is breech. Immediately contact E.M.S. and place the mother on her left side with her head lower than her hip. Keep the casualty warm and treat her for shock. Encourage her not to bear down on the contractions. Getting the casualty to medical aid is imperative.

Mental Health Emergencies

A **mental health emergency** is any situation where an individual's feelings, behaviors and/or actions can lead them to harming themselves or others, and/or put them at risk of being unable to care for themselves or function in the community in a **healthy** manner
Every person has a variety of ways of coping with these everyday life and work-related

stressors. Here are practical strategies for preventing and reducing the effects of these stress reactions:

Identifying Stress Responses

Be on the alert for these immediate stress responses and/or long-term effects:
Physical Reactions

- Fatigue
- Sleep disturbances
- Changes in appetite
- Headaches
- Upset stomach
- Chronic muscle tension
- Sexual dysfunction

Emotional Reactions

- Feeling overwhelmed/ emotionally spent
- Feeling helpless
- Feeling inadequate
- Sense of vulnerability
- Increased mood swings
- Irritability
- Crying more easily or frequently
- Suicidal or violent thoughts or urges

Behavioral Reactions

- Isolation, withdrawal
- Restlessness
- Changes in alcohol or drug consumption
- Changes in relationships with others, personally & professionally

Thought Reactions

- Disbelief, sense of numbing
- Replaying events in one's mind over & over
- Decreased concentration
- Confusion or Impaired memory
- Difficulty making decisions or problem-solving
- Distressing dreams or fantasies

Seek **immediate help** for any individual you see in these situations:

- Thinking about or actually attempting to ending their life
- Experiencing sensations that aren't real and/or beliefs that can't possibly be true
- Making choices that put them in serious danger
- Becoming unable to care for themselves, and it's putting them at risk of serious harm
- Experiencing medication problems like serious side effects
- Experiencing an alcohol or any other drug overdose
- Taking a dangerous combination of substances (like antianxiety medication and alcohol)

If you encounter someone with these signs, call 911 or go to the nearest emergency room. If you call 911, don't leave anyone alone before emergency responders arrive. Wait until emergency responders say you can leave.
First aiders, as emergency responders can find themselves in situations where the abnormal stressors of responding to individuals who are injured or ill, can take a toll on their mental health. How do you take care of yourself? The first step is recognizing that you are at risk and employ some self-care management techniques.

Preventing Responder Stress: In your daily routine:

- Eat sensibly and regularly every day
- Get adequate sleep each night
- Exercise regularly
- Be aware of your stress level; take precautions against exceeding your own limits
- Acknowledge your reactions to stressful circumstances; allow yourself time to cope with these emotions

Preventing Responder Stress: At work:

- Try to diversify tasks at work, to the extent that you can
- Take breaks during your workday
- Take vacation days
- Use relaxation techniques (e.g., deep breathing) as needed
- Talk with colleagues about how these situations affects you
- Seek out, or establish, a professional support group
- Recognize and admit that you have personal limitations and get the assistance you need.

Preventing Responder Stress: Outside of work:

- Spend time with family and friends
- Stay connected with others through community events, religious groups, etc.
- Engage in pleasurable activities unrelated to work, especially those that allow for creative expression (writing, art, music, sports, etc.)
- Be mindful of your own thoughts (especially cynicism) and feelings; seek out the positives in difficult situations
- Engage in rejuvenating activities such as meditation, prayer, or relaxation to renew your energy
- Seek therapy if these situations are negatively impacting your self-esteem, quality of life or relationships

CHAPTER 8 ENVIRONMENTAL CONDITIONS

Objectives

After reading this chapter, you should be able to

1. List 3 signs and symptoms of heat related conditions
2. Describe the first aid for a casualty with a heat-related condition
3. List 3 signs and symptoms of cold related conditions
4. Describe the first aid for a casualty of cold related conditions
5. List 4 things that a casualty can do to prevent environmental conditions
6. Identify the classification of burns
7. Identify the 4 causes of burns
8. Signs and symptoms of burns
9. List the treatment for all types of burns

After reading this chapter and completing the activities, you should be able to

1. Properly treat for: frost nip, frost bite, trench foot or snow blindness
2. Perform treatment for heat cramps, heat exhaustion and heat stroke
3. Properly treat for superficial, partial thickness and full thickness burns

Environmental Illnesses

Heat Exhaustion

Heat exhaustion is the gradual effects of exposure to high temperatures or direct rays of sun.

SIGNS AND SYMPTOMS

- ✓ The body's temperature begins to rise
- ✓ Becoming weak and tired
- ✓ Nausea and vomiting
- ✓ Pale, cool, clammy skin
- ✓ Increased sweating
- ✓ Complaining of a headache
- ✓ Increased pulse and respiration

FIRST AID TREATMENT

- Maintain an open airway and move the casualty to a cool environment
- Remove all clothing and use a fan to cool the casualty
- Cover the casualty lightly if they become chilled and begin to shiver
- Provide the casualty with sips of cool water
- With the loss of fluids, salts and enzymes of the body, the casualty may find that sips of a Sport Drink may also be effective

Heat Stroke

Heat stroke is a sudden onset of illness from exposure to the direct rays of the sun or too high temperature without exposure to the sun. Physical exertion and high humidity definitely contribute to the incidence of heat stroke.

SIGNS AND SYMPTOMS

- ✓ High body temperature caused by a disturbance in the heat-regulating mechanism
- ✓ The casualty no longer sweats causing a rise in body temperature
- ✓ More common in the elderly. Alcoholics, obese persons, and those on medication
- ✓ The skin is flushed, very hot, and very dry. Perspiration is usually absent
- ✓ The pulse is usually strong & rapid, but may become weak & rapid as the casualty's condition worsens.
- ✓ The respirations are rapid and deep, followed by shallow breathing
- ✓ The body temperature can reach 108 degrees
- ✓ The casualty rapidly becomes unconscious and may experience convulsions .

FIRST AID TREATMENT

- Care should be centered on lowering the body temperature as quickly as possible. Failure to do this will result in permanent brain damage or death
- Maintain an open airway. Move the casualty to a cool environment
- Remove all clothing and immerse the casualty, up to their chin, in cold water.
- If the above treatment is not feasible, Wrap the casualty in a cool, moist sheet and use a fan to cool.
- Use cool packs placed in the underarms, groin and sides of the neck, if the above treatments are not feasible.
- Transport the casualty to the hospital as rapidly as possible, continuing cooling enroute.

Hypothermia

Hypothermia is the overcooling of the body where the core temperature of the body is reduced by 2 degrees Celsius or more. The misconception of hypothermia is that it occurs to individuals in extremely cold temperatures. This is not so. In fact, hypothermia usually occurs during the late spring, summer and fall of the year.

SIGNS AND SYMPTOMS

- ✓ The casualty of hypothermia will usually have been exposed to dampness in their clothing as a result of sweat, rain, mist or submersion in water
- ✓ The casualty is improperly dressed for the weather conditions
- ✓ As the body cools further and the brain tissue becomes colder the shivering will stop
- ✓ Lack of fine muscle coordination to loss of gross muscle coordination
- ✓ Slurred speech
- ✓ Aggressiveness
- ✓ They will also be exposed to the wind which further aids in cooling the body
- ✓ uncontrollably shivering
- ✓ The casualty will experience forgetfulness
- ✓ Stumbling and fumbling
- ✓ Restlessness
- ✓ A feeling of drowsiness

FIRST AID TREATMENT

- In the early stage of shivering, remove all damp clothing and replace with dry clothing
- Give the casualty sips of a warm, sweet drink to replace the calories lost
- Do NOT give alcohol to the casualty as this will result in the casualty becoming colder
- Keep the casualty sheltered in a warm environment away from rain and/or wind
- If the casualty progresses to severe hypothermia , then more aggressive rewarming techniques are necessary

- Remove all the casualty's clothing and placing them into a sleeping bag
- The rescuer donates heat to the casualty by providing body to body contact inside the sleeping bag
- External heat sources such as a fire or tent heater can be used to keep the rescuer warm
- The casualty must be protected from external heat sources as burns can easily occur
- With all environment injuries prevention is the key.
- Dress for the conditions you will be exposed to
- Wear proper sunscreens and wear a hat
- Wear layered clothing in a cold environment
- Bring proper raingear
- Change wet clothing immediately
- Eat regularly
- Keep a close eye on each other
-

Trench Foot

Trench foot is a medical condition, which is caused by the infection of the foot brought about by prolonged exposure to wet, cold and unsanitary conditions. Constricted footwear could also aggravate the condition. The temperature in which the foot would usually be exposed to would range from 0 degrees Celsius up to 15 degrees Celsius and could occur with as little as 12 to 13 hours of exposure to unsanitary conditions.

Trench foot may be temporary or may lead to a permanent condition depending on the degree of injury of the foot. Chillblains is the term used to describe several incidences of trench foot.

SIGNS AND SYMPTOMS

- Numbness or loss of sensation
- Blue colouration to the skin.
- Tingling and itching sensations
- Pain and swelling of the foot especially after the foot becomes warm.
- Blisters may appear two to seven days after exposure to wet conditions.
- Possible sloughing off of tissues.
- Leg cramps
- Possible open sores leading to development of fungal infections.
- Gangrene may result if the condition is left untreated.

PREVENTION AND TREATMENT

- Keep the foot dry and warm.
- Maintain good hygiene. Socks and footwear should be kept dry at all times and regularly changed.
- Prevent prolonged exposure of the foot to cold and unsanitary conditions.
- The affected foot should be applied with warm packs or soaked in warm water, preferably within 39 to 43 degrees Celsius. This should be done for approximately 5 minutes.
- See a Doctor if symptoms like itching, numbness and pain are noted.
- Surgical amputation of the foot may be necessary if gangrene sets in.
- Trench foot is a wound and could lead to infection
- Monitor the foot daily for possible worsening of the symptoms.

Frostbite

Frostbite results from exposure to severe cold. It is more likely to occur when the wind is blowing, rapidly taking heat from the body. The nose, cheeks, ears, toes, and fingers are the body parts most frequently frostbitten. As a result of exposure to cold, the blood vessels constrict. Thus the blood supply to the chilled parts decreases and the tissues do not get the warmth they need.

SIGNS AND SYMPTOMS

- ✓ The casualty may not be aware of it until told by someone
- ✓ The affected area will feel numb to the casualty.
- ✓ The skin becomes red, then white during frostnip
- ✓ As exposure continues the skin becomes white and waxy
- ✓ The skin is firm to touch, but underlying tissues are soft

FIRST AID TREATMENT

SUPERFICIAL FROSTBITE

- Remove the casualty from the environment
- Apply a steady source of external warmth
- DO NOT RUB AREA
- Cover the area with a dry, sterile dressing
- When dressing the foot or hand, pad between toes and fingers
- Splint if dealing with an extremity
- Transport to the hospital
- As area thaws, it may become a mottled blue and blisters will develop

DEEP FROSTBITE

- Leave area frozen until casualty reaches hospital
- Dress, pad, and splint frostbitten extremities
- When dressing injury, pad between fingers and toes
- Transport the casualty to a hospital
- If there is a delay in transport, rewarming may be done at the site
- Place the affected part in water bath of 40 - 42 degrees Celsius or 100-105 degrees Fahrenheit
- Apply warm cloths to areas that cannot be submerged
- An extreme amount of pain is associated with rewarming
- Rewarming is complete when the area is warm and red or blue in color and remains so after removal from the bath

DO NOT REWARM IF THERE IS A POSSIBILITY OF REFREEZING.

GENERAL RULES FOR TREATING FROSTBITE

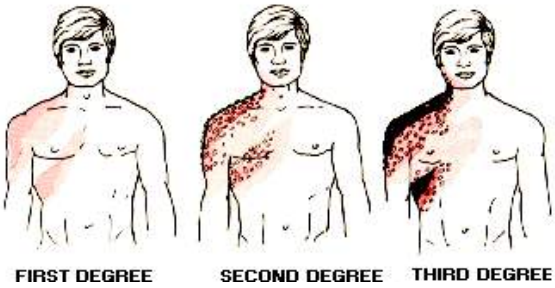
- Apply loose, soft, sterile dressings to affected area
- Splint and elevate the extremity
- Give the casualty warm fluids containing sugar to drink if he/she does not have an altered level of consciousness
- Do not rub, chafe or manipulate frostbitten parts
- Do not use hot water bottles or heat lamps
- Do not place the casualty near a stove or fire, because excessive heat can cause further tissue damage
- Do not allow the casualty to smoke, because nicotine constricts the blood vessels
- Do not allow the casualty to drink coffee, tea, or hot chocolate because these substances will cause the blood vessels to constrict
- Do not allow the casualty to walk if the feet are frostbitten

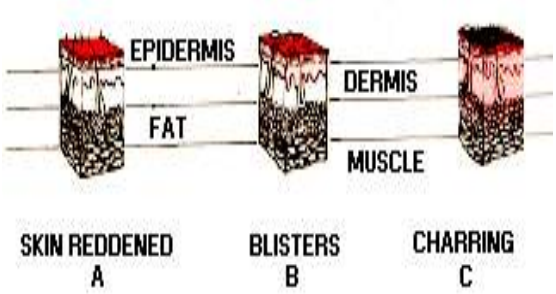
Burns And Scalds

CLASSIFICATION OF BURNS

Burns may be classified according to extent and depth of damage as follows

First Degree Minor - Superficial	1. The burned area is painful. 2. The outer skin or epidermis is reddened. Slight swelling is present.
Second Degree Moderate Partial Thickness	1. The burned area is painful. 2. The under skin or dermis is affected. Blisters may form. 3. The area may have a wet, shiny appearance because of exposed tissue.
Third Degree Critical Full Thickness	1. Insensitive due to the destruction of nerves. Skin is destroyed. 2. Muscle tissues and bone underneath may be damaged. 3. The area may be charred, white, or grayish in color.

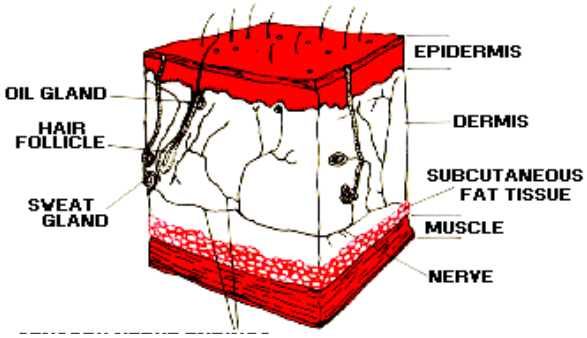




Burns may also be classified according to cause. The four major types of burns by cause are as follows:

- ☑ Chemical
- ☑ Electrical
- ☑ Thermal
- ☑ Radiation

The seriousness of a burn or scald is influenced by the extent of the body surface involved, as well as by the depth to which the tissues are penetrated. It is generally assumed that where a second-degree burn or scald injures two-thirds of the surface of the body, death will usually follow, but a much smaller area injured by a third-degree burn can also cause death.



Burns can do more damage than injure the skin. Burns can damage muscles, bones, nerves, and blood vessels. The eyes can be burned beyond repair. The respiratory system structures can be damaged, with possible airway obstruction, respiratory failure, and respiratory arrest . In addition to the physical damage caused by burns , casualties also may suffer emotional and psychological problems that could last a lifetime.

Shock is very severe when burns are extensive and may cause death in a few hours.

FIRST AID TREATMENT - GENERAL

The first aid given to a burn casualty largely depends on the cause of the burn and the degree of severity.

Emergency first aid for burns or scalds should primarily be exclusion of air from the burned area, relief of the pain that immediately follows burns, minimizing the onset of shock , and the prevention of infection.

- Remove all clothing from the injured area,
- Cut around any clothing that adheres to the skin and leave it in place
- Keep the casualty covered, except the injured part, since there is a tendency to chill

NOTE

First aid dressings for burnsand scalds should be free of grease or oil

- ❑ The use of greases or oils in the treatment of burnsmakes it necessary to cleanse the burned or scalded areas with a solvent before medical treatment can begin
- ❑ This delays the medical treatment and is very painful
- ❑ Be careful when dressing burnsand scalds
- ❑ Burned and scalded surfaces are subject to infection the same as open wounds and require the same care to prevent infection
- ❑ Do not break blisters intentionally
- ❑ Never permit burned surfaces to be in contact with each other, such as:

  - ⇗ Areas between the fingers or toes,
  - ⇗ The ears and the side of the head
  - ⇗ The undersurface of the arm and the chestwall,

- Cover bandages should be loose enough to prevent pressure on burned surfaces
- As swelling often takes place after burn dressings have been applied, check them frequently to see that they are not too tight
- Watch for evidence of shock and treat if it is present

SEVERE BURNS

Remove the casualty to the hospital as quickly as possible. The casualty will probably require an anesthetic so that ordinarily nothing should be given by mouth.

In addition to the general principles listed, certain other principles must be followed when giving first aid for specific types of burns .

CHEMICAL BURNS

GENERAL

- Remove all clothing containing the chemical agent.
- Do not use any neutralizing solution, unless recommended by a physician.
- Irrigate the skin with water for at least 15 minutes; use potable water if possible.
- Treat for shock .
- Transport to a medical facility.

NOTE

First aid for dry chemical (alkali) burns is an exception to the general first aid for chemical burns -- mixing water with dry alkali creates a corrosive substance. The dry alkali should be brushed from the skin and water should then be used in very large amounts.

EYES

Frequently chemical substances, especially lime, cement, caustic soda, or acids or alkalis from storage batteries get into the eyes . Chemical splashes to the eyes must be flushed for a minimum of 15 minutes. Some eyewash stations require casualties to stand up and bend over. First aiders should be familiar with the specific eyewash stations on their worksite.

Chemical burns of the eyes should receive the attention of an eye specialist as soon as possible.

FIRST AID TREATMENT

- Wash the eyes freely with clean water
- Have the casualty lie down, hold the eyelids open with the fingers
- Pour the water into the inner corner of the eyes from a pitcher or other container
- Use plenty of water and wash the eyes thoroughly, be sure the water actually flows across the eyes
- Do not put neutralizing solution in the eyes
- Cover the injured eye with a moistened sterile gauze pad and secure in place
- Section 13 of the First Aid Regulation states that an employer is required to have emergency facilities to cleanse contaminated body areas such as emergency baths, showers or eyewash equipment. Under the Workplace Hazardous Materials Information System (WHMIS), worksites are also required to have Safety Data Sheets (SDS) for all harmful substances. When a worker has been exposed to a harmful substance, the first aider should refer to the SDS for the specific first aid required when the casualty has been exposed.

THERMAL BURNS

MINOR - SUPERFICIAL

Use cool, moist applications of gauze or bandage material to minimize blistering.

Treat for physical shock .

If the casualty has thermal burns on the eyelids, apply moist, sterile gauze pads to the injured eye and secure in place

MODERATE AND CRITICAL – PARTIAL AND FULL THICKNESS

Do not use cold applications on extensive burns ; cold could result in chilling.

- Cover the burn with a clean, moist dressing.
- Treat for shock .
- Transport to a medical facility.

ELECTRICAL BURNS

- Conduct a primary survey, as cardiac and respiratory arrest can occur in cases of electrical burns .
- Check for points of entry and exit of current.
- Cover burned surface with a clean, moist dressing.
- Splint all fractures . - Violent muscle contractions caused by the electricity may result in fractures
- Treat for physical shock .
- Transport to a medical facility.

NOTE:

Respiratory failure and cardiac arrest are the major problems caused by electrical shock and not the burn. Monitor pulse and

RADIATION BURNS

Radiation presents a hazard to the rescuer as well as the casualty. A rescuer who must enter a radioactive area should stay for as short a time as possible.

Radiation is undetectable by the human senses and the rescuer, while attempting to aid the casualty, may receive a fatal dose of radiation without realizing it. ***Notify experts immediately of possible radioactive materials contamination***.

A more common cause of a radiation burn would be sunburn. Sunburns can cause superficial or partial thickness damage to the skin tissue. It is important to get the casualty out of the sunlight and treat the burn with cool, moist cloths or soaking in a cool tub of water. Be wary of overcooling the casualty. NEVER use ointments or lotions on a burn.

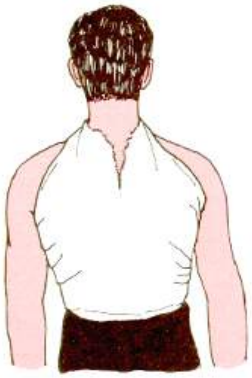
Bandaging

FACE, HEAD, AND NECK

- Apply several layers of gauze to the burned area and ensure that the gauze is placed between raw surfaces of ears and head .
- Loosely apply a cravat bandage around the forehead to secure layers of gauze for the upper part of the face.
- Loosely apply a second cravat bandage around the chin to secure layers of gauze for lower part of the face.
- If the neck only is burned
- Dress it by applying gauze or other burn dressing.
- The burn dressing should be applied in several layers and covered with a cravat bandage the same as for wounds and bleeding of the neck .
- Burn dressings should always be applied loosely.

NOTE
Any burn of the face is dangerous since it may involve injury to the airway or the eyes . When applying gauze for burns of the face or head , avoid covering the nostrils as the casualty may already be having respiratory problems. Casualties with respiratory illnesses will be placed in greater jeopardy when exposed to heated air or chemical vapors. Casualties with other health problems such as heart disease, kidney disease, or diabetes will react more severely to burn damage. Treat all burns as more serious if accompanied by other injuries.

BACK



- For burns of the back apply gauze in several layers
- Ensure that it covers all burned surfaces including between the arm and chest wall and in the armpit
- Cover the gauze dressings with a cover dressing as follows
- Split the apex of a triangular bandage just far enough to tie around the front of neck .
- Place the base of bandage around the lower part of the back and tie in front
- Dress small burns of the back loosely with a triangular or cravat bandage as for wounds and bleeding between shoulders or wounds of the back as the injury may indicate.

CHEST

- For burns of the chest apply gauze in several layers
- **Ensure that it covers all burned surfaces including between the arm and chest wall and in the armpit**
- Cover the gauze dressing with a cover dressing as follows
- Split the apex of a bandage just enough to tie at the back of neck .
- Place base of bandage around the waist and tie in back.
- Dress small burns of the chest loosely with a triangular cravat bandage as for wounds and bleeding between the shoulders or wounds of the chest as the injury may indicate.

EXTREMITIES

Burn dressings should be loosely covered with a bandage as described for wounds and bleeding.

CHAPTER 9 HEAD, NECK & SPINAL INJURIES

Objectives

After reading this chapter, you should be able to

1. Identify the types of head injuries
2. List the signs and symptoms of a neck or spinal injury
3. Identify the treatment for a head , neck or spinal injury
4. Identify the signs and symptoms of traumatic brain injury including concussion

After reading this chapter and completing the activities, you should be able to

1. Log roll a casualty with a suspected neck or spinal injury
2. Management for suspected fractures involving the spinal column
3. Stabilize a spinal injured casualty

Head Injuries

CONCUSSION

Concussion by definition is a violent shaking of the brain resulting in bruising of brain tissue. The actual damage to the brain may be found on the opposite side of where the impact to the head happened. This is because the brain is encased in fluid known as Cerebrospinal Fluid or CSF. While suspended in this fluid, the brain may be slammed against the opposite side of the skull and become bruised on the impact. Since bruising is a form of bleeding, pressure can build against the brain tissue, irreparably damaging the brain tissue.

SIGNS AND SYMPTOMS

- ✓ Severe Headache
- ✓ Nausea and/or vomiting
- ✓ Restlessness
- ✓ Sweating
- ✓ Disorientation
- ✓ Loss of memory prior to and/or of the incident
- ✓ History may involve impact, or severe shaking of the head
- ✓ Dizziness
- ✓ Confusion
- ✓ Pale, cold, clammy skin
- ✓ Drowsiness with a need to sleep
- ✓ May have suffered a momentary loss of consciousness
- ✓ Pupils may be unequal
- ✓ Signs and symptoms of Shock

FIRST AID TREATMENT

The casualty must be seen by medical aid in order to diagnose this condition properly

- **It is possible that concussion can accompany the other types of head injuries**

- Try to keep the casualty conscious until turned over to medical aid
- Treat the casualty for shock and any injuries that may have occurred
- If the injuries sustained also involve head , neck or spine or pelvic injuries, immobilize the casualty to a firm flat surface.

LACERATION

SIGNS AND SYMPTOMS

- ✓ Bleeding from the injury site
- ✓ Dizziness
- ✓ Confusion
- ✓ Pale, cold, clammy skin
- ✓ Disorientation
- ✓ Pieces of flesh still attached but pulled back (Avulsion)
- ✓ Nausea and/or vomiting
- ✓ Restlessness
- ✓ Sweating
- ✓ Signs and symptoms of Shock

History may include impact of the head or cutting of the flesh

FIRST AID TREATMENT

- Apply direct pressure to the wound site
- Place the casualty at rest and treat for shock
- Keep the edges of the wound together by using specialty bandages such as butterfly or streristrip type bandages to reduce scarring
- **If the wound involves an avulsion, keep the flesh in place, do not cut it away or remove it**
- Cover with sterile dressings and seek medical aid
- Monitor the casualty and watch for signs and symptoms of a concussion

SKULL FRACTURE

Skull Fracture is the cracking and/or breaking of the bones that make up the skull. The skull is actually not one solid bone but rather a series of plates that have fused together. A skull fracture may include the following signs and symptoms.

SIGNS AND SYMPTOMS

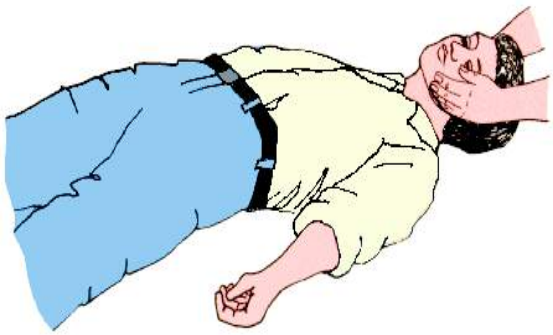
- ✓ Cerebrospinal fluid **- *clear or straw colored*** - and/or blood from the ears or nose
- ✓ Bruising behind the ears - Battle Sign
- ✓ Unequal pupils
- ✓ Dizziness
- ✓ Confusion
- ✓ Convulsions
- ✓ Bruising around both eyes - Raccoon Eyes
- ✓ Depression or protrusion of the skull bones
- ✓ Severe Headache
- ✓ Nausea and/or vomiting
- ✓ Speech disturbance
- ✓ Impaired vision/sudden blindness

- ✓ Restlessness
- ✓ Sweating
- ✓ Disorientation
- ✓ Loss of memory prior to and/or of the incident
- ✓ Signs and symptoms of Shock
- ✓ Pale, cold, clammy skin
- ✓ Drowsiness with a need to sleep
- ✓ May have suffered a momentary loss of consciousness or be found unconscious
- ✓ History may involve impact, or severe shaking of the head

FIRST AID TREATMENT

Skull fractures could also mean that the casualty might have sustained damage to the spinal cord. *Consider all serious injuries to the head as possible fractures of the skull.*

Treat any injuries that would be considered life threatening, such as airway, breathing or bleeding problems first



- Stabilize the head as you open the airway using the modified jaw-thrust maneuver.
- Check breathing - restore if necessary.
- Check pulse.
- Control bleeding from the scalp with minimal pressure and dress the wound; tie the knots of the bandage away from injured area. Do not try to control bleeding from ears or nose.
- Keep the casualty quiet and lying down.
- Simply apply a clean dressing loosely over the ears or nose to protect the area from infection
- The flow of fluid from the ears and/or nose would not be considered life threatening -- don't stop the flow

This will cause a backpressure against the brain tissue, resulting in brain damage

While you are doing this, have a bystander steady and support the casualty's head in the position it is found and monitor the casualty's airway and breathing

Complete a secondary survey of the casualty to assess any other injuries

When all injuries have been treated, treat the casualty for shock and continue to monitor their condition until medical aid arrives

If medical aid is a great distance away, or transportation of the casualty is your only option, the casualty must be immobilized on a firm flat surface as if they had a spinal injury

- **A fracture may occur to any area of the skull and is considered serious due to possible injury to the brain**

Injuries to the back of the head are particularly dangerous since a fractured skull may result without a visible wound to the scalp

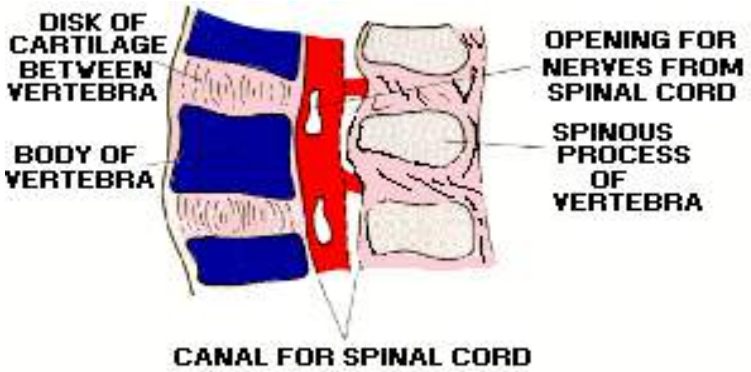
NOTE Never give a stimulant.

Neck, Spinal and Pelvic

Anatomically, the head , neck , spine and pelvis are connected. Through different mechanisms of injury, impact at one location may actually inflict damage at another location. These injuries are considered to be the most traumatic injuries, not only from a physical standpoint but also from a psychological point.

It is important to note that any time you the rescuer suspect the casualty has suffered an injury to the head , neck , spine or pelvis, immobilize the casualty as if the have suffered a spinal injury.

- ✓ The spinal column consists of bones called vertebrae.
- ✓ Each vertebra surrounds and protects the spinal cord and specific nerve roots.



Fracture of the spinal column may occur at any point along the backbone between its junction with the head at the top and junction with the pelvic basin below. Where portions of the broken vertebrae are displaced, the spinal cord may be cut, or pressure may be put on the cord.

Spinal cord injuries can result in paralysis or death, because they cannot always be corrected by surgery and the spinal cord has very limited self-healing powers. Thus, it is extremely important for the person giving first aid to be able to recognize the signs of spinal column

damage.

The nerves for all sensations and motor ability branch off the neck and spinal region from the spinal cord. The spinal cord runs through the center of the bones of the neck and back known as the vertebrae. This cord, if injured, does not regenerate and the casualty will suffer long term effects from these types of injuries.

Always remember that if the outcome of the rescue is not favorable to the casualty, that you the rescuer were not the cause of their disability. Our job is to attempt to reduce the amount of injury that may occur.

SIGNS AND SYMPTOMS

- ✓ History of incident may involve a head injury, fall, and impact to the head, neck or spine
- ✓ Pain at the injury site
- ✓ Loss of mobility below the injury site
- ✓ Difficulty in breathing
- ✓ Casualty found in a position with head at an odd angle, hand across the chest -- *Decorticate Position*, or hands raised above their head *Stick-Em-Up Position*.
- ✓ Deformity at the injury site
- ✓ Loss of sensation below the injury site

FIRST AID TREATMENT

- Assess for the life-threatening priorities
- Have a bystander stabilize the head and neck area of the casualty and if the casualty is conscious, tell them not to move
- Treat the casualty for shock and begin a secondary survey
- Treat any fractures or minor bleeding before beginning to immobilize the casualty to a firm flat surface
- Keep the head , neck and spine in aligned throughout the rescue process

IMMOBILIZE VICTIM'S HEAD (ROLLED BLANKET OR PADDING)

NOTE E.M.S. is best equipped and trained for doing all the treatment and transportation of the casualty as they have specialized equipment designed to move the casualty with the least amount of aggravation.

If transportation of the casualty is inevitable, secure the casualty's legs together with padding between the legs and broad bandages placed at the thigh, knees and ankles

Secure the arms together by placing the arms across their chest and tying them together
With the help from at least three other rescuers, roll the casualty onto their side and have a fourth rescuer place the board behind the casualty and hold it at a forty-five-degree angle
The board should have an open blanket on it that will allow the rescuers to move the casualty into the center of the board

Additional padding should be placed where there are natural hollows such as behind the neck , lower back, knees and ankles. This is supportive padding and should not be too bulky

SECURING THE CASUALTY TO THE BOARD

- Use a blanket or padding around the head and neck .
- Pass first bandage around the forehead padding and splint, and tie on the outer side of splint.
- Pass second bandage around the splint and padding at the chin, and tie on the outer side of splint.
- Pass third bandage around the body and well up in the armpits and tie on outer side of splint.
- Pass fourth bandage around the body and splint at the lower part of the chest and tie on the outer side of the splint.
- Pass the fifth bandage around the body and splint at the hips and tie on the outer side of the splint.
- Pass the center of the sixth bandage well up on the shoulder, passing one end between the long boards under the neck , continuing under the crosspiece, completing the tie at the upper edge of splint under the armpit.
- Tie the seventh bandage in the same manner around the other shoulder.
- Pass the eighth bandage around one hip and crotch and crosspiece between long boards and tie on outer side of splint.
- Apply ninth bandage in the same manner around the other hip.
- Apply tenth bandage around the upper part of one thigh and the long board and tie on the outer side of the splint.

- Apply eleventh bandage on the other side in the same manner.
- Pass twelfth bandage around the leg and long board just below the knee and tie on the outer side of the splint.
- Apply thirteenth bandage on the other side in the same manner.
- Pass the fourteenth bandage around one ankle and the long board, and tie on the outer side of the splint.
- Apply fifteenth bandage on the other side in the same manner.
- Cover with a blanket and treat for shock . Should the casualty vomit, then the entire board must be turned onto it's side in order to clean out the mouth of the

casualty

- The casualty must be secure enough so that they do not move if the board is tipped

> ***NOTE*** Treat all questionable injuries to the spinal column, even in the absence of signs of paralysis, as a fracture of the spinal column. The initial care that the casualty receives at the scene of the accident is extremely important. Proper care, not speed, is essential. Improper care or handling could result in paralysis or death.

CHAPTER 10 MUSCULOSKELETAL INJURIES

Objectives

After reading this chapter, you should be able to

1. Define the terms Strain , Sprain , Dislocation , and Fracture
2. List the 4 Mechanisms of Injury
3. Identify the 2 types of fractures and the difference between them
4. List the signs and symptoms for a strain, sprain, dislocation and fracture
5. List the proper treatment for a strain, sprain, dislocation and fracture
6. List the types of materials that can be used to splint an injury

After reading this chapter and completing the activities, you should be able to

1. Apply proper treatment for Strains
2. Apply proper treatment for Sprains
3. Apply proper treatment for Dislocations
4. Apply proper treatment for Fractures

Musculoskeletal Injuries

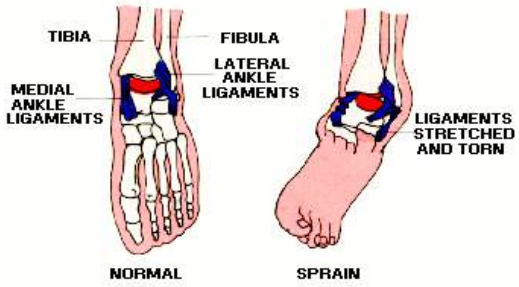
The Musculoskeletal System is composed of all the bones, joints, muscles, tendons, ligaments, and cartilage in the body. The makeup of the Musculoskeletal System is subject to injury from sprains, strains, fractures and dislocations.

SPRAINS

Sprains are injuries due to stretching or tearing ligaments or other tissues at a joint. They are caused by a sudden twist or stretch of a joint beyond its normal range of motion.

Sprains may be minor injuries, causing pain and discomfort for only a few hours. In severe cases, however, they may require many weeks of medical care before normal use is restored.

SIGNS AND SYMPTOMS



- ✓ Pain on movement
- ✓ Swelling
- ✓ Tenderness
- ✓ Discoloration
- ✓ Sprains present the same signs as a closed fracture
- ✓ If you cannot determine whether the injury is a fracture or a sprain, treat it as a fracture

FIRST AID TREATMENT

- Elevate the injured area and place it at complete rest.
- Reduce swelling and relieve pain by applying an ice bag, a cloth wrung in cold water or a chemical cold pack
- Remember, never use ice in direct contact with the skin; always wrap it in a towel or other material
- If swelling and pain persist, take the casualty to the doctor.
- When the ankle has been sprained and the injured person must use the foot temporarily to reach a place for further treatment, the following care should be given
- Unlace the shoe, but do not remove it.
- Place the center of a narrow cravat bandage under the foot in front of the heel of the shoe.
- Carry the ends up and back of the ankle
- Cross above the heel, then forward crossing over the instep
- Then downward toward the arch.

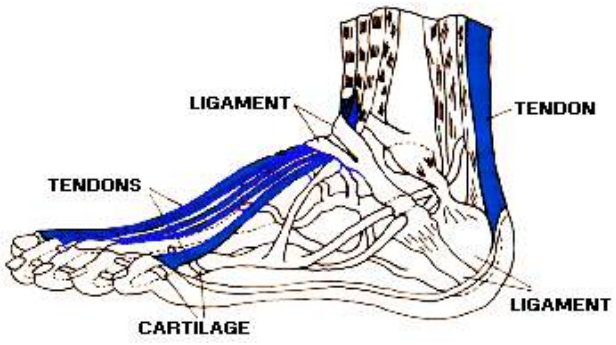
- Make a hitch under the cravat on each side, just in front of the heel of the shoe.
- Pull tightly and carry the ends back across the instep.
- Tie at the back of the ankle.

STRAINS

A strain is an injury to a muscle or a tendon caused by over-exertion. In severe cases muscles or tendons are torn and the muscle fibers are stretched. Sudden movements or overexertion causes strains.

SIGNS AND SYMPTOMS

- ✓ Intense pain
- ✓ Moderate swelling
- ✓ Painful and difficult movement
- ✓ Sometimes, discoloration



FIRST AID TREATMENT

- Place the casualty in a comfortable position.
- Apply a cold pack
- Keep the injured area at rest
- Gently massage the affected area
- Seek medical attention.

FRACTURES

There are over 200 bones in the body, all with the potential of being fractured. Fractures can occur in a variety of ways based on the mechanism of injury.

THERE ARE FOUR MECHANISMS OF INJURY

TYPE	DEFINITION
Direct Force	A fracture at the point directly at the impact sight. An example of this would be a casualty being struck by a baseball bat on the humerus – *upper arm* – and the fracture occurring at the humerus.
Indirect Force	A fracture that occurs at a site away from the impact site. An example of this would be a fracture clavicle – *collarbone* - where the casualty has slipped and fallen on an outstretched arm.
Severe Twisting Force	**Occurs when one end of a limb is trapped and cannot** move as the rest of the limb is turned around this point. An example would be a fracture tibia and/or fibula - *bones in lower leg* - if the foot was trapped behind a brake pedal during a motor vehicle accident.
Extreme Energy Transfer	Is where energy is transferred from one object to the body. For example, when a motorcycle and its rider who is travelling at 100 km per hour come to a sudden halt, the energy of the moving motorcycle is transferred to the rider. The rider is propelled and can sustain injuries ranging from minor to major.

SIGNS AND SYMPTOMS

- ✓ Pain at the injury site
- ✓ Swelling at and around the injury site
- ✓ Loss of function and/or Casualty may have heard a loud "crack" or "snap"
- ✓ Bone protruding from injury
- ✓ Deformity
- ✓ Signs and symptoms of shock

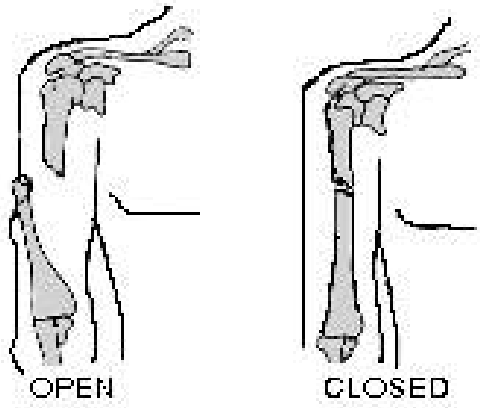
A fracture is a broken or cracked bone. For first aid purposes fractures can be divided into two classifications:

Open	**Compound**	The bone is broken and an open wound is present. Often the end of the broken bone may protrude from the wound.
Closed	**Simple**	No open wound is present, but there is a broken or cracked bone.

Broken bones, especially the long bones of the upper and lower extremities often have sharp, sawtooth edges; even slight movement may cause the sharp edges to cut into blood vessels, nerves, or muscles, and perhaps through the skin.

Careless or improper handling can convert a closed fracture into an open fracture, causing damage to surrounding blood vessels or nerves, which can make the injury much more serious.

A person handling a fracture should always keep this in mind. Damage due to careless handling of a closed fracture may greatly increase pain and shock , cause complications that will prolong the period of disability, and endanger life through hemorrhage of surrounding blood vessels.



If the broken ends of the bone extend through an open wound, there is little doubt that the casualty has suffered a fracture. However, the bone does not always extend through the skin, so the person administering first aid must be able to recognize other signs that a fracture exists.

Be careful when examining injured persons, particularly those apparently suffering from fractures . For all fractures the first aider must remember to maintain an open airway, control bleeding and treat for shock .

NOTE

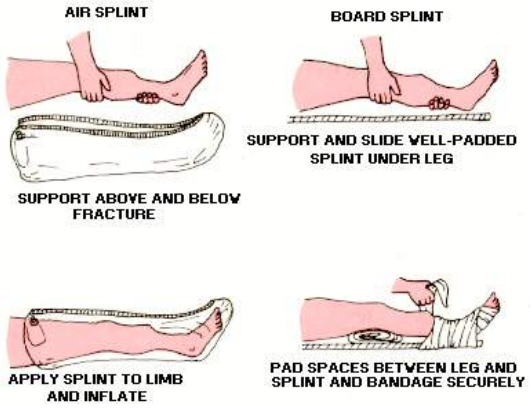
Do not attempt to change the position of an injured person until he/she has been examined and it has been determined that movement will not complicate the injuries.

If the casualty is lying down, it is far better to attend to the injuries with the casualty in that position and with as little movement as possible.

If fractures are present, make any necessary movement in such a manner as to protect the injured part against further injury.

SPLINTS

Use splints to support, immobilize, and protect parts with injuries such as known or suspected fractures , dislocations or severe sprains. When in doubt, treat the injury as a fracture and splint it.



Splints prevent movement at the area of the injury and at the nearest joints. Splints should immobilize and support the joint or bones above and below the break.

Many types of splints are available commercially. Easily applied and quickly inflated plastic splints give support to injured limbs. Improvised splints may be made from pieces of wood, broom handles, newspapers, heavy cardboard, boards, magazines, or similar firm materials.

Rules To Remember When Splinting A Fracture

1) Padding has four uses in splinting.

- physical splints for comfort,
- to provide support of deformity
- to fill natural hollows,
- to provide comfort between natural protrusions

2) Splints can be a physical item such as a slat of wood, or anatomical such as the uninjured leg used to support an injured leg

- When choosing a splint ensure that it is long enough to support the joint above and below the fracture point, is wide enough, firm enough and is padded for comfort

- Splinting must be in the position found, therefore the rescuer must choose the splints that conform to the position of the fracture or support the fracture in the position found

3) Tying of splints in place also follows some simple rules

- Always secure the splints from a stable area to an unstable area.

- For example, if the casualty has a fractured lower arm, then the most stable area is that above the fracture point and the unstable area is that below the fracture point

- Once the splint is secured at the most stable point, tying progresses toward the least stable area
- Narrow bandages should always be used when securing the fracture site; all other bandages used should be broad bandages
- When securing a leg fracture, a "figure of eight" bandage is always tied at the ankles with the knot secured against the edge of the sole of the foot
- In order to stabilize the fracture to reduce movement and ease pain, it is important that the joints above and below the fracture site be secured
- When splinting the upper extremities, stabilization of the elbow joint is accomplished with the use of a sling

FIRST AID TREATMENT

- Gently remove all clothing from any suspected fracture or dislocation.
- Do not attempt to push bones back through an open wound.
- Do not attempt to straighten any fracture.
- Cover open wounds with a sterile dressing before splinting.
- Pad splints with soft material to prevent excessive pressure on the affected area and to aid in supporting the injured part.
- Pad under all natural arches of the body such as the knee and wrist.
- Support the injured part while splint is being applied.
- Splint firmly, but not so tightly as to interfere with circulation or cause undue pain.
- Support fracture or dislocation before transporting casualty.
- Elevate the injured part and apply ice when possible.
- Once splinted, always check the circulation in the extremities by checking and comparing the temperature of the limbs and the capillary refill by pinching the finger nail beds and noting the color change.
- Always monitor for signs and symptoms of shock and treat the casualty for shock.
- Splint injuries only if time allow. In some communities, EMS response is quick and this may not allow you the time to apply a splint.
- Use inflatable splints to immobilize fractures of the lower leg or forearm. When applying inflatable splints (non-zipper type), follow these guidelines
- Put splint on your own arm so that the bottom edge is above your wrist.
- Help support the casualty's limb or have someone else hold it.
- Hold injured limb , and slide the splint from your forearm over the casualty's injured limb.
- Inflate by mouth only to the desired pressure. The splint should be inflated to the point

where your thumb would make a slight indentation.

- Do not use an inflatable plastic splint with an open fracture with protruding bones.
- For a zipper-type air splint, lay the casualty's limb in the unzipped air splint, zip it and inflate. Traction cannot be maintained with this type of splint
- Change in temperature can affect air splints. Going from a cold area to a warm area will cause the splint to expand or vice versa, therefore, it may be necessary to deflate or inflate the splint until proper pressure is reached

Areas of Fracture – Upper Extremities

COLLARBONE/DISLOCATION OF THE SHOULDER

Fracture of the collarbone frequently is caused by a fall with the hand outstretched or by a blow to the shoulder.

SIGNS AND SYMPTOMS

- ✓ Deformity of the shoulder
- ✓ The injured shoulder tends to droop forward
- ✓ Partial or total disability of the arm on the injured side
- ✓ The casualty will be holding the arm tightly to the body with their head slumped toward the injured side
- ✓ Pain in the area of the shoulder
- ✓ The casualty frequently supports the arm on the injured side at the elbow or wrist with the other hand

FIRST AID TREATMENT

- Dislocation
- If the elbow can be bent, then stabilize the arm into a TUBULAR sling
- Pad for the deformity
- Tie an overbandage at the elbow just tight enough to keep the padding in place.

FRACTURE

Support in a tubular sling
Apply a broad overbandage at the elbow and tie off on the opposite side slightly in the front
Tighten the bandage by pulling from the back as opposed to the front as

- **This will cause the bone ends to be force together**
- **Pulling from the back will tend to pull the bone ends apart**

> **NOTE** If the elbow cannot be bent, secure the arm in the position found or most comfortable position for the casualty, securing the arm to the body. Do NOT under any circumstance attempt to realign or move a joint into its original position.

UPPER THIRD OF THE ARM

SIGNS AND SYMPTOMS

- ✓ Swelling
- ✓ Deformity
- ✓ Inability to use the arm below the point of the fracture

FIRST AID TREATMENT

Fractures to the upper arm, the humerus, should be stabilized in the position found or of most comfort to the casualty

If the elbow cannot be bent then position some padding along the length of the arm, from the armpit to the hand and secure the arm to the body using broad bandages
If the elbow can be bent, then support the arm in an Arm Sling, ensuring that the elbow is **NOT** part of the sling

- **By putting a pocket at the elbow, it will force the bone ends of the fracture to grind together; therefore the elbow must be left out of the sling**

Place some padding between the upper arm and the body extending from the armpit

- **This may cause some pain but is necessary in keeping the fracture stabilized when splinted**

To splint the arm to the body, we must tie two broad overbandages

- **One above the fracture site at the shoulder and tying off on the opposite side above the hand and slightly in the front**

The second at the elbow, below the hand and slightly in the front
This will help prevent the movement of the injured limb sideways and from front to back

LOWER TWO-THIRDS OF ARM, ELBOW

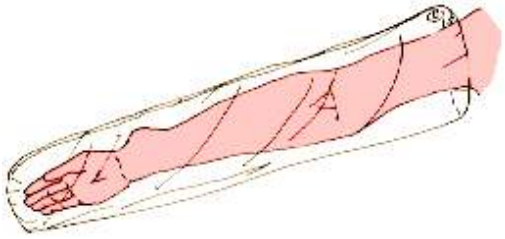
Since there are two bones in the lower arm, the radius and ulna, it is possible to fracture one or both of these bones. Always remember to first treat any open wound as a result of the fracture. To stabilize this injury, a splint must be used that extends from the hand to the elbow. It is not necessary for the splint to be a piece of wood but can be something as simple as a magazine or newspaper. Ensure that you follow the previously mentioned rules for splinting by padding the splint, hollows, protrusions and deformity; tie the splint to the arm at the elbow first using a narrow bandage and then below the fracture also with a narrow bandage and tie off against the splint itself. Stabilize the elbow by putting the arm into an Arm sling. For a long, rough journey, a broad overbandage can be used to secure the elbow tightly to the body.

Take extreme care when dealing with a fractured elbow, as the fracture may cause extensive damage to surrounding tissues, nerves, and blood vessels. Improper care and handling of a fractured elbow could result in a permanent disability.

SIGNS AND SYMPTOMS

- ✓ Extreme pain
- ✓ Extensive discoloration around elbow
- ✓ Swelling
- ✓ Deformity
- ✓ Bone may be visible or projecting from the wound

FIRST AID TREATMENT



- Do not bend, straighten, or twist the arm in any direction.
- If available, apply an inflatable plastic splint.
- If an inflatable plastic splint is not available, use a splint long enough to reach from 2.5 cm (1-inch) below the armpit to 2.5 cm (1 inch) beyond the tip of the middle finger.
- While the fracture is being supported, pad to conform to the deformity and place splint on the inner side of the arm.

- Place the center of the first cravat bandage on the outside of the arm at the upper end of the splint, cross on the inside of the arm over the splint, pass the ends one or more times around the arm and splint, and tie on the outside.
- Place the centers of the second and third cravat bandages on the arm just above and below the elbow apply in a similar manner.
- Center the fourth cravat bandage on the back of the wrist. Pass the ends around and cross on the splint under the wrist, bring one end up around the little finger side, and cross over the back of the hand and down between the forefinger and thumb. Pass the other end up over the thumb, cross it over the back of the hand down around the little finger side, then cross both ends on the splint and tie on top of the hand
- Tie a fifth cravat bandage around the splint, arm and body to prevent movement during transportation.

If the arm is bent

- Immobilize in a bent position by making an L-shaped splint for the forearm and wrist from two pieces of board 7 mm (1/4 inch) thick and 10 cm (4 inches) wide. One piece should be long enough to extend from 2.5 cm (1 inch) below the armpit to the point of the elbow and the other long enough to extend from the point of the elbow to 2.5 cm (1 inch) beyond the end of the middle finger. Immobilize the limb to the splint in the following manner:
- Fasten the boards together securely to form an L-shaped splint.
- Pad the splint.
- While an assistant supports the fracture on both sides of the break apply the splint to the inner side of the arm and forearm after placing the forearm across the chest .
- Use four cravat bandages to hold the splint in place.
- Place the center of the first cravat bandage on the outside of the arm at the upper end of the splint. Pass around the arm one or more times, and tie on the arm.
- Place the centers of the second and third cravat bandages on the arm and forearm, respectively, passing around one or more times and tying on the arm.
- Apply the fourth cravat bandage by placing the center of the bandage on the back of the wrist, passing the ends around and crossing on the splint under the wrist. Take one end up around the little finger side, passing over the back of the hand and down between the forefinger and thumb. Pass the other end up over the thumb, and cross it over the back of the hand down around the little finger side; then cross both ends on the splint and tie on top of the hand.
- Place the arm in a cravat bandage sling.

FOREARM AND WRIST

Fractures of the forearm and wrist are usually less painful than fractures of the arm, shoulder blade, or elbow.

SIGNS AND SYMPTOMS

- ✓ Pain
- ✓ Tenderness
- ✓ Severe deformity, especially if both bones of the forearm are broken

FIRST AID TREATMENT

If available, use a plastic inflatable splint to immobilize the forearm or wrist
Splint the wrist using a soft splint, such as a blanket or pillow
Tie the splint in place with two broad bandages
Forearm could be splinted with a rigid splint such as a slat of wood or folded newspaper
Tie bandages on either side of the fracture
Stabilize in an arm sling

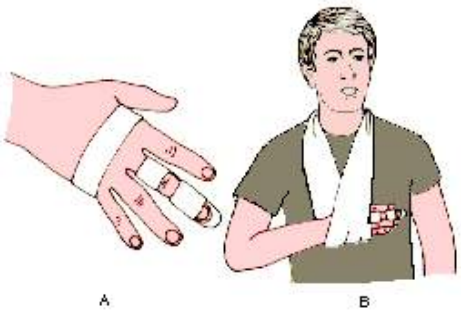
FINGER

SIGNS AND SYMPTOMS

- ✓ Pain
- ✓ Swelling
- ✓ Deformity

FIRST AID TREATMENT

- Place a narrow padded splint under the broken finger and palm of the hand.
- Pass a narrow strip of cloth around the splint and palm of the hand; tie over the splint.
- Pass a narrow strip of cloth around the finger and the splint above the fracture; tie over the splint.
- Pass a narrow strip of cloth around the finger and the splint below the fracture; tie over the splint
- Place the hand in a narrow cravat bandage sling



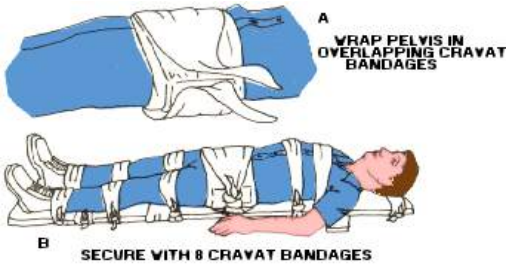
Areas of Fracture – Lower Extremities

PELVIS OR HIP

Fracture of the pelvis or hip usually results from a squeezing-type injury through the hips or from a direct blow. Use extreme care when handling an individual with a fracture of the pelvis or hip because there is a possibility of associated internal injuries to the digestive, urinary, or genital organs.

SIGNS AND SYMPTOMS

- ✓ Pain in the w region
- ✓ Discoloration
- ✓ Unable to raise his/her leg
- ✓ Inward rotation of foot and leg on affected side



FIRST AID TREATMENT

- Maintain support of the pelvic region with hands at the side of the hips until two wide bandages have been applied.
- Place the center of a wide cravat bandage over one hip, the upper edge extending about 5 cm (2 inches) above the crest of the hip bone.
- Pass the ends around the body and tie over a pad on the opposite hip.
- Place the center of a second wide cravat bandage over the opposite hip, the upper edge extending about 5 cm (2 inches) above the crest of the hipbone.
- Pass the ends around the body and tie on the first bandage.
- Lift the casualty only high enough to place him/her on a firm support, preferably a broken back splint.
- When a broken back splint is used, secure the body to the splint with eight cravat bandages as follows
- Pass the first cravat bandage around the splint and the upper part of the chest well up in the armpits and tie on one side near the splint.
- Pass the second cravat bandage around the splint and the lower part of the chest and tie near the splint.
- Pass the third and fourth cravat bandages around the splint and each thigh just below the crotch and tie on the outside near the splint.

- Pass the fifth and sixth cravat bandages around splint and each leg, just below the knee and tie on the outside near the splint.
- Pass the seventh and eighth cravat bandages around the splint and each ankle, and tie on the outside near the splint.
- Cover the casualty with a blanket and treat for shock .
- Get the casualty to the doctor or hospital.

THIGH OR KNEE

Fractures to the upper leg or femur, can be life threatening. The major artery for the leg, the femoral artery, passes through this region and can be severed by fractured bone ends. Since this is the largest bone in the body, it also has the largest muscles attached to it.

SIGNS AND SYMPTOMS

- ✓ Severe shock may result
- ✓ The foot may be rolled outward with a distinctive shortening of the leg
- ✓ If the fracture is open, dress the wound first
- ✓ Obvious deformity. Do not attempt to straighten the leg, but splint in the position found

FIRST AID TREATMENT

- Apply the splint with bandages. All bandages should be tied on the injured side near the splint
- Tie the first bandage around the body and splint under the armpits.
- Tie the second around the chest and splint and the third around the hips and splint.
- Tie the fourth and fifth bandages on the injured leg just below the crotch at the thigh and above the knee, respectively, (above and below fracture) and tie on the injured side near the splint.
- Tie the sixth and seventh bandages on the injured leg below the knee and at the ankle.
- An additional bandage at the ankle on the uninjured side may be needed for additional support

- The casualty should be transported on a regular stretcher or stretcher board.
- When using a stretcher board, it should be well padded and the bandages applied in normal order. On some types of stretcher boards, it may be necessary to tie both lower limbs together with each of the last four cravat bandages. To prevent movement of the legs, pad well between the legs before applying the cravats
- Any improvised splint for the thigh or knee should be long enough to immobilize the hip and the ankle

LEG

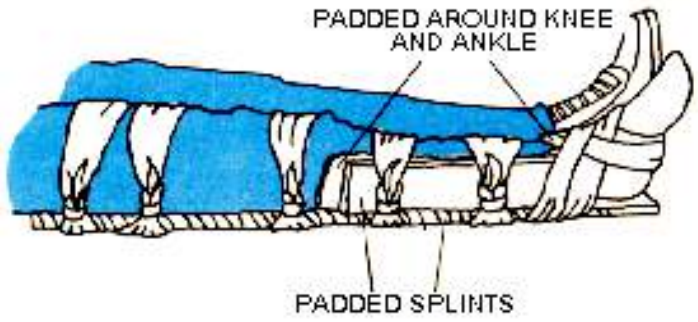
Like the lower arm, the lower leg has two bones, the tibia, the flat bone the forms your shinbone, and the fibula, located behind the tibia. Again, a fracture can occur to one or both of these bones.

SIGNS AND SYMPTOMS

- ✓ Severe pain at the fracture site.
- ✓ Tenderness over the fracture
- ✓ Deformity
- ✓ Loss of mobility or function of the leg
- ✓ The leg may be at an awkward angle

FIRST AID TREATMENT

- Remember that it is best to splint in the position found, so if gross deformity occurs, the rescuer must pad the deformed areas
- As with all injuries, assess the injured area before applying treatment to it. This means that as the rescuer you must expose the injury first, assess the injury and then provide the appropriate treatment
- Treat any open wounds before splinting fractures
- If applying a rigid splint such as a piece of wood, ensure that it extends past the joint above the fracture to past the joint below the fracture and is well padded for comfort. Place your bandages before putting your splint in place
- Narrow bandages will be needed only above and below the fracture site, the remainder will be a broad bandage
- For this type of fracture, a minimum of five bandages will be required, and placed as



follows; broad at the thigh, broad at the knee, narrow above the fracture, narrow below the fracture and broad at the ankle

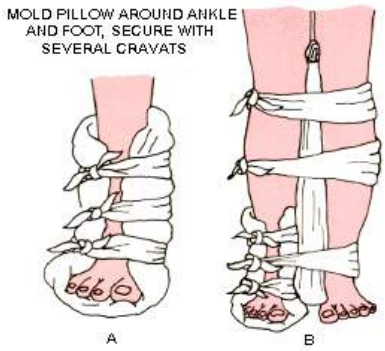
- The splint will be placed on the outside of the injured leg and tied in place from the most stable area (the thigh) to most unstable area (the ankle)
- A "Figure of 8" bandage will be used to secure the ankle in place
- For additional stability, a second splint may be used on the inside of the leg, and/or more bandages can also be used
- When a rigid splint is unavailable, the uninjured leg may be used as a splint
- The placement and tying of bandages is the same except that padding will be placed between the legs. In this case, the casualty must be transported as a stretcher case

- **If the fracture is open, dress the wound before splinting**

When it is necessary to remove a shoe or boot because of pain from swelling of the ankle or for any other reason, the removal must be carefully done by unlacing or cutting the boot to prevent damage to the ankle. In the absence of severe swelling or bleeding it may be wise to leave the boot on for additional support

ANKLE

Injuries to the ankle or wrist involves some involves some of the small bones located for the rotational motion of these areas



SIGNS AND SYMPTOMS

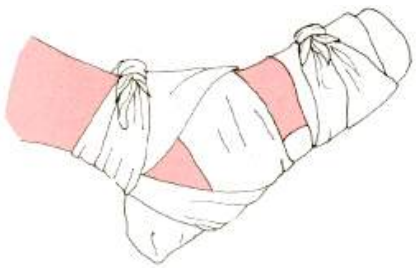
- ✓ Severe pain at the fracture site.
- ✓ Swelling over the fracture
- ✓ Deformity
- ✓ Loss of mobility or function of the leg
- ✓ The ankle may be at an awkward angle

FIRST AID TREATMENT

- Since it is extremely difficult to isolate and splint these small bones, splinting is accomplished by using a "soft" splint such as a rolled blanket or pillow around the area and tied in place
- With the ankle, a broad bandage around the splint above the fracture and a broad bandage tied in a "Figure of 8" is enough to stabilize this area
- Do not remove the shoe since it provides a natural splint and reduces swelling. Instead, if the shoe is causing discomfort, loosen the laces and place a cold pack inside the soft splint to minimize the swelling

CRUSHED BONES OF FOOT OR TOES

SIGNS AND SYMPTOMS



- ✓ Severe pain at the fracture site.
- ✓ Tenderness over the fracture
- ✓ Deformity
- ✓ Loss of mobility or function of the toes or foot
- ✓ The toes or foot may be at an awkward angle
- ✓ Flesh may be ruptured at the sides of the foot or toes
- ✓ Casualty may complain of a throbbing sensation

FIRST AID TREATMENT

- When caring for a fracture of the foot or toes, leave a boot or shoe in place if possible and support the injured foot. Use extreme care if it is necessary to remove any type of footwear. If a damaged protective cap of a safety boot has become embedded in the foot, do not remove the boot.
- It should be noted that it might be impossible to use an inflatable splint with the shoe on. If footwear is removed, carefully dress any open wounds before applying a splint
- Place a well-padded splint, about 10 cm (4 inches) wide and long enough to extend from 13 mm (1/2 inch) beyond the heel to 13 mm (1/2 inch) beyond the big toe, on the bottom of the foot.
- Start the center of a cravat bandage around the ankle from the back just above the heel. Cross over the arch and carry under the foot and splint. Cross under the splint and bring the ends to the back of the heel. Cross at the back of the heel, carry the ends around the ankle and tie in front.
- Start the center of a second bandage on top of the toes, carry the ends around the foot and splint several times, then tie on top of the foot.
- An air splint specifically made for the foot and ankle or an improvised splint made from a blanket or pillow as in caring for a fractured ankle may be used

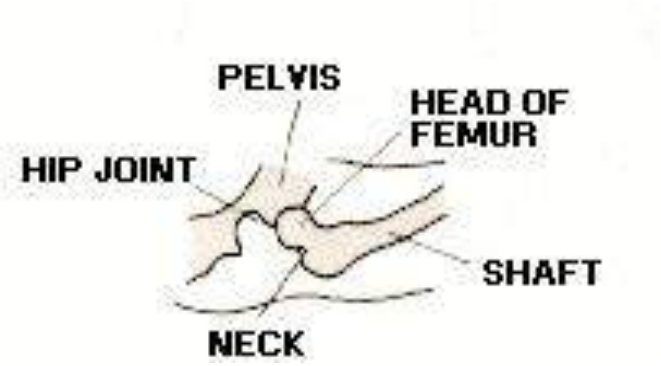
Dislocations

Where two or more bones come together, they form a joint. The bones forming a joint are held in place by bands of strong, fibrous tissue known as ligaments. There are three varieties of joints: Immovable joints, joints with limited motion, and freely movable joints. The first aider is concerned particularly with the freely movable joints - the lower jaw, the shoulders, the elbows, the wrists, the fingers, the hips, the knees, the ankles, and the toes. These are the joints most commonly dislocated.

A dislocation is when one or more of the bones forming a joint slip out of normal position. The ligaments holding the bones in proper position are stretched and sometimes torn loose. Fractures are often associated with dislocations.

Dislocations may result from the following:

- ✓ Force applied at or near the joint
- ✓ Sudden muscular contractions
- ✓ Twisting strains on joint ligaments
- ✓ Falls where the force of landing is transferred to a joint



SIGNS AND SYMPTOMS

- ✓ Rigidity and loss of function
- ✓ Deformity
- ✓ Pain
- ✓ Swelling
- ✓ Tenderness
- ✓ Discoloration

FIRST AID TREATMENT

- A first aider does not have the skill necessary to reduce dislocations
- Inexperience in manipulating the joints can further damage to the ligaments, blood vessels and nerves found close to joints
- Splint and/or dress the affected joint in line of deformity in which you find it as you would a fracture
- Obtain medical help

Chest injuries

FLAIL CHEST

Impacts to the chest wall can cause breakage of ribs. One broken rib will provide pain on breathing, laughing or coughing. Treatment is just rest with this type of injury. However, when several ribs in the same area are broken in more than one place this produces a flail segment. This segment will move opposite to the rest of the chest while breathing, which causes pain and difficulty in breathing.

SIGNS AND SYMPTOMS

- Bruising on the chest at site of the injury
- Opposite or paradoxical movement of the segment to the rest of the chest
- Painful breathing

FIRST AID TREATMENT

- Survey the scene, if head or neck injury is suspected treat as if a broken neck
- Primary survey.
- Expose and examine the chest area. Look for paradoxical motion.
- Have the casualty support the injured area with their hand.
- Using a tubular sling, secure the arm on the injured side and tie in place with a broad bandage to prevent movement of the arm and stabilize the chest segment.
- Provide on-going care until medical help arrives.

CHAPTER 11 POISONING

Objectives

After reading this chapter, you should be able to

1. Name the 4 routes of entry for poisons
2. Outline specific treatment for the 4 routes of entry
3. Explain the general treatment for any poisoning situation
4. Identify the importance of WHMIS (Workplace Hazardous Materials Information System) information found on SDS (Safety Data Sheets), first aid treatment and medical follow-up
5. Identify the importance of PADIS (Poison and Drug Information Service)

Poisoning

Accidental poisoning is the cause of many unnecessary deaths every year in North America. Prevention of poisoning is easily accomplished.

- ✓ Ensure that all products are properly labeled and stored
- ✓ Adhere to Workplace Hazardous Materials Information System (WHMIS) guidelines for labeling hazardous materials used in the worksite.
- ✓ In the home, medicine should not be referred to as "candy" when being administered to children , and stored in a locked cupboard when not being administered
- ✓ Household cleaners should never be mixed together and the directions for application and storage should be read carefully
- ✓ Always dispose of hazardous materials properly

When a poisoning happens, it is important that the Poison Control Center be notified immediately so that proper information regarding treatment may be relayed to the rescuer. If Poison Control is not available in your area then prompt activation of the Emergency Medical Services is needed. Before attempting any treatment, give the following information to Poison Control:

- ✓ Type of poison
- ✓ Method of entry into the system
- ✓ Approximate amount taken or length of exposure
- ✓ Status of casualty; i.e. vital signs
- ✓ Any First Aid that was attempted

Follow the directions of the Poison Control Center. To induce vomiting only follow the recommended procedures outlined by Poison Control. Under the Workplace Hazardous Materials Information System (WHMIS), worksites are also required to have Safety Data Sheets (SDS) for all harmful substances. When a worker has been exposed to a harmful substance, regardless of the physical characteristics of the substance, the first aider should refer to the SDS for the specific first aid required when the casualty has been exposed. This information can usually be found under Section 4 of every SDS.

POISONING THROUGH INHALATION

Some substances can enter the body through the respiratory system. By inhaling a toxic substance, this can interfere with the respiratory function of the body and consequently the casualty may stop breathing all together.

SIGNS AND SYMPTOMS

- ✓ Changes in skin color
- ✓ Change in attitude
- ✓ Dizziness
- ✓ Respiratory distress
- ✓ Altered levels of consciousness
- ✓ Weakness
- ✓ Nausea and vomiting

FIRST AID TREATMENT

- If the casualty is conscious - Move them to a safe environment away from all toxins
- Activate E.M.S.
- Have the casualty assessed by medical aid
- If the casualty is found unconscious
- Ensure your safety first before attempting to rescue the casualty
- Move the casualty to a fresh air environment
- Assess for breathing
- If the casualty is not breathing, then begin artificial respiration
- Any unconscious breathing casualty should be placed into the recovery position while awaiting the arrival of E.M.S.

POISONING BY INJECTION

Poisons can enter the body by means of injections or bites of animals, poisonous snakes, and insects. Some people may have an allergic reaction to an insect bite or drug, which may result in Anaphylactic Shock or allergy shock .

SIGNS AND SYMPTOMS

- ✓ Swelling and constricting the tissues surrounding the windpipe
- ✓ Swelling of the facial tissue
- ✓ Hives
- ✓ Watery eyes
- ✓ These reactions may take only a few minutes and is a true medical emergency
- ✓ Respiratory distress
- ✓ Mottled skin
- ✓ Itchy skin
- ✓ Sinus congestion

FIRST AID TREATMENT

- Keep the person calm, quiet, and at rest.
- Check for medic alert information that might indicate an allergy.
- All jewelry (bracelets, rings, watches, etc.) should be removed from the bitten extremity, in case of swelling.
- Apply a constricting bandage above and below the bite at the edge of the swelling, loosely enough to slide a finger under the bandage
- The pulse should be checked periodically below the bite; bandages are only to be used as a constriction, not as a tourniquet.
- If an EPIPEN has been prescribed for the casualty
- Assist them in injecting their medication only inject the medication for them when they are incapable of doing it themselves
- Activate E.M.S. immediately

Bites of Animals

Any warm-blooded animal may suffer from rabies. If a person is bitten by an animal, always suspect the animal to be rabid until it is proven otherwise. The saliva from a rabid animal enters the wound caused by the bite, transmitting the disease to the casualty. If possible, the animal should be captured or identified and held for medical observation.

FIRST AID TREATMENT

- Control bleeding.
- Wash the wound with soap and water and rinse with alcohol.
- Dress and bandage the wound.
- Splint if dealing with extremities.
- Take the casualty to a medical facility as quickly as possible.

SNAKEBITES

Coral snake s and pit vipers such as copperheads, rattlesnakes, and water moccasins are the four types of poisonous snakes in Canada and the United States

SIGNS AND SYMPTOMS

- ✓ A sharp, stinging pain with one or more puncture marks in the area.
- ✓ As the poison goes through the body, other symptoms develop such as:
- ✓ Nausea and vomiting
- ✓ Respiratory distress
- ✓ Swelling , discoloration, and pain in the bitten area.
- ✓ Weakness
- ✓ Weak and rapid pulse
- ✓ Shock

FIRST AID TREATMENT

- ♦ Begin care at once.
- ♦ Keep the casualty lying down and quiet with the injured part immobile and lower than the rest of the body
- ♦ Activate E.M.S. or arrange for immediate transportation to the nearest medical facility
- ♦ Remove all rings, watches, and bracelets from the extremity.
- ♦ Apply constricting bands above and below the area. The constricting bands should be tight enough to slow down surface circulation but not so tight as to cut off arterial flow.
- ♦ Treat for shock
- ♦ Apply an ice pack to the wound only if the poison control center or a physician advises to do so
- ♦ Do not cut into the bite and suction or squeeze unless you are directed to do so by a physician. NEVER suck the venom from the wound using your mouth
- ♦ Do not give the casualty anything by mouth
- ♦ Identify the snake if possible. If the snake can be killed, take it to the hospital with the casualty. DO NOT put yourself at risk
- ♦ Monitor vital signs while transporting casualty to a medical facility

- ♦ *For persons who frequent regions infested with poisonous snakes, it is recommended that proper precautions be taken. These would include*

  - ❑ wearing appropriate clothing
  - ❑ watching where and how you step
  - ❑ look inside crevices or openings before entering them
  - ❑ carry a well-stocked snakebite kit

Insect Bites and Stings

Many insects bite or sting, but few can cause serious symptoms by themselves, unless of course, the person is allergic to them. Whenever a person has been in contact with an insect, check for any medic alert information that may indicate an allergy. When possible, take the insects or spiders to the hospital for identification.

However, some insects transmit diseases. For example, certain types of mosquitoes transmit malaria, yellow fever, West Nile and other diseases; certain types of ticks transmit Spotted or Rocky Mountain Fever ; and certain types of biting flies transmit Tularemia or Rabbit Fever.

Occasionally, stinging or biting insects that have been feeding on or have been in contact with poisonous substances can transmit this poison at the time of the sting or bite.

Persons who have experienced serious reactions from previous insect bites should be urged to secure any possible immunization or have an antidote readily available to prevent more serious reactions from future insect bites and stings.

SIGNS AND SYMPTOMS

- ✓ Local irritation and pain in the region stung or bitten.
- ✓ Moderate swelling and redness
- ✓ Some itching, burning, and pain may be present

FIRST AID TREATMENT

- ♦ Inspect the area to determine whether the stinger is still in the body
- ♦ If it is, remove it to prevent further injection of toxins by carefully scraping it off the skin, rather than grasping with tweezers, so as not to squeeze toxin into the body.
- ♦ Check for medic alert information that might indicate an allergy.
- ♦ Application of ice or ice water to the bite helps to slow absorption of toxin into the blood stream
- ♦ A paste of baking soda and water can also be applied to the bite.
- ♦ Observe the casualty for signs of an allergic reaction
- ♦ For people who are allergic, maintain an open airway and get the casualty to medical help as quickly as possible.

BITES AND STINGS OF SPIDERS, CENTIPEDES, TARANTULAS, AND SCORPIONS

The effect of stings and bites of spiders, centipedes, tarantulas, and scorpions in some instances are much more severe than those of the insects previously mentioned. They may cause alarming symptoms.

The black widow spider is a moderately large, glossy black spider with very fine hairs over the body, which gives it a silky appearance. On the abdomen is a characteristic red or crimson marking in the form of an hourglass. Only the female is poisonous; the male, which is smaller, is harmless.

The brown recluse spider and hobo spider inject venom that causes a limited destruction of red blood cells and certain other blood changes

Tarantulas are hairy spiders. Usually they are not poisonous, but occasionally a casualty will have an allergic reaction to the injected venom. Their bites may cause marked pain and local redness with swelling. Death is extremely rare.
Most species of scorpions in this country do not inject a toxin that is generally harmful to humans. The sting may result in local swelling and discoloration, similar to a wasp sting, and may sometimes cause allergic reactions.

SIGNS AND SYMPTOMS

- ✓ Generally, the bite consists of two small pinpoint punctures of the skin and produce local swelling and redness with a smarting, burning pain.
- ✓ Exhaustion
- ✓ Chills, sweating
- ✓ Joint pains
- ✓ A rash may also develop within 24 to 48 hours
- ✓ Pain or cramping may develop in the back, shoulders, chest , and limbs.
- ✓ Symptoms may be mild or severe
- ✓ Fever
- ✓ Nausea , and vomiting

FIRST AID TREATMENT

- Apply constricting band between the bite or sting and the heart if the bite is to an extremity.
- Apply a cold pack on the area.
- Check for medic alert information that might indicate an allergy.
- Get the casualty to medical help as quickly as possible.
- Keep the casualty quiet to retard absorption of the poison into the circulatory system.
- If the bite is on an extremity, splint it and keep it lower than the heart.

Drug Use

If the result of the poisoning happens to be self-induced (i.e. syringes, vials, etc.), handle the situation as a medical professional. Be non-judgmental and handle the situation by dealing with any medical problems that may arise. Gather any clues that may indicate what the casualty took and check with bystanders as to what was injected and if any "street" first aid was applied.

Drugs may be classified as uppers, downers, narcotics, mind affecting - hallucinogens, or volatile chemicals. Uppers are stimulants that affect the nervous system to excite the user. Downers are depressants that affect the central nervous system and relax the user. Narcotics affect the nervous system and change many of the normal activities of the body and often produces an intense state of excitement or distortion of the user's senses. Volatile chemicals are depressants acting upon the central nervous system. It is important for the first aider to be able to detect possible drug abuse at the overdose level and to relate certain signs to certain types of drugs. You will use the same care for all drug abuse casualties and that care will not change unless you are ordered to do something by a poison control center.

SIGNS AND SYMPTOMS

- ✓ Drug abuse and drug overdose signs and symptoms can vary from one casualty to another, even for the same drug. The scene, bystanders, and the casualty may be your only sources for finding out if you are dealing with drug abuse and the substance involved. When questioning the casualty and bystanders, ask if the casualty has been taking any medications rather than using the word "drugs."

FIRST AID TREATMENT

- Activate E.M.S
- Monitor breathing and be alert for respiratory arrest
- Talk to the casualty to gain confidence and to maintain the level of consciousness
- Protect the casualty from further harm
- Treat for shock
- Continue to reassure the casualty throughout all phases of care

> **NOTE**: You should always be alert and ready to protect yourself since many drug abusers appear calm at first and then become violent as time passes. If the casualty creates an unsafe scene and you are not a trained law enforcement officer, GET OUT and find a safe place until the police arrive.

POISONING THROUGH CONTACT

Toxic substances can enter the system through the skin without breaking the skin.

SIGNS AND SYMPTOMS

- ✓ Local irritation, burning and pain in the affected area.
- ✓ Swelling, redness, blisters
- ✓ Skin may be hot, and visual skin damage

CHEMICALS

If the chemical is a powder,

- Provide first aid as instructed in the WHMIS Safety Data Sheet of the product
- Brush as much of the powder off with a cloth
- DO NOT use your other hand to wipe off the powder but utilize a cloth or glove to remove any excess powder
- Continue the treatment by flushing the area with a large amount of water for at least fifteen minutes
- Cover the affected area with sterile dressings and seek Medical Aid and send SDS with casualty

If the substance is a liquid**,**

- Provide first aid as instructed in the WHMIS Safety Data Sheet of the product
- Flush with a large amount of water for at least fifteen minutes
- Cover the affected area with sterile dressings and seek Medical Aid and send SDS with casualty

POISON IVY, POISON OAK, AND POISON SUMAC

These poisonous plants grow as vines or shrubs, from ankle to shoulder high. The poison comes mainly from their leaves but also may come from bruising their roots, stems, and berries. The smoke from burning brush containing these plants has been known to carry the poisons considerable distances.

SIGNS AND SYMPTOMS

- ✓ Red rash
- ✓ Itching and burning
- ✓ Symptoms appear on the exposed skin surfaces, usually the hands, wrists & arms, six hours to several days after exposure.
- ✓ Crusts and scabs are formed when they break
- ✓ There may be fever, headache, and general body weakness. First Aid Treatment
- ✓ Wash the area with soap and water.
- ✓ If a severe reaction appears, seek medical help.
- ✓ Some swelling
- ✓ Formation of blisters of various sizes filled with blood serum.
- ✓ The blisters may fill with pus or contaminated fluid
- ✓ Considerable fluid may exude from broken blisters.
- ✓ Contaminated clothing and jewelry should be removed.
- ✓ A lotion may be applied to ease the casualty's discomfort, if the rash is mild.

POISONING BY INGESTION

Statistically the majority of poisons enter the system through ingestion. Interview the casualty to obtain further information about the poison. Ask how it felt when they swallowed it; observe any unusual odors from their breath and increase in saliva production.

SIGNS AND SYMPTOMS

- ✓ Burning sensation on swallowing
- ✓ Stomach ache
- ✓ Unusual odor to breath
- ✓ Constipation
- ✓ Signs and symptoms of shock
- ✓ Sweet or fruity taste
- ✓ Nausea and vomiting
- ✓ Diarrhea
- ✓ Tarry consistency to their stool
- ✓ Burns or "Stains" around their mouth

FIRST AID TREATMENT

- Contact Poison Control Center or E.M.S
- DO NOT induce vomiting
- Only induce vomiting upon the directions of the Poison Control Center or E.M.S
- Give nothing by mouth unless directed to do so by the Poison Control Centre or E.M.S
- Treat for Shock
- Maintain an open airway, breathing and circulation

CHAPTER 12 HANDLING & TRANSPORTATION

Objectives

After reading this chapter, you should be able to

1. Identify criteria for transporting injured workers
2. Describe safe lifting and safe carrying procedures
3. State 3 situations that require the use of an emergency move

After reading this chapter and completing the activities, you should be able to

1. Decide what to do in an example of an emergency situation in which someone may need to be moved
2. Confidently utilize proper lifting and moving techniques
3. Attempt a proper moving technique in an emergency situation

Handling and Transportation

After receiving first aid, an injured person often requires transportation to a medical facility. Under special circumstances like those in mining accidents, the casualty needs to be transported to a place accessible to ambulance personnel. The first aider is responsible for seeing that the casualty is transported in such a manner as to prevent further injury and is not subjected to additional pain or discomfort. Improper handling and careless transportation often adds to the original injuries, increase chance of shock , and endanger life.

Under normal circumstances, do not move a casualty until a thorough examination has been made and first aid has been given. Move a seriously injured person in a position that is least likely to aggravate injuries. Various methods for carrying a casualty can be used in emergencies, but the stretcher is the preferred method of transportation. Use other means of transportation when a stretcher is unavailable or impractical.

The E.M.S. professionals are trained in advanced techniques for moving and transporting a casualty. In other words, the casualty should always be left in the position found until medical aid arrives. Why then, would it be necessary for you to move a casualty? If the casualty's life was at risk due to the surroundings or, impossible for the rescuer to perform the necessary life-saving skills would be examples of such times. As a rescuer you must choose the appropriate method to safely moving a casualty without causing further injury. This section identifies a number of different methods of moving a casualty and examples of first aid situations they would be used. Every incident you encounter will be different and you may need to use a variety of methods.

MOVES WHEN YOU ARE THE LONE RESCUER

Sometimes YOU may be the only rescuer. Do not limit yourself to just the moves that are indicated in this section. The following are a few examples that you can utilize to move a casualty to a safe location

CLOTHING DRAG

- Kneel at the top of the casualty's head
- Reach under the casualty's shoulders
- Grab the clothing at the under arm level
- Support the casualty's head between your forearms
- Pull the casualty to a safe location

BLANKET DRAG

- Place the casualty onto a blanket
- Roll the casualty into the recovery position
- Tuck about two-thirds of the blanket up to the casualty's back
- Roll them onto the remaining third
- Pull the tucked in part of the blanket from under the casualty
- Roll the corners of the blanket together at the head of the casualty
- Pull the casualty to a safe location

FIREFIGHTER DRAG

- Kneel astride the casualty's hips
- With the conscious casualty, have them grasp their hands behind the rescuer's neck
- The rescuer then crawls towards the casualty's head
- Pulling them to a safe location
- For the unconscious casualty
- Tie the casualty's wrists together
- Place them over the rescuer's head and neck
- The rescuer then crawls towards the casualty's head
- Pulling them to a safe location

HUMAN CRUTCH

- Stand beside the casualty's injured limb
- The casualty puts their arm around the rescuer's neck
- The rescuer will support the casualty around their waist
- Grab some clothing or a belt
- The rescuer must support the weight of the injured side
- The casualty hops on the good leg and leans on the rescuer

EXTREMITY DRAG

- Kneel at the top of the casualty's head ,
- Reach under the casualty's shoulders
- Move the casualty into a sitting position
- Reach under the casualty's arms
- Grasp the wrists with your hands
- Holding their arms across their chest area
- Lift the casualty up and drag them to a safe location

MULTIPLE RESCUER CARRIES

Using other rescuers makes it possible to move a casualty quickly and easily to a safe location.

THE SQUARE FOUR HANDED SEAT CARRY

- The rescuers' grab their own left wrist
- The rescuers combine to form a square with their hands
- The casualty holds onto the rescuers around their neck
- The square is brought under the casualty
- The casualty is then lifted off the ground by both rescuers

THE TRIANGLE THREE HANDED SEAT CARRY

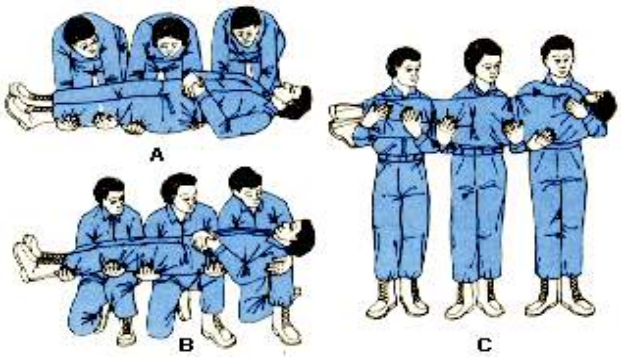
- One rescuer will grab their own left wrist forming two sides of a triangle.
- The second rescuer will use one arm to complete the triangle
- The casualty will support themselves around the necks of the rescuers
- This would allow for a free hand for one of the rescuers to support the casualty in case they become unconscious or for opening doors

THE CRADLE TWO HANDED SEAT CARRY

- Also known as the Cradle Carry, this is used for an unconscious casualty or an injured casualty who cannot walk or hold onto the rescuers for support
- Standing on either side of the casualty
- Reaching under the knees and under the arms
- The rescuers grab onto each other's wrists forming two parallel lines
- The rescuers form a cradle to move the casualty

THREE-PERSON CARRY

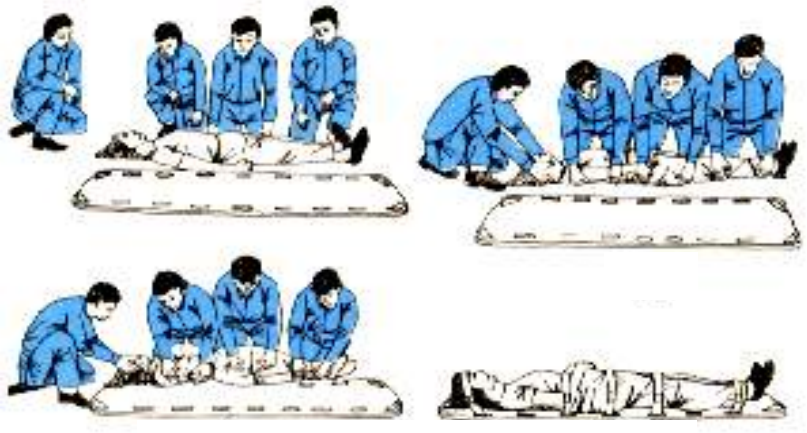
Use the three-person lift and carry to move an injured person a short distance, through narrow passageways, or when a stretcher is not available. Also use this lift when an injured person is being placed on or removed from a stretcher



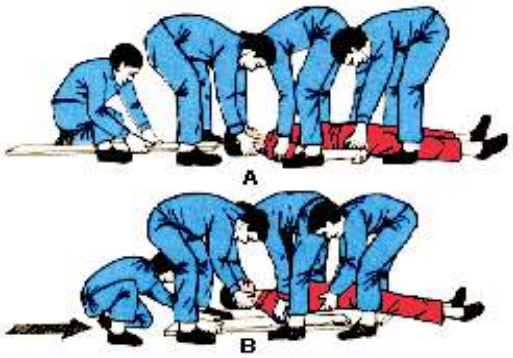
- This lift requires three persons, and a fourth is desirable. Lifting must be done on command of one person
- Each of the three rescuers kneels on the knee nearest the casualty's feet and on the least injured side, if possible
- One bearer, opposite the casualty's shoulders, supports the casualty's neck and shoulders
- One bearer, opposite the casualty's hips, supports casualty's thighs and small of back.
- The other bearer, opposite the casualty's knees, supports the casualty's knees and ankles.
- On command, the bearers slowly lift the casualty in a prone position to rest on their knees
- On command, the bearers slowly raise the casualty on his/her side so that the casualty rests in the bend of their elbows and is held closely to their chests
- When the command is given, all bearers rise in unison
- The bearers can then, when commanded, move the casualty

FOUR-PERSON LOG ROLL

- This technique for moving a person with spinal injuries requires four persons, one who acts as captain
- One rescuer (who acts as captain) applies stabilization to the neck and head as he/she opens the airway by using the modified jaw-thrust maneuver
- Place board parallel to the casualty
- Three rescuers (one rescuer at shoulder, one at waist, one at knee) kneel at the casualty's side opposite board, leaving room to roll casualty towards them while one rescuer maintains stabilization of the neck and head
- The shoulder level rescuer is commanded to extend casualty's arm over the head of the side on which the casualty will be rolled
- The shoulder level rescuer places one hand under casualty's shoulder and the other hand under casualty's upper arm
- The waist level rescuer places one hand on the casualty's waist and the other hand under casualty's buttocks
- The knee level rescuer places one hand under the casualty's knees and the other hand under the midcalf.
- Command is given to roll casualty as a unit on side
- Command is given for waist level rescuer or bystander to pull spine board into position against casualty.
- Command is given to roll casualty as a unit onto board.
- Place rolled blankets beside head and neck for additional protection and secure head to board with cravat bandages.
- Secure casualty to the splint or stretcher so that the entire body is immobilized



STRADDLE SLIDE



- Another technique for moving a person with a spinal injury onto a long board is the straddle slide. Three persons handle the casualty and the fourth person slides the board into place
- One rescuer maintains an open airway with the modified jaw-thrust.
- The second rescuer faces and straddles the casualty. Bending at the waist, the rescuer grips the casualty's arms just below the shoulders.
- A third rescuer also faces and straddles the casualty. Bending at the waist, the rescuer places his/her hands on sides of the casualty's waist. (The legs of the three rescuers must be spread sufficiently to allow the passage of the long board between them.)
- The fourth rescuer positions the board at the casualty's head in line with his/her body
- On a signal from the commanding rescuer, the rescuers lift the casualty just high enough to allow the fourth rescuer to slide the board under casualty.
- On command, the rescuers gently lower the casualty onto the board. Support must be maintained until casualty is secured.

STRETCHERS

- Test any stretcher to determine serviceability immediately before placing an injured person on it. Place an uninjured person, weighing as much or more than the casualty, face down on the stretcher.
- Lift the stretcher waist high and lower it to the ground. Pad the stretcher with a blanket or similar material after it has been tested.

Due to deterioration of the canvas stretcher, take extra precautionary measures when testing the stretcher.

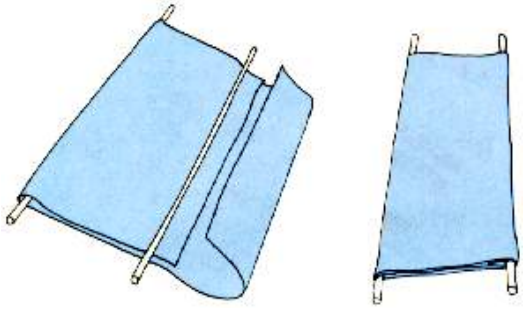
BLANKET STRETCHER

- With a minimum of four rescuers it is possible to improvise a stretcher with just a blanket. By simply placing a blanket under a casualty as stated earlier
- Two rescuers on each side would roll the edges of the blanket tightly to the casualty's body the rescuers at the upper torso grabbing the blanket at the casualty's head and hip
- Rescuers supporting the lower body grabbing the blanket at the hips and ankles
- All rescuers position themselves on one knee
- Keeping their arms locked
- Take one step backward
- This will keep the casualty level and ensure that the rescuers lift with their legs rather than their backs
- There are many methods of improvising stretcher using poles and sweaters, burlap sacks, coats or blankets. As a rescuer, you must choose the appropriate method given each situation.

REMEMBER - DO NOT MOVE A CASUALTY UNLESS ABSOLUTELY NECESSARY and always keep your safety in mind.

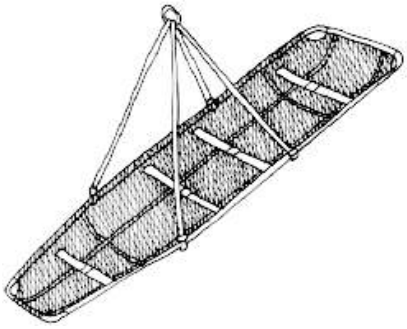
CANVAS STRETCHER

The canvas stretcher consists of canvas stretched between two poles. The poles are long enough to afford handholds for the bearers at each end.

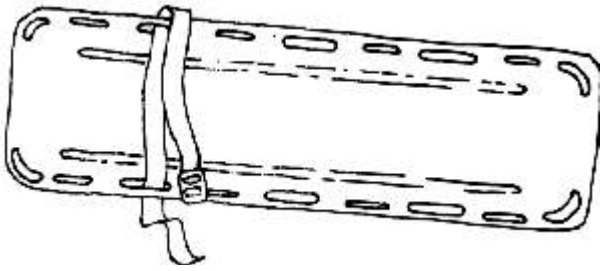


BASKET STRETCHER

Various types of basket stretchers are also used to transport the injured. After the casualty has been secured by means of straps and foot braces, the basket may be transported even in a vertical position.



STRETCHER BOARD OR SPINE BOARD



A stretcher board or spine board is made from a wide board approximately 4 cm (1 1/2 inches) thick, or from laminated plywood about 2cm (3/4 inch) thick. The length is usually about 195 cm (78 inches) and the width 45 cm (18 inches). Slots about 2.5 cm (1 inch) wide are placed along the edges. Pass cravat bandages through these slots to secure the casualty to the board. The slots also serve as handholds. Some variations have additional slots in the center of the boards so that each leg may be secured separately to the board. The aluminum stretcher is similar to the wooden board except that it folds in half.

SCOOP STRETCHER

The scoop stretcher is another means for lifting and transporting a casualty. A minimum of body movement in placing the casualty on the stretcher is its prime advantage. Both sides of the casualty must be accessible to use this type of stretcher. Slide the frame halves under the casualty from either side. Prevent pinching the casualty or catching the clothing between the stretcher halves by lifting the casualty by the clothes as the stretcher is being closed. In cases of spinal injury, pelvis, hip, or thigh fractures use a spine board or broken-back splint.

CHAPTER 13 FIRST AID /SURVIVAL KITS

Objectives

After reading this chapter, you should be able to

1. Identify the supplies necessary for first aid and survival kits
2. Explain why barrier devices are a necessity in first aid

FIRST AID /SURVIVAL KITS

Your best emergency protection is to be prepared before an accident or incident happens. Your first priority should be the health of you and your family. Keep a family record of immunization dates, blood types, known medical conditions and allergies and other pertinent medical data. Medical identification tags, such as Medic Alert Tags, should be worn at all times.

WORKPLACE FIRST AID KITS

For a listing of workplace Health and Safety Supplies please consult the federal/provincial/territorial Occupational Health & Safety Legislation and the Canadian Standards Association CSA Z1220-17 – ***Workplace First Aid Kits***.

PERSONAL/HOME FIRST AID KIT

This listing of supplies below is for a personal first aid kit. Keep a Personal First Aid Kit where it can be found easily, in your home, cottage, car, etc. Renew the supplies periodically.

- ❑ Antiseptic solution such as Hydrogen Peroxide
- ❑ Baking soda
- ❑ Cough mixture
- ❑ Diarrhea medication
- ❑ Laxative
- ❑ Antihistamine Tablets or Liquid
- ❑ Nose drops
- ❑ Petroleum jelly
- ❑ Rubbing alcohol
- ❑ Aspirin
- ❑ Water purification materials (a small amount of household bleach would suffice)
- ❑ Disposable gloves such as surgical or examination gloves
- ❑ Tweezers
- ❑ Calamine lotion
- ❑ Ice bag or chemical ice pack
- ❑ Thermometer
- ❑ Flashlight, with extra batteries in a separate bag
- ❑ Pencil and pad
- ❑ Emergency blanket
- ❑ Eye patches
- ❑ Protective eyewear
- ❑ Barrier device for providing artificial resuscitation such as a Pocket Mask

- ❑ Keep an extra supply of personal medicines -- Insulin or allergy medication, with the first aid kit.
- ❑ Tensor bandages
- ❑ Triangular bandages
- ❑ Adhesive tape
- ❑ Sterile gauze pads
- ❑ Sterile gauze rolls
- ❑ Cotton tip applicators
- ❑ Plastic strip bandages
- ❑ Phone numbers for EMS, Poison Control Centre, and personal physician
- ❑ Soap with hexachlorophene
- ❑ First aid manual
- ❑ Hot water bag or chemical hot pack
- ❑ Safety pins
- ❑ Scissors
- ❑ Medicine dropper
- ❑ Charged old Cell Phone & Charger
- ❑ Be sure that at least one adult in your family has taken a first aid course

EMERGENCY SURVIVAL KITS

- ❑ Keep a supply of goods available in case of a home emergency. These can be stored in a duffel bag, backpack or plastic tote container. The home emergency supply might include
- ❑ Supply of water, approximately 4 liters for each person per day. Use sealed plastic containers
- ❑ Non-perishable food, either packaged or canned with a can opener
- ❑ Blankets and/or sleeping bags
- ❑ First aid kit and manual
- ❑ Charged old Cell Phone & Charger
- ❑ Personal medication
- ❑ Eye glasses
- ❑ A change of clothes, rain weather gear, shoes, appropriate for the season
- ❑ Battery powered radio and flashlight, with extra batteries
- ❑ Extra set of keys for the car and house
- ❑ Important family information such as medical condition and medical devices used, such as pacemakers
- ❑ List of family physician, friends, and relatives who could be of assistance
- ❑ Cash and Credit Card
- ❑ Special items needed for infants , elderly or disabled members of the family

FOR THE AUTOMOBILE, AN EMERGENCY KIT MIGHT INCLUDE

- ❑ Battery powered radio and flashlight, with extra batteries
- ❑ Charged old Cell Phone & Charger
- ❑ Blanket
- ❑ Change of clothing and footwear appropriate for the season
- ❑ Personal medication
- ❑ Booster or jumper cables
- ❑ First aid kit and manual
- ❑ Fire extinguisher
- ❑ Bottled water
- ❑ Non-perishable high energy foods such as dried fruit, nuts, packaged soups
- ❑ Maps
- ❑ Shovel
- ❑ Flares
- ❑ Tire repair kit and pump
- ❑ Four flat candles and waterproof matches
- ❑ Rock salt or sand

APPENDIX A FIRST AID SUPPLIES

FIRST AID DRESSINGS AND BANDAGES

First aid materials include triangular bandages that can be used open or folded, strips of cloth, bandage compresses, gauze, adhesive bandages, and roller bandages.

BANDAGE COMPRESS

A bandage compress is a special dressing to cover open wounds. It consists of a pad made of several thicknesses of gauze attached to the middle of a strip of gauze. Pad sizes range from 1 to 4 inches. Bandage compresses usually come folded so that the gauze pad can be applied directly to the open wound with virtually no exposure to the air or fingers. The strip of gauze at either side of the gauze pad is folded back so that it can be opened and the bandage compress tied in place with no disturbance of the sterile pad. The gauze of a bandage compress may be extended to twice its normal size by opening up folded gauze. Unless otherwise specified, all bandage compresses and all gauze dressings should be covered with an open triangular cravat or roller bandage.

GAUZE

Gauze is used several ways in applying first aid dressings; plain gauze may be used in place of a bandage compress to cover large wounds and wounds of the trunk. Plain gauze of various sizes is supplied in packets. In cases of profuse bleeding or where bulk is required to stabilize embedded objects, use several layers of gauze. Care should be taken not to touch the portion of the gauze that is to be placed in contact with the wound.

GAUZE ROLLER BANDAGE

The gauze roller bandage is a self-adhering form-fitting bandage. It can be made secure with several snug-overlapping wraps then tied in place.

ADHESIVE COMPRESS

An adhesive compress is a self-adhering bandage that has gauze to cover the wound and a sticky backing that holds to the casualty's skin.

TRIANGULAR BANDAGES

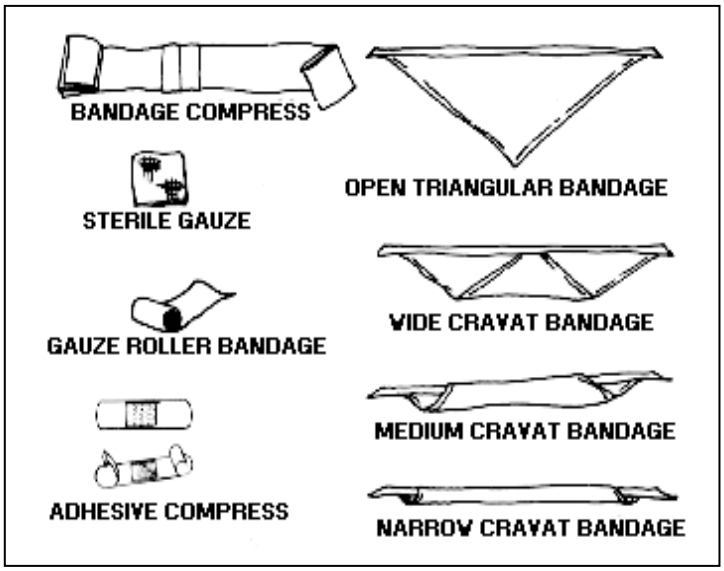
A standard triangular bandage is made from a piece of cloth approximately 40 inches square by folding the square diagonally and cutting along the fold. It is easily applied and can be handled so that the part to be applied over wound or burn dressings will not be soiled. A triangular bandage does not tend to slip off once it is correctly applied. It is usually made from

unbleached cotton cloth, although any kind of cloth will do. In emergencies, a triangular bandage can be improvised from a clean handkerchief, a clean piece of shirt, etc.

The triangular bandage is also used to make improvised tourniquets, to support fractures and dislocations, to apply splints, and to form slings. If a regular-size bandage is found to be too short when a dressing is applied, tying another bandage to one end can lengthen it.

CRAVAT BANDAGES

A triangular bandage may be used open or folded. When folded it is known as a cravat.



A cravat bandage is prepared as follows:

- Make a 1-inch fold along the base of the triangular bandage.
- Bring the point (apex) to the center of the folded base, placing the point underneath the fold, to make a wide cravat bandage.
- A medium cravat is made by folding lengthwise along a line midway between the base and the new top of the bandage.
- A narrow cravat is made if folding is repeated.

This method has the advantage that all bandages can be folded to a uniform width, or the width may be varied to suit the purpose for which it is to be used. To complete a dressing, the ends of the bandage are tied securely.

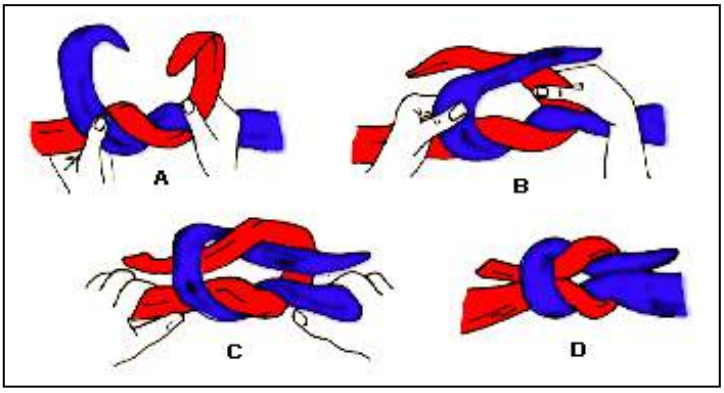
SQUARE KNOT

Unless otherwise specified, all knots or ties mentioned in this manual should be tied in a square knot.

To tie a square knot

- Take an end of the bandage in each hand
- Pass the end in the right hand over the end in the left, and tie a single knot
- Then pass the end now in the left hand over the end in the right hand, and complete the knot. The free ends after the second knot are in the same place as the end after the first knot

The rule to remember in tying a square knot is right over left, then left over right.



This knot can be untied easily by converting it into a slipknot

- Grasp one tail of the bandage in one hand
- Hold the bandage with the other hand
- Pull the tail under the knot rolls
- Release the tail, and with the free hand grasp the knot holding it firmly; with the other hand,
- Pull the bandage away from the knot.

APPENDIX B WORKPLACE HEALTH AND SAFETY DOCUMENTS

- First Aid Records
- Workplace First Aiders and Legal Requirements
- Developing a First Aid Plan
- Automated External Defibrillators in the Workplace
- Medications in a First Aid Kit
- Oxygen Equipment

First Aid Records

OHS information for employers

First Aid Records

The purpose of regulating workplace first aid is to ensure that every work site in the province has the equipment, supplies, and trained staff to provide first aid care in the event of workplace injury or illness. OHS legislation contains the minimum requirements, and employers are free to exceed them based on a site-specific assessment of their workers' first aid needs.

Workers Duty to Report an Injury or Illness

Under Alberta's OHS Code, workers are required to report to their employer any work-related injury or sudden occurrence of illness experienced while at work. The employer should establish to whom the report is communicated (e.g., first aider, foreman, nurse, supervisor, safety person, or some other individual).Prompt reporting ensures complete and accurate information and allows the injury or illness to be assessed and treated as necessary. Such information is also useful in injury surveillance. Similar recurrent injuries reported by several workers may suggest the need to change some aspect of the work site or the tasks performed by workers.

Did You Know?

- Prompt reporting ensures complete and accurate information;
- Reporting allows injury or illness to be assessed and treated as necessary;
- Information is also useful in injury surveillance and that similar, recurrent injuries reported by several workers may suggest the need to change some aspect of the work site or the tasks performed by workers.

Written Record of Injury or Illness

The employer is required to create and maintain an accurate written record of all work-related injuries or occurrences of illness that workers experience while at work.

Although the cause of the injury or illness may be unknown at the time it is being treated, every effort should be made to determine the cause within a reasonable period of time. The cause of work injuries should be added to the record and if an illness is the result of occupational causes, this information should also be added. Even if no first aid is administered, an injury or illness reported by a worker must be recorded.

Included with this Safety Bulletin is an example of a First Aid Record. It contains the minimum information required. Completed forms should be sent to an individual designated by the employer to keep all first aid records. Each injury or illness record must be retained for a minimum of 3 years from the date on which the injury or illness was reported. ***Completed records must not be kept in the first aid kit.***

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Access to Records

In respecting worker privacy, the current requirements limit access to first aid records. A person designated by the employer to keep the first aid records must ensure the information is kept confidential and that no person other than the worker has access to their first aid records unless Alberta or Canada legislation grants disclosure of the information; the record is in a form that does not identify the worker; or the worker has given written permission.

WHO HAS ACCESS TO MY RECORDS?

A worker can allow his or her first aid record to be made available to other persons but ***permission must be in writing*** indicating the information that can be released, the name of the person to whom the information is to be released, the date and the worker's signature.

The *Occupational Health and Safety Act*, section 8, allows OHS officers and the Director of Medical Services, Occupational Health and Safety Policy and Program Development, Alberta Labour access to the records.

Other legislation such as the *Workers' Compensation Act*, the *Health Information Act (HIA)*, the *Personal Information Protection Act* (PIPA) and Canada's *Personal Information Protection and Electronic Documents Act* may also have provisions authorizing access, use and disclosure of personal information.

Upon request, an employer must provide the worker with a copy of their first aid record.

Records Binder Available

A first aid records binder is now available from the Queen's Printer Bookstore. Designed to fit most standard first aid kits, the 5.5" x 9.5" binder comes with 28 first aid records. Additional replacement pages are available. Orders may be placed on-line. See contact information for the Queen's Printer at the end of this publication.

FIRST AID RECORD

Date of injury or illness: _____ Time: _____ AM PM
Day Month Year

Date injury or illness **REPORTED:** _____ Time: _____ AM PM
Day Month Year

Full name of injured or ill worker: _____

Description of the injury or illness: _____

_____

_____

Description of where the injury or illness occurred/began: _____

_____

_____

Cause of the injury or illness: _____

_____

_____

First aid provided? ❒ Yes ❒ No

Name of first aider: _____

First aider qualifications:

Emergency First Aider ❒ Emergency Medical Technologist--Paramedic ❒ Nurse ❒
Standard First Aider ❒ Emergency Medical Technician ❒
Advanced First Aider ❒ Emergency Medical Responder ❒

Describe first aid provided:

Copy provided to worker ❒ Copy refused ❒ Injured/ill worker initial _____

Keep this record confidential and retain for at least 3 years from date of injury/illness is reported

Contact Us

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Throughout Alberta
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Deaf or hearing impaired:
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FOR MORE INFORMATION:

Workplace First Aiders and Legal Requirements (FA011)

Developing a First Aid Plan (FA012)

Oxygen Equipment and Related Training Requirements at Work Sites (FA013)

Medication in First Aid Kits (FA014)

Automated External Defibrillators in the Workplace (FA015)

Workplace first aiders and legal requirements

OHS information for employers and workers

This health and safety bulletin outlines the requirements of specific sections of Alberta's OHS legislation that are relevant to work site first aiders. Anyone responsible for providing first aid services at the workplace needs to understand what is required by law.

What is the *Emergency Medical Aid Act*?

The *Emergency Medical Aid Act* is the name given to Alberta's "Good Samaritan" legislation, which may be applicable to voluntary first aid services rendered at a work site.

If applicable, the *Emergency Medical Aid Act* provides the following legal liability protection:

A person is "not liable for damages for injuries to or the death of that person alleged to have been caused by an act or omission on his or her part in rendering the medical services or first aid assistance, unless it is established that the injuries or death were caused by gross negligence on his or her part." (Section 2 (b) of the *Emergency Medical Aid Act*).

Please note that workers whose job description includes first aid may not be covered under this legislation and should speak with their employer regarding their legal status and protections in the provisions of first aid services.

KEY INFORMATION

- Workers should speak with their employer regarding their legal status and protections in the provision of first aid services
- Workers whose job description includes first aid may not be covered under the *Emergency Medical Aid Act*

Alberta *Occupational Health and Safety (OHS) Act*

- The *OHS Act* is the umbrella legislation for all OHS legislation in Alberta. According to the act, employers, supervisors, workers, self employed persons, contractors and prime contractors, service providers, suppliers, owners, and temporary staffing agencies are all responsible for ensuring health and safety at work.
    - First aiders that meet the definition of service provider may have additional responsibilities under the OHS Act.
- If a first aider attends to an injured worker in response to an incident that meets the criteria under the *OHS Act*, Section 40(2) as a reportable serious incident, or 40(5) as a reportable potentially serious incident, the prime contractor or employer, if there is no prime contractor, has a responsibility to report to a Director of Inspections.

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- Section 48(2) of the *OHS Act* allows the Director of Medical Services to ask for first aid reports and requires first aiders to provide them.

Alberta Occupational Health and Safety Code – Part 11 First Aid

- The OHS Code requires employers to provide first aid and have designated first aiders at work sites.
- The OHS Code defines the minimum standards in first aid services, equipment and supplies.
- The OHS Code stipulates the required number of first aiders, the level of first aid training, the required type and number of first aid kits and type and quantity of supplies and equipment.
    - These requirements are based on the hazard level of the work performed at the workplace, the number of workers at the work site per shift, and the distance of the work site to the nearest health care facility as defined in OHS legislation.
- The OHS Code details record keeping requirements for designated work site first aiders.
- Safety data sheets (SDSs) and product labels may provide a valuable source of information on first aid treatment.
- Employers must ensure a means of transportation is available for taking injured or ill workers to a health care facility as defined in OHS legislation.
    - If a licensed ambulance service is not available, then the means of transport used must be suitable considering the distance to be travelled, the types of acute illnesses or injuries, must provide protection against the weather, have a means of communication with the health care facility and be large enough to accommodate a stretcher and an accompanying person.

Workers' Compensation Act

- Section 37 of the *Workers' Compensation Act* allows first aid records required to be kept under occupational health and safety legislation to be inspected by the Board or a designate of the Board, and by the injured worker (or his/her representative) to whom the records relate.
- First aid treatment provided by work site first aiders for minor injuries does not need to be reported to the Workers' Compensation Board (WCB). However, workers and employers must report any workplace incident to the WCB where the work injury disables or is likely to disable the worker beyond the day of the incident. Employers must also notify the WCB if the worker has medical aid treatment or other services provided by licensed medical practitioners.

Contact Us

OHS Contact Centre

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- 1-866-415-8690

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- 780-415-8690

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FOR MORE INFORMATION:

First Aid Records (FA009)

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Developing a First Aid Plan

OHS information for employers

Introduction

Health and safety programs at the workplace aim to prevent injuries and illnesses, but sometimes, despite the best prevention efforts, injuries and illnesses occur. Planning for emergencies and having a First Aid Plan is not only legally and morally the right thing to do, it makes sense from a business point of view.

The purpose of this Safety Bulletin is to describe the basics of a First Aid Plan, which is one component of an overall Emergency Response Program. The Bulletin describes the factors to consider when developing and implementing a First Aid Plan,and includes explanations of what should be included in terms of first aid services, equipment, supplies, records, communication and transportation.

How do you develop the plan?

When planning for first aid at a work site, the first step is to review the potential and known hazards at the work site, and the types of injuries and illnesses likely to occur. Consider information such as the number of workers at the work site per shift, the type of work that is done, hazards to which workers are exposed, and distance from a health care facility as defined by OHS legislation. How close medical treatment services are to the work site will also help determine the services and supplies needed.

This review helps determine the potential injuries and illnesses and the extent of the First Aid Plan that may be required. ***When developing a First Aid Plan, keep in mind the worst case scenario.***

FIRST AIDERS

Alberta's OHS Code, Part 11 First Aid, specifies the number of first aiders, their level of first aid training and supplies and equipment required at work sites. These are based on three criteria:

1) how hazardous the work is;
2) the time it takes to travel to a health care facility; and
3) the number of workers at the work site per shift.

When assessing a particular work situation, you may find that the first aid supplies, equipment and services required by the OHS Code are insufficient to meet the needs of that situation. Employers are encouraged to exceed the minimum requirements in such circumstances.

The OHS Code states that designated workplace first aiders must have approved first aid training from an approved first aid training agency. Approved training agencies and courses are listed on the Occupational Health and Safety web site and these are updated on a regular basis. Before enrolling in a course, make sure it is government approved by checking the listing.

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EQUIPMENT AND SUPPLIES

In addition to first aid services, the OHS Code specifies the equipment and supplies that are required at a work site.

Contents of the various required first aid kits are listed in Schedule 2, Table 3, and the requirements for stocking a first aid room is listed in Schedule 2, Table 4. Where specialized equipment is made available, the employer must ensure that first aiders are trained and competent in the use of that equipment. It is recommended that medications not be included in first aid kits. Healthcare professionals designated to administer medication should have specific written medical directives from a licensed physician and these should be reviewed on a regular basis.

Training standards for the designated workplace first aider do not include administering medications, although first aiders can assist workers in taking their own medications.

FIRST AID RECORD KEEPING

Various written records must be developed and maintained as part of a First Aid Plan. The records to include are:

- names of first aiders, including their current first aid certificates and training records;
- first aid supplies and equipment inventories;
- injury and illness first aid records in accordance with the OHS Code;
- procedures for communication, including how to summon help; and
- transportation plans for getting injured or ill workers to health care facilities for treatment.

These records are important for administrative purposes and to meet legal requirements.

TRANSPORATION

Employers must arrange for the transportation of injured or ill workers to a health care facility where medical treatment is available. This is a requirement in section 180 of the OHS Code, and applies to all work sites, regardless of the types of injuries and illnesses, the number of workers at the work site, the number and level of trained first aiders and the supplies and equipment required.

Transportation arrangements must be made prior to dispatching workers to a work site, and therefore advanced planning is needed.

Transporting injured or ill workers in urban settings is straightforward and does not normally require any additional, specialized planning since appropriate supplies and transportation services are readily available. There may be cases where potential work exposures require specialized treatment. In these situations, municipal emergency services may need to be contacted ahead of time so that any specialized supplies, equipment, or specific arrangements for transportation or treatment are in place.

More planning is generally required for rural and remote locations where workers may be isolated or working alone. Once again, it is important to consider the extent of possible injuries and illnesses that may occur.

The goal for the transportation section of the First Aid Plan is to get the injured/ill worker to medical treatment as soon as possible.

Injured or ill workers can be transported by any mode of transportation that meets the requirements of the OHS Code, including a designated vehicle, a ground ambulance from a municipal ambulance service, or emergency air transportation. Prior arrangements should be made with the ambulance service that may be summoned.

If a licensed ambulance service is not available, then the means of transport being used must be suitable considering the distance to be travelled, the types of acute illnesses or injuries, must provide protection against the weather, have a means of communication with the health care facility and be large enough to accommodate a stretcher and an accompanying person. A mobile treatment centre (MTC) is sometimes used to fulfill this requirement.

Before transport in a MTC is undertaken emergency medical dispatch is to be contacted and a rendezvous with an ambulance is to be arranged. A MTC is not meant to replace transport by a licensed ambulance when available.

If an employer is operating a MTC they must ensure the appropriate permits are acquired from Alberta Transportation.

When appropriate, highly specific latitude and longitude coordinates may need to be provided. It is important to provide specific directions with highway, township or range road numbers and landmarks so that those responding can find the work site.

FIRST AID RECORD KEEPING

Communication is one of the most important elements of the First Aid Plan. Communication involves informing workers about:

- who the designated first aiders are;
- how to summon the first aiders;
- what the check-in procedures are when working alone or at an isolated work site;
- where first aid supplies and equipment are located;
- when to summon transportation;
- what type of transportation is available to get injured or ill workers to medical care;
- who to call to summon transportation;
- what the back-up plan is if the first type of transportation is unavailable; and
- when to report incidents to Workplace Health and Safety.

Finalizing the plan

Once developed, the plan should be endorsed by management and communicated to all workers. It should be in writing and accessible to everyone at the work site. No matter what or where injuries or illnesses occur, everyone at the work site should know how to respond and how to get help.

It is recommended that plans be tested before being finalized. Even the best plans can have gaps. It is important to have drills at least once a year, or more often if work locations, workers or other factors change. Before conducting drills, be sure to let emergency response personnel know ahead of time.

An effective First Aid Plan is one that provides appropriate, immediate and temporary first aid and, when necessary, transportation to medical treatment in a timely manner so that health is preserved, safety is protected, and injury and illnesses are not made worse.

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FOR MORE INFORMATION:

Quality Management Plan Requirements for First Aid Training in Alberta Workplaces

First Aid Records

Workplace First Aiders and Legal Requirements

Oxygen Equipment and Related Training Requirements at Work Sites

Medication in First Aid Kits

Automated External Defibrillators in the Workplace

Reporting and Investigating Injuries and Incidents

Approved First Aid Agencies

Automated External Defibrillators in the Workplace

OHS information for employers

Introduction

Occupational Health and Safety supports the use of Automated External Defibrillators (AEDs) at the work site provided the employer ensures that AED use is integrated into the first aid program and emergency response plan at the site, and can be safely used in the specific work environment intended.

Background

AEDs can be effective at improving survival from sudden cardiac arrest due to ventricular fibrillation or ventricular tachycardia when their use is incorporated into an emergency response plan that includes early recognition, notification and response to the emergency, access of emergency medical services, early cardiopulmonary resuscitation (CPR), early defibrillation, and timely advanced cardiac life support.

AEDs are approved for sale as medical devices by Health Canada, Medical Devices Bureau (MDB). They are regulated in Canada as medical devices. The manufacturer is required to license the AED. MDB imposes labelling requirements on these devices as required by the Canadian Medical Devices Regulation.

Did You Know?

The OHS Code, Part 1, defines "competent" in relation to a person; means adequately qualified, suitably trained and with sufficient experience to safely perform work without supervision or with only a minimal degree of supervision.

Labels must state indications and conditions for AED use including a requirement that they are used only by properly qualified individuals. Labels must also include directions for the safe use of AEDs in the manner intended. The OHS Regulation (AR 62/2003), Section 13 (1), requires that workers be competent to safely use the AED. AED training is a required component in the Emergency, Standards and Advanced First Aid courses.

If the first aider is under the supervision of a licensed medical practitioner, the Alberta College of Physicians and Surgeons has guidelines covering responsibilities of the medical practitioner.

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Alberta Government

Recommendations

In considering authorizing the use of AEDs at a work site, an employer should ensure assessment of specific needs of the work site including:

- whether AEDs can be safely used (e.g. not to be used in a flammable environment);
- the population at risk - identify hazards of the workplace that may increase risk of sudden cardiac arrest;
- existing emergency response plan; and
- availability of emergency medical services.

The employer should ensure AEDs are integrated into the existing emergency response plan and First Aid programs.

Anyone using an AED must be competent therefore; the employer must ensure appropriate training in CPR and AEDs for equipment that is present at the worksite. There also must be a system to ensure update of these skills and recertification.

The employer should ensure there is a quality assurance program in place that includes regular maintenance and inspection of AED equipment which includes: verifying the AED's status, checking the pad and accessories and batteries, and cleaning the AED, The record keeping process and emergency response plan should also be evaluated. Employers and workers should follow the manufacturer's specifications for AED use, care and maintenance.

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Medication in First Aid Kits

OHS information for employers

KEY INFORMATION

- First aiders may assist with medication in cases where the casualty is unable to take his/her own medication without assistance.
- For employers considering naloxone, please review

  Naloxone in the Workplace: OHS Information for Workers and Employers .

What is the Issue?

There are questions about whether medications should be included in first aid kits.

What to consider when dealing with medication at the work site?

Including medication in first aid kits falls outside of the scope of first aid. Routine inclusion of over-the-counter medications in first aid kits is not recommended as there are potential adverse outcomes.

If it is determined that it is necessary to provide medication at the work site, a physician should write policies and procedures to cover their use. Health care professionals should then be designated to administer medications.

If there are medications at the work site, it is important that there is a regular process to check that these medications are not expired.

In workplace first aid courses in Alberta, first aiders are taught that they may assist the casualty with his/her own medication in cases where the individual is unable to take the medication without assistance.

The goals of a first aider are to preserve life, alleviate suffering, prevent increased severity of the injury or illness and promote recovery. It is important for the first aider to do no harm when providing first aid.

What are the Legislative Requirements?

Employers must provide and maintain first aid kits that meet the requirements in the Alberta Occupational Health and Safety (OHS) Code. Additional equipment or supplies may be indicated as a result of a hazard assessment.

Anyone responsible for providing first aid services at the workplace needs to understand what is required by law.

First aiders are to be competent when providing care. The OHS Code defines "competent" to mean: adequately qualified, suitably trained and with sufficient experience to safely perform work without supervision or with only a minimal degree of supervision.

alberta.ca
FA014 - December 2017 - ISBN 978-1-4601-3285-2 (PDF)

Alberta Government

Contact Us

OHS Contact Centre

Edmonton & Surrounding area
- 780-415-8690

Throughout Alberta
- 1-866-415-8690

Deaf or hearing impaired:
- 780-427-9999 (Edmonton)
- 1-800-232-7215 (Alberta)

Website
work.alberta.ca/ohs-contact us

Get Copies of OHS Act, Regulation and Code

Alberta Queen's Printer
www.qp.gov.ab.ca

Occupational Health and Safety
work.alberta.ca/ohs-legislation

FOR MORE INFORMATION:

Naloxone in the Workplace: OHS Information for Workers and Employers (CH076)

Workplace First Aiders and Legal Requirements (FA011)

First Aid Records (FA009)

Quality Management Plan Requirements for First Aid Training in Alberta Workplaces (FA010)

Developing a First Aid Plan (FA012)

Oxygen Equipment and Related Training Requirements at Work Sites (FA013)

Automated External Defibrillators in the Workplace (FA015)

Oxygen equipment and related training requirements at work sites

OHS information for workers and employers

KEY INFORMATION

- Work sites that require a first aid room must have an advanced first aider, nurse or advanced care provider (ACP) that is competent and trained to use oxygen equipment.
- Work sites that do not require a first aid room but deem oxygen equipment necessary through a hazard assessment must ensure the user is competent and is suitably trained.

Occupational health and safety requirements

Alberta's Occupational Health and Safety (OHS) Code, Schedule 2, Table 4 requires oxygen equipment in the first aid (FA) room. Oxygen equipment includes a cylinder(s) containing compressed oxygen, a pressure regulator, pressure gauge, a flow meter and oxygen delivery equipment.

Under the OHS Code, Schedule 2, Tables 6 & 7, work sites required to have a FA room must also have a First Aider with a minimum of an advanced first aid certificate. The OHS Code defines "advanced first aider" as "an emergency medical responder, primary care paramedic, nurse or other person who holds a certificate in advanced first aid from an approved training agency".

If a work site requires a nurse or an advanced care paramedic (ACP), the employer is responsible to ensure that training meets Alberta standards.

When a first aid room is not required

Employers or prime contractors may complete a work site hazard assessment and deem oxygen equipment necessary, even when there is no FA room required.

On a work site where a first aid room is not required but an employer or prime contractor has deemed oxygen equipment necessary, the employer or prime contractor must ensure that anyone using oxygen equipment is competent or is under the supervision of someone who is competent. The OHS Act defines "competent" in relation to a person, as meaning "adequately qualified, suitably trained and with sufficient experience to safely perform work without supervision or with only a minimal degree of supervision".

Training

Employers or prime contractors must provide training in oxygen administration that meets the minimum training standards for Alberta approved workplace advanced first aid and the Canadian Standards Association (CSA) Standard Z1210-17 L.6.1.

Anyone administering oxygen as part of a FA response at work sites must receive training that includes:

- types of oxygen delivery systems;
- indications for oxygen administration;
- safe handling of oxygen delivery systems, and;
- oxygen administration using appropriate equipment.

FA013 – March

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PSI Online Reporting Service
alberta.ca/report-potentially-serious-incidents.aspx

Website
alberta.ca/occupational-health-safety.aspx

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Occupational Health and Safety
alberta.ca/ohs-act-regulation-code.aspx

FOR MORE INFORMATION:

Workplace First Aiders and Legal Requirements (FA011)
ohs-pubstore.labour.alberta.ca/fa011

Developing a First Aid Plan (FA012)
ohs-pubstore.labour.alberta.ca/fa012

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