

FIRST AID

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Unit III: First Aid in Emergency

8 hrs

- Assessment of casualty, action at road traffic accident, mass casualties, emotional response in emergency, cardiopulmonary resuscitation (CPR), pregnancy and emergency child birth
- Fire emergency: elements and types ,methods of extinguishing fire, parts and use of portable fire extinguisher and use of bucket brigade
- Water emergencies: common water emergencies, steps of water based rescue

UNIT III: First Aid in Emergency

Assessment of casualty

Action at road traffic accident (RTA)

Mass casualties

Emotional response in emergency

Cardio Pulmonary Resuscitation (CPR)

Pregnancy and Emergency Child birth

Assessment of casualty

Assessment: the act of judging or assessing a person or situation or event

Casualty : a person killed or injured in a war or accident.

Assessment of casualty

If someone is in need of emergency help, before we do anything we need to check the situation is safe and assess what's wrong with them.

These assessments are broken into two stages - called **The Primary and Secondary Survey**.

Primary Survey

A primary survey is a **quick** assessment of a casualty to find and correct any life-threatening issues.

It often follows a structure such as DR ABC. This involves checking the following things:

1. Danger - any hazards to oneself or bystanders?

Contd...

2. Response - is the casualty unconscious?

- Shout for help - if they are unconscious, shout for further help but do not leave their side

3. Airway - open the airway by tilting the head back and lifting the chin

Contd...

4. Breathing - check for normal breathing for up to 10 seconds

5. Circulation - perform CPR and use a defibrillator if the victim isn't breathing

Secondary Survey

If the situation is found to be safe in primary survey and managed to deal with anything life-threatening successfully, or there is nothing life-threatening to deal with, then first aider can assess someone in more detail for any other injuries or conditions which is known as secondary survey.

Only move onto the Secondary Survey if Primary Survey is already done and succeeded in dealing with any life-threatening conditions.

Contd...

It may not be possible to perform a secondary survey if there are problems with the primary survey.

For example, performing CPR takes priority over performing a secondary survey.

Contd...

The secondary survey involves:

1. History - finding out the history of the incident / illness from the casualty or bystanders
2. Examination - looking for visual clues
3. Vital signs / observations - if trained, recording relevant observations

1.History

Ask their medical history by using word **AMPLE** to remember

Allergy - do they have any allergies?

Medication - are they taking any regular or prescribed medication?

Previous medical history - did they already have any conditions?

Last meal - when did they last eat something?

Event history - what happened?

2. Examination

Perform Head to toe examination

Breathing and pulse: How fast and strong is their breathing and pulse?

Bleeding: Check the body from head-to-toe for any bleeding.

Head and neck: Is there any bleeding, swelling, sensitivity or a dent (cavity) in the bone, which could mean a fracture?

Ear: Do they respond when talked to them? Is there any blood or clear fluid coming from either ear? If so, this could mean a serious head injury.

Eyes: Are they open? What size are their pupils? If they're different sizes this could mean a head injury.

Nose: Is there any blood or clear fluid coming from the nostrils? This could mean a serious head injury.

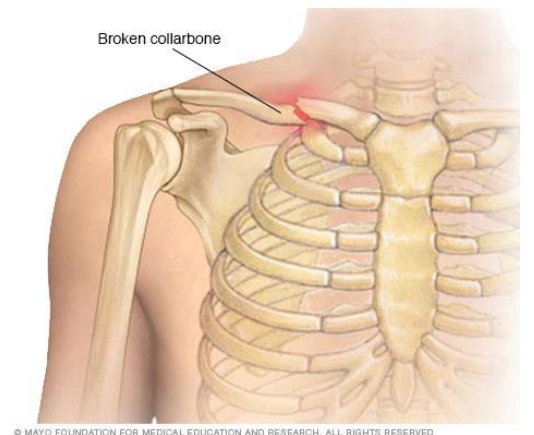
Mouth: Check their mouth for anything which could block their airway. Look for mouth injuries or burns in their mouth and anything unusual in the line of their teeth.

Skin: Note colour and temperature of skin. Pale, cold, clammy skin suggests shock. A flushed, hot face suggests fever or heatstroke. A blue tinge (shade) suggests lack of oxygen from an obstructed airway, poor circulation, or asthma.

Neck: Loosen clothing around their neck to look for any signs around their windpipe. Run fingers down their spine without moving it to check for any swelling, sensitivity or deformity.

Chest: Check if the chest rises easily and evenly on each side as they breathe. Feel the ribcage to check for any deformity or sensitivity. Note if breathing is difficult for them or painful in any way.

Collar bone, arms and fingers: Feel all the way along the collar bones to the fingers for any swelling, sensitivity or deformity. Check they can move their elbows, wrists and fingers.



Arms and fingers: Check they don't have any unusual feeling in their arms or fingers. If their fingertips are pale or greyish-blue this could suggest their blood isn't circulating properly. Also look for any **needle marks** on the forearms, which suggest drug use and if they have a **medical warning bracelet**.



Spine: If they've lost any movement or sensation in their legs or arms. Don't move them to check their spine as they may have a spinal injury. Otherwise, gently put hand under their back and check for any swelling or soreness

Abdomen: Gently feel their abdomen to check for any signs of internal bleeding, like stiffness or soreness, on each side.

Hips and pelvis: Feel both hips and pelvis for signs of a fracture. Check their clothing for any signs of incontinence, which may suggest a spinal injury or bladder injury.

Legs: Check the legs for any bleeding, swelling, deformity or soreness. Ask them to raise one leg and then the other, and to move their ankles and knees.

Toes: Check movement and feeling in their toes. Compare both feet and note the colour of the skin: greyish-blue skin could suggest a problem with their circulation or an injury due to cold, like hypothermia.

Action to Road Traffic Accident

Road Traffic Accident

A road accident refers to any accident involving at least one road vehicle, occurring on a road open to public traffic, resulting in one or more person being injured or killed.



First aid in RTA

- ❖ First ensure own safety
- ❖ If other people are around, get them to phone the emergency services if available.
- ❖ Quickly establish how many vehicles has been involved and access the occupants of all the vehicles to ensure no one has life threatening injuries.
- ❖ People screaming, crying and making noise have to be breathing - so initial priority is therefore to check anyone quiet and not moving.

- ❖ Support head and neck to avoid them twisting - do not cover their ears, keep talking to them calmly and keep checking that they are still breathing or not.
- ❖ Only remove an unconscious person from vehicle if there is an immediate danger to their life.
- ❖ Conscious casualties should be taken to a safe area.
- ❖ Note the nature of wreckage (damage) and be aware of possible injuries as well.

❖ If there is severe bleeding this need to be controlled so, wear gloves and apply dressings.

❖ Do not allow anyone to smoke at the scene or give the casualties anything to eat or drink following the accident.

Action at mass casualty



Mass Casualty

A mass casualty incident is defined as an event which generates more patients at one time than locally available resources can manage using routine procedures. It requires exceptional emergency arrangements and additional or extraordinary assistance.

It can also be defined as any event resulting in a number of victims large enough to disrupt the normal course of emergency and health care services (WHO).

So, Triage System is used to prioritize patients into categories of acuity, which range from life-threatening to non-urgent.

The triage category is based on a physical assessment of the patient and accurate history-taking. The signs and symptoms that discriminate between the triage categories are termed 'discriminators' and have been classified as:

- Life threat
- Hemorrhage
- Pain
- Conscious level
- Temperature
- Acuteness

Triage

In a disaster or mass casualty situation, different systems for triage have been developed. One system is known as START (Simple Triage and Rapid Treatment). In START, victims are grouped into four categories, depending on the urgency of their need for evacuation. The categories in START are:

The deceased, who are beyond help

The injured who could be helped by immediate transportation

The injured with less severe injuries whose transport can be delayed

Those with minor injuries not requiring urgent care.

Cont...

Another system that has been used in mass casualty situations is an example of advanced triage implemented by skilled health personnel.

This advanced triage system involves a color-coding scheme using red, yellow, green, , and black tags.

Red tags - (immediate) are used to label those who cannot survive without immediate treatment but who have a chance of survival.

Yellow tags - (observation) for those who require observation. Their condition is stable for the moment and, they are not in immediate danger of death. These victims will still need hospital care and would be treated immediately under normal circumstances.

Green tags - (wait) are reserved for the "walking wounded" who will need medical care at some point, after more critical injuries have been treated.

White tags - (dismiss) are given to those with minor injuries for whom a doctor's care is not required.

Black tags - (expectant) are used for the deceased and for those whose injuries are so extensive that they will not be able to survive by giving care that is available.

Emotional Response in Emergency

“The worst thing that you can do is lose your will to survive”.

Statistics show that 95% of people who die with psychological trauma, do so within the first three days of a traumatic event.

How people respond in an emergency situation will determine the outcome of that situation.

Common Reaction during emergency are:

Anxiety

Depression

Hyperactivity

Anger

Guilt

First Aid Provider's Response in Emergency

- Speak calmly. Be patient, responsive, and sensitive.
- Speak slowly, in simple concrete terms; don't use acronyms or jargon.
- If survivors want to talk, be prepared to listen. When you listen, focus on hearing what they want to tell you, and how you can be of help.
- Acknowledge the positive features of what the survivor has done to keep safe.
- Give needed information to the survivor and family and clarify answers repeatedly as needed.

Give information that is accurate and age-appropriate for your audience.

Help to verbalize their feelings, concerns and questions; provide simple labels for common emotional reactions (for example, sad, scared, worried). Do not use extreme words like "terrified" or "horrified" because this may increase their distress.

When needed, try to provide assistance in an area with little noise or other stimulation.

Address the person directly, rather than the caretaker, unless direct communication is difficult.

If communication (hearing, memory, speech) seems impaired, speak simply and slowly.

Cardio Pulmonary Resuscitation (CPR)



Introduction

According to recent statistics sudden cardiac arrest is rapidly becoming the leading cause of death.

Once the heart ceases to function, a healthy human brain may survive without oxygen for up to 4 minutes without suffering any permanent damage.

It is during those critical minutes that CPR can provide oxygenated blood to the victim's brain and the heart, dramatically increasing the chance of survival.

And if properly instructed, almost everyone can lead and perform CPR.



CPR is done to prevent biological death after clinical death.

Clinical death: heartbeat and breathing stopped but reversible with CPR if started during the first few minutes.

Biological death: permanent cellular death.

Cardiopulmonary resuscitation (CPR)

Cardiopulmonary resuscitation (CPR) is an emergency procedure that combines chest compressions often with artificial ventilation in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest.

It is recommended in those who are unresponsive with no breathing or abnormal breathing.

CPR involves chest compressions for adults between 5 cm (2.0 inch) and 6 cm (2.4 inch) deep and breathing at a rate of at least 100 to 120 per minute.

CPR must be performed within four to six minutes after cessation of breathing to prevent brain damage or death. CPR consists of rescue breathing, which delivers oxygen to the victim's lungs, and external chest compressions, which help circulate blood through the heart to vital organs.

Purpose

CPR is performed to restore and maintain breathing and circulation and to provide oxygen and blood flow to the heart, brain, and other vital organs.

Indication

Cardiac arrest

Respiratory arrest

UNRESPONSIVE

Classification

Basic Life Support (BLS)

Advanced Cardiac Life Support (ACLS)

Basic life support (BLS)

Basic life support (BLS) is a level of medical care which is used for victims of life-threatening illnesses or injuries until they can be given full medical care at a hospital.

It can be provided by trained medical personnel, including emergency medical technicians, paramedics, and by qualified bystanders.

BLS includes psychomotor skills for performing high-quality CPR, using an automated external defibrillator (AED) and relieving an obstructed airway for patients of all ages.



Steps of BLS

1. Check Responsiveness

Tap the person's shoulder and shout, "Are you OK?"

2. Check breathing

Place your ear near the victim's mouth and nose. Is there breath on your cheek? Is the victim's chest moving?

The American Heart Association uses the letters **C-A-B** — compressions, airway, breathing — to help people remember the order to perform the steps of CPR.

3. Begin chest compressions

- For chest compression, put the person on his or her back on a firm surface.
- Kneel next to the person's neck and shoulders.



Contd...

Place the heel of hand on the center of the victim's chest. Put other hand on top of the first with your fingers interlaced. Press down so the chest is compressed at least **2 inches** in adults and children and **1.5 inches** in infants.

One hundred times a minute or even a little faster is optimal.

4. Airway: Open the airway

After 30 chest compressions, open the person's airway using the head-tilt, chin-lift maneuver.

(Put palm on the person's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway).



4. Breathing: Breathe for the person

Rescue breathing can be mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or can't be opened.

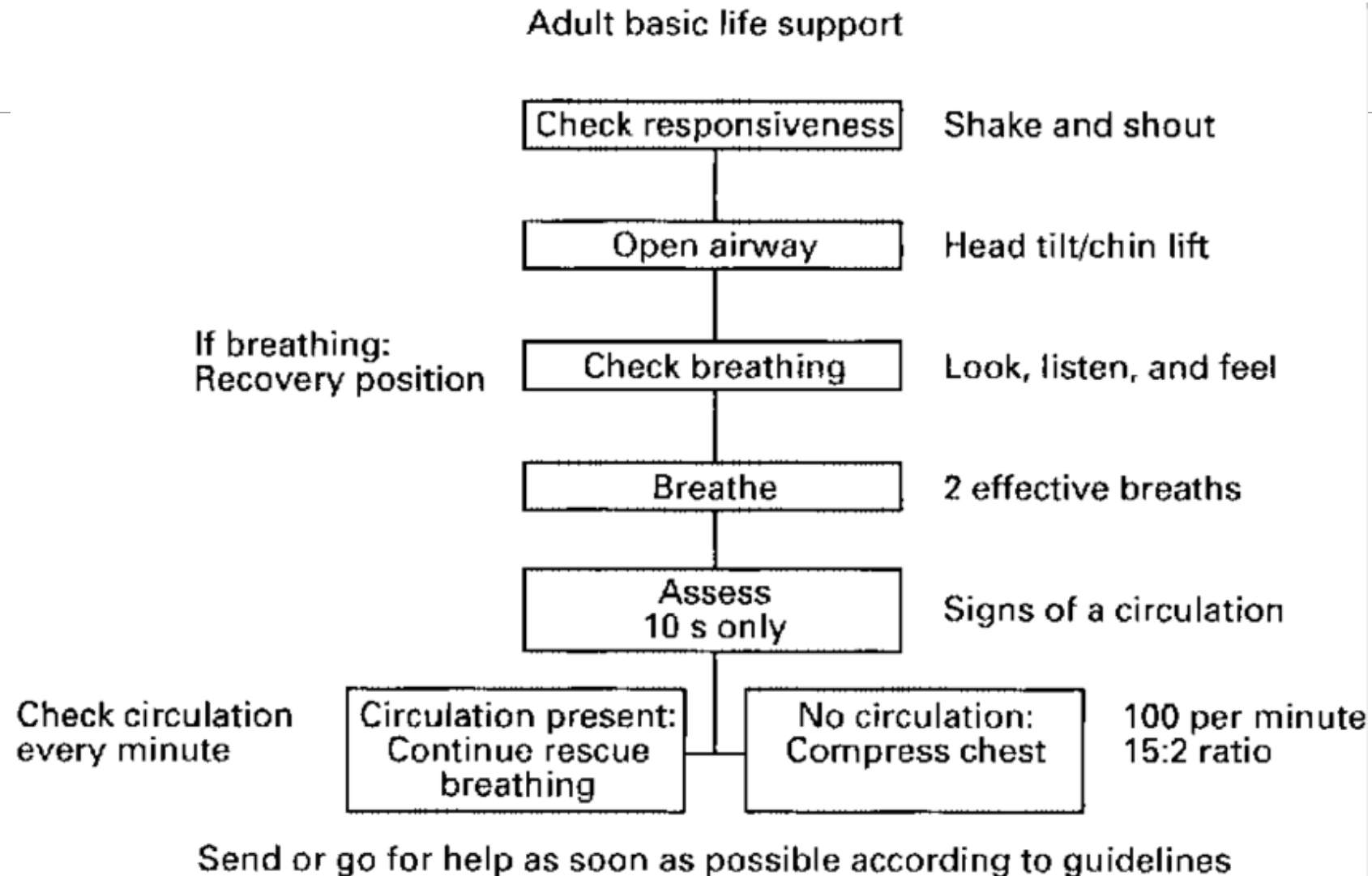


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Steps for breathing

Pinch the victim's nose closed. Take a normal breath, cover the victim's mouth with yours to create an airtight seal, and then give two, one-second breaths as you watch for the chest to rise. Continue compressions and breaths -- 30 compressions, two breaths -- until help arrives.

BLS Algorithm



Basic Life Support



When Can I Stop CPR?

- Victim revives
- Trained help arrives
- Too exhausted to continue
- Unsafe scene
- Physician directed (do not resuscitate orders)
- Cardiac arrest of longer than 30 minutes (***controversial***)



Complications of CPR



- ★ Rib & sternal fractures
- ★ Pneumothorax
- ★ Pericardial tamponade
- ★ Pulmonary contusion
- ★ Aspiration
- ★ Aortic laceration



Basic Life Support



A



B

Oropharyngeal Airway

Pregnancy and Emergency childbirth



Pregnancy

Pregnancy, also known as gestation, is the time during which one or more offspring develops inside a woman. A multiple pregnancy involves more than one offspring, such as with twins.

Pregnancy is divided into three trimesters.

Contd...

The first trimester is from week one through 12

It includes conception, which is when the sperm fertilizes the egg. The fertilized egg then travels down the fallopian tube and attaches to the inside of the uterus, where it begins to form the embryo and placenta. During the first trimester, the possibility of miscarriage is at its highest.

Contd...

The second trimester is from week 13 through 28. Around the middle of the second trimester, movement of the fetus may be felt. At 28 weeks, more than 90% of babies can survive outside of the uterus if provided with high-quality medical care.

The third trimester is from 29 weeks through 40 weeks.

Emergency childbirth

Emergencies are sudden, unexpected, hazardous situations where there is a need for an immediate response. They can cause severe disruption because they are unexpected. Resources are needed to cope with an emergency and they may have to be brought in from outside.

Emergency childbirth is the birth of an infant in places or situations other than what was planned.

Emergency childbirth

In most cases the location of childbirth is planned ahead of time and may be at home, a hospital, a medical facility or a birthing center. In other situations, the birth occurs on the way to these facilities. Oftentimes, no trained medical personnel are present, other times there may be police or other first responders.

Contd...

It is a birth that occurs accidentally or precipitously or out of the hospital, without standard obstetric preparations and procedure.

Incidence

Each year more than 250,000 women around the world die from complications due to childbirth or pregnancy, with bleeding and hypertension as the leading causes.

In 2012, 1.36% of births took place outside of a hospital, and this number has been increasing over the last 30 years

During the Lockdown period announced by Nepal government in 2020 to prevent the risk of COVID-19, the maternal death rate increase by 200%.

Emergency child birth

Childbirth is a natural event that has been going on since the beginning of time. So don't panic and trust that you can do this, billions of people have.

Labor or childbirth is the process of delivering a baby and the placenta, membranes, and umbilical cord from the uterus to the vagina to the outside world

The stages of labor is divided into following **4 stages**:

1. First stage: latent phase and active phase

From true labor pain to full dilatation of cervix (10cm)

2. Second stage : Expulsion of fetus

Full dilatation of cervix to expulsion of fetus

3. Third stage : Expulsion of placenta and membranes

4. Fourth stage: The "fourth stage of labour" is the period beginning immediately after the birth of a child and extending for about six weeks.

Steps of emergency child birth

1. Stay Calm and Get Yourself Ready

Prepare yourself mentally and physically for the task ahead. The two most important things are staying calm and keeping the mother calm.

Take few deep breaths and focus on the task ahead.

Remind the mother to breathe and encourage her to breathe long through contractions.

2. Keep mother into position

Put the mother on the floor or a steady surface.

Make sure mother is as comfortable as possible.

Remind the mother breathe long, or only push very gently with the contractions

3. Gather Supplies

The baby will be very slippery when s/he comes out and will need to be wrapped up. Pillows, towels, blankets, or things that can be used as a blanket and cushioning, like a coat or shirt.

4. Wash Hands

Wash hands as possible because the baby will be born with very little immune system and is susceptible to infections.

5. Catch Baby's Head

As the baby's head becomes visible, place hand on the head and provide it with support to keep it from popping out. Remind mother to try to breathe long during this time to help prevent tearing.

6. Gently Guide Baby Out

Do not pull on the baby's head or body. Let the baby and labor contractions do the work. You may gently guide the baby out.

7. Clean Baby's Nose

Once, the baby comes out, gently stroke downward on the baby's nose to help expel the excess mucus and amniotic fluid.

8. Put Baby on Mother's chest (Kangaroo mother care)

Place the baby skin-to-skin on mother, with the baby's head slightly lower than its body (to help facilitate draining the mucus). Cover both of them with dry blankets or towels.



9. Deliver the Placenta

The umbilical cord is clamped and cut. The cord is clamped in two places about 6 cm to 8 cm from the baby. The clamps or ties are tight in order to stop the blood flow.

The cord is cut between the two clamps or ties.

Sterilized scissors or a sterilized knife is used.

10. Keep Mother and Baby Safe and warm

Fire Emergency

Fire emergency means an emergency response involving fire protection or prevention, rescue, emergency medical, or hazardous material response services.

It is a situation in which fire may cause death or severe injury.



Classes of fire

Class A - fires involving solid materials such as wood, paper or textiles.

Class B - fires involving flammable liquids such as petrol, diesel or oils.

Class C - fires involving gases.

Class D - fires involving metals.

Class E - fires involving live electrical apparatus

Class F - fires involving cooking oils such as in deep-fat fryers.

Elements of an Emergency Evacuation Plan

The effect of fire is panic and solid emergency evacuation plan is to be in place to handle them.

Some crucial elements that should be included in every fire emergency evacuation plan are as follows:

Contd...

1. Conditions requiring an evacuation

Many conditions can create an emergency situation. But not all of them would require an evacuation. Whether or not there need to evacuate depends on several factors.

The plan should specify the exact conditions that require an evacuation of all victims.

Contd...

2. When to shelter-in-place rather than evacuate

In some situations, it would be safer to stay indoors. This could be in the case of extreme weather, or dangerous chemicals in the outside environment.

Contd...

3. A clear chain of command

Who is responsible for assessing the situation and deciding if an evacuation is necessary? Who will take charge on each floor of a high-rise building? What about notifying emergency services? Make sure everyone knows exactly what their role is and has been properly trained to perform it.

Contd...

4. Specific emergency evacuation plan procedures

Mark the locations of all emergency equipment, routes, and exits, and ensure they are functioning at all times.

Contd...

5. Specific evacuation procedures

Posting evacuation plans at cities and communities to inform everyone.

Identifying and training personnel on each community who will be responsible for getting people out, and making sure everyone is safe.

Contd...

6. Special equipment

In some emergency situations, there may be required to supply personal protective equipment (PPE). These may include,

- ❖ Safety glasses, goggles, or face shields, hard hats and shoes
- ❖ Chemical suits, gloves, and boots
- ❖ Special body protections for abnormal environmental conditions
- ❖ Make sure there is required emergency equipment on-hand and well-stocked, and clearly mark storage locations of that equipment.

Fire extinguisher



Fire Extinguisher

A portable device that discharges a jet of water, foam, gas, or other material to extinguish a fire.

A fire extinguisher is a metal cylinder which contains water or chemicals at high pressure which can extinguish fires.



Contd...

A fire extinguisher consists of a hand-held cylindrical pressure vessel containing an agent which can be discharged to extinguish a fire.



Types of extinguishers

1. Water extinguishers
2. Foam extinguishers
3. Powder extinguishers
4. Carbon dioxide extinguishers (CO₂)
5. Wet chemical extinguishers
6. Fire blankets

Water extinguishers

Water extinguishers are one of the most cost-effective ways to fight Class A fires, those fuelled by solid materials such as paper, wood and textiles.

There are four different types of water extinguishers: water jet, water spray, water with additives and water mist or fog.

All water extinguishers have a **red** label.

Foam extinguishers

Foam fire extinguishers can be used on Class A and B fires. They are most suited to extinguishing liquid fires such as petrol or diesel and are more versatile than water jet extinguishers because they can also be used on solids such as wood and paper. The foam extinguishes liquid fires by sealing the surface of the liquid, preventing flammable vapour reaching the air. They are not suitable for use on free flowing liquid fires.

Foam extinguishers have a **cream** label.

Powder extinguishers

Powder extinguishers are a good multi-purpose fire extinguisher because they can be used on Class A, B and C fires. They can also be used on fires involving electrical equipment however, they do not cool the fire so it can re-ignite. Powder extinguishers can also create a loss of visibility and may create breathing problems. They are not generally recommended for use inside buildings unless there is absolutely no alternative.

Powder extinguishers have a **blue** label.

Carbon dioxide extinguishers (CO2)

CO2 extinguishers are ideal for places with a lot of electrical equipment such as offices or server rooms because they are safe to use on fires involving electrical apparatus. Carbon dioxide extinguishers do not leave any residue, unlike a foam extinguisher. They can also be used on Class B fires, those involving flammable liquids. CO2 extinguishers work by smothering the fire and cutting off the supply of air.

Carbon Dioxide Extinguishers (CO2) have a **black** label.

Wet chemical extinguishers

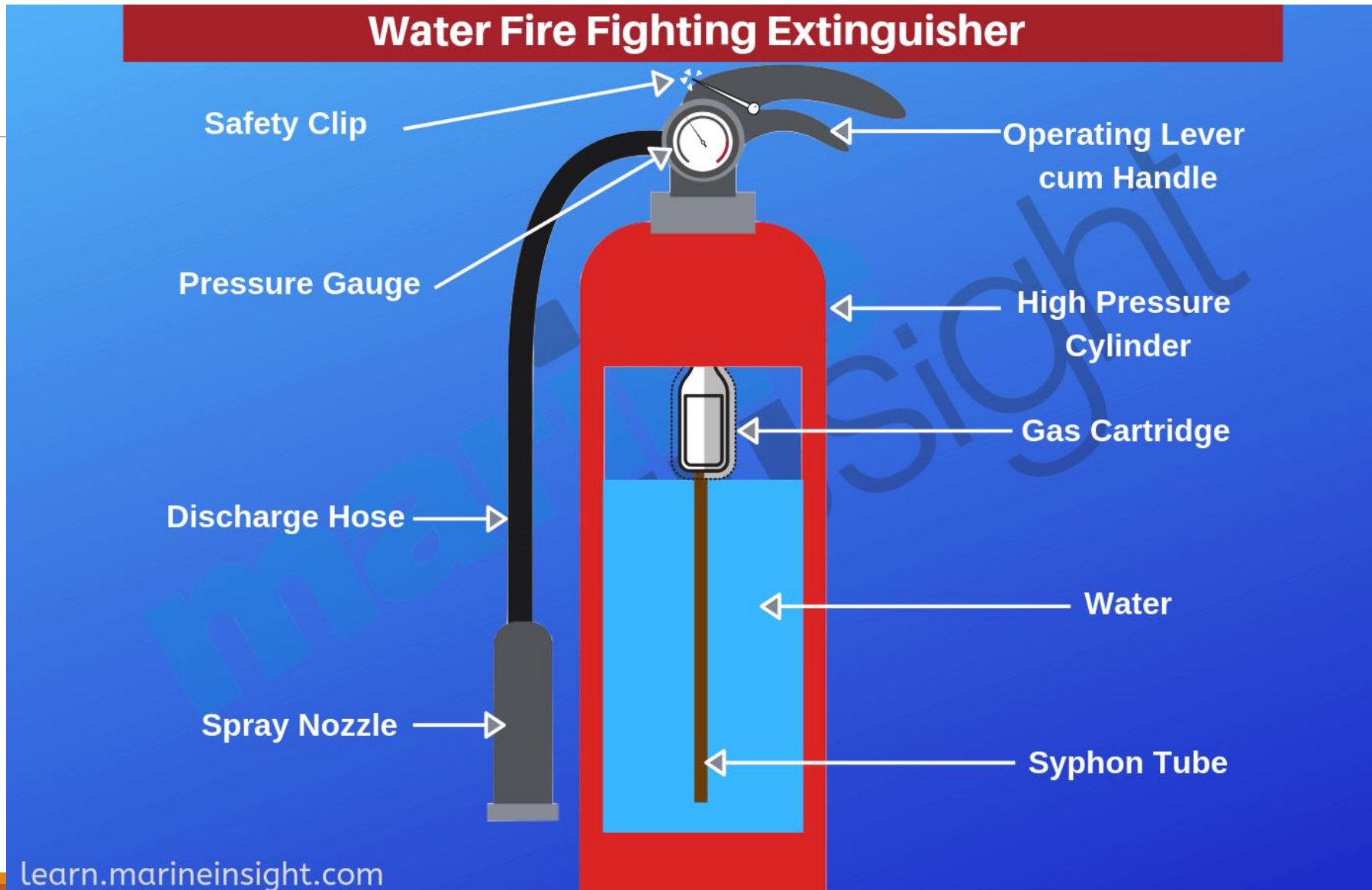
Wet chemical extinguishers are suitable for use on Class F fires involving cooking oils and fats, such as olive oil, sunflower oil, maize oil and butter. They are extremely effective, when used correctly. The wet chemical rapidly knocks the flames out, cools the burning oil and chemically reacts to form a soap-like solution, sealing the surface and preventing re-ignition. Although they are primarily designed for use on Class F fires, cooking oils and deep fat fryers. They can also be used on Class A fires (wood, paper and fabrics) and Class B fires (flammable liquids).

Wet chemical extinguishers have a **yellow** label.

Fire blankets

Fire blankets are primarily for use on hot oil fires such as frying pans or small deep fat fryers. They can also be used on someone whose clothing has caught fire. They work by smothering the fire, stopping access to the oxygen fuelling it and extinguishing it.

Parts of portable fire extinguisher



Bucket Brigade

Bucket Brigade is a chain of persons acting to put out a fire by passing buckets of water from hand to hand.

A **bucket brigade** or **human chain** is a method for transporting water from one (relatively stationary) person to the next to extinguish fire.



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Uses of bucket Brigade

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