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Do you need new Kits or refills? [www.tripleonecare.co.nz](http://www.tripleonecare.co.nz)  
(See Page 69 for your local Contact Information)
The Australian and New Zealand Committee on Resuscitation (ANZCOR) recommends that in all emergencies, the rescuer should:

- Quickly assess the situation
- Ensure safety for the rescuer, person in need and bystanders (this may mean moving the person in need)
- Send for help (call an ambulance. In New Zealand, 111)

Individuals who are unresponsive and breathing normally should be positioned into the stable side position.

Where more than one person requires attention, the care of an unconscious person has priority.

**General principles of management:**

After ensuring safety for the person in need, rescuer and bystanders and sending for help, the management of the collapsed or injured person involves:

- Prevention of further harm or injury
- Checking response to verbal and tactile stimuli (“talk and touch”)
- Care of airway, and breathing
- Control of bleeding
- Protection from the weather
- Other first aid measures depending on the circumstances
- Gentle handling
- Reassurance
- Continued observation

**Exposure To Biological Hazards**

First aiders may be exposed to biological substances such as blood-borne pathogens and communicable diseases, whilst dealing with a first aid incident.

*These may result from dealing with:*

- Trauma related injuries
- Resuscitation

There are many different blood-borne pathogens that can be transmitted from a penetrating injury or mucous exposure, in particular, Hepatitis B Virus, Hepatitis C Virus and Human Immunodeficiency Virus (HIV).

Other diseases not found in human blood may be carried in fluids such as saliva (e.g. Hepatitis A and the organism that causes meningitis) or animal blood and fluid.
**Universal Precautions:**

First aiders should equip themselves with - and use - personal protection equipment. This equipment is used to minimise infection from disease.

**Exposure sources:**

The following are common sources of exposure -

- All human body fluids and secretions, especially any fluid with visible blood.
- Any other human material.

**Exposure routes:**

The following are typical means of exposure -

- Punctures or cuts from sharp objects contaminated with blood / fluid
- A spill of blood / fluid onto mucous membranes of the eyes, mouth and/or nose
- A spill of blood / fluid onto skin that may or may not be intact
- A laceration and contamination with blood / fluid from a bite

The expression ‘universal precautions’ refers to the risk management strategy used to prevent the transmission of communicable disease, by reducing contact with blood and other body substances.

**Universal precautions include:**

- Wearing appropriate protective equipment for the task
- Treating all persons as if infectious
- Washing following completion of task
- Appropriate disposal of disposable protective items and/or equipment
- Maintaining good hygiene practices before, during and after tasks involving contamination risk

**Note:** Universal precautions are the most effective approach to protecting emergency first aiders in a biological substance exposure situation. If these guidelines are followed, the risk of infection can be significantly minimised.
Immediate action at scene following exposure

For an open wound:
- Encourage the wound to bleed, thoroughly wash with water for 15 minutes and dress
- Do not attempt to use a caustic solution to clean the wound
- Seek medical advice as soon as possible

For a splash to a mucous membrane:
- Flush splashes to nose, mouth or eyes thoroughly with water for 15 minutes
- If the splash is in the mouth, spit out and thoroughly rinse out with water for 15 minutes
- If the splash is in the eyes, irrigate with the eyes open for 15 minutes.
- Seek medical advice as soon as possible

For a splash to the skin:
- At the scene, wash thoroughly with soap and water
- Seek medical advice as soon as possible if the exposure is medium / high risk

The Primary Survey

The primary survey is a systematic checklist designed to maximise safety and identify / treat immediate life-threatening problems.

The steps to be followed for an adult, child and Infant casualty are remembered by the letters

**DRS ABCD** ("Doctors ABCD")

**D** - Dangers
**R** - Response
**S** - Send for help

**A** - Airway
**B** - Breathing
**C** - CPR (Cardiopulmonary Resuscitation) + Control Major Bleeding
**D** - Defibrillation

**Note:** CPR is continued until responsiveness or normal breathing returns!
Why do you need to know this?

It is very important that you understand the correct procedure to follow in order to offer effective primary care. At the same time, it is necessary to protect yourself from any harm. The initial steps of resuscitation are:

**D: Dangers**

Before approaching any situation, you must assess the scene for any threat to:

- Yourself and anyone else assisting with the situation
- The casualty or casualties
- Bystanders near the scene

By rushing into the situation without properly assessing what has occurred, you are compromising your safety. If you are injured while attempting to assist the casualty, you may not be able to help them. If the scene is not safe, remove the threat from the casualty (or the casualty from the threat). If this cannot be achieved, go to a safe place and wait for further assistance.

**Safety Note:**
Always remember to reassess the safety while treating the casualty. Bystanders should be warned about any dangers and kept at a safe distance to ensure they do not become casualties. Once the scene is considered safe, bystanders can be asked to assist if needed.

Remember to **ELIMINATE** or **MINIMISE** hazards!

**Moving a casualty?**

A rescuer should only move a collapsed or injured victim ...

- To ensure the safety of both rescuer and the victim
- Where extreme weather conditions or difficult terrain indicate that movement of the victim is essential
- To make possible the care of airway, breathing, and circulation (e.g. by turning the unconscious breathing victim to the stable side position, or turning a collapsed victim onto their back, to perform cardiopulmonary resuscitation effectively)
- To make possible the control of severe bleeding

All unconscious persons who are breathing normally must remain on their side (injuries permitting). It is reasonable to roll a face-down unresponsive victim into the supine (back) position to assess airway and breathing and initiate resuscitation. Concern for protecting the neck should not hinder the evaluation process or life-saving procedures.

**When ready to move the victim:**

- Avoid bending or twisting the victim's neck and back: remember, spinal injury can be aggravated by rough handling.
- Try to have three or more people to assist in the support of the head and neck, the chest, the pelvis and limbs
- A single rescuer may need to drag the victim (either an ankle-drag or arm-shoulder drag is acceptable)
- Make prompt arrangements for transport by ambulance to hospital

**R: Response**

Unconsciousness is a state of unresponsiveness, where the victim cannot be roused, is unaware of their surroundings, and no purposeful response can be obtained.

When checking a person’s response, you are assessing how well their brain is functioning. The brain requires a constant supply of oxygenated blood and glucose to function. Interruption of this supply will cause loss of consciousness within a few seconds and permanent brain damage in minutes. When the casualty’s brain is not functioning normally, they may not be able to look after their own airway. Their protective reflexes of coughing, swallowing, or gagging may not be working very well.

**Causes of unconsciousness:**

The causes of unconsciousness can be classified into four broad groups -

- Blood oxygenation problems (heart attack)
- Blood circulation problems (trauma, blood loss)
- Metabolic problems (e.g. diabetes, overdose, alcohol)
- Central nervous system problems (e.g. head injury, stroke, tumour, epilepsy, spinal injury)

**How to check for responsiveness:**

Assess the collapsed victim's response to verbal and tactile stimuli ('talk and touch'), ensuring that this does not cause or aggravate any injury. Give a simple command such as, “open your eyes, squeeze my hand, let it go”. Then grasp and squeeze the shoulders firmly to elicit a response.

![Checking for a response](image-url)
**The four levels of responsiveness are (AVPU):**

**A** - Alert: The casualty is alert and responsive. You can have a logical conversation with them.

**V** - Voice: Even if drowsy, the casualty is able to reply when you talk to them.

**P** - Pain: The casualty is responsive to pain (e.g. nail-bed pressure).

**U** - Unresponsive: The casualty is unresponsive to all stimuli.

If the casualty is breathing normally but is unresponsive, place them (if possible) in the stable side position.

**Note:** When possible, always approach the casualty from the direction of the head (for safety).

---

**S: Send For Help - Activating An Emergency Medical Services (EMS) System**

The goal of first aid intervention is to recognize when help is needed and how to get it. This goal includes learning how and when to access an **EMS** system (in New Zealand ☏ 111), how to activate the on-site emergency response plan, and how to contact the **NZ National Poisons Centre:** ☏ 0800 764 766 (0800POISON).

Providing care for someone who is ill or injured should not usually delay calling for more advanced care if needed.

However, if the first aid provider is alone with an injured or ill person and there are imminent threats to life involving the ABCs (airway, breathing, circulation), then basic care, such as opening an airway or applying pressure to the site of severe bleeding should be provided before leaving the victim to activate the emergency response system or phone for help.

Generally, an ill or injured person should not need to be moved. This is especially important if you suspect, from the person’s position or the nature of the injury, that the person may have a pelvic or spinal injury.

**There are times, however, when the person should be moved:**

- If the area is unsafe for the first aid provider or the person, move to a safe location if possible
- If a person is unresponsive and breathing normally, it may be reasonable to place him or her in the stable side position.

**Note:** There is evidence that this position will help increase total airway volume and decrease breathing difficulty. Extend one of the person’s arms above the head and roll the body to the side so that the person’s head rests on the extended arm. Once the person is on his or her side, bend both legs to stabilize the body.

If a person is unresponsive and not breathing normally, proceed with basic life support guidelines.
If a person has been injured and the nature of the injury suggests a neck, back, hip, or pelvic injury, the person should not be rolled onto his or her side and instead should be left in the position in which they were found (to avoid potential further injury).

If leaving the person in the position found is causing the person’s airway to be blocked, or if the area is unsafe, move the person only as needed to open the airway and to reach a safe location.

**Useful Phone Numbers:**

- Emergency Medical Services: In New Zealand ☎️ 111.
- NZ National Poisons Centre: ☎️ 0800 764 766 (0800POISON).

### A: Airway

When a victim is unconscious, all muscles are relaxed. If the victim is left lying on the back, the tongue, which is attached to the back of the jaw, falls against the back wall of the throat and blocks air from entering the lungs. Other soft tissues of the airway may worsen this obstruction.

The mouth falls open but this tends to block, rather than open, the airway. The unconscious victim is further at risk because of being unable to swallow or cough out foreign material in the airway. This may cause airway obstruction, or laryngeal irritation and foreign material may enter the lungs. For this reason, the rescuer should not give an unconscious victim anything by mouth, and should not attempt to induce vomiting.

**Note:** In an unconscious victim, care of the airway takes precedence over any injury, including the possibility of spinal injury. Airway management is high priority. It is important to check the airway before the breathing. If air cannot enter the lungs due to some sort of blockage, the casualty will not survive for long.

Airway management is required to provide an open airway when the victim:

- Is unconscious
- Has an obstructed airway
- Needs rescue breathing

**Airway obstruction:**

If during resuscitation the airway becomes compromised, the victim should be promptly rolled onto their side to clear the airway. The victim should then be reassessed for responsiveness and normal breathing. Most airway problems are caused by the tongue and/or vomit. These can often be resolved by simple airway management.
**Tongue:**

The muscle tone of the upper airway is directly related to the level of responsiveness: when sleeping, for example, minor degrees of reduced muscle tone may lead to sufficient obstruction to cause snoring. When unresponsive, however, this obstruction can become complete and fatal.

**Regurgitation:**

Regurgitation is the passive flow of stomach contents into the mouth and nose. Although this can occur in any person, regurgitation and inhalation of stomach contents is a major threat to an unconscious person. It is often unrecognised because it is silent and there is no obvious muscle activity.

Vomiting is an active process during which muscular action causes the stomach to eject its contents. In resuscitation, regurgitation and vomiting are managed in the same way: by prompt positioning the person on their side and manual clearance of the airway prior to continuing rescue breathing. If the person begins to breathe normally, they can be left on their side with appropriate head tilt. If not breathing normally, the person must be rolled on their back and resuscitation commenced.

**How to check an Airway:**

Airway management is required to provide an open airway when the person

- Is unconscious
- Has an obstructed airway
- Needs rescue breathing

For unresponsive adults and children, it is reasonable to open the airway using the head tilt chin lift manoeuvre. For lay rescuers performing compression-only CPR, there is insufficient evidence to recommend the use of any specific airway manoeuvre. However, the value of maintaining an unobstructed airway is recognised.

**Head tilt and chin lift:** Adults and Children (a child is defined as one year to eight years of age).

One hand is placed on the forehead or the top of the head. The other hand is used to provide the chin lift. The head is tilted backwards without placing your hand under the neck. It is important to avoid excessive force, especially where neck injury is suspected. Make sure that you are wearing barrier gloves.

The chin lift technique is commonly used in conjunction with a backward head tilt. The chin is held up by the rescuer’s thumb and fingers in order to open the mouth and pull the tongue and soft tissues away from the back of the throat. One technique involves placing the thumb over the chin below the lip and supporting the tip of the jaw with the middle finger and the index finger lying along the jaw line. Care is required to prevent the ring finger from compressing the soft tissues of the neck. The jaw is held open slightly and pulled away from the chest.
**Infants:** An infant is defined as younger than one year.

The upper airway in infants is easily obstructed because of the narrow nasal passages, the entrance to the windpipe (vocal cords) and the trachea (windpipe). The trachea is soft and pliable and may be distorted by excessive backward head tilt.

Therefore, in infants the head should be kept neutral and maximum head tilt should not be used. The lower jaw should be supported at the point of the chin with the mouth maintained open. There must be no pressure on the soft tissues of the neck. If these manoeuvres do not provide a clear airway, the head may be tilted backwards very slightly with a gentle movement.

**B: Breathing**

Normal breathing is essential to maintaining life. Victims who are gasping or breathing abnormally and are unresponsive require resuscitation.
Causes of absent or ineffective breathing:
- Direct depression of/or damage to the breathing control centre of the brain
- Upper airway obstruction
- Paralysis or impairment of the nerves and/or muscles of breathing
- Problems affecting the lungs
- Drowning
- Suffocation

Signs of ineffective breathing may include:
- Little or unusual chest movement
- Weak or abnormal breath sounds (wheezing, etc.)
- Occasional gasps
- Reduced responsiveness
- Anxiety
- Unusual skin colour (pallor)
- Rapid or slow breathing
- Unusual posture

How to check for breathing:
- **LOOK** for movement of the upper abdomen or lower chest
- **LISTEN** for the escape of air from nose and mouth
- **FEEL** for breath on the side of your face / movement of the chest and upper abdomen
- This should take you no longer than 10 seconds

Movement of the lower chest and upper abdomen does not necessarily mean the person has a clear airway. Impairment or complete absence of breathing may develop before the person loses consciousness.

If the unconscious victim is unresponsive and not breathing normally after the airway has been opened and cleared, the rescuer must immediately commence chest
compressions and then rescue breathing (CPR). Give 30 compressions and then two
breaths allowing about one second for each inspiration.

**Note:** If unwilling or unable to perform ventilations, rescuers should continue
compression-only CPR.

**Rescue breathing:**

- Kneel beside the victim’s head
- Maintain an open airway
- Take a breath, open your mouth as widely as possible and place it over the
  person’s slightly open mouth
- While maintaining an open airway, pinch the nostrils (or seal nostrils with
  rescuer’s cheek) and blow to inflate the person’s lungs.

Because the hand supporting the head comes forward some head tilt may be lost
and the airway may be obstructed. Pulling upwards with the hand on the chin helps
to reduce this problem.

For mouth to mouth ventilation, it is reasonable to give each breath in a short time
(one second) with a volume to achieve chest rise regardless of the cause of cardiac
arrest. Care should be taken not to over-inflate the chest. Look for rise of the chest
during each inflation.

**If the chest does not rise, possible causes are:**

- Obstruction in the airway (tongue or foreign material, or inadequate head tilt,
  chin lift)
- Insufficient air being blown into the lungs
- Inadequate air seal around mouth and or nose

If the chest does not rise, ensure correct head tilt, adequate air seal and ventilation.
After inflating the lungs, lift your mouth from the person’s mouth, turn your head
towards their chest and listen and feel for air being exhaled from the mouth and
nose.

Rescue breathing using universal precautions
**Mouth-to-nose:**

The mouth-to-nose method may be used -

- Where the rescuer chooses to do so
- Where the person’s jaws are tightly clenched
- When resuscitating infants and small children

The technique for mouth-to-nose is the same as for mouth-to-mouth except for sealing the airway. Close the mouth with the hand supporting the jaw and push the lips together with the thumb. Take a breath and place your widely opened mouth over the person's nose (or mouth and nose in infants) and blow to inflate the lungs. Lift your mouth from the person's nose. Look for the fall of the chest, and listen and feel for the escape of air from the nose and mouth. If the chest does not move, there is an obstruction, an ineffective seal, or insufficient air being blown into the lungs.

In mouth-to-nose resuscitation a leak may occur if the rescuer’s mouth is not open sufficiently, or if the person’s mouth is not sealed adequately. If this problem persists, use mouth-to-mouth resuscitation. If blockage of the nose prevents adequate inflation, the rescuer should use mouth-to-mouth resuscitation.

**Mouth-to-mask:**

Mouth-to-mask resuscitation is a method of rescue breathing which avoids mouth-to-mouth contact by using a resuscitation mask. Rescuers should take appropriate safety precautions when feasible and when resources are available to do so, especially if a person is known to have a serious infection (e.g. HIV, Tuberculosis, Hepatitis B virus, or Severe Acute Respiratory Syndrome SARS).

Position yourself at the person's head and use both hands to maintain an open airway and to hold the mask in place to maximise the seal. Maintain head tilt and chin lift. Place the narrow end of the mask on the bridge of the nose and apply the mask firmly to the face. Inflate the lungs by blowing through the mouthpiece of the mask with sufficient volume and force to achieve chest movement. Remove your mouth from the mask to allow exhalation. Turn your head to listen and feel for the escape of air. If the chest does not rise, recheck head tilt, chin lift and mask seal. Failure to maintain head tilt and chin lift is the most common cause of obstruction during resuscitation.

**Risks:**

No human studies have addressed the safety, effectiveness, or feasibility of using barrier devices to prevent person-to-rescuer contact during rescuer breathing. The risk of disease transmission is very low and need not deter rescue breathing without a barrier device. If available, rescuers should consider using a barrier device.
Effective CPR - 30 compressions followed by 2 breaths.

After airway opening, CPR is a repetitive cycle of:
- Chest compressions
- Rescue breathing

External chest compression is the most effective way of artificially circulating blood. Chest compressions are accompanied by rescue breathing which provides oxygen that the blood delivers around the body to its vital organs. This is the only way to keep the heart and brain oxygenated until a defibrillator arrives.

Recognition of the need for chest compressions:

First aiders should use unresponsiveness and absence of normal breathing to identify the need for resuscitation. Feeling for a pulse is unreliable and should not be performed to confirm the need for resuscitation.

Locating the site for chest compressions:

Perform chest compressions on the lower half of the sternum. Place the heel of the hand in the centre of the chest with the other hand on top. Avoid compression beyond the lower limit of the sternum. Compression applied too high is ineffective and if applied too low may cause regurgitation and/or damage to internal organs.

When not to perform CPR:

- When it is too dangerous to rescuers
- When there are obvious signs of death, for example rigor mortis
- When the casualty’s injuries are clearly too severe for survival

Complications:

Broken ribs are not uncommon during CPR. If this occurs, check your hand position and continue. You can reduce the chance of breaking ribs by placing your hands in the correct position and by avoiding excessive force during compressions. Broken ribs will decrease the effectiveness of chest compressions in generating blood flow, but this cannot always be avoided.

Reassessment:

If the casualty begins to show signs of life during CPR, reassess the breathing immediately. If the casualty is breathing, place them into the side stable position and monitor continuously.

When to stop CPR:

You must perform CPR without interruption until one or more of the following happens:
- The casualty recovers responsiveness and is able to breathe on their own
- You are placed at significant risk
- You cannot continue due to exhaustion
- Advanced help arrives and takes over the care of the casualty

**Compression-only CPR:**

If Rescuers are unwilling or unable to do rescue breathing, they should do chest compressions-only, although the outcome is lessened. If chest compressions-only are given, they should be continuous at a rate of 100 - 120 per minute.

**Risks:**

CPR should be initiated for presumed cardiac arrest without concerns of harm to persons not in cardiac arrest. If unsure, start CPR.

The risk of disease transmission during training and actual CPR performance is very low. A systematic review found no reports of transmission of Hepatitis B, Hepatitis C, Human Immunodeficiency Virus (HIV) or Cytomegalovirus (CMV) during either training or actual CPR.

If available, the use of a barrier device during rescue breathing is reasonable. After resuscitating a person, the rescuer should reassess and re-evaluate for resuscitation-related injuries.

**Method of compression:**

**Children and Adults:**

- Two hand technique is used for performing chest compressions in adults.
- Two or one hand technique is used to perform chest compressions on children under 8 years old.

Interrupts to chest compressions must be minimised. A person requiring chest compressions should be placed on their back on a firm surface (e.g. backboard or floor) before chest compressions to optimize the effectiveness of compressions.

Compressions should be rhythmic with equal time for compression and relaxation. The rescuer must avoid either rocking backwards and forwards, or using thumps or quick jabs. Rescuers should allow complete recoil of the chest after each compression.
Infants:

In infants the two-finger technique should be used by lay rescuers to minimise transfer time from compression to ventilation. The compression point is directly below an imaginary line across the nipples and in the midline of the chest. The rescuer places two fingers on this point and compresses the chest. Interruptions to chest compressions must be minimised.

Infants requiring chest compressions should be placed on their back on a firm surface (e.g. table or floor, or on the rescuer’s arm supported by their knee) to optimize the effectiveness of compressions. Compressions should be rhythmic with equal time for compression and relaxation. The rescuer must avoid either rocking backwards and forwards, or using thumps or quick jabs. Rescuers should allow complete recoil of the chest after each compression.

(Infant) 2-finger CPR

Depth of compression:

- The lower half of the sternum should be depressed approximately one third of the depth of the chest with each compression
- This should equate to more than 5cm in adults, approximately 5cm in children and 4cm in infants

Rate of chest compressions:

Rescuers should perform chest compressions for all ages at a rate of approximately 100 – 120 compressions per minute (almost two compressions per second). This does not imply that 100 - 120 compressions will be delivered each minute, since the number will be reduced by interruptions for breaths given by rescue breathing.

CPR quality:

When performing compressions, if feasible, change rescuers at least every two minutes, to prevent rescuer fatigue and deterioration in chest compression quality (particularly depth). Changing rescuers performing chest compressions should be done with minimal interruptions to the compressions.
**Pregnant women:**

Good quality, uninterrupted chest compressions as described above should be the immediate priority in all pregnant women who are unresponsive and not breathing normally. In noticeably pregnant women, standard CPR should be commenced immediately.

Once CPR is in progress, if there are sufficient resources available, rescuers should place padding such as a towel, cushion or similar object under the right hip to tilt the woman’s hips (approximately 15-30 degrees) to the left but leave her shoulders flat to enable good quality chest compressions.

The reason for this position in pregnant women is to move the weight of the pregnant uterus off of her major blood vessels in the abdomen. If a tilted position is not possible or tilting the hips compromises the quality of chest compressions, then chest compressions should be performed as described as above with the woman on her back.

**Risks:**

Rib fractures and other injuries are common but acceptable consequences of CPR. CPR should be initiated for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest.

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**D: Defibrillation - Automated External Defibrillator (AED)**

The importance of defibrillation has been well established as part of overall resuscitation, along with effective cardiopulmonary resuscitation (CPR). An Automated External Defibrillator (AED) must only be used for persons who are unresponsive and not breathing normally. With cardiac arrest, time-to-defibrillation is a key factor that influences a person’s chance of survival. A defibrillator should be applied to the person who is unresponsive and not breathing normally as soon as it becomes available so that a shock can be delivered if necessary.

Attach an **Automated External Defibrillator (AED)** if it is available and follow the instructions given by the AED.

There are several brands of AED’s available in NZ. They are all effective, but there are differences in their design and operation. If you have regular access to an AED, it is important that you familiarise yourself with its operation.

The heart is a muscle that pumps blood around the body. This function is achieved through a mechanical contraction of the heart initiated by a coordinated electrical stimulation from within the heart. When the rhythmic electrical activation of the heart becomes abnormal, the heart muscle contraction can become less effective.

Ventricular fibrillation (VF) is a catastrophic rhythm disturbance where electrical activation becomes uncoordinated. As a result, small parts of the heart muscle
contract rapidly and the heart stops effectively pumping blood to the brain, leading to a cardiac arrest.

Ventricular fibrillation is most commonly caused by a heart attack (a blocked artery within the heart), and is the leading cause of sudden death. People in VF lose responsiveness within 5-10 seconds, and without appropriate treatment this condition is fatal. CPR will keep some blood flowing to the brain, but it will not correct the ventricular fibrillation.

The only thing that will reliably stop VF and allow restoration of the normal coordinated electrical stimulation is a large electric shock. This procedure is called defibrillation. The chance that defibrillation will work is governed by time. For every minute of delay in receiving a defibrillating shock, a person’s chance of surviving the event decreases by about 10%.

An AED is a device that has been designed in a way that a person with little or no training can use it effectively and safely, to defibrillate a casualty within 60 seconds.

To operate an AED:

1. Turn the device on (there will be a clearly marked On/Off button)
2. Once the device is turned on, the device will start charging and provide audible prompts
3. Follow all the instructions given by the AED

Safety considerations:

Always keep in mind the following safety considerations:

- Do not touch patient when shocking, make sure everyone is clear
- Do not use the AED in flammable environments
- Do not use the AED on casualties who are lying in water
- Do not use the AED on casualties who are lying on metal surfaces.

Indications for use:
The AED should be used on all unresponsive casualties who are inadequately breathing or not breathing.

**Placement of pads:**

Effective pad placement ensures that a shock is delivered on an axis through the heart. Place pads on the exposed chest. One pad gets placed slightly below the collar bone on the person’s right chest and one pad on the person’s left side below the armpit.

Acceptable alternatives are where one pad is placed on the upper back between the shoulder blades and the other on the front of the chest (slightly to the left, if possible). In large-breasted individuals it is reasonable to place the left electrode pad lateral to the left breast to avoid breast tissue.

All pads have a diagram on the outer covering demonstrating the area suitable for pad placement. Pad-to-skin contact is important for successful defibrillation. Rescuers may need to remove moisture or excessive chest hair prior to the application of pads but emphasis must be on minimizing delays in shock delivery.

**Pad placement - Children and Infants:**

Ideally, for those under 8 years paediatric pads and an AED with a paediatric capability should be used. These pads also are placed as per the adult, and the pads come with a diagram of where on the chest they should be placed.

If the AED does not have a paediatric mode or paediatric pads, then it is reasonable to proceed with standard adult AED pads. Ensure the pads do not touch each other on the child’s chest. Apply the pad firmly to the bare chest in the anterior-lateral position (front). If the pads are too large and there is a danger of pad-to-pad arcing, use the front-back position: one pad placed on the upper back (between the shoulder blades) and the other pad on the front of the chest, if possible slightly to their left.

**Defibrillation Safety:**

Rescuers should follow the prompts. Care should be taken not to touch the person during shock delivery. There are no reports of harm to rescuers from attempting defibrillation in wet environments. In the presence of oxygen, there are no case
reports of fires caused by sparking when shocks were delivered using adhesive pads.

**Unconscious Person**

Before loss of consciousness, the person may experience yawning, dizziness, sweating, change from normal skin colour, blurred or changed vision, or nausea. Assess the collapsed person's response to verbal and tactile stimuli ('talk and touch'), ensuring that this does not cause or aggravate any injury.

This may include giving a simple command such as, “open your eyes; squeeze my hand; let it go". Then grasp and squeeze the shoulders firmly to elicit a response. A person who fails to respond or shows only a minor response, such as groaning without eye opening, should be managed as if unconscious.

The Australian and New Zealand Committee on Resuscitation (ANZCOR) recommends that in all emergencies, the rescuer should manage the unconscious person who is breathing normally as follows:

- Ensure the safety of both the person and the rescuer
- Assist the unconscious person to the ground and position on their side
- Ensure the airway is open
- Do not leave the person sitting in a chair nor put their head between their knees
- **Call an ambulance. In New Zealand, 📞 111**
- Promptly stop any bleeding
- Constantly re-check the person’s condition for any change

**Recognition and management of Upper Airway Obstruction:**

Airway obstruction may be partial or complete, and present in the conscious or the unconscious person. Typical causes of airway obstruction may include, but are not limited to:

- Relaxation of the airway muscles due to unconsciousness
- Inhaled foreign body
- Trauma to the airway
- Anaphylactic reaction (allergic reaction).

The symptoms and signs of obstruction will depend on the cause and severity of the condition. Airway obstruction may occur gradually or suddenly, and may lead to complete obstruction within a few seconds. As such the person should be observed continually.

In the conscious person who has inhaled a foreign body, there may be extreme anxiety, agitation, gasping sounds, coughing or loss of voice. This may progress to the universal choking sign, namely clutching the neck with the thumb and fingers.

Airway obstruction will cause the diaphragm muscle to work harder to achieve adequate ventilation/s. The abdomen will continue to move out but there will be loss
of the natural rise of the chest (paradoxical movement), and in-drawing of the spaces between the ribs and above the collar bones during inspiration.

**Partial obstruction can be recognised where:**
- Breathing is laboured
- Breathing may be noisy
- Some escape of air can be felt from the mouth

**Complete obstruction can be recognised where:**
- There may be efforts at breathing
- There is no sound of breathing
- There is no escape of air from nose and/or mouth

Airway obstruction may not be apparent in the non-breathing unconscious person until rescue breathing is attempted.

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**Foreign Body Airway Obstruction (Choking)**

A foreign body airway obstruction (FBAO) is a life-threatening emergency. Chest thrusts or back blows are effective for relieving FBAO in conscious adults and children.

Life threatening complications associated with use of abdominal thrusts have been reported in 32 case reports. Therefore, **the use of abdominal thrusts in the management of FBAO is not recommended** and, instead back blows and chest thrusts should be used. These techniques should be applied in rapid sequence until the obstruction is relieved.

The simplest way to assess severity of a FBAO is to assess for effective cough.

**Effective Cough (Mild Airway Obstruction)**
The person with an effective cough should be given reassurance and encouragement to keep coughing to expel the foreign material. If the obstruction is not relieved the rescuer should call an ambulance.

**Ineffective Cough (Severe Airway Obstruction)**

**Conscious person**
If the person is conscious send for an ambulance and perform up to five sharp, back blows with the heel of one hand in the middle of the back between the shoulder blades. Check to see if each back blow has relieved the airway obstruction. The aim is to relieve the obstruction with each blow rather than to give all five blows. An infant may be placed in a head downwards position prior to delivering back blows, i.e. across the rescuer's lap.

If back blows are unsuccessful the rescuer should perform up to five chest thrusts. To perform chest thrusts, identify the same compression point as for CPR and give up to five chest thrusts. The infant should be placed in a head downwards and on their back across the rescuer's thigh, while children and adults may be treated in the sitting or standing position.
With each chest thrust, check to see whether the airway obstruction has been relieved. The aim is to relieve the obstruction rather than deliver all five chest thrusts. If the obstruction is still not relieved and the person remains responsive, continue alternating five back blows with five chest thrusts.

**Unconscious person**
If the person becomes unresponsive a finger sweep inside the mouth can be used if solid material is visible in the airway. Call an ambulance and start CPR.

**The Secondary Survey**

The secondary survey is a systematic and thorough head-to-toe check (down the front and down the back) of the injured or ill casualty. It is performed after the primary assessment to identify any significant injuries. In an injured casualty, this is achieved through a body sweep, in an attempt to identify any obvious injuries such as fractures or bleeding.

The secondary survey is also useful to obtain information for more advanced medical assistance. Questioning techniques such as the medical acronyms ‘SAMPLE’ and ‘PQRST’ and the recording of vital signs can provide further information that may assist in the treatment of the casualty. These terms are discussed on the following page.

The secondary survey is also useful to obtain information for more advanced medical personal when they arrive. The assessment should not take any longer than 1–2 minutes. If the casualty is responsive, you need to talk to them and explain what you are doing. It should be undertaken only when the primary assessment has been completed and any issues resolved. **You need to record your findings and pass them on to the EMS staff during the handover.**

**Secondary survey procedure:**

- Always wear gloves. Systematically checking for blood / fluids on gloves as you progress through the secondary survey.
- Central nervous system: Talk to the casualty and assess their level of responsiveness.
- Starting at the casualty’s head: Look and feel for any deformity and tenderness. Check for fluid leaking from ears and nose.
- Neck: Look and feel for any deformity and tenderness. Consider the Mechanism Of Injury (‘MOI’), and any neck or spinal injury.
- Chest: Look and feel for any deformity and tenderness. Look for equal rise and fall of the chest, and for any obvious bruising.
- Back: Look and feel for any deformity and tenderness
- Abdomen and pelvis: Look and feel for any deformity and tenderness.
- Extremities (arms and legs): Look and feel for any deformities. Check for strength by asking the casualty to squeeze your hands or push your hands with their feet.
- Checking and recording of any vital signs
**Information gathering:**

As part of the secondary assessment in medical related incident this will involve questioning and the recording of vital signs. Good questioning enables you to gather information that may be useful for EMS staff.

**Note:** This may be the last opportunity to obtain this information (should the casualty become unresponsive).

**Managing a responsive casualty:**

- Undertake the primary assessment
- Call for assistance. Make sure an ambulance is coming
- Position the casualty in the most comfortable position for them, or stable side position if unresponsive and breathing normally
- Undertake the secondary assessment **PQRST** and **SAMPLE** questioning
- Encourage/ assist the casualty to administer their medicines (if required)
- Rest and reassure

**Questioning:**

There are two key questioning methods: **PQRST** and **SAMPLE**. It is good practice to write notes so that the information can be relayed to EMS staff.

**P** Promotes or alleviates. Does anything make the pain better or worse?

**Q** Quality. Can you describe what the pain feels like e.g. dull, sharp, crushing or throbbing?

**R** Region / radiates. Where is the pain? Does it go anywhere else?

**S** Severity. On a scale of 1-10, how would you rate the pain?

**T** Time. How long have you had the pain?

**S** Signs and symptoms.

**A** Allergies. Are you allergic to anything?

**M** Medications. Are you on any medication, when and how long ago did you take it?

**P** Past history. Do you have any medical conditions, has this happened before?

**L** Last meal. When did you last eat or drink?

**E** Events prior to incident. What happened? What were you doing?

**Vital signs:**

It is very important to have a clear understanding of the casualty’s vital signs and to know what they mean, and what the possible consequence are to any change to these vital signs. First aiders should check and record:
- **Respirations** - how many times per minute the patient breathes, laboured or normal.
- **Pulse** - how many times the heart beats per minute, weak or strong, regular or irregular?
- **Temperature** - what is the temperature of the casualty?
- **Pupils** - the pupils can tell a lot about how the brain is functioning. Both pupils should be roughly equal in size and reactive to light.

When a light is directed into the pupil, a normal functioning pupil should instantly constrict, and dilate again once the light is removed. Consider medical reasons for abnormal constriction and dilation or unequal pupil size.

A **normal** pupil in a fit and healthy person ranges from **3.0mm to 6.5mm**. Any abnormal change in pupil size can occur as a result of:

- Medications
- Drugs
- Toxins (poisons)
- Head trauma
- Stroke

**Vital signs – Ranges:**

<table>
<thead>
<tr>
<th></th>
<th>Respiration</th>
<th>Pulse</th>
<th>Temperature</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>12-20 rpm</td>
<td>60-80  bpm</td>
<td>37</td>
<td>120/80 mmHg</td>
</tr>
<tr>
<td>Child</td>
<td>20-30 rpm</td>
<td>60-100 bpm</td>
<td>37</td>
<td>100/65 mmHg</td>
</tr>
<tr>
<td>Infant</td>
<td>30-40 rpm</td>
<td>100-160 bpm</td>
<td>37</td>
<td>95/65 mmHg</td>
</tr>
</tbody>
</table>

**External Bleeding**

Usually external bleeding can be controlled by the application of pressure on or near the wound to stop further bleeding until help arrives. The main aim is to reduce blood loss from the victim. The use of **direct pressure** is usually the fastest, easiest and most effective way to stop bleeding.

However, in some circumstances, **indirect pressure** may be used. Other methods should be used if direct pressure does not control severe bleeding. There is no
evidence that elevation of a bleeding part aids control of bleeding and there is the potential to cause more pain or injury.

If there is an obvious embedded object, use indirect pressure.

**Management:**

- Use standard precautions (e.g. gloves, protective glasses) if readily available.
- Attempt to stop the bleeding by applying sustained direct or indirect pressure on or near the wound as appropriate.
- Lie the patient down if bleeding from the lower limb or severe bleeding.
- If severe bleeding is not controlled by above measures, use a ‘haemostatic dressing’ if available and if trained in its use.
- If severe bleeding not controlled by above measures, use a tourniquet above bleeding point if available and trained in its use.
- Call an ambulance.
- If the victim is unresponsive and not breathing normally, follow the Basic Life Support protocol.

The need to control the bleeding is paramount. The risks associated with the use of haemostatic dressings or a tourniquet are less than the risk of uncontrolled severe bleeding, though these are temporizing measures and transfer to hospital remains of high importance.

**Direct Pressure Method**

**Where the bleeding point is identified, control bleeding by applying pressure as follows:**

- Apply firm, direct pressure sufficient to stop the bleeding.
- Apply pressure using hands or a pad ensuring that sufficient pressure is maintained and that the pressure remains over the wound. If bleeding continues, apply another pad and a tighter dressing over the wound.

**To assist in controlling bleeding, where possible:**

- [Image of hands applying pressure to a wound]
- Restrict movement
- Immobilise the part
- Advise the victim to remain at total rest. If bleeding continues it may be necessary to remove the pad(s) to ensure that a specific bleeding point has not been missed.

The aim is to press over a small area and thus achieve greater pressure over the bleeding point. For this reason, an unsuccessful pressure dressing may be removed to allow a more direct pressure pad and dressing on the bleeding location.

**Tourniquet**

**Tourniquets should only be used for life threatening bleeding from a limb that cannot be controlled by direct pressure!**

A wide bandage (of at least 5cm) can be used as a tourniquet 5-7 cm above the bleeding point. The bandage should be tight enough to stop all circulation to the injured limb and control the bleeding. The time of application must be noted and passed on to emergency / ambulance personnel.

Once applied, the victim requires urgent transfer to hospital and the tourniquet should not be removed until the victim receives specialist care. A tourniquet should not be applied over a joint or wound, and must not be covered up by any bandage or clothing.

**Indirect Pressure Methods Embedded Objects**

- Do not remove the embedded object because it may be plugging the wound and restricting bleeding.
- Place padding around or above and below the object and apply pressure over the pads.

**Internal Bleeding**

Recognition of internal bleeding may be difficult to recognise, but should always be suspected where there are symptoms and signs of shock.

It includes bruising, haematomas and the internal bleeding associated with fractures.

Severe bleeding may occur from complications of pregnancy.

**Symptoms and signs may include:**

- Pain, tenderness or swelling over or around the affected area.
- The appearance of blood from a body opening, e.g. bright red and/or frothy blood coughed up from the lungs or vomited blood which may be bright red or dark brown “coffee grounds”
- Blood-stained urine
- Vaginal bleeding or bleeding from the penis
- Rectal bleeding which may be bright red or black and “tarry”
Management

Internal bleeding may be life-threatening and requires urgent treatment in hospital.

- Call an ambulance.

Nose Bleed (Epistaxis)

- Pressure must be applied over the soft part of the nostrils, below the bridge of the nose
- The victim should lean with the head forward to avoid blood flowing down the throat
- The victim should remain seated at total rest for at least 10 minutes. On a hot day or after exercise, it might be necessary to maintain pressure for at least 20 minutes
- If bleeding continues for more than 20 minutes seek medical assistance

Closed Bleeding - Limbs:

If bruising to a limb and no external bleeding, use cold pack and pressure

Management of All Bleeding

Apply the following measures until ambulance arrival:

- Reassure the victim
- Assist victim into position of comfort
- Monitor the signs of life at frequent intervals
- Administer oxygen if available and trained to do so
- Do not give anything orally, including medications and/or alcohol

Shock

Shock is a medical emergency in which the organs and tissues of the body are not receiving an adequate flow of blood. This deprives the organs and tissues of oxygen (carried in the blood) and allows the build-up of waste products.

The most common cause of shock you may encounter is caused by severe blood loss (Hypovolemic shock). **Shock can easily lead to death if the cause is not treated urgently.**

Five main types of shock:

- Cardiogenic shock (problems associated with the heart's functioning)
- Hypovolemic shock (the total volume of blood available to circulate is low)
- Anaphylactic shock (caused by a severe allergic reaction)
Septic shock (caused by overwhelming infection, usually by bacteria)  
Neurogenic shock (caused by damage to the nervous system from a spinal cord, injury or neurological disorder)

**Typical causes of shock include:**

Loss of circulating blood volume, which can result from

- Severe bleeding
- Major or multiple fractures
- Major trauma
- Severe burns or scalds
- Severe diarrhoea and vomiting
- Severe sweating and dehydration (heat stroke)
- Heart disorders
- Anaphylactic reaction
- Severe brain / spinal cord injury

**Signs and symptoms of shock:**

- Rapid weak pulse
- Pallor, cold, clammy, sweaty skin
- Nausea or vomiting
- Thirst
- Altered level of responsiveness

**Management:**

- Place the victim in the supine position
- If victim is unconscious, place victim in the stable side position
- Control any bleeding promptly
- Call an ambulance

**Administer treatments relevant to the cause of the shock:**

- Administer oxygen if available and trained to do so.
- Maintain body temperature (prevent hypothermia)
- Reassure and constantly re-check the victim’s condition for any change
- If the victim is unresponsive and not breathing normally, follow the Basic Life Support sequence

**Positioning of victims with shock:**

- Place individuals with shock in the supine position as opposed to the upright position.
- For individuals with shock who are in the supine position and with no evidence of trauma, the use of PLR (passive leg raise) may provide a transient (less than 7 minutes) improvement.
- Because improvement with PLR is brief and its clinical significance uncertain, after a few minutes revert to using the supine position without leg raising for victims in shock.
Fractures

Fractures in a pre-hospital environment rarely need splinting. The most important focus in fracture management is to effectively treat any associated external bleeding and to perform the primary survey. Significant blood loss can occur from fractures and bleeding can be internal.

**Types of fractures:**

**Open fractures** - These are fractures that have punctured the skin. The bone end may have returned and not be visible, but this is still an open fracture.

**Closed fractures** - These are fractures where the surrounding skin remains intact.

**Complicated fractures** - These are fractures that have caused damage to internal structures, such as a punctured lung, or a fracture that involves significant bleeding.

**Signs and symptoms:**

A casualty experiencing a fracture may experience one or more of the following signs and symptoms -

- Pain at the injury site
- Bleeding (internal or external)
- Open wounds with or without exposed bone ends
- Deformity
- Shortening or rotation of the limb
- Inability to move or stand
- The casualty reports hearing the bone break
- Tenderness
- Swelling or irregularity
- Shock like signs and symptoms
- Crepitus (the sound of bones grinding)
- Discolouration
- Shortening of the limb

**Management:**

The steps for the management of fractures are:

- Carry out primary assessment, DRS ABCD
- Seek medical attention (make sure EMS staff are underway)
- Control any external bleeding using direct pressure and elevation if possible.
- For a closed fracture, ice packs may be used to assist with pain relief and swelling
- Minimise any unnecessary movement unless for safety reasons
- If the injured limb needs to be immobilised, make use of whatever you have got at hand to do so e.g. pillows, magazines, or dressings to support the limb
- Check the circulation below the fracture site
- Carry out secondary assessment
- Rest and reassure

**Note:** In general, first aid providers should not move or try to straighten an injured extremity. Based on training and circumstance (such as remote distance from EMS or wilderness settings, presence of restriction of circulation), some first aid providers may need to move an injured limb or person.

In such situations, providers should protect the injured person, including splinting in a way that limits pain, reduces the chance for further injury, and facilitates safe and prompt transport.

If an injured extremity is blue or extremely pale, activate EMS immediately!

### Soft Tissue Injury (Sprains & Strains)

Ligaments and tendons are soft tissues that connect muscle and bones together. They can be damaged as a result of forceful joint movements and/or external pressure on the body. Sprains and strains can limit movement by causing pain and swelling in the area of injury. More serious underlying injuries can be present, for example fractures or tendon ruptures.

#### Signs and symptoms

A casualty experiencing a soft tissue injury may display one or more of the following signs and symptoms:

- Pain in the area of injury
- Lack of, or limited movement
- Inability to bear weight
- Swelling
- Tenderness
- Bruising

#### Management:

- Carry out primary assessment, DRS ABCD
- Seek medical attention (make sure EMS staff are underway)
- Remove constrictive clothing or jewellery
- Apply the RICED technique. ACC has specific guidelines on how to deal with sprains and strains. This is simplified with the acronym RICED:

  **R** Rest. Stop the activity
  **I** Ice. For up to 20 min
  **C** Compression. To reduce the swelling
  **E** Elevation
  **D** Diagnose. Soft tissue injuries may be referred to a doctor in order to identify any potential fracture/s.
Soft-tissue injuries include joint sprains and muscle contusions (bruises). Cold application decreases haemorrhage, swelling, pain, and disability and it is reasonable to apply cold to a soft-tissue injury. Cooling is best accomplished with a plastic bag or damp cloth filled with a mixture of ice and water; the mixture is better than ice alone. Refreezable gel packs do not cool as effectively as an ice-water mixture.

To prevent cold injury, limit each application of cold to periods of 20 minutes. If that length of time is uncomfortable, limit application to 10 minutes.

**Place a barrier, such as a thin towel, between the cold container and the skin.**

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**Concussion**

This is a temporary loss or altered level of consciousness occurring after a head injury or impact to the skull area. Casualties who subsequently show a decline in conscious level may be suffering from a more serious brain injury, requiring urgent medical attention.

The signs and symptoms of concussion (mild traumatic brain injury) are complex.

**The classic signs of concussion after head trauma include:**

- Feeling stunned or dazed
- Headache
- Nausea
- Dizziness and unsteadiness (difficulty in balance)
- Visual disturbance
- Confusion, or loss of memory (from either before or after the injury)

The various grades and combinations of these symptoms make the recognition of concussion difficult. Furthermore, changes may be subtle and yet progressive.

**Note:** First aid providers are often faced with the decision as to what advice to give to a person after minor head trauma, and it is now widely recognized that an incorrect decision can have long-term serious or even fatal consequences!

Any person with a head injury that has resulted in a change in level of consciousness, has progressive development of signs or symptoms as described above, or is otherwise a cause for concern should be evaluated by a healthcare provider or EMS staff as soon as possible.

Using any mechanical machinery, driving, cycling, or continuing to participate in sports after a head injury should be deferred by these individuals until they are assessed by a healthcare provider and cleared to participate in those activities.
Head Injury

Head injury may be caused by a number of mechanisms including, falls, assaults, motor vehicle crashes, sporting injuries and, less commonly, penetrating injuries. A victim may sustain a significant head injury without loss of consciousness or loss of memory (amnesia). Therefore, loss of consciousness or memory loss should not be used to define the severity of a head injury or to guide management. The initial first aid for a victim with head injury includes assessing and managing the airway and breathing, whilst caring for the neck until expert help arrives.

The serious consequences of not recognising concussion in the first aid environment warrants advising all victims who have sustained a head injury, regardless of severity, to seek assessment by a health care professional or at a hospital.

Recognition

A brain injury should be suspected if the victim has a reported or witnessed injury, has signs of injury to the head or face such as bruises or bleeding, or is found in a confused or unconscious state.

A victim may have a brain injury without external signs of injury to the head or face. Serious problems may not be obvious for several hours after the initial injury.

Management:

- Call an ambulance if there has been a loss of consciousness or altered consciousness at any time, no matter how brief
- A victim who has sustained a head injury, whether or not there has been loss of consciousness or altered consciousness, should be assessed by a health care professional
- Check for response
- Ensure that the airway is clear
- Protect the neck whilst maintaining a clear airway
- Identify and control any significant bleeding with direct pressure if possible.

All victims who appear to have suffered a head injury (including a minor head injury) should be assessed by a health care professional before continuing with sport or other activity. If the victim is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support sequence.

Spinal Injury

The spine is made up of 33 separate bones, known as vertebrae, extending from the base of the skull to the coccyx (tailbone). Each vertebra surrounds and protects the spinal cord (nerve tissue). Fractures or dislocations to the vertebral bones may result in injury to the spinal cord. The direct mechanical injury from the traumatic impact can compress or sever the nerve tissue. This is followed by secondary injury caused
by ongoing bleeding into the spinal cord as well as continued swelling at the injured site and surrounding area.

The possibility of spinal injury must be considered in the overall management of all trauma victims. The risk of worsening the spinal injury in the prehospital period is probably less than previously thought, yet to minimise the extent of the secondary injury, caution must be taken when moving a victim with a suspected spinal injury.

**Spinal injuries can occur in the following regions of the spine:**

- The neck (cervical spine)
- The back of the chest (thoracic spine)
- The lower back (lumbar spine)

The cervical spine is most vulnerable to injury, which must be suspected in any victim with injuries above the shoulders. More than half of spinal injuries occur in the cervical region. Suspected spinal injuries of the neck, particularly if the victim is unconscious, pose a dilemma for the rescuer because correct principles of airway management often cause some movement of the cervical spine.

**Recognition**

The most common causes of spinal cord injury are:

- A motor vehicle, motorcycle or bicycle incident as an occupant, rider, or pedestrian
- An industrial accident (i.e. workplace)
- A dive or jump into shallow water or water with obstacles, or being "dumped" in the surf
- A sporting accident (e.g. rugby, falling from a horse)
- A fall from greater than a standing height (e.g. ladder, roof)
- Falls in the elderly population
- A significant blow to the head
- A severe penetrating wound (e.g. gunshot)

**The symptoms and signs of a spinal injury depend on two factors:**

Firstly, the location of the injury and secondly, the extent of the injury – whether there is just bone injury or associated spinal cord injury, and whether the spinal cord injury is partial or complete. It will be difficult to elicit symptoms and signs in victims with an altered conscious state.

**Symptoms:**

- Pain in the injured region
- Tingling, numbness in the limbs and area below the injury
- Weakness or inability to move the limbs (paralysis)
- Nausea
- Headache or dizziness
- Altered or absent skin sensation

**Signs:**

- Head or neck in an abnormal position
- Signs of an associated head injury
- Altered conscious state
- Breathing difficulties
- Shock
- Change in muscle tone, either flaccid or stiff
- Loss of function in limbs
- Loss of bladder or bowel control
- Priapism (erection in males)

**Management:**

The priorities of management of a suspected spinal injury are -

- Calling for an ambulance
- Management of airway, breathing and circulation
- Spinal care

An awareness of potential spinal injury and careful victim handling, with attention to spinal alignment, is the key to harm minimisation.

**The Conscious Victim:** Tell the victim to remain still but do not physically restrain if uncooperative. Those with significant spinal pain will likely have muscle spasm which acts to splint their injury. Keep victim comfortable until help arrives. If it is necessary to move the victim from danger (e.g. out of the water, off a road), care must be taken to support the injured area and minimise movement of the spine in any direction.

Ideally, only first aid providers or health care professionals trained in the management of spinal injuries, aided by specific equipment, should move the victim.

**The Unconscious Victim:** Airway management takes precedence over any suspected spinal injury. It is acceptable to gently move the head into a neutral position to obtain a clear airway. If the victim is breathing but remains unconscious, it is preferable that they be placed in the stable side position.

The victim should be handled gently with no twisting. Aim to maintain spinal alignment of the head and neck with the torso, both during the turn and afterwards. In victims needing airway opening, use manoeuvres which are least likely to result in movement of the cervical spine. Jaw thrust and chin lift should be tried before head tilt.
Open Chest Wound

An open chest wound occurs when the chest wall is punctured by a penetrating object. Air can be sucked into the chest cavity (Pneumothorax), which may cause the lung to collapse. If air continues to enter the chest space faster than it can escape, then the rising pressure can force the collapsed lung to press on the heart and the other lung.

It can be difficult to identify when a penetrating wound to the chest is sucking air or not, so it's best to assume any penetrating wound to the chest is a sucking chest wound.

**Note:** a sucking chest wound is a life threatening critical incident and requires immediate medical assistance.

**Signs and symptoms:**

- Obvious trauma to chest (gun shot or stabbing)
- Pink frothy blood oozing out
- Difficulty breathing
- Unequal chest (one side looks different to the other)
- Veins on the neck bulging
- Blue lips, neck or fingers (cyanosis)
- No lung sounds on one side
- Severe shortness of breath

**Management:**

A first aid provider caring for an individual with an open chest wound may leave the wound open.
If a dressing and direct pressure are required to stop bleeding, care must be taken to ensure that a blood-saturated dressing does not inadvertently become ‘occlusive’ (completely blocking the wound).

The improper use of an occlusive dressing or device for open chest wounds may lead to development of an unrecognized life-threatening ‘tension pneumothorax’.

A pneumothorax is an abnormal collection of air or gas in the chest that causes an uncoupling of the lung from the chest wall. A pneumothorax may interfere with normal breathing. It is often called collapsed lung.

The application of an occlusive dressing or device by first aid providers for individuals with an open chest wound is not recommended.

Burns

A burn is an injury caused by heat, cold, electricity, chemicals, gases, friction and radiation (including sunlight). A significant burn for the purpose of this document includes:

- Burns greater than 10% of total body surface area (TBSA)
- Burns of special areas - face, hands, feet, genitalia, perineum, and major joints
- Full-thickness burns greater than 5% of TBSA
- Electrical burns
- Chemical burns
- Burns with an associated inhalation injury
- Circumferential burns of the limbs or chest
- Burns in the very young or very old
- Burns in people with pre-existing medical disorders that could complicate management, prolong recovery, or increase mortality
- Burns with associated trauma

All infants and children with burns should be medically assessed.

Initial approach:

- Ensure safety for rescuers, bystanders and the victim
- Do not enter a burning or toxic atmosphere without appropriate protection
- Stop the burning process:
  - Stop, Drop, Cover and Roll. Smother any flames with a blanket.
- Move away from the burn source to a safe environment as soon as possible
- Assess the adequacy of airway and breathing
- Check for other injuries
- If safe, and if trained to do so, give oxygen to all victims with smoke inhalation or facial injury, following The Use of Oxygen in Emergencies.
- Call for an ambulance
The aims of first aid treatment of burns should be to stop the burning process, cool the burn and cover the burn. This will provide pain relief and minimize tissue loss.

**Heat / Thermal / Contact Burns:**

- These include flame, scald, blast (hot gas), inhalation injury and direct heat contact
- IMMEDIATELY cool burns with cool running water - cooling for 20 minutes
- If possible, remove all rings, watches, jewellery or other constricting items from the affected area without causing further tissue damage
- Remove wet, non-adherent clothing as clothing soaked with hot liquids retains heat
- Cover the burnt area with a loose and light non-stick dressing, preferably clean, dry, lint free (non-fluffy) material e.g. plastic cling-film like Gladwrap™
- Cover unburnt areas and keep the rest of the victim warm to reduce the risk of hypothermia
- Where feasible elevate burnt limbs to minimise swelling

**DO NOT** peel off adherent clothing or burning substances

**DO NOT** use ice or ice water to cool the burn as further tissue damage may result

**DO NOT** break blisters

**DO NOT** apply lotions, ointments, creams or powders other than hydrogel

**Inhalation Burns:**

Always assume inhalation injury if there are burns to the face, nasal hairs, eyebrows or eyelashes, or if there is evidence of carbon deposits in the nose or mouth. Coughing of black particles in sputum, hoarse voice and/or breathing difficulties may indicate damage to the airway.

An inhalation burn should be suspected when an individual is trapped in an enclosed space for some time with hot or toxic gas, steam or fumes produced by a fire, chemicals etc. An inhalation injury may result from irritant gases such as ammonia, formaldehyde, chloramines, chlorine, nitrogen dioxide and phosgene. These agents produce a chemical burn and an inflammatory response.

Do not assume the burn victim is stable following an inhalation injury simply because the victim is breathing, talking and able to get up.

Some agents produce delayed pulmonary inflammation which may develop up to 24 hours later.

- Remove to fresh air
- Assess and manage the airway
- Give oxygen if available and trained to do so
- Call for an ambulance
**Electrical Burns:**

Electrical burns, including lightning strike, are often associated with other injuries including involvement of the cardiac and respiratory systems, loss of consciousness and trauma.

The priorities in the management of the electric shock victim are to -

- Isolate / turn off the power supply without touching the victim
- Commence cardiopulmonary resuscitation if required following the Basic Life Support sequence
- Cool burns if safe to do so, with cool running water for 20 minutes
- Give oxygen if available and trained to do so
- Call an ambulance. Lightning may cause cardiac arrest
- Commence cardiopulmonary resuscitation if required following the Basic Life Support sequence

**Radiation Burns:**

Radiation burns may be caused by solar ultraviolet radiation (sunburn), welder’s arc, lasers, industrial microwave equipment and nuclear radiation.

- Cover radiation burns with a clean, dry dressing to prevent infection

**Chemical Burns:**

Government regulations on hazardous substances and work, health and safety require the manufacturer or importer of a hazardous chemical to prepare a safety data sheet (SDS) for the chemical.

A supplier must provide a SDS to a workplace at the time of first supply or upon request. These SDS’s provide first aid information specific to each chemical and include information relevant to eye contact, skin contact, inhalation and ingestion. The aim of first aid for chemical burns is not to cool the burn but to dilute the chemical.

- Avoid contact with any chemical or contaminated material, using appropriate personal protection equipment
- Remove the victim to a safe area
- Remove the chemical and any contaminated clothing and jewellery as soon as practical
- Brush powdered chemicals from the skin
- Without spreading the chemical to unaffected areas, IMMEDIATELY run cool running water directly onto the area for one hour or until the stinging stops.
- Apply a non-adherent dressing even if no burn mark is obvious
- If chemical enters the eye, open and flush the effected eye(s) thoroughly with water for as long as it can be tolerated and refer the victim for urgent medical attention. If only one eye is affected, then flush with the head positioned so as the affected eye is down to avoid spread of the chemical to the unaffected
eye. The flushing of the eye is more important than immediate transfer for medical care.

- Refer to instructions on the container for further specific treatment
- If available, in hard copy or on the internet, refer to Safety Data Sheets (SDS) for specific treatment
- Call the Poisons Information Centre for further advice. DO NOT attempt to neutralise either acid or alkali burns, because this will increase heat generation which may cause more damage. DO NOT apply cling wrap or hydrogel dressings to chemical burns.

**Trauma – Crushed Victim**

Crush injuries may result from a variety of situations, including vehicle entrapment, falling debris, industrial accident or by prolonged pressure to a part of the body due to their own body weight in the case of an immobile victim.

**Crush syndrome** refers to the multiple problems that may subsequently develop, most commonly as a result of crush injuries to the limbs, particularly the legs.

Crush syndrome results from disruption of the body’s chemistry and can result in kidney, heart and other problems. The likelihood of developing acute crush syndrome is directly related to the compression time, therefore victims should be released as quickly as possible, irrespective of how long they have been trapped.

**Management:**

- Ensure the scene is safe, and that there is no risk of injury to the rescuer or bystanders
- Call an ambulance
- If it is safe and physically possible, all crushing forces should be removed from the victim as soon as possible
- A victim with a crush injury may not complain of pain, and there may be no external signs of injury. All victims who have been subjected to crush injury, including their own body weight, should be taken to hospital for immediate investigation
- Keep the victim warm, treat any bleeding
- Continue to monitor the victim’s condition
- If the victim becomes unresponsive and is not breathing normally, follow the Basic Life Support sequence if possible
- DO NOT leave the victim except if necessary to call an ambulance
- DO NOT use a tourniquet for the first aid management of a crush injury

**NOTE:** Crushing force applied to the head, neck, chest or abdomen can cause death from breathing failure or heart failure so must be removed promptly.

Although the victim may appear to be alert and not distressed, there is a risk of deterioration so ongoing reassessment of the victim’s condition is essential.
Drowning is the process of experiencing respiratory impairment from submersion / immersion in liquid. Drowning outcomes are classified as death, morbidity and no morbidity – the latter two now referred to as “non-fatal drownings”.

The most important consequence of drowning is interruption of the oxygen supply to the brain. Early rescue and resuscitation by trained first responders or first aiders at the scene offer the victim the best chance of survival.

**Possible sequence of events:**

- Immersion of the face in water (or other liquid). Water entering the mouth is spat out, swallowed or aspirated.
- Breath-holding, usually lasting no more than a minute.
- Vigorous breathing efforts. These may continue, even after loss of consciousness. Some amount of water is aspirated into the airways causing coughing and sometimes laryngeal spasm, which temporarily prevents further water entering the lungs.
- Swallowing of air and water, often in large amounts. This usually causes vomiting or regurgitation of stomach contents, which may be aspirated into the lungs.
- Respiratory impairment causes brain hypoxia, leading to unconsciousness and cessation of breathing efforts.
- The heart rate initially increases with exercise and panic. With hypoxia, the heart rate and blood pressure begin to fall, progressing finally to a cardiac arrest, requiring CPR.

**Management:**

- Remove the victim from the water as soon as possible but do not endanger your own safety. Throw a rope or something to provide buoyancy to the victim. Call for help; plan and effect a safe rescue.
- In minor incidents, removal from the water is often followed by coughing and spontaneous resumption of breathing.
- In more serious incidents, assess the victim. If unconscious or not breathing normally, commence resuscitation.
- Assess the victim on the back with the head and the body at the same level, rather than in a head down position. This decreases the likelihood of regurgitation and vomiting and is associated with increased survival.
- The victim should not be routinely rolled onto the side to assess airway and breathing. Assessing the airway of the victim without turning onto the side (i.e. leaving the victim on the back or in the position in which they have been found) has the advantage of taking less time to perform and avoids movement.
- The exceptions to this would be where the airway is obstructed with fluid (water or blood) or particulate matter (sand, debris, vomit). In this instance the victim should be promptly rolled onto the side to clear the airway. The mouth
should be opened and turned slightly downwards to allow any foreign material to drain using gravity

- Vomiting and regurgitation often occur during the resuscitation of a drowned victim. If the victim has been rolled to the side to clear the airway, then reassess their condition. If breathing commences, the victim can be left on the side with appropriate head tilt. If not breathing normally, the victim should be promptly rolled onto the back and resuscitation recommenced as appropriate.

- Avoid delays or interruptions to CPR
- Do not empty a distended stomach by applying external pressure. Do not attempt to expel or drain clear water or frothy fluid that may re-accumulate in the upper airway during resuscitation
- Victims who appear to have been successfully rescued and resuscitated require close monitoring to detect a relapse into cardiopulmonary arrest. This can occur in the minutes or hours following return of spontaneous circulation and breathing, due to persisting lung damage and hypoxic injury to the heart.
- Call an ambulance for all victims of an immersion event, even if seemingly minor or the victim appears recovered.

**Oxygen:** The administration of oxygen is beneficial in the resuscitation of drowned victims, but resuscitation efforts should not be delayed while waiting for oxygen equipment to become available.

**Medical conditions leading to sudden incapacitation in the water:**

Not all water related deaths are primary drowning. Sudden incapacitation leading to swim failure, unconsciousness and subsequent water in the airway can occur due to heart attacks, cardiac rhythm disturbances, seizure disorders, hyperventilation, drugs and alcohol, dementia, frailty and other conditions causing loss of consciousness, e.g. low blood sugar in a diabetic. These conditions should be suspected in known competent swimmers found drowned unexpectedly. In some victims these medical conditions can be aggravated by the shock of sudden immersion in cold water.

**Spinal injuries occurring in the water:**

Spinal injury occurring concurrently with drowning is rare, estimated at less than 0.5% but should be suspected if the victim dived into shallow water, is found in an area of dumping surf, rocks or after an accident involving a boat or other aquatic craft.

Remove the victim from the water taking care to keep the airway clear of wave splash while minimising movement of the spine in any direction. Airway management takes precedence over a suspected spinal injury and an unconscious, non-breathing victim should be removed immediately from the water by whatever means possible.

**Concurrent hypothermia:**

There is no evidence that drowning in colder water has an increased survival rate compared with warmer water, yet the literature yields many case reports of successful outcomes of victims rescued from icy waters, even after prolonged
resuscitation efforts. Hypothermia is more likely due to prolonged immersion time and ongoing cooling during resuscitation at the scene, in a wet, open environment.

**In-water resuscitation**

In-water resuscitation may improve survival of victims who are in the initial stages of the drowning sequence but delays time to full assessment and CPR.

Remove the victim from the water as soon as possible, and only begin in-water rescue breathing if immediate removal from the water is delayed or impossible. Rescue breathing in deep water requires an appropriately trained rescuer and floatation aid such as a rescue board, tube or buoyancy vest. In water, chest compressions are ineffective and should not be attempted.

**Use of the AED**

If available, the AED should be attached and the prompts followed. Dry the victim’s chest before applying pads. Although the rhythm deterioration in drowning is usually to a non-shockable rhythm, the AED may be lifesaving in ~ 6% of drowning victims who, on initial assessment, are found to have a shockable cardiac rhythm.

**Compression-only CPR.** The primary cause of cardiac arrest in drowning is a lack of breathing. Compression-only CPR circulates oxygen-poor blood and fails to address the victim’s need for immediate ventilation. It is not the recommended resuscitation method in a victim of drowning and should only be used temporarily if the rescuer is unable or unwilling to perform rescue breathing before the arrival of a barrier device, face mask or bag-valve-mask device.
Medical Emergencies Overview

Management of medical emergencies

This section will equip you with the knowledge and skills to assist in providing First Aid care to casualties with specific medical conditions. The following medical conditions are frequently seen in a pre-hospital setting:

- Diabetes
- Heart attack
- Angina
- Stroke
- Seizure
- Asthma
- Severe allergic reactions (anaphylaxis)

Why you need to know this:

These are the most common conditions that you may encounter, therefore it is very important that you have a good knowledge of how to deal with them. One of the roles of the first aider is to prevent the deterioration of the casualty’s condition as much as possible, while waiting for more advanced medical assistance.

Diabetes

Diabetes is a disease which causes the body to insufficiently use glucose (sugar). Insulin is a hormone that the pancreas produces to move glucose around the body. In diabetes, the pancreas does not make enough, or cannot properly use insulin. This condition can lead to the body having too little sugar (Hypoglycaemia), or too much sugar (Hyperglycaemia) in the blood.

A diabetic casualty might have special blood sugar monitoring equipment. Some diabetic casualties can regulate their condition through diet alone, while others take regular medication or get insulin injections. In an emergency, it can be difficult or impossible for the first aider to diagnose whether a diabetic has too much or too little blood sugar.

Too little sugar is life threatening, and casualties respond almost immediately when you give sugar or a sugary food (or drink) to a responsive casualty. Too much sugar tends to build up slowly, and does not normally present as an emergency. Giving sugar to a casualty with too much sugar does not alter their condition dramatically, whereas giving sugar to a casualty with low sugar levels can be a life-saving treatment.

There are two types of diabetes:

**Type 1** - This usually develops in childhood. Sufferers require daily insulin injections because their bodies produce little or no insulin.

**Type 2** - This usually develops in adulthood and mainly affects people aged over 40 years. Sufferers typically still secrete some insulin however this is insufficient.
If the person is unconscious, exhibits seizures, or is unable to follow simple
commands and swallow safely, the use of glucose tablets should be assumed by the first aid provider to have hypoglycaemia.

If the person is unconscious, exhibits seizures, or is unable to follow simple commands or swallow safely, the first aid provider should call for EMS immediately.

**Signs, symptoms, indicators:**

The following are indicators, signs and symptoms of a diabetic event:

- Aggressive demeanour (sometimes can be mistaken for drunkenness)
- Breath smells like acetone, or nail polish remover
- Unconsciousness (coma)
- Thirst
- History of diabetes, a Medic Alert bracelet
- Missing a meal
- Missing medication
- Confusion, inability to concentrate, or difficulty speaking
- Dizziness
- Racing heart or irregular heart rhythm
- Sweating or clamminess
- Muscle tremors

**Management**

For diabetics with mild symptoms of hypoglycaemia who are able to follow commands and swallow safely, the use of glucose tablets e.g. GlucoTabs™, provides more rapid clinical relief compared with other forms of sugar found in common food products.

Glucose tablets (if available) should be used to resolve hypoglycaemia in these individuals. If glucose tablets are not available, other foods and liquids containing sugars (such as sucrose or fructose) can be effective alternatives for reversal of mild hypoglycaemia.
Hypoglycaemia is a condition that first aid providers commonly encounter. Early treatment of mild hypoglycaemia may prevent progression to severe hypoglycaemia.

Severe hypoglycaemia can result in loss of consciousness or seizures and typically requires management by EMS.

**Angina**

People usually get angina because they have coronary artery disease. A coronary artery is a blood vessel taking blood to the heart. In coronary artery disease, clumps of fat build up on the lining inside the arteries. Over time, the arteries get narrow resulting in poor blood flow through the blood vessels of the heart muscle (partial blockage of the artery).

During exercise, physical activity or stress, the heart muscle does not get enough oxygen rich blood to meet the demands and effectively pump properly resulting in chest pain.

There are two main types of angina:

- Stable
- Unstable

Stable angina is pain or discomfort that typically occurs with some type of exercise, physical activity or stress. Angina symptoms should improve or go away completely when the person stops or slows down the exercise or activity. The pain of stable angina usually begins slowly and gets worse over the next few minutes before going away. Stable angina normally improves with the use of medication.

Unstable angina is the most dangerous. It does not follow a pattern and can happen without physical exertion. It does not go away with rest. It is a sign that the patient could have a heart attack soon. Unstable angina does not improve with the use of medication.
Normally people who suffer from angina are aware of their condition and carry medication to assist with alleviating symptoms.

**Signs and Symptoms**

The patient may experience:

- Pressure or a squeezing pain in the chest, lasting more than 10 minutes
- Pain radiating in the shoulders, arms, neck, jaw or back
- Shortness of breath
- Increased pulse and breathing rates
- Nausea or vomiting
- Shock like symptoms (pale, cold and sweaty skin)
- Sudden collapse

**Management**

- Carry out primary assessment, DRS ABCD
- Seek medical attention (make sure EMS staff are requested and underway)
- If unresponsive and breathing is adequate, place the casualty in the stable side position
- Have the casualty stop all physical activity, and any unnecessary movement
- If conscious, place them in a comfortable position, normally the sitting position as it is easier to breathe
- If the casualty has their medication, assist them in following their cardiac action plan
- Loosen any tight clothing
- If the person becomes unconscious, prepare for potential cardiac arrest - follow DRS ABCD (CPR and AED)
- Carry out secondary assessment
- Rest and reassure

**Medication:**

If a casualty experiences chest pain, ascertain if they are carrying their prescribed medication (glyceryl trinitrate products like Nitrolingual™ spray or tablets), suggest that the casualty take their medication, or assist them to self-administer it.

**Heart Attack**

A person experiences a heart attack when there is a sudden partial or complete blockage of one of the coronary arteries that supply the heart muscle. As a result of the interruption to the blood supply, there is an immediate risk of life-threatening
changes to the heart rhythm. If not corrected quickly there is also a risk of serious, permanent heart muscle damage.

To reduce the chance of sudden death from heart attack, urgent medical care is required – **every minute counts**. Heart attack is different from, but may lead to, cardiac arrest.

Cardiac arrest is cessation of heart action. Survival after heart attack can be improved by current treatments and clot-dissolving medications that clear the blocked artery, restore blood supply to the heart muscle and limit damage to the heart. These therapies are most effective if administered as soon as possible following the onset of symptoms with these benefits declining with delays in treatment.

**Recognition**

For some victims, sudden cardiac arrest may occur as the first sign of heart attack – however most experience some warning signs.

It is important to note:

- A heart attack can occur in a victim without chest pain or discomfort as one of their symptoms
- The most common symptom of heart attack in a victim without chest pain is shortness of breath
- A victim who experiences a heart attack may pass off their symptoms as ‘just indigestion’

**Warning signs**

If the warning signs are severe, get worse quickly, or last longer than 10 minutes, act immediately.

The victim may experience one or a combination of these symptoms:

- Pain or discomfort
- Pale skin
- Shortness of breath
- Nausea or vomiting
- Sweating
- Feeling dizzy or light-headed
Discomfort or pain in the centre of the chest may start suddenly, or come on slowly over minutes. It may be described as tightness, heaviness, fullness or squeezing. The pain may be severe, moderate or mild.

The pain may be limited to, or spread to, the neck, throat, jaw, either or both shoulders, the back, either or both arms and into the wrists and hands. Atypical chest pain is defined as pain that does not have a heaviness or squeezing sensation (typical angina symptoms), precipitating factors (e.g., exertion), or usual location.

Some people are more likely to describe atypical or minimal symptoms and include:

- The elderly
- Women
- People with diabetes
- Australian Indigenous population and Māori and Pacific Island people

These people should seek urgent assessment by a health care professional if they have any warning signs of heart attack, no matter how mild.

**Management**

- Encourage the victim to stop what they are doing and to rest in a comfortable position.
- If the victim has been prescribed medication such as a tablet or oral spray to treat episodes of chest pain or discomfort associated with angina, assist them to take this as they have been directed.
- Call an ambulance if symptoms are severe, get worse quickly or last longer than 10 minutes.
- Stay with the victim until the ambulance or on-site resuscitation team arrives.
- Give aspirin (300 mg) - Dissolvable aspirin is preferred.
- Administer oxygen if there are obvious signs of shortness of breath and you are trained to do so.
- If practical and resources allow, locate the closest AED and bring it to the victim. If the victim is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support sequence.

**Cardiac Arrest And The Chain Of Survival**

**Cardiac arrest** occurs when the heart is no longer able to effectively pump blood around the body. If not treated, this will cause death within minutes. One of the consequences of cardiac arrest is the disruption of the electrical activation of the heart. When this happens, the heart muscle can rapidly contract in an uncoordinated fashion. This rhythm is called **ventricular fibrillation (VF)**.

**Note:** While a heart attack is the most common cause of cardiac arrest, it is not the only cause and the majority of people who suffer a heart attack do not have cardiac arrest.

**Adult chain of survival:**
The key steps to surviving a cardiac arrest in adults are described as the **adult chain of survival**.

There are five links in this chain and each one needs to occur promptly to ensure survival -

- **Early recognition** by a bystander that a problem exists
- **Early 111** call to activate the Emergency Medical Services (EMS)
- **Early CPR** to maintain artificial ventilation and circulation until the EMS arrives
- **Early defibrillation** to deal with the heart’s electrical problems
- **Early advanced medical care**

The survival rate for cardiac arrest is **very low** in most countries, including New Zealand. It is time-critical, with the chances of survival decreasing by about 10% for **every minute** you have to wait for a defibrillator.

**Stroke**

Stroke (previously known as cerebrovascular accident) is the second most common cause of death after heart disease. A stroke occurs when the supply of blood to part of the brain is suddenly disrupted or when spontaneous bleeding from a blood vessel within the skull occurs.

Approximately 80% of strokes are caused by an acute blockage of a blood vessel supplying part of the brain. Stroke is a medical emergency. When stroke is caused by an interruption to the blood supply to a part of the brain, that area of the brain is damaged and may die.

The surrounding brain tissue is also affected and is at risk of dying. However, if the blockage can be rapidly cleared and blood supply restored, the amount of damage to brain tissue can be significantly reduced. Rapid recognition, protection and support of the airway, breathing and circulation, and rapid access to definitive stroke care can all contribute to reducing deaths and long term damage from stroke.
**Recognition**

A sudden blockage of blood flow to an area of the brain, or bleeding, will produce symptoms of stroke. Symptoms may seem to improve but should still be considered as a stroke. First aid providers can use stroke assessment systems such as FAST for individuals with suspected acute stroke.

**FAST is a simple way for remembering the signs of stroke:**

**F**acial weakness - can the person smile? Has their mouth or eye drooped?

**A**rm weakness - can the person raise both arms?

**S**peech difficulty - can the person speak clearly and understand what you say?

**T**ime to act fast – seek medical attention immediately. Call 111 for an ambulance.

**Other common symptoms of strokes include:**

- Numbness of the face, arm or leg on either or both sides of the body
- Difficulty swallowing, dizziness, loss of balance or an unexplained fall
- Loss of vision, sudden blurred or decreased vision in one or both eyes
- Headache, usually severe and of abrupt onset or unexplained change in the pattern of headaches
- Drowsiness
- Confusion
- Reduced level of consciousness

Symptoms of stroke may also be caused by other conditions such as epilepsy, migraine or diabetes with low blood sugar. If trained to check a blood sugar level, this can improve the accuracy of stroke diagnosis when used in conjunction with a stroke assessment tool.

When there is doubt over diagnosis, the victim should be managed as having a stroke until proven otherwise. A victim with the symptoms of stroke should be transported by ambulance because paramedics can start the management of stroke and make sure the victim is taken to the most appropriate hospital for specialist stroke management. Paramedics can also notify the receiving hospital, reducing time to the start of treatment.

**Management**

- Call an ambulance for any victim who has shown signs of stroke, no matter how brief or if symptoms have resolved.
- Do not give anything to eat or drink
- Administer oxygen if available and trained to do so. If a pulse oximeter is available, oxygen should only be administered to victims with oxygen saturation < 94%.
- If victim is conscious, provide reassurance
- If the victim is unconscious but breathing, lay victim on the side and ensure airway is clear.
- If the victim is unresponsive and not breathing normally, commence resuscitation following the Basic Life Support sequence.

**Seizures**

A seizure is a sign of abnormal brain activity, which can be caused by many problems. Up to 10% of the population is likely to experience a seizure at some time in their life.

A seizure may occur when the normal pattern of electrical activity of the brain is disrupted. This can cause changes in sensation, awareness and behaviour, or sometimes convulsions, muscle spasms or loss of consciousness. Seizures vary greatly and most are over in less than 5 minutes. **Not all seizures are considered epilepsy.**

**A seizure may occur due to:**

- Lack of oxygen (hypoxia)
- Onset of cardiac arrest
- Medical conditions affecting the brain, e.g. low blood sugar, low blood pressure, head injury, neurological diseases, epilepsy.
- Trauma to the head
- Some poisons and drugs
- Withdrawal from alcohol and other substances of dependence
- Fever in children under six years

**Recognition**

A casualty experiencing a seizure may display one or more of the following signs and symptoms:

- Sudden spasm of muscles producing rigidity. If standing, the victim will fall down
- Jerking movements of the head, arms and legs
- Shallow breathing, or breathing may stop temporarily
- Dribbling from the mouth; the tongue may be bitten leading to bleeding.
- Incontinence of urine and/or faeces
- Changes in conscious state from being fully alert to confused, drowsy, or loss of consciousness
- Changes in behaviour where the victim may make repetitive actions like fiddling with their clothes. Generalised seizures usually involve the entire body and cause a loss or marked alteration in consciousness.

Some generalized seizures result in life-threatening problems with airway or breathing, or risk of trauma from muscle spasms or loss of normal control of posture and movement. During partial seizures, usually only part of the body is affected and
the person retains consciousness but may be frightened or confused. Febrile convulsions are associated with fever and usually resolve without treatment. They occur in approximately 3% of children at some stage between the age of six months and six years.

Children who suffer from a febrile convulsion are not at increased risk of epilepsy as a result of experiencing febrile convulsions.

**Management**

If the victim is unresponsive and not breathing normally, follow Australian Resuscitation Council / New Zealand Resuscitation Council Basic Life sequence.

**If the victim is unconscious and actively seizing, the rescuer should:**
- Follow the victim’s seizure management plan, if there is one in place
- Call an ambulance
- Remove the victim from danger or remove any harmful objects which might cause secondary injury to the victim
- Note the time the seizure starts
- Protect the head
- Avoid restraining the victim during the seizure unless this is essential to avoid injury
- Lay the victim down and turn them to the side stable position when practical
- Maintain an airway. Reassure the victim who may be dazed, confused or drowsy
- Frequently reassess the victim

**Do not:**
- Put a child in a bath (to lower their temperature) during a convulsion as this is dangerous
- Do not force the victim’s mouth open nor attempt to insert any object into the mouth

**A seizure in water is a life threatening situation.**

If the seizure occurs in water:
- Support the victim in the water with the head tilted so the face is out of the water
- Remove the victim from the water as soon it is safe to do so
- Call an ambulance
- If the victim is unresponsive and not breathing normally, perform the Basic Life Support sequence

**Asthma**

Asthma is a disorder of the smaller airways of the lungs. People with asthma have sensitive airways which can narrow when exposed to certain ‘triggers’, leading to difficulty in breathing. Three main factors cause the airways to narrow:
The muscle around the airway tightens (bronchoconstriction).
The inside lining of the airways becomes swollen (inflammation).
Extra mucus (sticky fluid) may be produced.

In asthma, symptoms are made worse by 'triggers'. Every person's asthma is different and not all people will have the same triggers.

Triggers can include:

- Respiratory infection
- Irritants (e.g. cigarette, wood fire or bushfire smoke, occasionally perfumed or cleaning products)
- Inhaled allergens (e.g. dust mite, mould spores, animal dander’s, grass/tree pollen)
- Cold air, exercise, laughing/crying
- Non-steroidal anti-inflammatory agents (e.g. aspirin, ibuprofen)
- Sulphite additives (food preservatives) – more common in those with poorly controlled asthma
- Food allergy – while usually accompanied by other symptoms such as rash or vomiting, isolated severe asthma may occur as the only presentation and may result in death
- Food colours and flavours
- Emotional triggers such as stress

Most fatal cases of food-induced anaphylaxis occur in those with asthma. In patients with asthma known to be at risk from anaphylaxis, if it is uncertain whether the patient is suffering from asthma or anaphylaxis, it is appropriate to administer an adrenaline auto-injector first, followed by asthma reliever medication. No harm is likely to occur by doing so in a patient having asthma without anaphylaxis.

**Recognition**

**Asthma can be recognised by the following symptoms and signs:**

- A dry, irritating, persistent cough, particularly at night, early morning, with exercise or activity
- Chest tightness
- Shortness of breath
- Wheeze (high pitched whistling sound during breathing)

**Symptoms and signs of a severe asthma attack include some or all of the following:**

- Gasping for breath (may have little or no wheeze due to little movement of air)
- Severe chest tightness
- Inability to speak more than one or two words per breath
- Feeling distressed and anxious
- Little or no improvement after using “reliever” medication
- ‘Sucking in’ of the throat and rib muscles, use of shoulder muscles or bracing with arms to help breathing
- Blue discolouration around the lips (can be hard to see if skin colour also changes)
- Pale and sweaty skin
- Symptoms rapidly getting worse or using reliever more than every two hours

As well as the above symptoms, young children appear restless, unable to settle or become drowsy. A child may also ‘suck’ in muscles around the ribs and may have problems eating or drinking due to shortness of breath. A child also may have severe coughing and vomiting. An asthma attack can take anything from a few minutes to a few days to develop.

**Management**

If the victim has a personal written asthma action plan, then that plan should be followed. If there is no action plan in place, then use the following Asthma First Aid plan.

**If a victim has any signs of a severe asthma attack, call an ambulance straight away and follow the Asthma First Aid Plan while waiting for the ambulance to arrive.**

**Asthma First Aid Plan:**

1. Sit the person comfortably upright. Be calm and reassuring. Do not leave the person alone.
2. Without delay give four to six separate puffs of a “reliever”. The medication is best given one puff at a time via a spacer device. If a spacer is not available, simply use the inhaler. The first aid rescuer should provide assistance with administration of the bronchodilator reliever inhaler.

   Ask the person to take four to six breaths from the spacer after each puff of medication. Use the victim’s own inhaler if possible. If not, use the first aid kit inhaler if available or borrow one from someone else.
3. Wait four to six minutes. If there is little or no improvement give another four to six puffs.
4. If there is still no improvement, call an ambulance immediately. Keep giving four to six puffs every four to six minutes until the ambulance arrives.

No harm is likely to result from giving a “reliever” inhaler to someone without asthma. If oxygen is available, it should be administered by a person trained in its use.
If a severe allergic reaction is suspected - If victim becomes unresponsive and not breathing normally, commence resuscitation following the Basic Life Support sequence.

**Hyperventilation**

Hyperventilation is rapid or deep breathing that can occur with anxiety or panic. It is also called 'over breathing', and may lead to breathlessness. Excessive breathing leads to **low** levels of carbon dioxide in the blood. This causes many of the symptoms experienced during hyperventilation.

**Signs and symptoms**

- Light-headedness
- Shortness of breath
- Numbness and tingling in the arms
- Muscle tremors
- Rapid breathing
- Anxious demeanour
- Rapid pulse

**Common Causes**

- Panic attack
- Stress and anxiety
- Stimulant use (alcohol)
- Drug overdose

**Management**

It is important to note that any casualty suffering from hyperventilation must **increase their carbon dioxide** levels in their bloodstream. You need to assist them to take in **less** oxygen by:

- Sitting the casualty down and instruct them to breathe less deeply, more slowly, try and relax and concentrate on their breathing. If possible, get reassurance from a friend or family member to help relax their breathing.
- Tell the casualty to breathe through their nose, this increases the amount of air which is exhaled and immediately re-inhaled and is therefore relatively rich in carbon dioxide.
- Tell the casualty to slow their breathing down to 1 breath every 5 seconds, or slow enough that symptoms gradually go away.
- Try and have casualty mirror your breathing.

**Note:** If hyperventilation continues for longer than 30 minutes, **call for medical assistance immediately!**
Anaphylaxis (Severe Allergic Reaction)

Anaphylaxis is a severe allergic caused by an ‘antigen’ to which the individual has previously been exposed to. The immune system misidentifies the allergen as dangerous and may produce a severe histamine release, **causing a sharp drop in blood pressure**, hives and breathing difficulties.

The reaction may be fatal if emergency treatment, including epinephrine (adrenaline) injections, is not given immediately.

**Typical causes**
- Peanuts
- Dairy products
- Wheat
- Soybean
- Fish and shellfish
- Bee stings
- Animal fur
- Some medications (penicillin)
- Latex rubber

**Signs and symptoms**
- Itching or tingling in or around the mouth and throat
- Swelling of the lips, face, eyes and throat area
- Shortness of breath
- Wheezing
- Tightening of the chest
- Hives or redness
- Abnormal pain or vomiting
- Loss of consciousness and collapse

**Management**
- Carry out primary assessment, DRS ABCD
- Seek medical attention (make sure EMS staff are called and are underway)
- If unresponsive and breathing is adequate, place the casualty in the stable side position
- Assist patient to self-administer prescribed medication that the patient may have
- If breathing is inadequate (less than 6 breaths per minute), assist breathing with the bag mask or rescue breathing
- Be prepared for the deterioration of the casualty’s condition (CPR and AED if the casualty is non-breathing)

**Note:** Allergic reactions do not require adrenaline, but a small portion of reactions can progress to anaphylaxis. Adrenaline is recommended for anaphylaxis, and
persons at risk are typically prescribed and carry an adrenaline auto-injector e.g. EpiPen® or Anapen®.

**An anaphylactic reaction involves 2 or more body systems and can be life-threatening!**

First aid providers should also know how to administer the auto-injector if the victim is unable to do so, provided that the medication has been prescribed by a physician.

First aid providers should call 911 immediately when caring for a person with suspected anaphylaxis or a severe allergic reaction.

When a person with anaphylaxis does not respond to an initial dose of adrenaline, and arrival of advanced care will exceed 5 to 10 minutes, a repeat dose may be considered.

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**Environmental Conditions (Heat And Cold)**

The control of the body’s temperature is very complex and involves a number of processes. Body temperature is regulated by the brain in response to factors such as disease and external temperature. Our normal temperature is about 37°C. When the temperature of the body increases (hyperthermia = heat illness) or decreases (hypothermia = cold emergency), the functions of the body can stop or be impaired. This can cause life threatening emergencies that require immediate action and medical attention.

**Hypothermia:**

Hypothermia is caused by exposure to cold. The urgency of treatment depends on the length of exposure and the victim’s body temperature.

Begin rewarming a victim of hypothermia immediately by moving the victim to a warm environment, removing wet clothing, and wrapping all exposed body surfaces with anything at hand, such as blankets, clothing, and newspapers.

If the hypothermia victim is far from definitive health care, begin active rewarming, although the effectiveness of active rewarming has not been evaluated.

Active rewarming should not delay definitive care. Potential methods of active rewarming include placing the victim near a heat source and placing containers of warm, but not hot, water in contact with the skin.
**Frostbite:**

Frostbite usually affects an exposed part of the body such as the extremities and nose. In case of frostbite, remove wet clothing and dry and cover the victim to prevent hypothermia. Transport the victim to an advanced medical facility as quickly as possible.

Do not try to rewarm the frostbite if there is any chance that it might refreeze or if you are close to a medical facility.

Minor or superficial frostbite (frost-nip) can be treated with simple, rapid rewarming using skin-to-skin contact such as a warm hand.

Severe or deep frostbite should be rewarmed within 24 hours of injury and this is best accomplished by immersing the frostbitten part in warm (37° to 40°C or approximately body temperature) water for 20 to 30 minutes.

Chemical warmers should not be placed directly on frostbitten tissue, because they can reach temperatures that can cause burns.

Following rewarming, efforts should be made to protect frostbitten parts from refreezing and to quickly evacuate the patient for further care.

**Heat Emergencies**

**Heat induced illness may be caused by:**

- Excessive heat absorption from a hot environment
- Excessive heat production from metabolic activity
- Failure of the cooling mechanisms
- An alteration in the body’s set temperature

**Factors which may contribute to heat induced illness include:**

- Excessive physical exertion
- Hot climatic conditions with high humidity
- Inadequate fluid intake
- Infection (particularly a viral illness)
- Inappropriate environments (e.g. unventilated hot buildings)
- Wearing unsuitably heavy, dark clothing on hot days
- Drugs which affect heat regulation

The very young and very old are more prone to heat induced illness.

**Prevention**

On warm, humid or hot days:

- Keep infants and the elderly in cool, ventilated areas and provide ample oral fluids
- Wear light coloured, loose-fitting clothing during physical exertion and hats during outside activities
- Take adequate fluids during exertion on hot days – thirst is a useful guide to required fluid intake
For participants in, and organisers of sporting events:

- Allow six weeks for acclimatisation with progressive exercise before competition
- Avoid vigorous exercise during a viral illness
- Plan to conduct events in the early morning or late evening or in the cooler months of the year
- Provide regular drink stations
- Follow the support guidelines relevant to specific activities

At no time should children or the elderly be left unattended in parked cars. For workers in outdoor or potentially hot environments, refer to occupational health guidelines relevant to the particular environment.

Work environments that may be particularly prone to precipitating hyperthermia and heat induced illness include those in which there is a high ambient temperature with reduced air movement, the worker is exposed to radiant heat and there is difficulty in maintaining adequate hydration.

**Recognition:**

Mild elevation in body temperature is normally controlled with sweating, which allows cooling by evaporation. Once the individual becomes too dehydrated to sweat, body temperature can rise rapidly and dramatically.

Heat exhaustion is recognized by fatigue associated with headache, nausea, vomiting, malaise and dizziness, which may be accompanied by collapse. Body temperature will be less than 40°C and conscious state will become normal once the victim is lying down.

**Heat Stroke**

Heat stroke is the most serious form of heat related illness and may lead to unconsciousness and death. All body organs may be affected. Heat stroke may be recognized by lack of sweating, temperature above 40°C, an altered conscious state, hot dry skin (however, in some victims profuse sweating is common) and collapse.

**Heat stroke is a life threatening condition!**

- Call for an ambulance
- Resuscitate following the Basic Life Support sequence
- Place the victim in a cool environment
- Moisten the skin with a moist cloth or atomizer spray and fan repeatedly
- Apply wrapped ice packs to neck, groin and armpits
- Give a 3-8% carbohydrate electrolyte fluid (any commercially available ‘sports drink’) for the treatment of exertion related dehydration
- If carbohydrate electrolyte fluid is unavailable, water is an acceptable alternative
Febrile Convulsions

Follow First Aid Management of a Seizure.

The management of heat induced illness is aimed at removing the cause and assisting the normal cooling mechanisms of evaporation, conduction, radiation and convection.

Heat Exhaustion

Management

- Lie the victim down in a cool environment or in the shade
- Loosen and remove excessive clothing
- Moisten the skin with a moist cloth or atomizer spray
- Cool by fanning
- Give water to drink if fully conscious
- Call for an ambulance if not quickly improving

Emergency Childbirth

Child birth is a natural process and complications are uncommon.

Signs and symptoms of an imminent child birth:

- Obvious signs of late stages of pregnancy
- Waters break
- Sudden increase in energy

Management

- Call for assistance (make sure EMS staff are contacted and are underway)
- Try and move the pregnant woman out of public view
- Encourage the woman to lie on her back
- Lay a clean towel or plastic sheet under the mother’s buttocks
- Ensure good hygiene - wash hands, use gloves from PPK kit (the mother must be asked if she is allergic to latex).
- If the membrane around the baby is intact, rupture this with your fingertip to allow the amniotic fluid to leak out.
- Check to see if umbilical cord is around the infant’s neck, slip over the head if possible.
- Leave umbilical cord attached to baby
- Support the head (this normally appears first) face down, the natural contractions will assist to deliver the baby.
After the delivery

- Baby should start to cry - encourage a response and carry out primary assessment if required
- Ensure the baby stays warm, wrap in towel, sheets, blanket or anything else available to keep baby warm
- Encourage the woman to start breast feeding
- The placenta may take up to an hour to deliver, place in clean container and give to attending EMS personnel or take to hospital if required
- Rest and reassure

Poisoning

A poison is a substance (other than an infectious substance) that is harmful to human health if ingested, inhaled, injected, or absorbed through the skin. Substances that are benign or therapeutic at low levels (for example, pharmaceuticals and herbal remedies) may be poisonous at higher concentrations. Toxins are poisons that are produced by living organisms. Venoms are toxins that are injected by an organism.

Recognition:

Poisons can cause harm by a wide range of mechanisms and can cause a wide range of symptoms including unconsciousness, nausea, vomiting, burning pain in the mouth or throat, headache, blurred vision, seizures, difficulty breathing, respiratory arrest, and cardiac arrest.

Recognition of poisoning may be obvious from the circumstances of the incident, but this is not always true. A person may complain of physical symptoms without realising these are due to a poison. Alternatively, they may exhibit abnormal behaviour, which may be misinterpreted as alcoholic confusion or psychiatric disturbance.
Most pharmaceuticals are poisonous in overdose. Some are relatively safe unless many times the recommended dose is taken, but many are lethal if less than a single pack is taken simultaneously.

Poisons may have a rapid effect, but their effects may also be delayed. Speed of effect is determined by the nature of the poison, its concentration, and the time of exposure.

It is important to seek medical assessment or advice after significant exposure to a poison, even if symptoms are initially mild or absent.

When any form of poisoning occurs, you can obtain advice about how to manage the situation and treat the casualty by calling the NZ Poison Centre ☎️ 0800 POISON (0800 764 766), available 24/7. The main role of the National Poisons Centre is to provide advice to members of the public and health care professionals about acute poisoning situations.

**Management**

**The principles of managing a patient who has been poisoned are:**

- Prevention of poisoning of the rescuer
- Decontamination of the patient
- Resuscitation and supportive care, using the Basic Life Support sequence.
- Specific management of particular poisons: antidotes, techniques to remove the poison from the body, and the treatment of complications of the poison.
- If the victim is unconscious or is not breathing normally, commence resuscitation if necessary, following the Basic Life Support sequence.
- Ensure that an ambulance has been called

**Prevention of poisoning to the rescuer:**

During first aid and subsequent treatment, the suspected poison should be identified and safely handled to minimise further exposure. The victim may pose a danger if the poisonous substance can be transferred to the rescuer (for example, by contact with contaminated clothing).

If the poisoning occurs in an industrial, farm or laboratory setting suspect particularly dangerous agents and take precautions to avoid accidental injury.

If more than one person simultaneously appears affected by a poison, there is a high possibility of dangerous environmental contamination.

The rescuer may need to wear personal protective equipment (PPE) during decontamination and resuscitation. The need for PPE will be guided by knowledge of the likely poison. If equipment is not available to safely decontaminate and treat a victim, rescue may not be possible.
**Decontamination**

Separate the victim from the poisonous substance. How this is done will depend on the type of the poison. Examples are listed below.

**If the poison is SWALLOWED:**
- Give the person who has swallowed the poison a sip of water to wash out their mouth
- Do NOT try to make them vomit
- Do NOT use Ipecac Syrup

**If the poison is INHALED:**
- Immediately get the person to fresh air, without placing yourself at risk.
- Avoid breathing fumes. Special breathing apparatus may be required, for example, with cyanide or agricultural chemicals poisoning.
- If it is safe to do so, open doors and windows wide

**If the poison contacts the EYE:**
- If the poison enters the eye, flood the eye with saline or cold water from a running tap or a cup / jug. Continue to flush for 15 minutes, holding the eyelids open.

**If the poison contacts the SKIN:**
- Remove contaminated clothing, taking care to avoid contact with the poison
- Flood the skin with running cold water
- Wash gently with soap and water and rinse well

**Resuscitation and supportive care**
- If the victim is unconscious or is not breathing normally, commence resuscitation if necessary, following the Basic Life Support sequence.
- Before commencing resuscitation, quickly wipe obvious contamination from around the mouth
- Ensure that an ambulance has been called
- A self-inflating bag-valve-mask apparatus is the safest way to provide ventilation for the BLS rescuer. If this equipment is not available, mouth-to-mask or mouth-to-mouth ventilation may be considered depending on the chemical ingested. Mouth-to-mouth ventilation should be avoided if cyanide or organophosphate poisoning is suspected
- Inhaled poisons are unlikely to pose a risk during mouth to mouth ventilation unless the victim is contaminated with the liquid phase of the inhaled poison

**Prevention**
- Many poisons are substances that also have a useful purpose. Poisoning is particularly common in children and vulnerable adults. Ensuring poisons are only accessible by people who need and know how to use them reduces their risk of harm.
• Make a survey of your home or workplace and identify all poisonous substances
• Remove poisons or medicines that are unwanted. Dispose of chemicals safely using their accompanying directions. Pharmaceuticals can be returned to a pharmacy for safe disposal, which is safer and more environmentally friendly than disposal in domestic waste or flushing down a toilet. The Poisons Information Centre can also advise on methods of safe disposal
• Store poisonous substances in their original containers in locked or child-resistant cupboards or containers out of reach of children. Do not store medicines in the refrigerator unless advised to do so by a pharmacist
• Use non-poisonous alternatives to cleaning products, insecticides, etc. when possible
• Keep the amount of poisonous substances stored in a home to a minimum.
• When possible, choose substances available in child-resistant packaging. However, do not rely on child-resistant packaging to prevent a child’s access to a poison
• Read medicine labels and use according to the directions
• Ensure the right:
  - medication
  - person
  - dose
  - route of administration
  - time and frequency of administration
• Wear the recommended personal protective equipment when using toxic or caustic chemicals, for example spraying, painting, or oven cleaning
• Do not eat or drink near poisons

Specific Poisons

Cyanide

Cyanide may be present in the bush as it is used to eradicate pests. It comes in paste form or in pellets (Ferratox™). Some organised groups carry the antidote (Amyl Nitrite), which is contained in ampoules.

Recognition

• Headache
• Convulsions
• Breath smells of bitter Almonds
• Confused, erratic behaviour
• Heart and breathing failure

Management

• There is a high risk of the rescuers being poisoned by Cyanide, through absorption or inhalation
- Wear gloves
- Avoid vapours from the poison source, or the breath of the casualty.
- Move to a well ventilated area
- If the casualty is breathing, administer Amyl Nitrite by cracking the ampoule (whilst protecting your hand) and getting the casualty to inhale the vapour
- CPR required? Do not administer rescue breaths .. use compression-only CPR
- Evacuate the casualty as a priority

_Ongaonga (Tree Nettle)_

Contact with this plant can cause:

- Intense, burning pain
- Redness & swelling (affected area)
- Loss of coordination
- Anaphylactic (severe allergy) shock
- Difficulty in breathing
- Difficulty in seeing
- Convulsions and paralysis

_Management_

- Crushed up Dock Leaf(s) may relieve the pain
- Lay the casualty down with legs raised if showing signs of shock
- Use sticky tape to remove visible stinging hairs
- The use of a Ventolin inhaler may help
- Antihistamines may help
- Signs of Anaphylaxis? An EpiPen® (or Anapen® or equivalents) may help

If anaphylactic shock is suspected, arrange **urgent evacuation** as the casualty may need more adrenaline!

_1080 Pellets (Sodium Fluoroacetate)_

1080 is a substance found naturally in many plants throughout the world. Plants have developed it as a natural defence against browsing mammals. It is synthetically manufactured for use in pest control operations and is highly toxic to mammals (in particular).

_Recognition (in humans)_

_Early Symptoms:_ Nausea, vomiting, tingling and numbness in face and hands, stomach pains, apprehension and anxiety

_Later Symptoms:_ Muscular twitching, blurred vision, confusion.
Severe Symptoms: Coma, convulsions

Management

Ingestion
- Seek immediate medical assistance in all cases where poisoning is suspected.
- NZ National Poisons Centre recommends against inducing vomiting in most cases, but in particular, never use any chemical means of inducing vomiting.
- In areas remote from medical assistance, there may be benefit in inducing vomiting by placing a finger down the throat.

Eye Contact
- Wash eyes with copious amounts of water

Skin Contact
- Wash exposed area twice with soap and water

Contaminated Clothing
- Remove contaminated clothing and wash before re-use
- Clothing must be decontaminated by washing in hot soapy water

Do NOT induce vomiting or give anything by mouth if the casualty is unconscious or convulsing!

Carbon Monoxide (CO)

CO has no smell or taste. It doesn’t irritate your nose, mouth or skin and is invisible. It has caused serious illness and deaths, which are mostly preventable. It is the largest cause of death related to camping equipment in NZ. CO is a very flammable gas in high concentrations, so as well as being a health hazard, it is also a fire hazard!

Recognition
- Headaches and dizziness
- Bright pink skin
- Erratic, confused behaviour
- Convulsions
- Circulatory & respiratory failure

Management
- Without placing yourself in danger, ventilate the area to remove the CO and/or remove the casualty from the area
- Conscious casualty - place in semi-sitting position and rest (to make breathing easier)
- Unconscious casualty - Carry out primary survey and monitor them in the stable side position.
- Mild poisoning - the casualty may recover spontaneously over time, but they should be seen by EMS staff as a precaution

**References**

- NZ Resuscitation Council: www.nzrc.org.nz
- NZ Red Cross: www.redcross.org.nz
- NZ Mountain Safety Council: www.mountainsafety.org.nz
- NZ National Poisons Centre: www.poisons.co.nz
- Department of Conservation: www.doc.govt.nz
- WorkSafe New Zealand: www.business.govt.nz/worksafe

**Triple One Care – Contact Information**

Email: info@tripleonecare.co.nz  
Website: www.tripleonecare.co.nz

**South Island Locations**

- National Support Office  
  ☎️ 0800 487 475  
  ☎️ 03 544 9180

- Nelson  
  ☎️ (03) 544 9180

- Marlborough  
  ☎️ (03) 573 7189

- Christchurch  
  ☎️ (028) 8500 3958

**North Island Locations**

- National Support Office  
  ☎️ 0800 487 475  
  ☎️ 03 544 9180

- Northland  
  ☎️ (09) 422 4015

- Auckland  
  ☎️ (09) 440 9321

- Bay of Plenty  
  ☎️ (07) 307 8223

- Wellington  
  ☎️ (021) 967 448
Useful Emergency Telephone Numbers In New Zealand:

- Emergency Medical Services: ☏ 111 For Ambulance, Fire, Police.

- Healthline: ☏ 0800 611 116

- New Zealand National Poisons Centre: ☏ 0800 764 766 (0800POISON)