



# First Aid and Co-response for Firefighters

## Technical Manual

## Status of this document

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Training encourages and welcomes feedback on all its products and processes to ensure currency and continuous improvement.

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# Contents

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<b>Introduction</b>	<b>3</b>
Definition of First Aid	3
<b>Section 1: Legal and policy matters</b>	<b>5</b>
Injury Prevention, Rehabilitation and Compensation Act 2001	5
Health and Disability Commissioner Act 1994	5
Privacy Act 1993	6
Memoranda of Understanding	6
<b>Section 2: Safety and infection control</b>	<b>7</b>
Exposure to biological substances	7
<b>Section 3: Primary survey</b>	<b>16</b>
Introduction	16
Danger	17
Response	18
Send for help	19
Airway	20
Breathing check	24
CPR	26
Defibrillation	33
Using an AED	34
<b>Section 4: Foreign body airway obstruction (choking)</b>	<b>36</b>
Airway obstruction	36
Partial airway obstruction	36
Total airway obstruction	37
<b>Section 5: Oxygen overview</b>	<b>40</b>
Introduction	40
Oxygen administration	40
Cylinders	50
Safety issues	52
<b>Section 6: Secondary survey and patient questioning and management</b>	<b>53</b>
Secondary survey	53
Questioning methods	55
Patient management	56

<b>Section 7: Medical conditions</b>	<b>59</b>
Diabetes	59
Heart attack	60
Stroke	61
Seizure	62
Asthma	63
Poisoning	64
Anaphylaxis and allergic reactions	65
<b>Section 8: Trauma</b>	<b>66</b>
Burns	67
Heat emergencies	68
Heat emergencies (cont.)	69
Cold emergencies	70
Cold emergencies (cont.)	71
Smoke inhalation	72
Fractures	73
Chest injuries	74
Blast injuries	75
Crush injuries and crush syndrome	76
Soft tissue injuries	77
Bleeding	78
Internal bleeding	78
Other bleeding	79
Shock	80
Spinal injuries	81
Head injuries	82
Eye injuries	83
<b>Section 9: Mass casualty incident</b>	<b>85</b>
<b>Section 10: Handover</b>	<b>88</b>
<b>Appendix: NZFS Karakia</b>	<b>89</b>

# Introduction

The primary focus of the New Zealand Fire Service (NZFS) First Aid training is to provide firefighters with the skills to minimise the effect of accident or illness in the workplace, and to enable firefighters to provide a professional response to other emergencies.

## Definition of First Aid

First Aid is the emergency care and treatment of a sick or injured person before more advanced medical assistance, such as a paramedic, arrives.

## Responsibilities of a first aider

The responsibilities of a first aider are:

- to provide initial emergency care and treatment to sick or injured people
- to have knowledge of First Aid equipment
- to recognise and understand safe and unsafe work practices, and to know the process for reporting processes for workplace hazards.



### NOTE

Protocols and procedures change over time. If you have any questions or concerns about the content of this manual, please follow the advice of your First Aid Instructor.



Station equipment check



Appliance equipment check



### NOTE

It is important to check and be competent in using First Aid equipment on station and on appliances.

## Philosophy of First Aid

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In the pre-hospital setting, the key contributors to survival and recovery from illness and injury are prompt and effective maintenance of the body's primary functions:

- airway
- breathing
- circulation.

Medical research data suggests that effective support of these basic functions provides the most significant contribution to positive outcomes for patients in the pre-hospital setting.

Underpinning First Aid philosophies for firefighters:

1. Treat what you see rather than make a diagnosis.
2. Perform the basic tasks well.

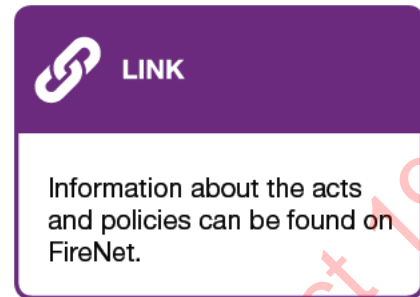
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# Section 1: Legal and policy matters

This section details the legislation and policy relevant to the application of First Aid in the Fire Service. It contains information about:

- the Injury Prevention, Rehabilitation and Compensation Act 2001
- the Health and Disability Commissioner Act 1994
- the Privacy Act 1993
- the Memoranda of Understanding.

By the end of this section you should have an understanding of the basic compliance issues surrounding First Aid, so that you can make informed decisions in line with current policy.



## Injury Prevention, Rehabilitation and Compensation Act 2001

This Act guarantees that the Accident Compensation Corporation (ACC) will provide insurance cover for people when they are injured in certain situations.

ACC is the Crown Entity that manages New Zealand's accident compensation scheme. The Act covers death, physical injuries, mental injuries that result from physical injuries, and even damage to dentures and **prostheses**.

In a First Aid situation, the Act covers injuries caused by an accident or by treatment for another personal injury.

If a person is covered by ACC, they cannot bring legal proceedings against others who may have caused their personal injuries.

## Health and Disability Commissioner Act 1994

The Code of Health and Disability Services Consumers' Rights contained within this Act states that:

- health services must be provided with reasonable skill and care
- consumers of health services have the right to be fully informed

### MEANING

**prostheses**

*an artificial body part such as a limb or heart*

- consumers of health services have the right to be treated with dignity and respect.

**The 10 rights of a patient are the:**

1. right to be treated with respect
2. right to freedom from discrimination, coercion, harassment, and exploitation
3. right to dignity and independence
4. right to services of an appropriate standard
5. right to effective communication
6. right to be fully informed
7. right to make an informed choice and give informed consent
8. right to have support people of their choice
9. rights in respect of teaching or research
10. right to complain.

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**Privacy Act 1993**

Firefighters cannot disclose any information about a medical incident without the consent of the person involved (information could include that which is simply remembered, names of the people involved, types of injuries or afflictions, etc.).

In general, any requests for information should be referred to the Ambulance Service as they are the lead agency for medical incidents.

If a person involved in an incident asks for information, the firefighter must give it to them. Firefighters must follow Fire Service policy about this issue. The Privacy Act 1993 can be found on FireNet.

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**Memoranda of Understanding**

The New Zealand Fire Service has MOUs with St John Ambulance and Wellington Free Ambulance to provide assistance at selected medical incidents.

The St John MOU lists selected stations that are trained to provide 'First Response' to medical incidents. All other stations provide 'Co-response' to medical incidents.



# Section 2: Safety and infection control

## Exposure to biological substances

Fire Service operational personnel may be exposed to biological substances such as blood-borne pathogens and other communicable diseases during the normal course of their work.

There are many different blood-borne pathogens that can be transmitted from a penetrating injury or mucous membrane exposure, in particular, hepatitis B virus, hepatitis C virus and human immunodeficiency virus. Other diseases not found in human blood may be carried in fluids such as human faeces (for example, hepatitis A) or animal blood and fluids.

### General definitions

The Fire Service defines 'significant exposure to a biological substance' as meeting either the **high or medium** risk criteria described below.

<b>Affected person</b>	Person exposed to blood or body fluids.
<b>Source individual</b>	Person whose blood or body fluid is the source of exposure.
<b>Blood-borne pathogen</b>	Any micro-organism that exists in human blood and other body fluids. When infected body fluids enter the bloodstream of another person they can cause disease.
<b>HBV</b>	<b>Hepatitis B</b> virus.
<b>HCV</b>	Hepatitis C virus.
<b>HIV</b>	Human <b>immuno-deficiency</b> virus – the virus that causes AIDS.
<b>Universal precautions</b>	Risk management strategy of treating all blood and body fluids as if infectious, regardless of source, which calls for the use of protective gloves, safety glasses and clothing.
<b>Zoonoses</b>	Diseases that may be transferred to humans from animals, for example, leptospirosis, salmonella. These are not primarily human infections.

#### MEANING

##### hepatitis

*a disease characterised by inflammation of the liver*

##### immuno-deficiency virus

*a virus that attacks the body's natural defence system*

## Exposure sources

---

The following are common sources of exposure.

- All human body fluids and secretions, especially any fluid with visible blood
- Microbial cultures and packaged human blood products for hospital use
- Body parts, organs, corpses, and any other human material
- Medical, clinical, laboratory equipment/work surfaces, hospital linen and waste
- Animal blood, fluid and waste

## Potential exposure situations

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The following are common situations firefighters encounter that create exposure risk.

- Patient extrication/first aid provision at an accident or medical assist incident
- Physical recovery of a body or body parts
- Handling of blood/body fluid contaminated objects, for example, needles
- Police assist rescue calls, for example, a disturbed person threatening self-harm
- Incidents at hospitals, veterinary clinics, medical or research labs
- Incidents involving animals
- Incidents involving contact with sewage

## Exposure routes

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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

## Exposure levels

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### High risk

The following are examples of incidents that carry a high risk of biological contamination.

- A deep puncture wound caused by an object contaminated with blood/body fluid or other non-clean substance
- A puncture wound from a hollow-bore needle used in the vein or artery of another individual
- A cut with a sharp instrument visibly contaminated with blood/body fluid or other non-clean substance
- Contamination with blood/body fluid/sewage over a large area of intact skin
- Inhalation of blood/body fluid/sewage

### Medium risk

The following are examples of incidents that carry a medium risk of biological contamination.

- A splash of blood/body fluid/sewage onto mucous membranes, for example, in the eyes, in the mouth or up the nose
- Contact of blood/body fluid/sewage onto broken skin, for example, a patch of dermatitis
- Prolonged contact with blood/body fluid/sewage on a large area of intact skin
- An animal or human bite breaking the skin

### Low risk

The following is an example of an incident that carries a low risk of biological contamination.

- A small amount of blood/body fluid/sewage on intact skin

## Universal precautions

---

The expression 'universal precautions' refers to the risk management strategy we use to prevent the transmission of communicable disease by reducing contact with blood and other body substances.

Universal precautions include:

- treating all persons as if infectious
- covering all cuts or abrasions with a waterproof plaster or dressing when on duty
- wearing appropriate Personal Protective Equipment (PPE) for the task – officers should determine the level of protection required based on a risk assessment of the incident.
- being careful handling high-risk or known contaminated objects
- washing following completion of task
- cleaning of high-risk or contaminated equipment
- appropriate disposal of disposable PPE 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 service workers in a biological substance exposure situation. If these guidelines are followed, the risk of infection can be significantly minimised.

## Management of sharps

---

Occupational exposure to blood-borne pathogens from needle sticks and other sharps injuries is a serious problem. Sharps injuries are primarily associated with occupational transmission of hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), but they have been implicated in the transmission of more than 20 other pathogens.

### What can I do to safely handle sharps?

- Be prepared – have a suitable container to dispose, have gloves.
- Be aware – consider your own safety whenever handling sharps.
- Dispose with care – secure the container. Do not over-fill.

In the event of a needle stick injury taking place:

- wash the area well with soap and water and cover with a waterproof dressing
- notify your manager.

## Personal Protective Equipment (PPE)

Universal precautions should be used with all patients and not just with those who have a disease. This also protects you from:

- chemical hazards
- physical hazards.



Universal precautions

Full PPE may not be required for all medical incidents, particularly when carrying out CPR at co-response incidents. Officers should take a risk based approach and be guided by the paramedics on scene.

## Immediate action at scene following exposure

---

Report the accident and initiate immediate First Aid as follows:

### 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 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.


## Decontamination

Check clothing, PPE and other equipment. Avoid re-contamination and remove any contaminated article. Wash your hands after removal and clean, bag or dispose of any contaminated article, object or item of equipment. Use the following process to decontaminate clothing and equipment:

- Securely bag the contaminated clothing and label, 'Blood contaminated clothing – wash separately' and forward to the appropriate laundry.
- Clean equipment and working surfaces by first rinsing in water (the effectiveness of disinfectant is reduced by organic matter, so clean visible matter off first), scrubbing if necessary to remove material such as soil, faeces, etc.
- Soak or wash all surfaces in a 0.5% Sodium Hypochlorite solution (follow manufacturer's recommendations or use 9 parts water to 1 part bleach [i.e. bleach with a 0.5% Sodium Hypochlorite solution] or a granular chlorine compound), and leave in contact with contaminated surfaces for 5-10 minutes.
- Finally, drain and rinse well with potable water and dry thoroughly.

 **NOTE**

Residual bloodstains may contain viruses, which remain active for some time.

 **NOTE**

A '10% Sodium Hypochlorite solution' bleach is a double-strength household bleach.

## Disposal

Securely bag contaminated disposable equipment and disposable PPE and put the bag in the correct collection bin. If you are unsure, contact qualified personnel, for example, hospital (Infection Control), ambulance, GP, or nursing staff at local A&E for advice.

## Recording exposure to a biological substance

Any personnel who are exposed to biological substances must complete:

- NZFS Accident Report Form (FS 432/432a OSH Kiosk) – identify the source or source individual if possible
- G7a Significant Hazard Exposure & Decontamination Form FS431 (If low risk category, complete form and mark 'Precautionary')
- District/Station Accident register.

## Ongoing health monitoring requirements

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The Regional Health and Safety Coordinator, or other designated officer, in liaison with the Regional Medical Officer (where available), will coordinate a follow-up assessment, monitoring, treatment, health advice, welfare and counselling support with appropriate providers as required.

All employees who experience a significant exposure will undergo, as soon after the incident as is practicable (within 12-24 hours), blood tests for baseline monitoring of appropriate pathogens (this is to make sure the person did not have the infection before the exposure). Baseline testing usually includes HepB antigen testing, HBV, HCV and HIV antibody levels.

The Regional Health and Safety Manager or the accountable line manager will inform the Principal Medical Officer of all significant hazard exposures to biological substances.

Medical records are to be kept for each employee as per NZFS policy.

## Infection risk assessment

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Most exposures do not result in an infection. Risk of infection varies and depends on:

- the source, type and level of exposure
- whether a pathogen is involved and its level in/on the source item/individual
- the status of the affected individual's immune system.

Where the source is known, most employees can be quickly reassured by obtaining antibody levels (HBV, HCV, and HIV) from the source. Negative levels eliminate the risk except in some special circumstances, which the medical officer will determine.



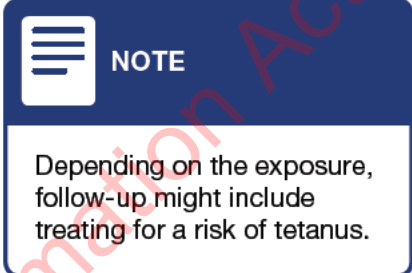
## Exposure where source item or individual cannot be identified

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The Medical Officer will make an assessment of the risk. From this they will decide the treatment and follow-up.

They will consider:

- the location and circumstances of the exposure
- the prevalence of hepatitis B, hepatitis C or HIV in the area/ community where:
  - the source item or individual is from
  - the exposure occurred
- any additional information on the use of the source item or the lifestyle of the source individual, for example, whether they are an IV drug user.



**NOTE**

Depending on the exposure, follow-up might include treating for a risk of tetanus.

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# Section 3: Primary survey

## Introduction

This section details the process to be followed during the initial encounter with a patient.

Whether you are looking after a person with a cut finger or a person in cardiac arrest, the same primary management priorities apply. This initial process is called the primary survey. It is a systematic checklist designed to ensure safety and establish whether a patient is alive, dead, or has any immediate life-threatening problems.

The steps to be followed are:

- **D**anger
- **R**esponse
- **S**end for help
- **A**irway
- **B**reathing
- **CPR**
- **D**efibrillation

### MEANING

#### CPR

*cardiopulmonary resuscitation (CPR) is a cycle of chest compressions and rescue breaths that keep blood and oxygen circulating in the body of a patient who is not breathing*

## Danger

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There are many factors to consider before and during your involvement at an emergency scene, apart from the normal role and responsibilities of a firefighter.

### Scene assessment

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The scene assessment starts right from the initial call and continues en route to the scene. Establish the type of call you are going to, such as a motor vehicle accident or house fire; this will help identify the types of injuries you may have to deal with. Establish a strategy en route regarding who will play what role at the scene from a medical perspective. When arriving at the scene, drive up slowly, so that you can gain a larger picture of events.



#### SAFETY NOTE

Always remember to reassess the safety of yourself and your crew while treating the patient.

### Ask yourself: What has happened?

On approach look for:

- anything that could be a danger, such as down powerlines
- the type of building involved in a fire, for example a house or a factory
- the number and types of people at the scene, such as members of the public, other emergency services personnel
- anything else that may provide useful information.

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

- yourself
- any other bystanders near the scene.
- the patient.

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 patient, you will be unable to help them. If the scene is not safe, remove the threat from the patient (or the patient from the threat). If this cannot be achieved, go to a safe place and wait for further assistance.

## Moving a patient

---

How or when you move a patient depends on the situation. There are, however, three situations in which a patient must be moved immediately, regardless of the type of lift used:

1. The patient is in a dangerous situation.
2. You cannot effectively maintain the patient's airway or treat them appropriately where they are placed.
3. A more advanced medical provider decides to move them.

The patient must be moved to a place of safety, where proper treatment can occur. Remember to take note of the position of the patient if necessary.

## Response

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When checking a person's response, you are assessing how well their brain is functioning. If the patient's brain is not functioning normally, they may not be able to look after their own airway.

## Causes of unconsciousness

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A range of things can cause unconsciousness, but they are not all equal – some can lead to life-threatening conditions:

- trauma to the head
- medical reasons, such as seizures, diabetes, some illnesses
- drugs/chemicals: alcohol, sedatives, narcotics, etc.

## Dangers for the unconscious patient

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When a person is unconscious, there are a number of things that first aiders should be aware of. The unconscious person:

- will be unable to avoid danger
- will be unable to maintain their own airway
- could vomit or regurgitate stomach contents into the lungs
- may have breathing difficulties.

## Procedure

Check for a person's response by talking to them and tapping them on the shoulder. AVPU is a simple reminder. The four levels of responsiveness are:

**Alert:** The patient is alert and responsive.

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

**Pain:** The patient is responsive to pain (hard pinch to earlobe or the **trapezius** muscle).

**Unresponsive:** The patient is unresponsive to voice or pain.

The unresponsive, but breathing patient should be put on their side.



Checking for response



### SAFETY NOTE

When possible, always approach the patient from the direction of the head.

## Send for help

Call comms, or get someone else to do this, to get an ambulance to respond to the incident.

### MEANING

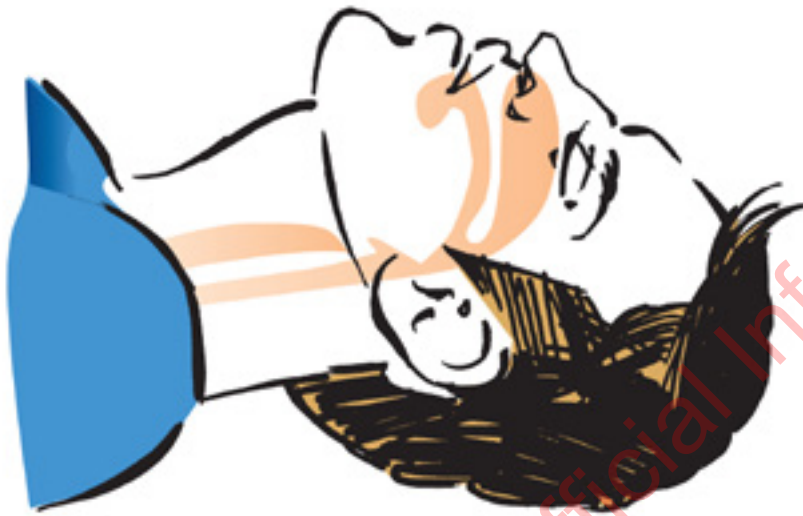
#### Trapezius

*large triangular muscles extending over the back of the neck and shoulders*

## Airway

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A patient with a lowered level of responsiveness may be unable to effectively manage their own airway. If someone is able to talk to you, then they are able to manage an airway. If they cannot talk, their airway may be compromised.



The upper airway

**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 patient will not survive for long.**

## Airway obstruction

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During resuscitation and emergency situations, most airway problems are caused by the tongue and/or vomit obstructing the airway. These can often be resolved by simple airway management (see 'Airway procedures', next page).

## Airway procedures

There are three procedures to ensure the airway is clear:

1. Head-tilt and chin-lift
2. Finger sweep
3. Jaw thrust

### Head-tilt and chin-lift

In order to manually open the airway, tilt the head back, putting one hand on the forehead, and lift the jaw forward with two fingers on the bony part of the chin. Open the patient's mouth. Remove any obvious obstructions from the mouth with a finger sweep (see following paragraph). Make sure that you are wearing barrier gloves.



Head-tilt and chin-lift

### Finger sweep

The finger sweep is used to clear the mouth of fluid and debris in the unresponsive patient. It should only be performed if you can see something to remove. It should always be performed with a gloved hand, with the patient positioned on their side in the side stable position.

Insert your finger into the side of the patient's mouth and perform a single sweeping motion to the opposite side, flicking out vomit, blood and debris.



## Jaw thrust

The jaw thrust enables you to open an airway with the head in the neutral position, without having to tilt the head back. It is used to open the airway of unresponsive patients where spinal injury is suspected, while preparing to log roll them to the side stable position. It can be difficult and tiring to maintain a jaw thrust for an extended period of time.

With the patient lying on their back:

- 1.** Kneel behind the head of the patient.

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- 2.** Place your hands on either side of the patient's head.

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- 3.** Place your thumbs on the patient's cheek bones, just below the eyes.

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- 4.** Put your first fingers on the angle of the jaw and cradle the back of the head with the remaining finger.

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- 5.** Use the thumbs on the cheek bones to brace the head in position while shifting the jaw upward with your first fingers.

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- 6.** Remember to keep the head in neutral alignment, especially if spinal injury is suspected.

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- 7.** Keep the head raised slightly with a towel.

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## Jaw thrust when seated

Place your hands on either side of the patient's head, preferably from behind:

1. Place the tips of your first fingers on patient's temples.
2. Place your ring finger behind the angle of patient's jaw.
3. Place your thumbs high on patient's head.
4. Move the patient's head gently into position in line with the spine.
5. Push the jaw forward using your ring fingers.



Jaw thrust back to neutral position



Jaw thrust when seated

## Breathing check

---

Adequate (normal) breathing is a very passive process and should always be:

1. effortless
2. painless
3. quiet.

Any patient who has to put significant effort into breathing, has pain when breathing, or has noisy breathing requires assistance.

## Inadequate breathing

---

Signs of inadequate breathing may include:

- little or unusual chest movement
- weak or abnormal sounds (wheezing, etc.)
- occasional gasps
- reduced responsiveness
- rapid or slow breathing
- unusual posture.

Always position responsive patients with breathing concerns in an upright position.

## Breathing rates

---

Infants 20-50 breaths/minute

Children 20-50 breaths/minute

Adults 10-20 breaths/minute

## How to check for breathing

Look, listen, and feel for breathing.  
This should take you no longer than 10 seconds.

1. If the patient is unresponsive and not breathing, begin CPR.
2. If the patient is unresponsive and their breathing sounds and looks abnormal, begin CPR.
3. If the patient is breathing normally but is unresponsive, place them in the side stable position and continue to monitor their breathing.



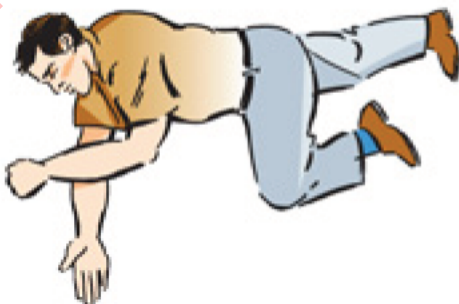
Look, listen, and feel for breathing

## Side stable position

The side stable position is the single most effective method of providing and maintaining a clear airway in the unresponsive, breathing patient.

The side stable position:

- allows the tongue to fall away from the back of the throat, enabling the patient to maintain a clear airway
- allows for drainage of vomit and fluids from the airway
- is suitable for patients who are unresponsive but are breathing.



## Assess for spinal injury

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All unresponsive, breathing patients who are suspected of having a spinal injury should still be placed on their side in the side-stable position. Airway takes precedence over any suspected spinal injury.

## CPR

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### Establishing the need for CPR

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The next step in your primary survey is to establish whether the patient has any problems with their circulation.

The circulation assessment of the primary survey involves:

1. assessment and management of cardiac arrest
2. assessment and management of bleeding.

If major bleeding is found manage simultaneously.



LINK

For information on managing bleeding refer to Section 8: Trauma

## The role of CPR in the adult chain of survival

The key steps to surviving a cardiac arrest in adults are described as the adult chain of survival. There are six links in this chain and each one needs to occur promptly to ensure survival.

1. Prevention
2. Early recognition by a bystander that a problem exists
3. Early 111 call
4. Early bystander cpr to keep oxygenated blood pumping to the vital organs
5. Early defibrillation to restart the heart
6. Early arrival of 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.

## What is CPR?

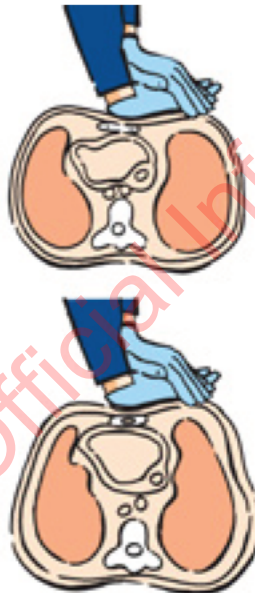
The term Cardiopulmonary relates to heart and lungs:

- Cardio: heart
- Pulmonary: lungs

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. This is the only way to keep the heart and brain oxygenated until a defibrillator arrives.



External chest compression



Cross-section of chest compression

CPR is a repetitive cycle of:

1. airway opening
2. chest compressions
3. rescue breathing.

## When to perform CPR

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CPR should be performed on patients who are not breathing, or unresponsive and breathing inadequately. Sometimes a patient suffering a cardiac arrest may occasionally gasp, but this does not constitute normal breathing.

## When not to perform CPR

---

You should not perform CPR:

- when it is too dangerous to rescuers
- when there are obvious signs of death, for example rigor mortis
- when the patient's injuries are clearly too severe for survival.

## Do not resuscitate (DNR) orders

---

Patients who are terminally ill or have chronic health issues have the right to sign a do not resuscitate order. These orders are discussed at length with the patient's doctor and are routinely completed in the hospital setting.

The only person who can make the call to not resuscitate is a medical professional. If an emergency response has been activated (for example, 111 called), resuscitation should always be commenced by the responding fire crew and maintained until the arrival of a medical professional.

When becoming aware that the patient has requested not to be resuscitated, crews should follow the New Zealand Fire Service DNR Procedure as outlined below.

## New Zealand Fire Service Do Not Resuscitate (DNR) Procedure

---

When arriving on scene and becoming aware that the patient has requested not to be resuscitated, crews must follow these steps:

1. Ask to view the 'Do Not Resuscitate' certificate.

2. Start CPR while the certificate is being located.
3. Contact the St John Clinical Advisor.

The contact number is 0800 244 111 then press:

- 9 for Northcom
  - 4 for Centralcom
  - 3 for Southcom
  - then 9 for the Clinical Desk.
4. Relay the information on the certificate to the Clinical Advisor.
  5. Comply with the guidance provided by the St John Clinical Advisor.
  6. If the certificate is not available to view, resuscitation attempts should continue while awaiting clinical advice.

If crews become aware of a DNR request by other means, such as instructions on a bracelet or other information on a patient, steps 3, 4 and 5 should be followed.

Should an ambulance crew arrive on the scene during this process, scene control reverts to the ambulance crew, who will complete the decision process in relation to the DNR order.

The DNR request should be included in the sitrep or stop message.

## Reassessment

---

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

## When to stop CPR

---

You must perform CPR continuously until one or more of the following happens:

- The patient recovers responsiveness and is able to breathe on their own
- You are placed at significant risk



- You cannot continue due to exhaustion
- An aed is attached and instructs you to stop
- You are advised to stop by the st john clinical advisor, or a paramedic or doctor

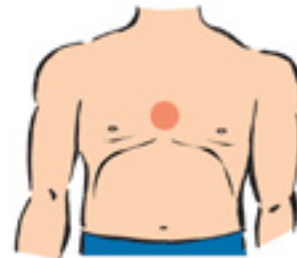
## Adult CPR procedure

Steps of the CPR technique:

- 1.** Move the patient to a safe area.
- 2.** Lay the patient on a firm, flat surface.
- 3.** Open the airway using the head-tilt/chin-lift.
- 4.** Assess breathing. Look, listen, and feel for 10 seconds.

If the patient is not breathing or is unresponsive and breathing, continue as follows:

- 5.** Expose the patient's chest.
- 6.** Place the heel of your hand over the breastbone in the middle of the patient's chest.
- 7.** Place the heel of the other hand on top of the first hand, and lock the fingers together.
- 8.** Your fingers should be lifted from the chest wall and only the heel of the lower hand should be in contact with the breast bone. Your fingers should not touch the patient's chest during compressions.
- 9.** Hold your arms straight, with your elbows locked in position.
- 10.** Position your shoulders directly over the hands, so that the thrust for each compression is straight down onto the breastbone.
- 11.** Press down firmly with a controlled action. The force should come from the movement at your hip rather than bending your elbows.



- 12.** Compress the patient's chest hard and fast one third of the chest depth. The rate of compression should be 100 -120 per minute.
- 
- 13.** After 30 compressions, open the airway using the head-tilt/ chin-lift.
- 
- 14.** Attempt to give two breaths (using an OPA and bag mask if attached).
- 
- 15.** Repeat the cycle of 30 compressions and two breaths continuously.
- 



### Children (1-8 years) CPR procedure

---

CPR for a child aged 1-8 years is exactly the same as for an adult, except use one hand on the chest rather than two.



Chest compressions – child

### Infants (less than 1 year) CPR procedure

---

CPR for an infant aged 0 - 1 years is the same as CPR for an adult, except you use 2 fingers to do the compressions.

Move the head into a neutral position for the breaths.



Chest compressions – infant

## Capillary refill

---

Capillary refill is the rate at which blood refills empty capillaries. It is a simple indication of perfusion and can indicate if a body has suffered blood loss, etc.

Capillary refill is measured by pressing a fingernail until it turns white and taking note of the time needed for colour to return once the nail is released. If it takes longer than 2 seconds, it is a sign of poor perfusion.

## Defibrillation

---

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 so that a person with little or no training can use it effectively and safely to defibrillate a patient. All fire appliances carry AEDs.

## Using an AED

The LifePak 1000 is the standard New Zealand Fire Service AED and is carried on all frontline appliances. It is important you familiarise yourself with its operation.



Examples of AEDs

To operate an AED:

1. Turn the device on (there will be a clearly marked On/Off button). The device will start and provide either audible or text prompts.
2. Once the device is turned on, follow the instructions given by the AED.

### Safety considerations

Do not use the AED in flammable environments. Do not touch the patient when shock is being delivered. Follow the instructions of the AED.

### Indications for use

The AED should be used on all unresponsive patients who are inadequately breathing or not breathing.



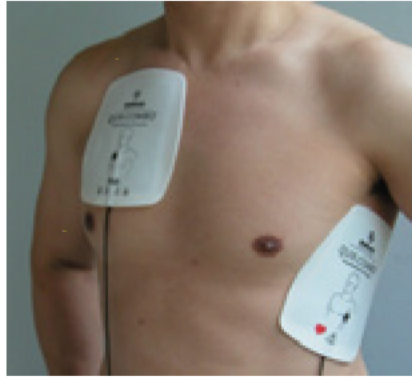
#### SAFETY NOTE

Oxygen should be used with caution around Automated External Defibrillator (AED) equipment. Try to keep the cylinders at least one arm's length from any AED equipment, especially while shocking a patient.

## Placement of pads

Follow the manufacturer's directions for specific placement of pads on the patient's body.

1. Using a razor if provided, remove excess hair to assist with adhesion of the pads.
2. Dry the chest of excessive moisture to assist with adhesion.



Adult placement of AED pads

## Using the LifePak 1000 AED on children and infants

The LifePak 1000 AED can be used on children and infants with adult pads. Use the anterior/posterior for small children.

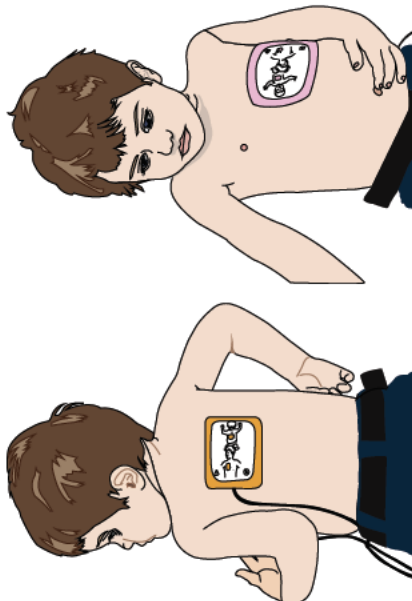
St John Ambulance have evaluated the use of paediatric pads and found that:

- it is exceptionally rare to defibrillate a child
- when adult defibrillation pads have been attached and used on children, these have successfully reverted the rhythm
- they were unable to locate any compelling evidence or research to support the use of paediatric specific pads.

(St John Clinical Update 015, Dr Tony Smith)



Child pads



Child pad placements  
(front and back)

# Section 4: Foreign body airway obstruction (choking)

## Airway obstruction

The airway can become obstructed by objects, such as food, becoming stuck in the throat.

There are two types of airway obstruction:

- Partial airway obstruction: The patient is distressed and feels an obstruction in the throat.
- Total airway obstruction: The patient's airway is blocked and they cannot breathe.



Universal sign for choking

## Partial airway obstruction

The indications that someone may be struggling with an obstruction are:

- breathing gasping or laboured
- some air escaping from mouth
- patient coughing or making a 'crowing' noise
- extreme anxiety or agitation.

## Treatment for partial airway obstruction in adults and children

Never use back blows on a person who is able to cough effectively or breathe. Instead:

- 1.** Ask the patient 'Are you choking?' to determine whether their airway is completely blocked.
- 2.** Encourage the patient to cough and expel the foreign body.



### SAFETY NOTE

Do not give back blows or chest thrusts to a person suffering from a partial obstruction.

## Total airway obstruction

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The indications that someone may be struggling with an obstruction are:

- panic
- grasping the throat
- inability to breathe, speak or cough.

### Treatment for total airway obstruction in adults and children

---

The following back blow procedure is for adults and children:

- 1.** Ask the patient if they are choking.

---

- 2.** Try to position the person so they can support themselves on a table or desk.

---

- 3.** Stand to the side of the patient and slightly bend the patient over.

---

- 4.** Support the patient's chest with one hand and give five sharp blows between the shoulder blades with the palm of your hand.

---

- 5.** Check effectiveness after each back blow.

---




Treatment for choking - adults and children

If the obstruction is still present, perform chest thrusts:

- 1.** Stand behind the patient and wrap your arms around at chest level.

---
- 2.** Place one fist with the thumb side against the middle of the breastbone.

---
- 3.** Grasp that fist with your other hand and give up to five separate, inward thrusts.

---
- 4.** Check effectiveness after each chest-thrust.

---
- 5.** Repeat the process of five back blows (checking between each one) followed by chest thrusts (checking between each one) until the obstruction is cleared or the patient becomes unresponsive.

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- 6.** Commence CPR if the patient becomes unresponsive.

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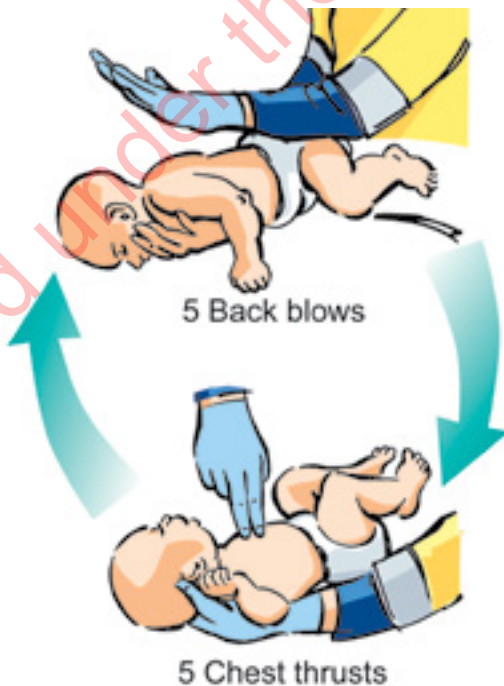
Released under the Official Information Act 1982



## Treatment for choking infants (less than 1 year)

The following procedure is for a choking infant:

- 1.** Check to see if the obstruction can be cleared using the finger sweep.
- 2.** Lay the infant in a prone position over your forearm, supporting the baby's face and body with your arm. The head should be facing the ground and lower than the chest.
- 3.** Deliver five blows between the infant's shoulder blades. Check between each back blow.
- 4.** If the obstruction is still present, turn the infant onto their back, head down towards the ground.
- 5.** Deliver five chest thrusts between the infant's nipples using two fingers. Check between each chest thrust to see if the obstruction has been relieved.
- 6.** Repeat this process until the obstruction is cleared or the infant becomes unresponsive.
- 7.** Commence CPR if the infant becomes unresponsive.



Treatment for choking-infants

# Section 5: Oxygen overview

## Introduction

This section outlines the following key areas:

1. Oxygen administration, including equipment descriptions and use
2. Cylinder parts and maintenance
3. Safety issues

Effective administration of oxygen is a vital component of First Aid delivery. Having an understanding of the underpinning airway and breathing management techniques is important as well.

Correct use of the equipment will ensure that use of oxygen is effective and efficient.

## Oxygen administration

Oxygen is a treatment for hypoxia. Oxygen is not a 'general treatment' for patients who are unwell or injured.

Oxygen administration is restricted to those patients that have an indication to receive it, because when oxygen levels within blood are higher than normal:

- blood vessels (particularly small arteries) vasoconstrict – this has the potential to lower blood flow to tissues and organs
- inflammation is increased and this may worsen inflammatory states.

Few sections in this manual contain specific instructions on oxygen and clinical judgement is required. Oxygen does not necessarily provide benefit and should not be routinely used. Administer oxygen if the patient has:

- airway obstruction or
- respiratory distress (exception – see 'patients at high risk' below) or
- shock or
- inability to obey commands from TBI or
- carbon monoxide poisoning or
- traumatic brain injury or
- smoke and toxic gas inhalation or
- decompression illness.



### SAFETY NOTE

Industrial oxygen is concentrated and can be dangerous.

## Oxygen flow rates

For most patients nasal prongs or a simple mask will be sufficient.

Reservoir masks should be reserved for those with severe hypoxia. Usually, 10 litres/minute is sufficient oxygen flow through a reservoir mask. If the reservoir bag is not completely deflating, the oxygen flow is sufficient.

If you are unsure about administering oxygen, contact the St John Clinical Advisor. The contact number is 0800 244 111, then press:

- 9 for Northcom
- 4 for Centralcom
- 3 for Southcom.

Then 9 for the Clinical Desk.

Use the following oxygen flow rates:

Device	Flow rate
Nasal prong (if carried)	1-4 litres/minute
Acute (simple) mask	6-8 litres/minute
Reservoir mask and bag mask	10-15 litres/minute



### SAFETY NOTE

Wherever possible, use the simplest device and the lowest oxygen flow rate.

## Oxygen devices

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### Nasal prongs (if carried)

This device consists of a tube with two prongs which are placed in the nostrils and from which oxygen flows.



### Acute (simple) mask

The acute (simple) mask has no reservoir bag. It consists of a mask and a tube from which oxygen flows.



### Oxygen reservoir masks

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In a patient who appears to be breathing adequately, it may still be appropriate to provide additional oxygen. This is particularly true if the patient is experiencing a severe bleed or shortness of breath, or has suffered from smoke inhalation. In these settings, providing additional oxygen via a reservoir mask is indicated.

The reservoir mask is a high-concentration oxygen delivery mask for all unresponsive and responsive, breathing patients.

There are adult and child size masks and it is essential that the correct size is used. The facemask is the correct size if the pointed end is at the bridge of the nose, and the rounded end is on the cleft of the chin.

The reservoir mask has a reservoir bag attached that increases the delivery of oxygen. This reservoir bag must be inflated before use. The simple mask has no reservoir bag.

## Technique

Reassure and explain to the patient what you are doing. You may need the support of a caregiver to apply the mask to children.

All unresponsive patients require the insertion of an OPA (see next section) and should be placed in the side stable position.

- 1.** Select an appropriate sized mask.

---

- 2.** Reassure the patient and explain what you are doing.

---

- 3.** Turn on oxygen to the required rate and inflate the reservoir.

---

- 4.** Fit the mask to the patient's face, ensuring that the pointed end is at the bridge of the nose and the rounded end is on the cleft of the chin.

---

- 5.** Pull the neck straps to ensure the mask is secure.

---




Reservoir mask – adult



Reservoir mask – child

## Oropharyngeal airway (OPA)

An oropharyngeal airway (OPA) is a soft, hollow, curved plastic tube, which is inserted through the mouth. It is positioned behind the tongue and sits in place in the throat. It is designed to stop the tongue from blocking the airway. It is fitted to unresponsive patients who don't have a gag or cough reflex.

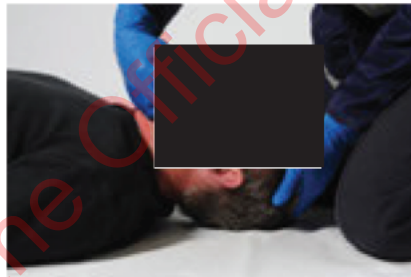


OPAs of various sizes

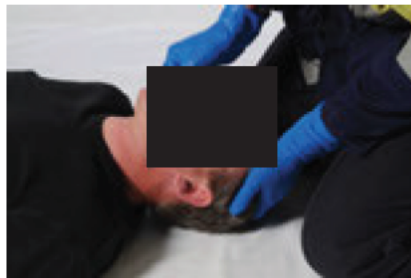
### Technique

When inserting an OPA:

- 1.** Select an airway nearest to the length from the corner of the patient's mouth to the tip of their earlobe.

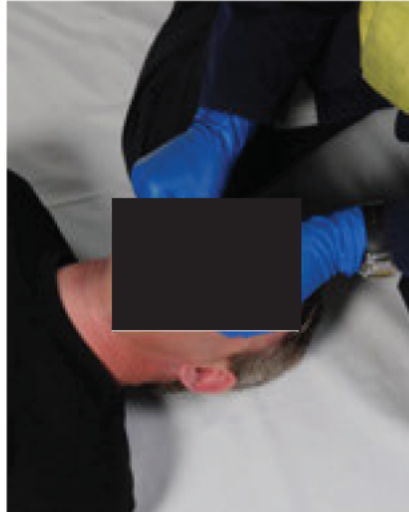


- 2.** Use the head-tilt chin-lift technique to open airway.



- 3.** Insert the airway with the curved part facing the roof of the mouth, passing the airway behind the tongue.

4. Rotate 180° so that the curved part is sitting over the tongue.



For children and infants, insert the correct way round (no rotation).

5. Check that the flange/bite block is sitting flush with the patient's lips or teeth.



#### NOTE

To remove the airway, gently pull it straight out without rotating.

### Complications

Damage to teeth, lips and throat can occur if the OPA is inserted incorrectly. If the patient begins to cough, gag or vomit, the OPA should be removed and the airway reassessed.

## Bag mask resuscitation/adults

A Bag Mask Resuscitator is a high-concentration, manually operated oxygen delivery device suited to patients who are not breathing adequately, or non-breathing patients who require resuscitation. It has a reservoir bag attached that increases the delivery of oxygen.



Adult bag mask



Child bag mask



## Technique

- 1.** Ensure that the bag mask is assembled correctly.

---

- 2.** Make sure the patient is positioned on their back.

---

- 3.** Manually open the airway and maintain it open at all times.

---

- 4.** Assess breathing, look, listen, and feel.

---

- 5.** Insert an OPA if the patient is unresponsive.

---

- 6.** Turn the oxygen on and inflate the reservoir.

---

- 7.** Place the facemask over the mouth and nose. The facemask is the correct size if the pointed end is at the bridge of the nose, and the rounded end is on the cleft of the chin.

---

- 8.** Press downward on the mask with your thumb positioned above where the bag meets the mask and your forefinger below (forming a C grip). Make sure the air does not leak out around the facemask.

---

- 9.** Position the remaining three fingers under the chin, so that you can lift the chin (chin-lift). Make sure the airway remains open.

---

- 10.** Slowly compress the bag while applying downward pressure on the mask, forming a tight seal over the patient's face.

---

- 11.** Check that the patient's chest rises and falls adequately.

---

- 12.** If there is no chest movement, recheck the airway and mask application, and ensure that the airway is open.

---

- 13.** While you perform the bag compression, another person can apply downward pressure on the mask and airway opening using both hands.

---



Single-person bag masking



Two-person bag masking

## Complications

Bag mask ventilation is not a simple technical skill. Care must be taken to ensure that the airway is opened and that air does not escape around the edge of the mask. If the chest fails to rise, recheck the equipment, reposition the airway using head-tilt/chin-lift, and then consider the two-person technique.

Excessive pressure may cause stomach distension possibly causing the patient to vomit. If vomiting occurs:

- 1.** Remove the OPA, if fitted.

---

- 2.** Roll patient onto side.

---

- 3.** Clear airway.

---

- 4.** Return to back and continue CPR as soon as possible.

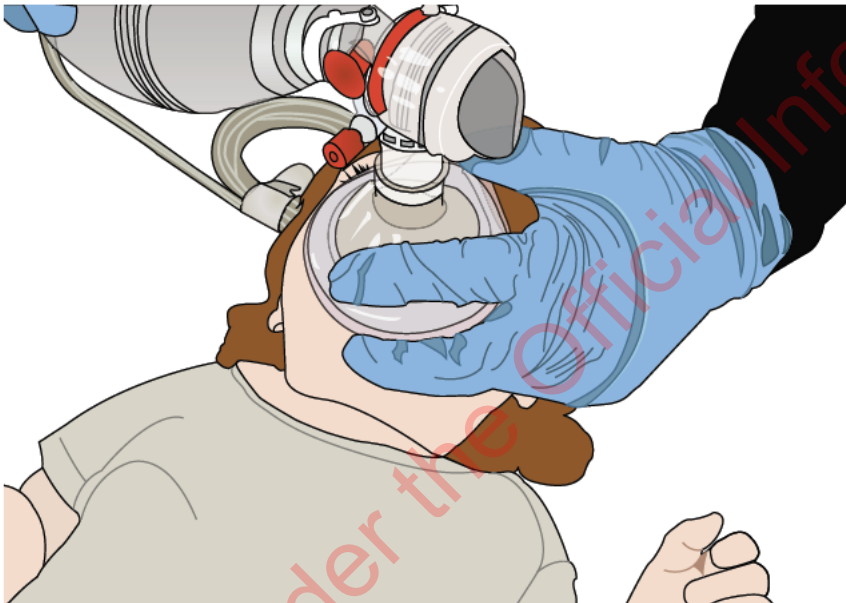
Minimise pauses and perform uninterrupted compressions whenever possible.

## Bag mask resuscitation infants/children

The technique is the same as for adults; however, the airways in infants are not as developed as children and adults, so avoid pressure on the soft tissue of the neck. Specific child and infant bag mask resuscitators should be used.

It is important to get an adequate seal around the patient's nose and mouth and ensure the airway is open. For infants and small children you may have to apply the EC grip (fingers form a C around the mask and an E under the jaw).

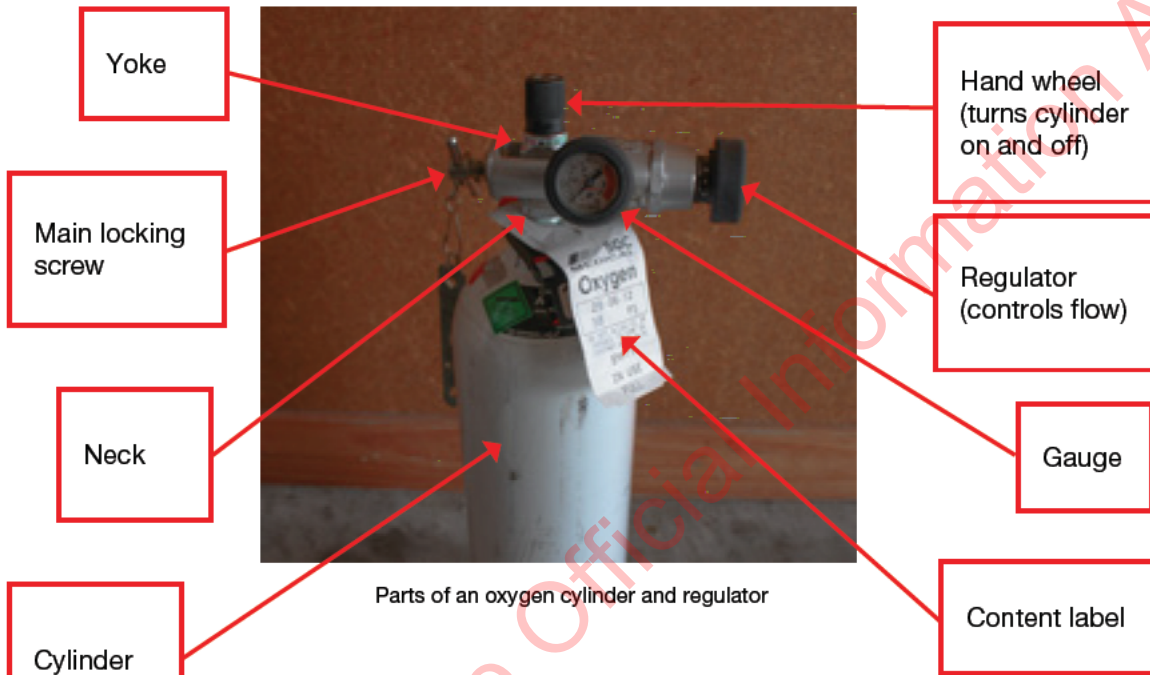
In infants under 1 year old it is particularly important not to distend the stomach with excessive air – ensuring that the bag is squeezed gently, and the airway opened properly, is the best way to avoid this.



Baby EC grip

# Cylinders

## Parts of a cylinder



Cylinder part	Description
Hand wheel	Turns the cylinder on and off.
<b>Yoke</b>	The top part to which the gauge and oxygen key are attached. The yoke section has a pin safety system.
<b>Main locking screw</b>	Secures the regulator to the cylinder yoke.
<b>Pin safety system</b>	A safety system designed to allow only an appropriate medical oxygen regulator to be fitted to the cylinder.
<b>Neck</b>	The tapered section carries the colour coding and contents label.
<b>Regulator</b>	Device that reduces the pressure of the cylinder and controls flow.
<b>Gauge</b>	Displays the volume of the contents of the cylinder.
<b>Content label</b>	Carries the name of the contents and the Standards Identification Code.
<b>Cylinder body</b>	The main part of the cylinder.
<b>BODOK seal</b>	Seals the regulator to the cylinder yoke.

## Maintenance

Regular maintenance of cylinders is essential.

Make sure you:

- regularly check the cylinder pressure
- regularly check the cylinder for damage
- check to ensure the cylinder is free of oil, grease and dirt.

## Safety issues

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### Potential hazards

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There is the potential danger of the cylinder exploding.

### Safe operational use

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When working with an oxygen cylinder, you must take certain precautions:

- No smoking, naked flames, sparks or flammable fluids where oxygen is stored or administered.
- Handle cylinders with care.
- Store cylinders securely at all times.
- Lay cylinders on their sides when in use.
- Do not store above 52°C.
- Do not use oil or grease on or near cylinders, regulators or hoses.
- Never use the cylinder without the correct gauges.
- Open the pressure-reducing valve slowly to prevent a surge of pressure into the valve.
- Close valves when the cylinders are not in use, even when empty.
- Do not put any part of your body over the cylinder or valve.

# Section 6: Secondary survey and patient questioning and management

## Secondary survey

The secondary survey is a systematic and thorough head-to-toe check of the traumatically injured patient. It is performed after the primary survey to identify any significant injuries.

In the trauma patient, 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 SAMPLE and OPQRST can provide further information that may assist in the treatment of the patient.

As a firefighter, your goal in the secondary survey is to identify any major bleeding that you can stop using direct pressure, and to identify any other injuries, for example, fractures. The secondary survey is also useful to obtain information for more advanced medical assistance.

The secondary survey should not take any longer than 1–2 minutes. If the patient is responsive, you need to talk to them and explain what you are doing. It should be undertaken only when the primary survey has been completed and any issues resolved.

You need to record your findings and pass them on to ambulance crew during the handover.

## Secondary survey procedure

The procedure for the secondary survey is as follows:

- 1.** Central nervous system: Talk to the patient and assess their level of responsiveness.

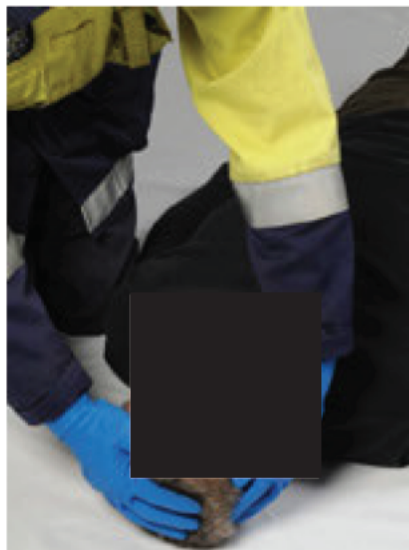
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- 2.** Head and face: Look and feel for any deformity and tenderness.

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- 3.** Neck: Look and feel for any deformity and tenderness.

---

Head and face check

**4.** Chest: Look and feel for any deformity and tenderness. Look for equal rise and fall of the chest, and for any obvious bruising.

---

**5.** Back: Look and feel for any deformity and tenderness or signs of bleeding.

---

**6.** Abdomen and pelvis: Look and feel for any deformity and tenderness.

---

**7.** Extremities (arms and legs): Look and feel for any deformities. Check for strength by asking the patient to squeeze your hands or push your hands with their feet.

---



Abdomen and pelvis check



Leg check



Arm check



## Questioning methods

After the primary survey is complete, you need to undertake a secondary survey. The secondary survey in medical patients involves questioning. Good questioning enables you to gather information that may be useful for ambulance staff.

There are two key questioning methods: **OPQRST** and **SAMPLE**.

It is good practice to write notes so that the information can be relayed to ambulance staff.

### OPQRST

This method helps you to assess the patient's pain.

- O Onset – What was the patient doing when the signs and symptoms first occurred. Was the onset sudden or gradual?
- P Promotes or alleviates – Does anything make the pain better or worse?
- Q Quality – Can you describe what the pain feels like? For example, dull, sharp, crushing, throbbing?
- R Region/radiates – Where is the pain? Does it go anywhere else?
- S Severity – On a scale of 1 to 10, how would you rate the pain?  
(10 – worst; 1 – least)
- T Time – How long have you had this pain?

### SAMPLE

This method helps you to learn about their medical history and the events leading up to the accident.

- S Signs and symptoms –  
A sign is something you can see, for example, pale skin.  
A symptom is something the patient experiences, for example, the patient feels sick.
- A Allergies – Are you allergic to anything?
- M Medications – Are you on any medication? Have you taken it?
- P Past history – Has this happened before? Have you been to hospital recently?
- L Last meal – When did you last eat or drink? What did you eat or drink?
- E Events prior – What were you doing when this happened?

## Patient management

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### Managing a responsive patient

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If the patient is responsive:

- 1.** Undertake the primary survey – give reassurance.

---

- 2.** Provide oxygen if appropriate.

---

- 3.** Position the patient in the most comfortable position for them.

---

- 4.** Undertake the secondary survey – **OPQRST** and **SAMPLE** questioning.

---

- 5.** Encourage patient to administer their medicines – if required.

---

### Managing an unresponsive patient

---

If the patient is unresponsive:

- 1.** Undertake the primary survey.

---

- 2.** Provide OPA and oxygen if appropriate.

---

- 3.** Place the patient in the side stable position.

---

- 4.** Undertake the secondary survey – question witnesses, examine the environment.

---

## Helmet removal

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It is difficult to adequately assess and manage airway, breathing, and circulation while the patient is wearing a motorcycle helmet.

If the patient is responsive and appears to be adequately maintaining their airway and breathing, the helmet may remain on.

If the patient is unresponsive or appears to be breathing inadequately, remove the helmet.

### Procedure

- 1.** One rescuer maintains in-line immobilisation by placing their hands on each side of the helmet with their fingers on the patient's jaw.

---
- 2.** A second rescuer cuts or loosens the strap and supports the patient's head and neck with both hands.

---
- 3.** The rescuer holding onto the helmet carefully removes the helmet.

---
- 4.** After the helmet has been removed, the rescuer at the head maintains a patent (clear) airway using a jaw thrust manoeuvre and in-line stabilisation.

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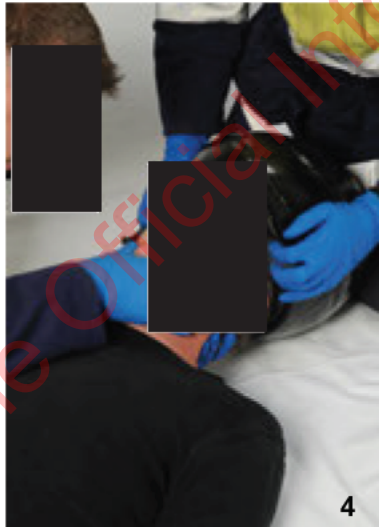
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2



3



4



5

1-5 Stages in helmet removal



## NOTE

- Helmets are egg-shaped and therefore must be expanded laterally to clear the ears.
- If the helmet provides full facial coverage, glasses must be removed first.
- If the helmet provides full facial coverage, the nose may hinder removal; to clear the nose, tilt the helmet backwards and raise it over the nose.
- Throughout the removal process, the second rescuer maintains in-line immobilisation from below to prevent unnecessary neck motion.

## Section 7: Medical conditions

This section covers the specific treatment of common medical conditions that often need to be treated in the field. These are:

- diabetes
- heart attack
- stroke
- seizure
- asthma
- poisons
- allergic reactions.

These are the most common conditions you may encounter. It is important you have a good knowledge of how to deal with them.

Your role as a first aider is to prevent the deterioration of the patient's condition as much as possible, while waiting for more advanced medical assistance.



### NOTE

The Fire Service approach is to treat the symptoms and not to try and diagnose the condition.

## Diabetes

Condition	Signs and symptoms	Management
<p>Diabetes is a medical condition in which there is a failure of insulin production in the pancreas. The result is a failure to process carbohydrates, fats and proteins correctly and the patient loses weight, becomes very thirsty and passes large quantities of urine. The patient with diabetes is usually treated with a modified diet, tablets or daily insulin injections. However, if the correct diet is not followed or if a severe infection occurs, this can lead to an insulin coma from too little sugar in circulation (hypoglycaemia). Unless prompt first aid, with sugar plus follow up medical care is available, death may occur.</p>	<ul style="list-style-type: none"> <li>• Confusion</li> <li>• A history of diabetes</li> <li>• Missing a meal</li> <li>• Missing medication</li> <li>• Extreme tiredness and loss of concentration</li> <li>• Erratic or argumentative behaviour</li> <li>• Rapid loss of consciousness if not treated promptly</li> <li>• Can seem drunk</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• If the patient is responsive, give them sugar or a sugar-rich food or drink.</li> <li>• If the patient is unconscious put them on their side and call for an ambulance.</li> </ul>

## Heart attack

A heart attack can be caused by narrowing of the blood vessels supplying blood to the heart or blocking off the blood vessels because of a clot.

Sometimes a heart attack can lead to a cardiac arrest.

Condition	Signs and symptoms	Management
<b>Angina</b>		
Pain caused when blood flow through the arteries of the heart is insufficient for the needs of the heart muscle.	<ul style="list-style-type: none"> <li>• Pain in the central chest region</li> <li>• Pain can spread to the neck, jaw and arms</li> <li>• May have medication with them</li> </ul>	<ul style="list-style-type: none"> <li>• Medication if available.</li> <li>• If conscious, help in to a comfortable sitting position.</li> <li>• Loosen clothing.</li> <li>• If symptoms persist for more than 15 minutes, seek medical attention.</li> </ul>
<b>Heart attack</b>		
Reduced blood supply to the heart because of a blockage or severe narrowing of a coronary artery. The blood supply to the coronary muscle is obstructed or considerably reduced, resulting in the death of heart muscle.	<ul style="list-style-type: none"> <li>• Sweating</li> <li>• Pain or discomfort in the chest, arms, jaw, neck, or teeth; normally described as squeezing, tightness, or a rushing pain, not as a stabbing pain</li> <li>• Nausea</li> <li>• Shortness of breath</li> <li>• Sense of impending doom</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• If the patient has their medication, assist them in following their cardiac plan.</li> <li>• Obtain the patient's history through OPQRST and sample questioning.</li> <li>• Prepare for potential cardiac arrest (CPR and AED).</li> </ul>

Stroke		
Condition	Signs and symptoms	Management
<p>A stroke is the loss of brain function that occurs due to a disruption in the blood vessels supplying blood to the brain. There are two ways in which this can occur:</p> <ul style="list-style-type: none"> <li>• A clot blocks an artery supplying blood to the brain (80% of strokes).</li> <li>• An artery in the brain ruptures.</li> </ul> <p>Strokes are the second most common cause of sudden death in New Zealand, and can lead to extensive damage to the brain that can result in paralysis.</p> <p>The key to surviving a stroke is urgent hospital treatment. Our focus in the pre-hospital setting is to get the patient to hospital via ambulance as soon as possible. The airway and breathing should be managed and monitored at all times before the arrival of an ambulance.</p>	<p>A patient experiencing a stroke may display one or more of the following signs and symptoms:</p> <ul style="list-style-type: none"> <li>• sudden weakness and/or numbness of the face, the arms, or the legs, especially on one side of the body</li> <li>• loss of normal speech</li> <li>• blurred or double vision</li> <li>• confusion</li> <li>• sudden severe headache</li> <li>• deteriorating level of consciousness (loc).</li> </ul>	<p><b>Steps for management of a responsive stroke patient:</b></p> <ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• Gain the patients history through SAMPLE questioning.</li> </ul> <p><b>Steps for the management of an unresponsive stroke patient:</b></p> <ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• Seek medical attention (make sure the ambulance is en route).</li> <li>• Place the patient on their side and observe for changes in condition.</li> <li>• Undertake the secondary survey – question witnesses, examine the environment.</li> <li>• Be prepared for deterioration of the patient’s condition (CPR and AED if the patient is not breathing normally).</li> </ul>

Use the following to help you remember signs of a stroke and act promptly.



### Face

Smile – is one side drooping?



### Arms

Raise both arms – is one side weak?



### Speech

Speak – unable to? Words jumbled, slurred?



### Time

Act fast and call 111. Time lost may mean brain lost.

## Seizure

### Febrile convulsions

High body temperatures in infants and children can cause seizures. The seizure is the body's attempt to raise its temperature to assist with creating a fever, to combat infection. Seizures in infants and children should be treated the same as in adults, but if it is caused by fever, you should also try to lower the patient's temperature by removing clothing.

### Cardiac arrest

Seizures are occasionally seen at the start of a cardiac arrest. It is important to undertake a proper primary survey and, if breathing is absent, begin CPR immediately.

Condition	Signs and symptoms	Management
<p>Seizure occur when parts of the brain are affected by sudden, uncontrolled activity. They are usually short-lasting and can appear in different ways. The most common is when the entire body of the patient has uncontrolled jerking movements in the head, the arms and the legs.</p> <p>The majority seizures are caused by a condition called epilepsy. However, they can also occur as a result of head injuries, or high temperatures in children. Most people with epilepsy take medication on a daily basis to control the condition and they may be wearing a medic alert bracelet.</p> <p>Seizures are normally brief (less than 10 minutes) and will result in little injury to the patient. A seizure that is prolonged or recurring is a serious medical emergency, and if untreated, can result in death.</p>	<p>A patient experiencing a seizure may display one or more of the following signs and symptoms:</p> <ul style="list-style-type: none"> <li>• loss of consciousness</li> <li>• loss of bladder control</li> <li>• jerking movements of the head, arms and legs</li> <li>• unusual breathing sounds</li> <li>• clenched jaw.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Protect the patient from injury.</li> <li>• Use SAMPLE questioning to obtain the patient's history from family and/or bystanders.</li> <li>• If the patient is unresponsive, place them in the side stable position and monitor airway and breathing.</li> <li>• If the patient is responsive, reassure them as they may be dazed or confused.</li> <li>• Seek medical attention if it is their first seizure or the patient does not wake up in 10 minutes, or is not breathing well.</li> </ul>



<b>Asthma</b>		
<b>Condition</b>	<b>Signs and symptoms</b>	<b>Management</b>
<p>Asthma is a condition in which breathing becomes difficult because of inflammation of the air passages. It is aggravated by a number of things, including allergies to inhaled material (pollen and smoke), changes in the environment (temperature), and emotional upset (anxiety).</p> <p>Asthma can be fatal if severe episodes occur, but the majority of these deaths are preventable if managed correctly. The key to survival is identifying that an asthmatic patient needs attention and getting medical help as soon as possible.</p>	<ul style="list-style-type: none"> <li>• Shortness of breath</li> <li>• Wheezing or other noises</li> <li>• Difficulty speaking or breathing</li> <li>• Anxiety and distress</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Assist them with their medication (often an inhaler).</li> <li>• Obtain the patient's history through SAMPLE questioning.</li> <li>• If the patient becomes unresponsive, commence CPR.</li> <li>• Ensure ambulance is en route if the medication is having no effect.</li> </ul>

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## Poisoning

### Recognition


If the patient is conscious or there is a witness present, ask them what has happened.  
If the patient is unconscious, look at the environment. Are there pills, fumes, or other clues in the area?

### Chemicals on the skin

Rinse residue away with copious amounts of water and get as much information on the chemical as you can – a sample if possible.

### Chemicals in the eyes

If the chemical is a general irritant, flush with lukewarm, flowing, low-pressure water for 15 minutes, or for 30 minutes if it is stronger acid or alkaline chemical.

Routes of absorption	Signs and symptoms	Management
Poison can be: <ul style="list-style-type: none"> <li>• inhaled</li> <li>• swallowed</li> <li>• absorbed.</li> </ul>	<ul style="list-style-type: none"> <li>• Fumes</li> <li>• Odours on the breath</li> <li>• Vomiting</li> <li>• Unusual skin colour</li> <li>• Blistering of the skin</li> <li>• Burns around and inside the mouth</li> <li>• Increased salivation</li> <li>• Abdominal pain</li> <li>• Nausea and vomiting</li> <li>• Altered level of consciousness</li> <li>• Breathing difficulties</li> <li>• Headaches</li> <li>• Ringing in the ears</li> <li>• Blurred vision</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Establish what the poison or medication is and how much has been taken, if possible.</li> <li>• Contact the New Zealand Poisons Centre – 24 hours a day (0800 POISON – 764766) or via FireComm.</li> <li>• Do not induce vomiting unless advised by the National Poisons Centre.</li> </ul> <div style="border: 1px solid red; padding: 5px; margin-top: 10px;"> <p style="text-align: center;"> <b>SAFETY NOTE</b></p> <p>DO NOT GIVE LIQUID IN NON-CAUSTIC CASES UNLESS advised to do so by the National Poisons Centre.</p> </div>

## Anaphylaxis and allergic reactions

Condition	Signs and symptoms	Management
<p>Anaphylaxis is a severe, system-wide allergic reaction. It is most often caused by an insect bite, food, or medications such as penicillin. In people with abnormal sensitivity to such substances, they can trigger a violent, often life-threatening reaction.</p>	<ul style="list-style-type: none"> <li>• Swelling of the face, tongue or airway</li> <li>• Hives</li> <li>• Blotchy rash</li> <li>• Shock</li> <li>• Nausea and vomiting</li> <li>• Breathing difficulties</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• Assist patient to administer epipen if available.</li> <li>• Attempt to discover what may have caused the reaction.</li> <li>• Seek medical attention.</li> </ul>



### SAFETY NOTE

If the patient is too unwell to administer their own adrenalin, you should administer it for them following the instructions on the pack.

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## Section 8: Trauma

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The priority with a trauma patient is treating life-threatening conditions, such as airway obstruction and uncontrolled bleeding.

Firefighters need to focus on completing the primary and secondary surveys and providing the treatment necessary to keep the patient's condition from worsening until advanced assistance arrives.

The most common injuries are:

- burns
- heat emergencies
- cold emergencies
- smoke inhalation
- blast and crush injuries
- fractures
- soft tissue injuries
- bleeding
- shock
- wounds
- spinal injuries
- head injuries
- eye injuries.

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Burns		
Condition	Signs and symptoms	Management
<p>Contact with any source of heat can cause a burn or scald injury. Effective pre-hospital care of burns can have a significant impact on the severity of burn, the recovery time, and the retention of function.</p>	<ul style="list-style-type: none"> <li>• Severe pain</li> <li>• Red, blackened or blistered skin</li> <li>• Watery fluid weeping from the injured area</li> <li>• Swelling of the injured area</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Cool burns with cool, flowing, low-pressure water for at least 20 minutes.</li> <li>• Remove jewellery and clothing from the burn, as soon as possible.</li> <li>• Apply a dressing loosely to the burned area. If plastic cling wrap is available, wrap it lengthways, rather than circumferentially, as the burn area is likely to swell.</li> <li>• Call an ambulance if the patient is badly injured or the burn is causing severe pain, involves the eyes, or is larger than half the patient's arm.</li> </ul>

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## Heat emergencies

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.

### Mild heat illness

Condition	Signs and symptoms	Management
Heat illness is caused by prolonged exposure to a hot environment. It is caused by heat and dehydration.	<p>The initial symptoms are mild but the patient can deteriorate and their condition can become life-threatening if untreated. A patient experiencing mild heat illness may display one or more of the following signs and symptoms:</p> <ul style="list-style-type: none"> <li>• nausea</li> <li>• headache or dizziness</li> <li>• sweating</li> <li>• general feeling of being unwell.</li> </ul>	<ul style="list-style-type: none"> <li>• Stop the activity causing the heat build-up.</li> <li>• Perform primary survey.</li> <li>• Move the patient to a cooler place.</li> <li>• Remove as much clothing as possible.</li> <li>• Give small sips of water if patient can drink.</li> <li>• Cool the patient's body with water, and try to create a current of air to increase the cooling effect.</li> </ul>

## Heat emergencies (cont.)

Severe heat illness		
Condition	Signs and symptoms	Management
	<ul style="list-style-type: none"> <li>• Rapid pulse</li> <li>• Shallow breathing</li> <li>• Hot skin, often without any sweating</li> <li>• Loss of coordination</li> <li>• Unusual behaviour</li> <li>• Collapse and/or seizures</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• Move the patient to a cooler place.</li> <li>• Remove as much clothing as possible.</li> <li>• Aggressively cool the patient with water, and try to create a current of air to increase the cooling effect.</li> <li>• Be prepared for cardiac arrest in severe cases (CPR and AED).</li> </ul>



### NOTE

Recovery should be rapid with cooling and rehydration. If the patient is not recovering within 10 minutes, or they continue to deteriorate or become unresponsive, you should call an ambulance immediately.

## Cold emergencies

Mild hypothermia		
Condition	Signs and symptoms	Management
<p>Hypothermia occurs when the brain and muscle functions are impaired as a result of the lowering of the body's temperature.</p>	<ul style="list-style-type: none"> <li>• Cold to the touch and shivering</li> <li>• Increased tiredness</li> <li>• Person may fall behind others</li> <li>• Clumsy and uncoordinated</li> <li>• Changes in mood, irritability</li> <li>• Abnormal behaviour and a resistance to help</li> <li>• Slow responses</li> </ul>	<ul style="list-style-type: none"> <li>• Protect yourself and patient from wind, rain and cold, wet ground.</li> <li>• Remove wet clothing and wrap patient in warm, dry clothing or a space blanket.</li> <li>• If possible put patient in a warmed sleeping bag.</li> <li>• If patient is conscious give warm fluids to drink.</li> <li>• Seek medical aid.</li> </ul> <p><b>DO NOT:</b></p> <ul style="list-style-type: none"> <li>• give alcohol</li> <li>• try to warm the patient in front of a fire</li> <li>• massage the patient.</li> </ul>



## Cold emergencies (cont.)

### Severe hypothermia

Condition	Signs and symptoms	Management
	<ul style="list-style-type: none"> <li>• Shivering may decrease and stop</li> <li>• Very clumsy and may fall</li> <li>• Slurred speech and blurred vision</li> <li>• May lose consciousness</li> <li>• Breathing is slow</li> </ul>	<ul style="list-style-type: none"> <li>• Handle with care or the heart could stop.</li> <li>• Give CPR if necessary.</li> <li>• Get into shelter with the patient.</li> <li>• Remove the clothing from patient and two first aiders.</li> <li>• Wrap patient and first aiders in dry blankets to warm.</li> <li>• Replace first aiders as required to maintain warmth.</li> <li>• If patient regains consciousness give warm fluids to drink.</li> <li>• Call an ambulance.</li> </ul> <p><b>DO NOT:</b></p> <ul style="list-style-type: none"> <li>• give alcohol</li> <li>• try to warm the patient in front of a fire</li> <li>• massage the patient.</li> </ul>

Smoke inhalation		
Condition	Signs and symptoms	Management
<p>When modern building materials and furnishings burn, they produce large volumes of poisonous smoke. Exposure to smoke and heat may result in:</p> <ul style="list-style-type: none"> <li>• carbon monoxide (CO) poisoning</li> <li>• thermal burns to the airway, causing swelling</li> <li>• chemical burns to the mucous membranes, caused by by-products of combustion such as hydrogen chloride, oxides of nitrogen, sulphur, and ammonia.</li> </ul> <p>It is important to give oxygen to any person who has significant exposure to smoke, even if they are not showing any signs of respiratory distress.</p> <p>Smoke inhalation can cause burns to the upper and lower airways and the associated swelling can obstruct the airways, leading to life-threatening injuries.</p>	<ul style="list-style-type: none"> <li>• Physical signs such as soot around the nose and the mouth</li> <li>• Redness around the mouth and the neck</li> <li>• Face or neck burns</li> <li>• Wheezing or other noises during breathing</li> <li>• Difficulty speaking</li> <li>• Difficulty breathing</li> <li>• Anxiety and distress</li> </ul>	<ul style="list-style-type: none"> <li>• Move the patient to clear air.</li> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• If breathing is inadequate, assist ventilation and administer oxygen.</li> <li>• Cool any burns to the patient's neck or face.</li> <li>• Undertake a secondary survey.</li> </ul>

**NOTE**

Be aware that a patient exposed to CO may have normal skin colour but will still require high-flow oxygen.

Fractures		
Condition	Signs and symptoms	Management
<p>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.</p> <p>Significant blood loss can occur from fractures, and bleeding can be internal.</p>	<ul style="list-style-type: none"> <li>• Pain at the injury site</li> <li>• Deformity</li> <li>• Shortening or rotation of the limb</li> <li>• Inability to move or to bear weight</li> <li>• The patient reports hearing the bone snap</li> <li>• Swelling</li> </ul>	<ul style="list-style-type: none"> <li>• Control any external bleeding using direct pressure and elevation if possible. Pad around any protruding bones.</li> <li>• For a closed fracture, ice packs may be used to assist with pain relief and swelling.</li> <li>• If the injured limb needs to be immobilised, make use of whatever you have got at hand to do so, for example, pillows, magazines, or dressings to support the limb.</li> <li>• Seek medical attention.</li> <li>• Call an ambulance if it is a suspected thigh fracture, or if bleeding is severe and uncontrolled.</li> </ul>
<b>Skull fractures</b>		
Condition	Signs and symptoms	Management
<p>A skull fracture may result in loss of consciousness compression – bleeding within or around the brain.</p>	<ul style="list-style-type: none"> <li>• Pain, bruises, obvious open fracture</li> <li>• History of a fall or blow to the head or other significant mechanism of injury</li> <li>• Bruise-like discoloration around eyes or behind ears</li> <li>• Leaking of csf (cerebro-spinal fluid) from ears or nose; this could be mixed with blood</li> <li>• Altered level of consciousness</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Protect the airway.</li> <li>• Immobilise the spine and constantly monitor the patient's vital signs, including AVPU assessment of level of consciousness.</li> <li>• Provide oxygen if required.</li> <li>• Ensure ambulance en route.</li> </ul>

Chest injuries		
Condition	Signs and symptoms	Management
<p>Chest injuries may result in:</p> <ul style="list-style-type: none"> <li>• rib or sternum fractures</li> <li>• 'flail' chest – two or more ribs broken in more than one place causing separation of a segment of the chest wall</li> <li>• Pneumo-thorax (air in the chest cavity) or haemo-thorax (blood in the chest cavity)</li> <li>• bruising to the heart.</li> </ul>	<ul style="list-style-type: none"> <li>• Pain, bruising, instability of chest on palpation</li> <li>• Paradoxical chest movement</li> <li>• Shortness of breath</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Position the patient so they can breathe easily.</li> <li>• If there is a flail segment, support it with your hand.</li> <li>• Ensure ambulance en route.</li> </ul>

**NOTE**

Look out for increased shortness of breath with distended neck veins. This indicates a development of a tension pneumo-thorax, which is an extreme medical emergency requiring paramedic treatment.

<b>Blast injuries</b>		
<b>Condition</b>	<b>Signs and symptoms</b>	<b>Management</b>
<p>A blast injury is any injury to the body, either external or internal, caused by an explosive force. When an explosion happens, a wave of pressure radiates out from the original source of the explosion. This force can enter the body through the mouth and nose if a patient is inhaling at the time. It exerts a great amount of pressure on the respiratory tract and can rupture the lungs.</p> <p>The effect is like blowing up a balloon until it bursts. The main organs affected by a blast injury are the respiratory organs, and the internal parts of the ears. These are entrances into the body easily accessible by a wave of pressure from an explosion.</p>	<ul style="list-style-type: none"> <li>• Breathing difficulties</li> <li>• Hearing difficulties</li> <li>• Discharge or bleeding from the ears</li> <li>• Facial or body burns</li> <li>• Disorientation/confusion</li> <li>• Altered level of consciousness</li> <li>• Coughing</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Treat any life-threatening bleeding first.</li> <li>• Administer oxygen if required.</li> <li>• Constantly monitor the patient's vital signs.</li> <li>• Seek medical attention.</li> </ul>

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## Crush injuries and crush syndrome

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

Condition	Signs and symptoms	Management
<p><b>Crush syndrome</b> 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 casualties should be released as quickly as possible, irrespective of how long they have been trapped.</p>	<ul style="list-style-type: none"> <li>• Patient may not complain of pain</li> <li>• May be no external signs of injury</li> <li>• May be bleeding</li> <li>• May be an object in situ</li> <li>• Person may appear to be alert and not distressed but deterioration may be sudden</li> </ul>	<p>Crushing forces should be removed from the patient as soon as possible. A patient with a crush injury may not complain of pain, and there may be no external signs of injury.</p> <ul style="list-style-type: none"> <li>• All patients should be taken to a hospital for immediate investigation.</li> <li>• Keep the patient warm.</li> <li>• Treat any bleeding.</li> <li>• Continue to monitor patient's condition.</li> </ul> <p>DO NOT leave the patient.</p>

## Soft tissue injuries

Condition	Signs and symptoms	Management
<p>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.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>• Pain in the area of injury</li> <li>• Lack of, or limited movement</li> <li>• Inability to bear weight</li> <li>• Swelling</li> <li>• Tenderness</li> <li>• Bruising</li> </ul>	<ul style="list-style-type: none"> <li>• Remove constrictive clothing or jewellery.</li> <li>• Apply the RICE technique.</li> <li>• Rest: for up to 24 hrs, but gentle movement should be encouraged after that time.</li> <li>• Ice: can help to reduce pain. Apply for up to 20 minutes at a time. Do not apply ice directly to the skin.</li> <li>• Compression: consider a bandage if there is visible swelling.</li> <li>• Elevation: keep the injured area elevated when at rest.</li> <li>• See a doctor if symptoms don't improve after 48 hours.</li> </ul>

Bleeding		
Condition	Signs and symptoms	Management
<p>Bleeding is one of the most rectifiable causes of death following trauma, therefore controlling external bleeding is a main priority when administering care in a pre-hospital environment.</p>	<ul style="list-style-type: none"> <li>• A wound with bleeding</li> <li>• Pain</li> <li>• Bruising or discolouration of the skin</li> </ul>	<p>Direct pressure is the main treatment used to manage bleeding.</p> <ul style="list-style-type: none"> <li>• Apply firm pressure, directly onto and into wound, using large sterile trauma dressings.</li> <li>• Elevate the injured area: only if this does not restrict your ability to apply firm pressure to the wound.</li> <li>• Administer oxygen if bleeding is severe and uncontrolled.</li> </ul>

Internal bleeding		
Condition	Signs and symptoms	Management
<p>Internal bleeding can be very serious, but is very difficult to assess.</p> <p>If there are no obvious signs, the mechanism of injury may suggest the potential for an internal injury/bleed.</p>	<ul style="list-style-type: none"> <li>• Vomiting/coughing blood</li> <li>• Rigid abdomen</li> <li>• Exterior bruising on abdomen or chest</li> <li>• Be experiencing tenderness or pain</li> <li>• Guard an area, for example, wrap their arms around their chest</li> <li>• Exhibit signs of shock</li> </ul>	<ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Ensure ambulance en route.</li> <li>• Maintain the patient's airway, breathing and circulation.</li> <li>• Expose the area.</li> <li>• Treat for shock.</li> <li>• Administer oxygen.</li> <li>• Keep the patient warm.</li> </ul>



## Other bleeding

### Amputations

- Perform primary survey.
- Control any external bleeding.
- Treat for shock.
- Administer oxygen if required.
- Wrap the amputated part in sterile gauze then place in a sealed plastic bag and place in a container with cold water and some ice if possible; if not, try to keep object as cool and clean as possible.

### Penetrating objects

If the trauma patient has a penetrating injury, and the implement is still in place:

- remove the penetrating item if it is small for example a staple or nail
- do not remove the item if it is large, such a knife or a screwdriver.
- assess and treat as for bleeding.

If there is severe bleeding apply direct pressure on either side of the object.

### Nose bleed

Noses can bleed copiously, but normally do not pose a serious threat to the patient.

- Apply direct pressure to the soft part of the nose, just below the bone at the edge of the nose.
- Sit the patient forward. Discourage them from swallowing blood.
- Consider a cool compress or ice pack applied to the bridge of the nose.
- Check at 10 minute intervals.
- If bleeding is uncontrolled, encourage the patient to breathe through their mouth and not to blow their nose.



#### NOTE

Nose bleeds in elderly people can be very serious and require more advanced medical care.

Shock		
Condition	Signs and symptoms	Management
<p>Shock is a condition in which the body responds to a lack of oxygenated blood.</p> <p>The most common cause of shock in the field is blood loss. This is also known as hypovolaemic (low volume) shock. Causes of this include:</p> <ul style="list-style-type: none"> <li>external bleeding (may be caused by multiple fractures)</li> <li>internal bleeding.</li> </ul>	<p>There are several indicators that a patient is going into shock:</p> <ul style="list-style-type: none"> <li>Rapid weak pulse</li> <li>Pale, cold, clammy, sweaty skin</li> <li>Nausea or vomiting</li> <li>Thirst</li> <li>Altered level of responsiveness</li> </ul>	<ul style="list-style-type: none"> <li>Perform primary survey.</li> <li>Ensure ambulance en route.</li> <li>Manage bleeding.</li> <li>Keep the patient warm but do not overheat.</li> <li>Rest and reassure.</li> <li>Administer oxygen.</li> <li>If the patient is unresponsive but breathing, put in side stable position and monitor airway.</li> <li>If not breathing, commence CPR.</li> </ul>

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## Spinal injuries

You should never move a patient with suspected spinal injuries without good reason. However, if the patient is in danger, unconscious or is not breathing, movement may be necessary. Life (airway) has priority over any potential injury.

Condition	Signs and symptoms	Management
<p>Spinal injuries are caused by traumatic forces on the body. The most common causes of spinal injuries are motor vehicle accidents, falls when the patient lands on their feet or head, diving accidents, and sporting accidents, for example, a rugby tackle.</p>	<ul style="list-style-type: none"> <li>• Pain in the injured area</li> <li>• Loss of feeling or weakness in parts of the body</li> <li>• Priapism in males (unwanted, uncontrolled erection)</li> <li>• Loss of bladder control</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise movement.</li> <li>• Perform primary survey and, if it is necessary to open the airway, use the jaw thrust technique.</li> <li>• Ensure ambulance en route.</li> <li>• Stabilise the patient's head in neutral alignment and maintain this position until the arrival of the ambulance.</li> <li>• If the patient is unresponsive, place them in the side stable position.</li> <li>• Undertake a secondary survey.</li> </ul>

Head injuries		
Condition	Signs and symptoms	Management
Head injuries are common in all walks of life. There are two main types: concussion and compression.	<ul style="list-style-type: none"> <li>• Changed level of consciousness</li> <li>• Headache</li> <li>• Dizziness and visual disturbances</li> <li>• Confusion and short-term memory loss that may result in repetitive questioning</li> </ul>	<p>Let the patient rest, and observe their condition. If there is any change to their level of consciousness or they start feeling nauseous and vomit, they should be assessed by more advanced medical personnel.</p> <ul style="list-style-type: none"> <li>• Perform primary survey.</li> <li>• Monitor the patient's airway and breathing.</li> <li>• Position them on their side if unconscious.</li> </ul>

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## Eye injuries

### Welding flash

A welding flash is a self limiting injury. It will heal on its own.

- Cover injured eye and encourage the patient to keep other eye closed.
- Rest the patient.
- Seek medical attention.

### Foreign bodies

To treat patients with a foreign body in their eye:

- irrigate with water or appropriate fluid
- use cotton bud or appropriate tool to remove item from corner of eye
- do not probe if the object is in the centre of the eye (this could damage the eye); try to remove to the corner with irrigation
- pad both eyes
- seek medical attention.

### Penetrating objects

If the patient has a penetrating injury to the eye:

- do not remove the penetrating object
- pad around the object to give support
- pad both eyes
- keep the patient calm and reassure them
- place the patient in semi-sitting position
- seek medical attention.

### Chemical injury

In the event of chemical injury to the eyes:

- irrigate the eye with running water for a minimum of 20 minutes
- pad both eyes
- seek medical attention.

## Eye injuries

### Blunt injury

If the patient has suffered a blunt impact to the eye:

- have the patient lie down
- pad both eyes
- seek medical attention.

### Evulsion

For a patient who has had an eye forced from the socket:

- support the avulsed eye with a sterile, saline-soaked dressing
- pad both eyes
- keep the patient calm and reassure them
- urgently request further medical assistance.

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## Section 9: Mass casualty incident

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This section covers vital information about the Simple Triage and Rapid Treatment (START) triage process. This system uses a simple formula to assess and prioritise patients quickly by looking at:

- respiration
- perfusion (fluid/blood flow)
- mental status.

At incidents where the patient numbers overwhelm the emergency personnel available, it is necessary to decide which patients need assistance the most. This technique provides a simple way of prioritising patients in these situations.

Triage means 'To sort'.

Triage can be implemented in the early stages of an incident until more rescuers and resources arrive.

The process of triage involves a simple and quick assessment of individual patients, with a primary concern for airway preservation and bleeding control.

Successful triage requires a philosophy of 'the greatest good for the greatest number'. Resuscitation is not attempted in triage situations. The maintenance of airways and the control of blood loss are the main priorities of the triage team.

### Triage classes

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#### Immediate – RED

**These patients have priority for treatment. They are at risk of death. They need to be stabilised and transported to hospital as soon as possible.**

#### Delayed –YELLOW

**These patients are injured – perhaps seriously, but they are stable enough to delay transportation to hospital.**

#### Minor – GREEN

**These patients are seen as the 'walking wounded'. They still need to be monitored to make sure they don't deteriorate.**

#### Deceased – BLACK

**These patients are deceased. You need to place deceased patients in a manner that protects their dignity but at the same time allows living patients to be attended to and complies with any police requirements.**

## Process

1. Check scene safety.
2. Ask all those who are not injured or have only minor injuries to identify themselves. These patients are classed as minor.

**Ask those who can to stay close to assist you and direct the others to an area away from the emergency.**

3. Respiration: check breathing – if the patient is not breathing after repositioning their airway, they are classed as deceased. DO NOT START CPR.
4. Spinal injury: repositioning the airway may result in a worsening of a spinal injury but if you do not, the patient may die from a lack of oxygen.
5. If the patient begins to breathe spontaneously after repositioning, they are to be placed in the side stable position and classed as immediate.

**Uninjured people can help in maintaining patients' airways.**

6. If the patient is breathing when you approach, you need to briefly count their respirations. If they are breathing at a rate of more than 30/min they are classed as immediate. Do not count their breathing formally – if they are breathing fast, they are immediate.
7. Check capillary refill. If it is more than 2 seconds, tag the patient as immediate. If it is less than 2 seconds move to mental status.

**Get someone to place direct pressure on any visible serious bleeding and move on to the next patient.**

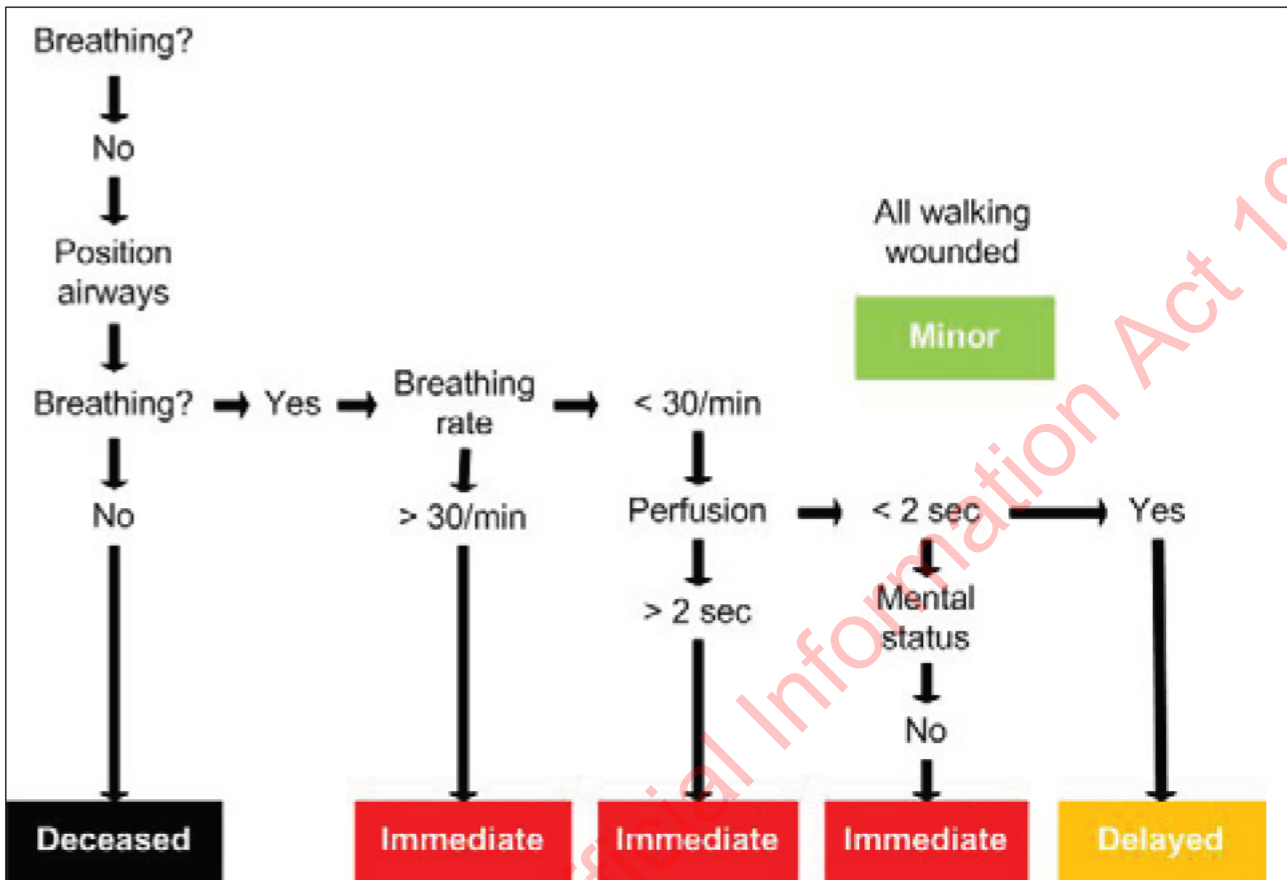
8. Mental status: If the patient is unresponsive or cannot follow simple commands, they are tagged as immediate. If the patient can follow simple commands, tag them delayed.



### NOTE

Not starting CPR may be the hardest thing you must do at a multi-casualty scene. You must focus on the greatest good for the greatest number.





The START Triage method

### Patient status codes

Patient status codes are a concise and effective way to communicate the status of the patient over the radio or when providing information to ambulance assistance. It is important that you do not use any 'identifying' information such as names or addresses.

[LINK](#)

Refer back to the beginning of this section for an explanation of triage classes shown above.

The table below shows the patient status codes and the related triage tags.

#### PATIENT STATUS CODES/TRIAGE TAGS

STATUS CODE	ZERO	ONE	TWO	THREE	FOUR
Patient condition	Dead	Critical	Serious	Moderate	Minor
Threat to life	Not applicable	Immediate	Potentially	Unlikely	None
Triage tag	White/black	Red	Yellow	Green	Green

Patient status codes/triage tags (Source: Courtesy of Wellington Free Ambulance)

## Section 10: Handover

In this section you will find an explanation of what you need to communicate when handing over a patient to the ambulance crew, as well as the basic information that the ambulance crew will need to know when you request their attendance over the radio.

Ambulance crews need to be fully informed on patient condition and the treatment undertaken by firefighters when they first arrive at the scene, so that they can dispatch the most appropriate resource. Ambulance crews often rely on the information provided by firefighters.

The Fire Service is often the first emergency service on the scene at incidents. When ambulance personnel arrive at the scene, it is important that they receive a brief but full account of the way you found a casualty, the treatment undertaken, and any other important information.

The Fire Service uses the CHAT procedure when handing over a patient.

### CHAT

- C** Chief complaint – What is wrong with them?
- H** History – What is the history behind the event? Is there a previous medical history?
- A** Assessments – What assessments have been made?
- T** Treatment – What treatment has been undertaken? With what effect?



#### NOTE

There are often regional variances in procedures, so different forms and documents may be used. It is important to recognise that these are legal documents, so they must be completed accurately.

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## Appendix: NZFS Karakia

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Unuhia, unuhia  
Unuhia ki te uru tapu nui  
Kia wātea, kia māmā te ngākau, te tinana, te wairua i te ara tangata  
Koia rā e Rongo, whakairia ake ki runga kia tina!  
TINA! Haumi e !Hui e! TĀIKI E!

Draw on, draw on,  
Draw on the supreme sacredness  
To clear, to free the heart, the body and the spirit of mankind  
Rongo, suspended high above us  
Draw together! Affirm!

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