



5th edition

# ABC of CPR

Includes.....

- Oxygen
- Defib
- LVR

BEST  
SELLER



**International  
Emergency Numbers**

Latest Guidelines



Dr Audrey Sisman

# ABC OF CPR

5th edition January 2018

Published by: ABC Publications  
PO Box 106, Mapleton, Qld 4560, Australia

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ISBN: 978-0-980-6283-1-9

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This book has been written based on current guidelines and requirements as defined by:

- Australian Resuscitation Council
- New Zealand Resuscitation Council
- European Resuscitation Council
- National Heart Foundation of Australia
- WorkCover QLD
- Australian Standards AS/NZS 4836:2001  
(Safe Working on Low Voltage Electrical Installations)

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*.....empowering people*

The information in this book contains, at the time of printing, the most current resuscitation guidelines. This book is designed to be an information resource and is not a substitute for attending a first aid course conducted by an approved provider. The author of this book accepts no responsibility for any injury or damage that may occur as a result of using this book in first aid management.



means call your country's emergency number

# Introduction

Congratulations on taking positive steps towards learning first aid which is an essential life skill we should all learn in order to help others and possibly save a life.

The **ABC of CPR** is written by a medical practitioner with experience in emergency medicine, hospital medicine, general practice and natural therapies.

The book contains clear, simple first aid advice which will assist you in handling most emergency situations.

Keep this book with your first aid kit in the workplace, at home, in your car or when travelling overseas.

## How to use this book:


The **ABC of CPR** is divided into four main colour coded sections:

- **Essential First Aid** • **Advanced Resuscitation** • **Low Voltage Rescue**
- **General First Aid**

Each subsection shows you step-by-step how to recognise and deal with an emergency situation.

Emergencies are recognised by **SIGNS & SYMPTOMS** which are contained in a **red box**.

Displayed in a **green box** is the **FIRST AID** management of an emergency situation.

 means dial your country's emergency number.

A fold out **World Map** of international emergency numbers at the back of the book identifies emergency numbers across the world.

Also at the back, there is a **First Aid Incident Report Form** which can be torn out and used in a first aid incident, and an **Emergency Numbers** page for writing local, national and international emergency numbers.

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**Unconsciousness** is a state of unrousable, unresponsiveness, where the person is unaware of their surroundings and no purposeful response can be obtained.

**NO RESPONSE** → **NO Breathing or Abnormal Breathing** → Follow **Basic Life Support Chart** →

→ **Breathing Normally** → Recovery Position, Call ☎, monitor

Causes of an **unresponsive (unconscious), breathing state:**

- A - Alcohol
- E - Epilepsy
- I - Insulin (Diabetes)
- O - Overdose
- U - Uraemia (renal failure)
- T - Trauma (head/spinal)
- I - Infections (meningitis)
- P - Pretending
- S - Stroke

Combinations of different causes may be present in an unconscious casualty eg head injury and diabetes.

NB. The sense of **hearing** is usually the last sense to go, so be careful what you say near an unconscious casualty.

All unconscious casualties must be handled gently and every effort made to avoid any twisting or forward movement of the head and spine.

(A noticeably pregnant, unconscious, breathing woman is best placed on her left side).

The recovery position:

- Maintains a clear airway - allows the tongue to fall forward.
- Facilitates drainage and lessens the risk of inhaling foreign material (eg saliva, blood, food, vomit).
- Permits good observation and access to the airway.
- Avoids pressure on the chest which facilitates breathing.
- Provides a stable position and minimises injury to casualty.



Airway management takes priority over spinal injury



**Step 1**

- Raise the casualty's furthest arm above the head.
- Place the casualty's nearest arm across the body.
- Bend-up the casualty's nearest leg.
- With one hand on the shoulder and the other on the knee, roll casualty away from you.



**Step 2**

- Stabilise the casualty by flexing the bent knee to 90° when resting on the ground.
- Tuck the casualty's hand under their armpit.
- Ensure the casualty's head is resting on their outstretched arm.

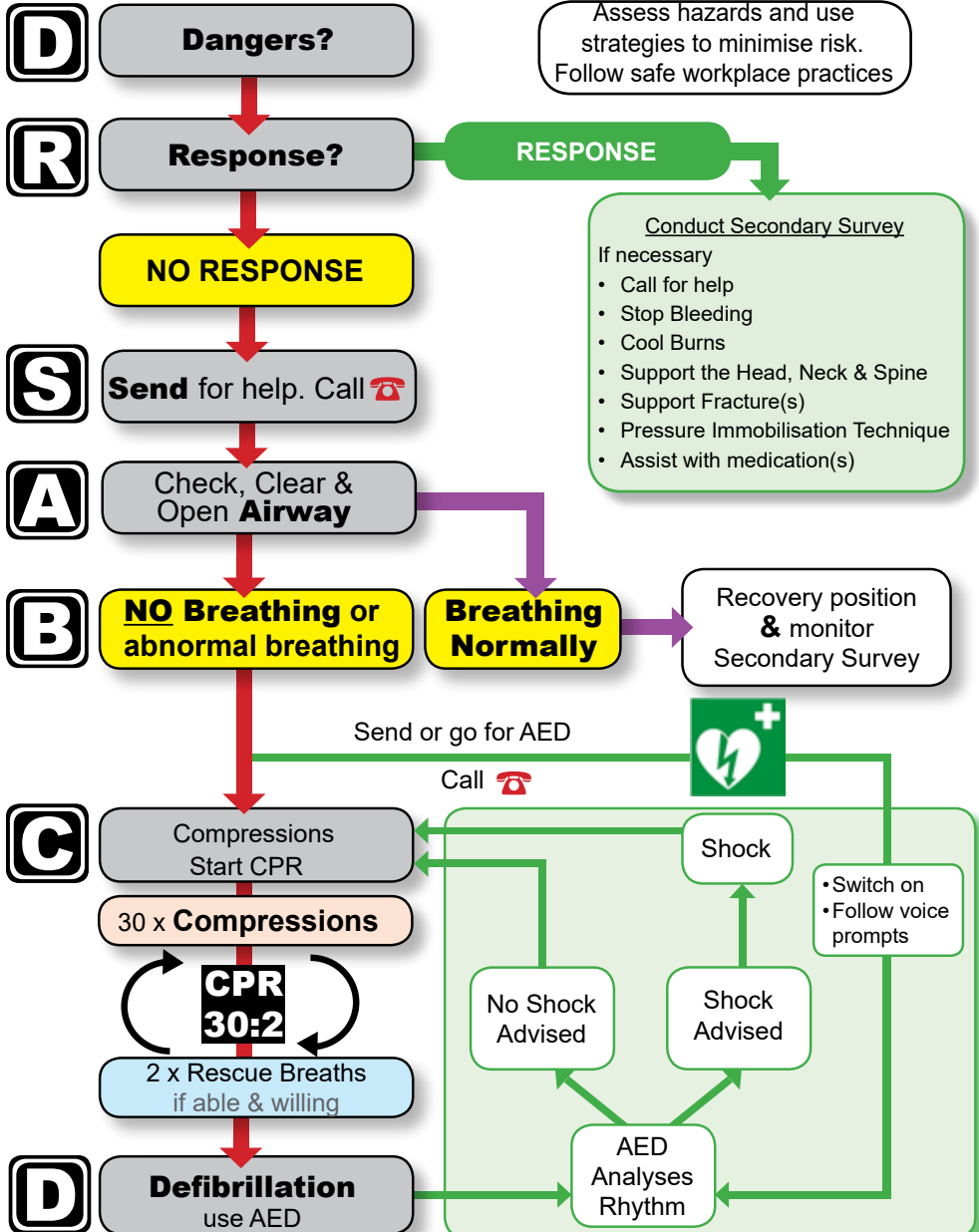


**Step 3**

- Carefully tilt the head slightly backwards and downwards. This facilitates drainage of saliva and/or stomach contents and reduces the risk of inhalation which may cause pneumonia.

# Basic Life Support & AED

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In an EMERGENCY CALL  or 

# What is Electric Shock?



An electric shock can occur upon contact of a person with any source of voltage high enough to cause sufficient current through the muscles or hair.

- Electrocutation is death caused by electric shock.
- Severity of injury depends on the voltage, the current, and the resistance of the body.
- Wet or damaged skin offers 100 times less resistance than dry intact skin allowing higher currents to flow.
- Currents across the heart are dangerous.



Always test a circuit to make sure it is de-energized before working on it.

Power drills use 30 times more power than needed to kill someone!

# What can Electric Shock do to me?

**LOW VOLTAGE = under 1000V AC or 1500V DC.**

**LOW VOLTAGE DOES NOT MEAN LOW HAZARD!**

## Effects of Electrical Current on the Body

This table shows what usually happens for a range of currents lasting for 1 second at typical household voltages. 100 milliamps can be lethal across critical parts of the body (eg heart/brain). Arc Flash can produce intense heat, light and pressure waves equivalent to several sticks of gelignite. This can result in radiation burns, broken bones, internal organ damage and bleeding.

Current	Reaction
1 milliamp	Just a faint tingle
5 milliamps	Slight shock felt. Disturbing, but not painful. Most people can "let go."
6-25 milliamps (women) 9-30 milliamps (men)	Painful shock. Muscular control is lost. This is the range where "freezing currents" start. It may not be possible to "let go."
50-150 milliamps	Extremely painful shock, respiratory arrest (breathing stops), severe muscle contractions. Flexor muscles may cause holding on; extensor muscles may cause intense pushing away. Death is possible.
1,000-4,300 milliamps (1-4.3 amps)	Ventricular fibrillation (heart pumping action not rhythmic) occurs. Muscles contract; nerve damage occurs. Death is likely.
10,000 milliamps (10 amps)	Cardiac arrest and severe burns occur. Death is probable.
15,000 milliamps (15 amps)	Lowest over-current at which a typical fuse or circuit breaker opens a circuit!

# What type of injuries follow Electrical Accidents?

- Cardiac Arrest
- Respiratory arrest
- Burns/ Tissue damage
- Poisoning
- Other injuries as a consequence of electric shock eg falling from a ladder

## Electrical Burns cause Massive Tissue Damage:

This worker fell and grabbed a power line to catch himself. The resulting electric shock mummified his first two fingers, which had to be removed.

The acute angle of the wrist was caused by burning of the tendons, which contracted, drawing the hand with them.





## What is Arc Flash?

Arc Flash is a short circuit that flashes from one exposed live conductor to another, or to the ground.

The Arc Flash produces intense:

- Heat (> 5000 degrees causing severe burns)
- Light (The same light radiation as welders)
- Pressure wave (blast) equivalent to several sticks of dynamite and can break bones and cause internal organ damage.
- Arc Flash can result from inserting a tool in the wrong place or dropping a tool into a circuit breaker or service area.
- 80% of all injuries and fatalities caused by electrical incidents are caused by Arc Flash..... not electric shock!



## What is Flash Burn?

Flash Burn also known as Arc Flash, Arc Eye or Welder's Flash, is a burn sustained from an electric arc either by the extreme heat it produces or through UV radiation.



- Minor Flash burn to the eyes becomes painful and 'gritty' about 2-3 hrs after the event.
- This is common when welding without protective eyewear.

**FIRST AID** - It usually resolves within 36hrs without medical intervention but sometimes local anaesthetic eye drops are required for pain management.

This man was near a power box when an electrical explosion occurred. He did not touch the box, but electricity arced through the air and entered his body. The current was drawn to his armpits because perspiration is very conductive.



This is severe flash burn caused by an Arc Flash. The explosion caused airway burns and embedded molten copper into the casualty's eyes, resulting in permanent blindness.



### FIRST AID


- Move to safety • Call  • Apply burns dressing
- For airway burns - see below

## What is Airway Burn?

Smoke, steam, superheated air or toxic fumes from Arc Flash explosions can cause severe damage to the airways resulting in swelling and possible airway obstruction.

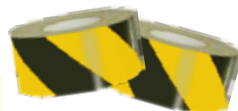
- Look for evidence of inhalation injury around nose or face (see photo above)
- Coughing or hoarseness may indicate exposure

### FIRST AID

- DO NOT enter a burning or toxic atmosphere without appropriate protection
- Remove to a safe, ventilated area ASAP
- Give oxygen if available
- Call 

## After an electrical incident

The site must be secured, and entry controlled until the appropriate authorities have inspected the site and released it. An incident report must be completed.



**DANGER  
 DO NOT  
 ENTER**

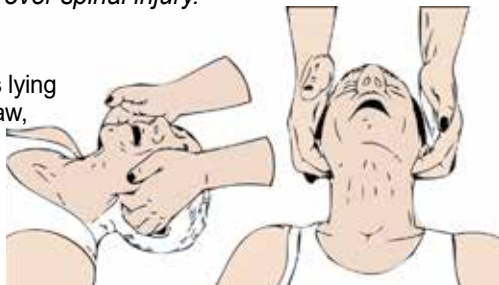
## Jaw Thrust

The jaw thrust method is used to open the airway with minimal neck movement on casualties with suspected spinal injury. The simplest way of ensuring an open airway in an unconscious casualty is to use the head tilt chin lift technique (pg 4).

**REMEMBER:** Airway management takes priority over spinal injury.

### Jaw Thrust Method:

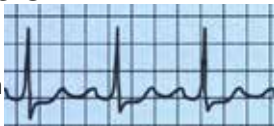
- Kneel at top of casualty's head
- Rest your elbows on the surface where casualty is lying
- Place one hand on each side of casualty's lower jaw, below the ears (angle of jaw)
- Use your index and middle fingers to push the jaw forward away from chest
- Use your thumbs to retract lower lip to keep casualty's mouth open if necessary
- Slight head tilt may be necessary to maintain airway patency



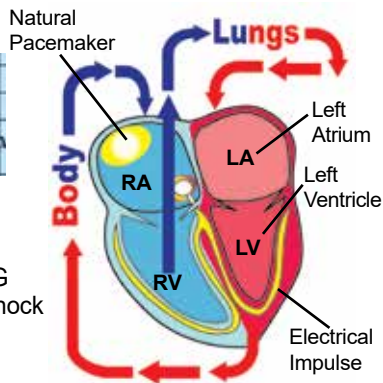
Opening Airway Using Jaw Thrust Method

## Normal Heart Function

- Electrical impulses generated within the heart from a natural pacemaker, coordinate contraction and pumping of the heart.
- These electrical impulses can be recorded by an ECG (Electrocardiograph).
- A normal functioning heart shows sinus rhythm on an ECG
- AEDs (Automated External Defibrillators) have an inbuilt ECG monitor which analyses the heart rhythm and determines if shock is required



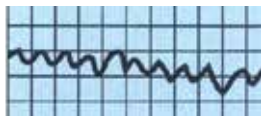
Normal Sinus Rhythm



## Abnormal Heart Rhythms

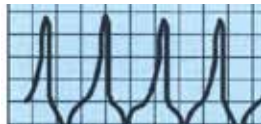
- During cardiac arrest, ECGs will detect abnormal electrical activity (heart rhythms)
- The following 3 heart rhythms are associated with cardiac arrest:

### Ventricular Fibrillation (VF):



- VF is the most common rhythm in cardiac arrest
- The heart quivers but doesn't pump
- VF lasts a few minutes before all electrical activity ceases (asystole)
- VF is a shockable rhythm - asystole is not (see below)

### Ventricular Tachycardia (VT):



- The heart beats too fast to pump effectively (pulseless VT)
- VT may progress to VF then asystole
- VT is a shockable rhythm

### Asystole\* (flat line):



- Asystole is a non-shockable heart rhythm
- All electrical activity has ceased and survival is unlikely

**AEDs only shock two rhythms - VF and VT (not asystole)**

\* Asystole is pronounced: ā-sis'tō-lē





## Defibrillation & AEDs

**Defibrillation** delivers an electric shock to the heart.

- The aim is to depolarize the heart muscle, terminate the abnormal rhythm, and allow normal sinus rhythm to be re-established by the heart's natural pacemaker (pg 20).
- Prompt defibrillation is the most important factor in survival from cardiac arrest. For every minute without defibrillation, survival declines by 10% ie 50% survival after 5 mins delay.
- Not all heart rhythms are reversible by defibrillation

**Automated External Defibrillators (AEDs)**, are simple-to-use units designed to analyse the heart rhythm and inform the user if a shock is advised.

- Use AED when casualty is unconscious & not breathing normally.
- If 2 rescuers then continue CPR while one of the rescuers locates an AED and organises AED pads.
- Switch on AED & follow voice prompts of the AED.
- Place pads on bare chest (remove clothing), wipe chest dry if wet. Remove clothing, jewellery, medication patches. Place pads 8 cm from implanted device (pace-maker), avoid piercings. Remove excessive chest hair.
- **No contact.** DO NOT touch casualty during analysis or shock.
- **No conduction.** DO NOT have casualty in contact with conductive material eg metal floor, puddles of water.
- **No explosion.** DO NOT use in explosive environment.

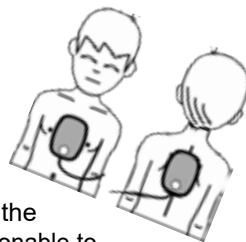
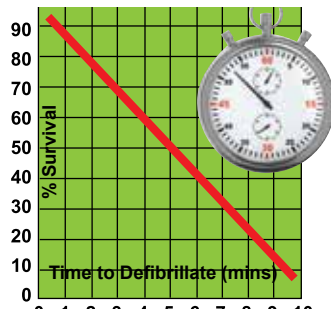
### Children and AEDs:

- **Over 8:** Use adult pads on a casualty who is unconscious and not breathing normally.
- **Under 8:** When using an AED on those under 8 years, **ideally** use paediatric pads and an AED with a paediatric capability. Defibs with paediatric capability, automatically adjust the size of the shock to the size of the casualty. However if these are unavailable then it is reasonable to proceed with standard adult AED pads.
- Place pads as per adult positioning, provided the pads do not touch each other. Pads can also be placed one on the front of the chest (over the heart), the other in centre of the back.

**Care should be taken when purchasing an AED for an education or care setting to select a device that is suitable for the age group.**

### Note:

- AEDs should only be used on unresponsive, non-breathing casualties.
- An AED can be used on unresponsive, non-breathing pregnant casualties.
- In large-breasted individuals, place the left electrode pad to side or underneath the left breast.
- If the casualty has an implanted pacemaker, raised area will be seen just below the left or right collar bone. Position AED pads 8cms from the pacemaker unit and proceed as usual.
- DO NOT bump or move casualty while AED is analysing rhythm.
- AED packs should include: razor, scissors, hand towel, spare pads, gloves and face shield.
- AEDs conduct automatic internal checks and provide visual indicators that the unit is ready and functioning properly - check indicator daily - follow manufacturer guidelines.



**ABC of CPR** is divided into four main colour coded sections:

- 1. Essential First Aid**
- 2. Low Voltage Rescue (LVR)**
- 3. Advanced Resuscitation**
- 4. General First Aid**

Each subsection shows you step-by-step how to recognise and deal with an emergency situation.

In conjunction with an approved first aid course, this book will assist you learn the skills to perform CPR, LVR and Advanced Resuscitation.

For training purposes, this book supports the Australian Health Training Package competency units:

HLTAID001: Provide CPR  
HLTAID007: Provide Advanced Resuscitation Techniques

UETTDRRF06B: Perform Rescue from a Live LV Panel

This book incorporates the latest Resuscitation Guidelines and is written for Australian conditions. This book contains international emergency numbers and is a useful resource no matter where you are in the world.