

# European First Aid

**A guide for Young People**

developed by Johanniter International

**johanniter**  
**international**



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## Representation on the Clinical Working Group

As Chair, I am immensely grateful to all the members of the Clinical Working Group, both Johanniter International (JOIN) members and those experts invited to join us for the development process. Without their commitment, diligence and ability to collaborate, these Guidelines would not have been possible.

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Richard Webber

Chair, Johanniter International Clinical Working Group

December 2023

## Conditions of use

These guidelines may be used without charge by any organisation or individual that teaches or provides first aid. If you are using these guidelines as a commercial organisation, we would ask that you consider making a donation to support the work of JOIN via our website.

The guidelines must be used in full as they are published and no alterations to the manuscript or its content are permitted without prior agreement.

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These guidelines are offered in good faith and represent the European consensus of opinion from a wide range of subject matter experts. Every effort has been made to ensure that this manual reflects the relevant guidance from authoritative sources, current at the time of publication.

However, responsibility for their use remains with the individual first aider or responsible body. Johanniter International and its partner organisations do not accept any responsibility for claims arising from the use of this manual. First aiders are advised to keep up to date with developments in policy and practice, and to recognise the limits of their competence. Whilst the material in the guidelines provides guidance on initial care and treatment, it must not be regarded as a substitute for medical advice from an accredited healthcare service or registered healthcare professional.

Feedback or comments regarding content should be directed to [join.office@johanniter.org](mailto:join.office@johanniter.org)

## Information for parents and teachers

This guide is intended for young people to help develop their knowledge and understanding of first aid, and apply some of the skills that may be needed to provide care to others. It provides an awareness of potential risks and situations that may lead to injury or illness, and how to avoid them. The information is also intended to build confidence in caring for oneself, with simple instructions to manage common minor medical problems or wounds, as well as recognising when to call for assistance and how to do so.

The materials should be suitable for the age range 13 to 17 years inclusive. They can be used by teachers, parents, carers or anyone who is interested in facilitating the learning of young people. They can be used in a classroom, at home, in large groups or on an individual basis.

As everyone learns in different ways and at different speeds, we do not offer a prescribed method for how the guide should be used. There is no set programme or timetable, and the approach is entirely at the discretion of the learner and educator. A wide range of courses and training resources are available for those who would like to study the subject of first aid in more detail or gain a recognised qualification.

# Introduction

**First aid** can be defined as the immediate care provided to someone acutely ill or injured.

A **first aider** is anyone with the skills and knowledge required to provide such care.

This guide is designed to be used by young people who want to learn simple methods of helping people who are ill or injured. It offers treatments which can be carried out with little or no equipment. Where we have recommended the use of equipment such as a bandage, we have also provided an alternative improvised solution using readily available materials. We hope therefore that wherever you find yourself using this guide, it will offer a simple and easily achievable means of helping your casualty.

The guide is aimed at members of the public encountering a medical problem and has been compiled by the Clinical Working Group of Johanniter International (JOIN). The topics include emergency situations where first aid may be of life-saving importance. This material provides basic guidance and should not replace medical advice if it is immediately available. It describes a level of first aid that might be taught in a single short course. Many of the techniques may also be used on a self-taught basis.



For the purposes of this guide, an **infant** is a child **under one year old**, and a **child** is regarded as between the age of **one and eight years inclusive**.

First aid can be provided by anyone. Training in first aid is best achieved on a face-to-face training course, but the basic principles and theory that underpin the practical application of first aid skills can be learnt via materials like this, and on a self-taught basis. One of the key principles is that the education should be universal, and that everyone should learn first aid.

**First aid training is not a one-off event – it requires ongoing experience and regular refresher training to ensure your knowledge and skills are kept up to date.** Although the knowledge and skills may not be difficult to learn, keeping up to date and applying these skills in a real-life situation can be challenging, even for the most experienced practitioners. Regular reading, training and application will help refresh and maintain your first aid knowledge and skills.

The information in this guide is set out so that you can:

- understand your role as a first aider
- deal with an incident where first aid is needed
- understand how the setting can affect first aid needs
- treat specific injuries
- manage common illnesses

# Background

This guidance was developed and agreed by the Clinical Working Group representing partner organisations from across Europe and within the JOIN community. The main philosophy of first aid education is that it is universal, available for everyone and free.

## The goals of first aid

The goals of first aid include the following:

- Preservation of life, including resuscitation
- Alleviation of suffering and providing comfort
- Prevention of further illness or injury
- Promotion of recovery and well-being

The JOIN Clinical Working Group has ensured as much as possible that this new European First Aid for Young People guide is consistent with recommendations provided by the European Resuscitation Council (ERC), and is appropriate in the context of the age group it is aimed at.

MEDICAL EMERGENCIES	TRAUMA EMERGENCIES
Recovery position for an unresponsive casualty Optimal positioning for shock victims Bronchodilator ('inhaler') treatment for asthma Recognition of stroke ('CVA') Early aspirin for chest pain Recognition of severe allergic reactions ('anaphylaxis') Management of low blood sugar ('hypoglycaemia') Oral rehydration treatment Cooling treatment for heat stroke ('severe heat illness') Fainting ('syncope')	Control of life-threatening bleeding Treatment of open chest wounds Cervical spine stabilisation Recognition of concussion Treatment of thermal burns Dental injuries including avulsion Bandaging for extremity joint injuries Straightening a broken bone ('angulated fractures') Eye injuries from chemicals

© European Resuscitation Council, 2021

The ERC also provided their First Aid **"5 Top Messages"** which JOIN endorses, and lists below:

- |                                      |  |
|--------------------------------------|--|
| <b>1. RECOVERY POSITION</b>          | Only for casualties NOT requiring rescue breaths or CPR  |
| <b>2. STROKE RECOGNITION</b>         | Use of a Stroke assessment protocol (e.g. F A S T)       |
| <b>3. COOLING OF HEAT CASUALTIES</b> | Immediate removal from heat, passive and active cooling  |
| <b>4. CONTROL SEVERE BLEEDING</b>    | Apply direct pressure, use of tourniquet or haemostatics |
| <b>5. THERMAL BURNS</b>              | Remove heat source, 20 minutes of cooling, cover loosely |

**In addition to these, JOIN wishes to emphasise the importance of prompt Cardiopulmonary Resuscitation (CPR) including good quality chest compressions and the early use of an AED.**

# CHAPTER 1: EMERGENCY!

## Responding to an Emergency

In an emergency it is important to follow a clear plan. This helps you to prioritise your actions and provide an appropriate and effective response.



A first aider should always follow a five-step approach when managing an incident:

1. **Assess** the situation
2. Ensure **safety**
3. Call for **help**
4. Provide emergency **first aid**
5. **After-incident** care



### 1. **Assess** the situation

2. Ensure **safety**
3. Call for **help**
4. Provide emergency **first aid**
5. **After-incident** care

► 1. Approach only if safe

► European First Aid – A guide for Young People developed by Johanniter International

## Assess the situation

Most of the incidents that a first aider will encounter will be relatively minor. When you encounter a medical emergency you should:

- identify yourself as a person with first aid skills
- find out what has happened
- ask if any other bystanders can help

Casualties may not require further medical attention. If they do, in most cases they will be able to access other healthcare professionals or make their own way to hospital. It is within the remit of the first aider to offer basic advice in directing casualties to the most appropriate onward care pathway.

For more serious incidents, an ambulance response may be required. A first aider can call the emergency services in such circumstances, or you may ask another member of the public to call for help whilst you provide first aid.



1. **Assess** the situation
2. Ensure **safety**
3. Call for **help**
4. Provide emergency **first aid**
5. **After-incident** care

## Safety

Safety is the first priority when responding to any situation and includes protecting yourself, the casualty, or other responders and bystanders from encountering further danger at the scene.

**Never put yourself or others at risk in the course of providing care to an ill or injured person.**

Common risks include fire, electricity, deep or rough water (especially cold), threat of violence or injury from an attacker, toxic chemicals or infection hazard, transport (road or rail) or from collapse of damaged building structure.

### Keep yourself safe

The aim is to avoid harming yourself as the scene may have threats such as broken glass on the ground. Special equipment is likely to be required in higher risk circumstances and only correctly-equipped, trained personnel should be providing care in those areas.

All individuals providing first aid must protect themselves as much as possible from exposure to body fluids, such as blood, which may cause a risk to the responder's health. Particular care must also be taken to avoid a 'sharp' injury.

The term used for equipment that is used to protect yourself is **"personal protective equipment"**, also referred to as PPE. This should always be carried in first aid packs.

Certain items of PPE are desirable as '**standard precautions**':

- disposable gloves
- a face shield to counter risk of infection when delivering rescue breaths
- alcohol gel or wipes for use before and after providing treatment



## ► 2. Items of Personal Protective Equipment, and the importance of hand-washing

Hand washing reduces the risk of infective organisms or contamination passing between the first aider and casualty. Ideally, hands should be thoroughly washed with soap and warm running water before and after casualty contact or activities likely to cause contamination. Hands should be dried, preferably with disposable towels. An alcohol-based liquid or gel can be used if soap and water are not available and your hands are not visibly dirty.

Different situations provide different hazards to the first aider and casualty. There are some specific precautions you can take depending on the situation you might face:



### Incidents involving fire outside

- Try to approach a situation with the smoke blowing away from you
- Be aware of risk of chemicals or explosions
- Only approach the casualty if they are a safe distance from the fire
- Warn others not to approach the fire

### Buildings on fire

- **Do not** enter a building which is on fire.
- Exit a building which is on fire as safely and quickly as possible through the nearest emergency exit. Help others out of the building if you can. **Do not** use a lift in a burning building - use the fire escape stairs. Close doors behind you as you leave to help slow the spread of fire. If used correctly, fire doors can hold back fire for 30 minutes or more.
- If you are trapped in a building which is on fire - enter a room with a window, shut the door, cover the bottom of the door with clothing or a blanket, open the window and shout for help.

### Clothing on fire

Remember "**Stop, Drop and Roll!**" - the casualty should:

- **STOP** moving
- **DROP** to the floor
- **ROLL** on the floor



### ▶ 3. STOP, DROP and ROLL

Wrapping the casualty in a coat or blanket may help to smother the flames. Use water to put out the flames if electricity is not involved.



## Electrical Injuries

If the situation involves power lines, overhead cables or live railway lines **DO NOT APPROACH** the casualty. High voltage energy can 'jump' through the air and cause injury even at distance. Keep at least 20 metres away from the source of the electricity and ensure that any bystanders do the same.

If emergency contact details are available, try to inform the organisation responsible for the power supply. **DO NOT APPROACH** until the relevant authority has confirmed that the area is safe.

**Do not** touch the casualty if they are still in contact with the electrical source or before it is switched off.



## Chemical Injuries

- if you think there is a risk from the chemical involved, **do not** approach the casualty unless you are sure it is safe to do so. If not, call for help from the Emergency Services and wait until they arrive.
- avoid pools of fluid and try to remain upwind of any smoke or vapour clouds.
- chemical containers usually show a code or a symbol to identify their contents. If you can do so safely, make a note of the code, as this can be used by emergency services to find out which chemical is present.



### ▶ 4. Examples of chemical warning symbols



## Road Accidents

If you find yourself at the scene of a road accident the most important thing is your personal safety. Some key things to consider doing are:

- get people to a place of safety or refuge away from moving traffic whenever possible
- If it is safe to do so, make sure that any vehicles which are involved have their hand-brakes on and ignition off, leaving the keys in the ignition in case the emergency services need to move the vehicle.
- provide a warning to other road users by doing things such as turning on hazard lights and putting out warning triangles or cones.
- if available, wear high visibility or bright clothing.
- ensure that no naked flames such as cigarettes, lighters or matches are brought close to the incident.



► 5. Image: National Highways (UK)

**If you are unable to exit the vehicle safely and get to a safe place, or have to stop in a live traffic lane, or feel your life is in danger:**

- **stay in your vehicle with your seatbelts and hazard lights on**
- **call emergency services immediately (or press the SOS button in your vehicle)**



## Incidents involving water

Rescue from a river, lake, canal, pond or the sea is **dangerous**. Specialist recovery and safety equipment may be required. You **must not enter the water** unless you are **absolutely sure** it is safe for you to do so. Rather than enter the water you can:

- **throw** rescue equipment such as a lifebuoy, ring or rope if available
- **call for help**

You should not enter water to save an animal.

If the casualty has already got out of the water:

- make sure they are in a safe place
- encourage the casualty to remove wet clothing (not completely!)
- wrap them in any dry, warm clothing or a blanket



1. **Assess** the situation
2. Ensure **safety**
3. **Call for help**
4. Provide emergency **first aid**
5. **After-incident** care

► 6. Emergency services numbers in Europe and UK

## Call for help

### Calling the Emergency Services

The Emergency Services can be called from any telephone by dialling **112** or **999**.

All emergency calls are **free**.

You will be asked for the following information:

- the emergency service you need
- your name and phone number
- what has happened
- the number of casualties
- where help is required and how to reach it
- any hazards you have found e.g. fire, chemical, electrical

Once the call is over it is important to do what you can to provide care until further help arrives. You may get advice by telephone from the emergency call handler. You may only be able to provide support and reassurance until help arrives, but this is really valuable.

If the emergency is in a large building, ask somebody to meet the emergency services at the entrance to guide them to the scene of the incident.

If you are able to, gather the casualty's medicines, secure any pets safely and, if it is dark, ensure that lights are left on to make it easier to find you.

When providing first aid it is important to ensure that you preserve the casualty's dignity and privacy as far as possible without interfering with your ability to help them, bearing in mind cultural sensitivities. In addition, whenever providing first aid for a child you should ensure that a parent or other carer/adult is present.

1. **Assess** the situation
2. Ensure **safety**
3. Call for **help**
4. **Provide emergency first aid**
5. **After-incident** care

## Provide emergency first aid

Emergency first aid requires a systematic, reproducible and consistent approach. These guidelines will describe the **DR-CABC** paradigm in more detail below in **CHAPTER 2**.

Briefly, the priorities are avoiding potential **D**angers, checking for **R**esponsiveness, **C**ontrolling severe bleeding and **C**alling for help, then assessing the **A**irway, **B**reathing and **C**irculation or **C**ardiopulmonary Resuscitation (CPR) if necessary.



1. **Assess** the situation
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## After-incident care

### Confidentiality

Sharing your experiences of providing first aid with others can help both you and other people learn from your actions. Doing so as part of your first aid training is acceptable, but **do not** share any information on social media.

## Looking after yourself

As a first aider you have the skills and knowledge that can save lives. Helping others usually results in a rewarding, positive experience. However, you may experience feelings afterwards, such as doubt, anxiety and sadness. Some situations can be particularly distressing so it is important you speak to someone afterwards.

**If you are worried about something you have seen or done as a first aider, talk about it with someone you trust**

### Where to get help

Sometimes talking to a friend, parent or teacher may be enough. Extra help can be sought through your own family doctor and if you are part of an organised first aid scheme in your own country, such as St John, your colleagues will be only too happy to point you, confidentially, towards appropriate assistance and to provide you with support.

“It’s OK not to be OK... but it’s also OK to be OK”

## Use of a casualty’s own medication

First aiders are encouraged to support a casualty in taking their own medication. Examples include the use of an inhaler in asthma or an auto-injector to treat severe allergic reactions.

## CHAPTER 2: HOW TO ASSESS THE CASUALTY

Finding out what is happening involves assessing the scene and the casualty. We have covered the steps required to assess the scene in **CHAPTER 1**. In this chapter, we will focus on how to methodically assess a casualty.

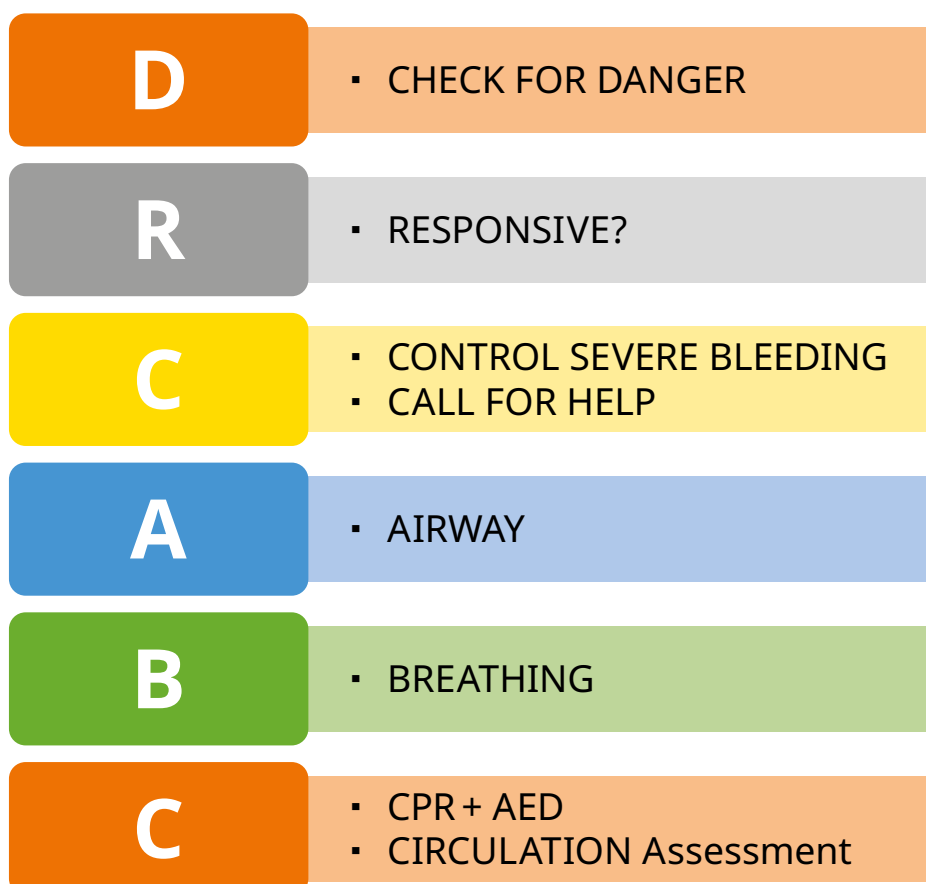
The **DR-CABC** mnemonic (remember “**Doctor-CABC**”) forms a simple and easy to remember framework for you as a first aider responding to an incident.

This is also known as a ‘**primary** survey’.

### Introducing DR-CABC

As a first aider you will encounter two types of casualty: someone who has been injured and someone who is ill. The **DR-CABC** approach provides the framework for managing both types of casualty. We will now look at each of these stages in turn.

Remember that whilst you are working through **DR-CABC** you should be asking questions to help you manage the casualty (**see page 24**).



**START  
HERE**

**D**

▪ CHECK FOR DANGER

see Chapter 1

As a first aider you must not put yourself in danger. We have covered safety at the scene in **CHAPTER 1**. You must make sure that it is safe for you to offer help. Don't become another casualty and always follow the advice or instructions of the emergency services. If you identify dangers, you should make sure that all those present move to a safer place. It may not be possible to offer help, which may have to wait until the emergency services arrive. This is fine - **do not** feel pressured to take unnecessary risks.

**R**

▪ RESPONSIVE?

see page 38

Firstly, talk to the casualty. In most cases they will talk to you or respond appropriately when you talk to them. If they don't answer, ask them to open their eyes. If they still don't respond, try a gentle shake of the shoulders. **Do not** shake the casualty too vigorously, as this risks making an injury worse.



► 7. Checking for responsiveness

The casualty may respond in a number of different ways, described as:

- **Alert** – the casualty is fully awake with eyes open and talking appropriately
- **Responsive** – the casualty responds to your voice or your gentle shake either by:
  - Speaking to you
  - Moaning or groaning
  - Moving or trying to push you away
- **Unresponsive** – the casualty does not respond at all to your voice or a gentle shake.

# C

- CONTROL SEVERE BLEEDING
- CALL FOR HELP

see page 61

If the casualty is bleeding heavily you should immediately attempt to control the bleeding. Methods to achieve this are covered in more detail in **CHAPTER 6**.

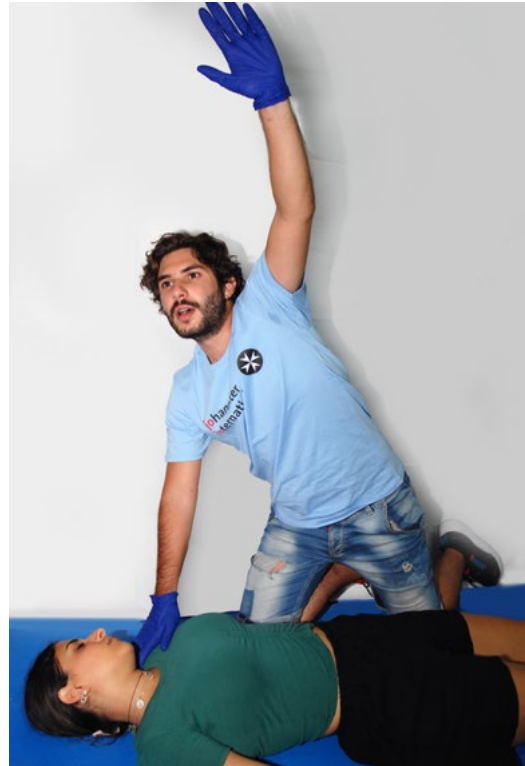
If you have not already done so, the next task is then to **call for help**.

## If you are alone:

- stay with the casualty
- use a mobile phone, ideally using the speakerphone, to call the emergency services (**112** or **999**) for assistance
- call for help or ask any passers-by for help

## If other people are present:

- continue your assessment and treatment of the casualty
- ask someone to call for help
- make sure that the person you have asked to call for help comes back to tell you help is on the way



► 8. Calling for help

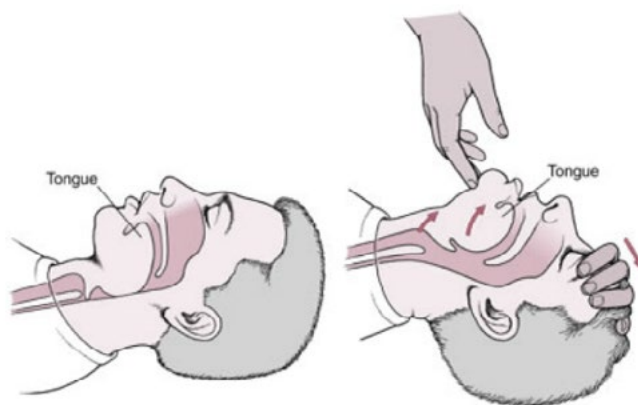
# A

## ▪ AIRWAY

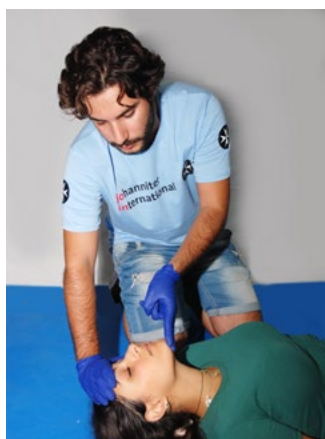
If the casualty does not respond, your next priority is to assess and open the airway. Open the casualty's mouth and remove any obvious, visible blockage this is possible and safe to do so, **do not** go "fishing around" in their mouth.

If required, use a simple manoeuvre - such as the **"head tilt - chin lift"**.

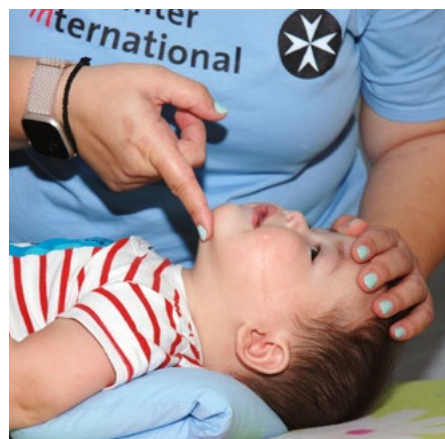
- Place the fingertips of one hand under the point of the casualty's chin, lift chin and hold.
- At the same time place your other hand on their forehead and gently tilt their head backwards.
- In a very young child, or infant, the most appropriate position is neutral (see figure 11).



► 9. Head tilt – chin lift manoeuvre



► 10. The „head tilt-chin lift“ manoeuvre



► 11. Neutral position for an infant

# B

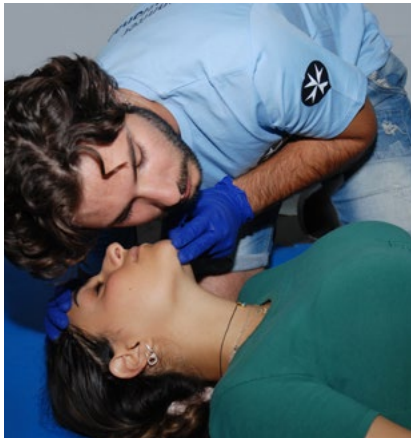
## ▪ BREATHING

see page 27

The next step is to see if the casualty is breathing normally. Normal breathing should be regular and appear comfortable. Abnormal breathing may be too slow or too fast, or may look or sound ineffective.

To assess breathing look for chest movement and listen and feel for breathing for no more than 10 seconds:

- **LOOK** (for chest movement)
- **LISTEN** (for breath sounds)
- **FEEL** (the casualty breathing on your cheek)

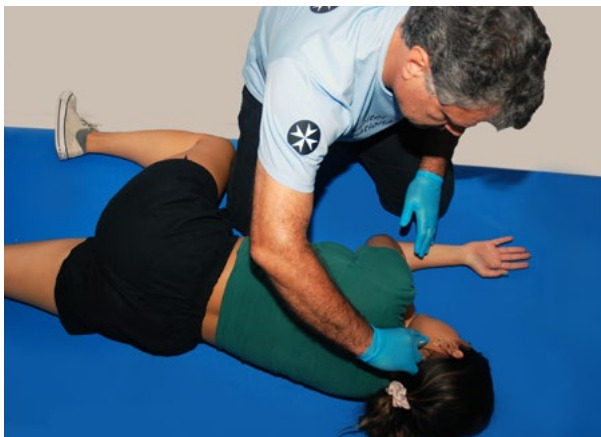


### ► 12. Look, listen and feel for breathing

If you are unsure whether the casualty is breathing normally, assume that they are not.

Next, if the casualty is:

- **Responsive** – place them in a comfortable position and move onto checking **CIRCULATION**
- **Unresponsive and breathing normally** – place them in the recovery position (see page 25) and move onto checking **CIRCULATION**
- **Unresponsive and not breathing normally** – immediately **start CPR** (see page 30)



The recovery position is explained further on **page 25**. Here we are just introducing you to the idea.

### ► 13. Casualty placed in the recovery position

**Remember, if you have not called for help yet then  
CALL NOW!**

**C**

- CPR + AED
- CIRCULATION Assessment

**see page 30**

## Cardiopulmonary resuscitation (CPR)

Start CPR if the casualty is unresponsive and not breathing normally

- follow the instructions on page 30.

## Automated External Defibrillator (AED)

Call someone to bring an **AED**, if one is nearby.



In all other cases, if the casualty is responsive or unresponsive **but breathing normally** check Circulation.

▶ 14. International sign for an AED

## Circulation

If the casualty has a problem with their circulation they may complain of:

- chest pain
- feeling sick
- feeling faint or light headed

and/or you may notice:

- pale, cool, and sweaty skin
- rapid, shallow breathing
- signs of confusion
- a reduced level of responsiveness

### What you can do:

- Casualties showing signs of a severe problem with their circulation, called “**shock**” (see page 60) are best placed lying on their back.
- If there is no evidence of injury, lifting the legs may help improve the circulation. This is called **passive leg raising**.
- Assist a responsive casualty who is experiencing non-traumatic chest pain that is suspected to be a heart attack (myocardial infarction), to take aspirin (see **CHAPTER 5**).

**DO NOT** give aspirin to anyone with a known allergy or reaction, such as severe asthma.

## Defibrillation (AED)

If the casualty is **unresponsive and not breathing normally** and if a defibrillator (**AED**) is available, follow the instructions the machine gives you.



Follow the instructions the **AED** gives you.

► 15. An automated external defibrillator (AED)

**A flowchart for when to use an AED is also shown on page 30**

While you're waiting for further help to arrive:



► 16. Examples of an AED being attached to a casualty

- always follow **DR-CABC**
- if you see bleeding, try to control it (**see page 61**)
- if they are feeling faint, lie the casualty on their back and, if possible, raise and support their legs
- cover the casualty with blankets or clothing to keep them warm
- advise them not to eat or drink but you can give them sips of water
- reassess the casualty regularly

Some people may carry an adrenaline auto-injector, also known as an “EpiPen™”, which contains adrenaline as an emergency self-treatment if they have a severe allergic reaction. If they do, you can assist them in using it (**see page 101**).

**This concludes the initial approach. If there has been any change in the casualty’s condition, you should repeat your assessment from the start.**

## Following DR-CABC

Once you have completed your **DR-CABC** the next step is to conduct a ‘head-to-toe’ assessment looking for signs of injury or illness, and ask about any symptoms. This information can then be handed over to the emergency services when they arrive.

Your **DR-CABC** assessment may not identify the problem which needs immediate treatment. In some cases you will need to use other sources of information. There may be clues such as a medic alert bracelet, an EpiPen™ or medications carried by the casualty or on their person.

It will not always be possible to gather all this information, for example if the casualty is unresponsive, there were no witnesses to an incident or anyone nearby who may know the casualty. Always check for any medic alert bracelets or necklaces which they may be wearing.



► 17. Examples of medical alerts (bracelet and necklace)

### Head-to-toe’ assessment

This is a careful, systematic examination covering all of the following:

- head and neck
- chest
- abdomen
- back
- arms and legs

Assess each limb and joint with a ‘look then feel’ approach, noting any deformity or swelling, wounds or other skin changes as you go. Ask the casualty to move their limbs and look for any restriction of movement or pain when doing so.

When you examine the head ensure you look through the casualty’s hair for any wounds. You should also look for injuries to the eyes, nose, mouth or ears, or the presence of foreign bodies. Remember that many people wear dentures, or use contact lenses.

## Removal of clothing

When providing CPR and performing defibrillation, any clothing or jewellery that could interfere with positioning of the pads should be removed or cut away, as the pads must be attached to bare skin. Clothing may also be moved or removed to allow you to assess and treat wounds, or to control severe external bleeding. Always remember to respect the casualty's dignity at all times, explaining what you are doing and why, and removing as little clothing as possible.

## History

As you begin to assess the casualty, you should try to gather as much information as you can about the situation by **taking a history**. This can be obtained from the casualty themselves, cares or relatives, witnesses or any combination of these. Elements of the history may alert you to possible causes of injury or illness that the casualty may be suffering from.



► 18. Clues at the scene - how many can you spot?

As you assess the casualty, they may tell you symptoms they are experiencing, such as pain, difficulty breathing or itching. As you perform your **DR-CABC** assessment you may find signs that are consistent with these symptoms, such as bruising, a wheeze or a rash.

You should start your history by finding out the casualty's name and age or date of birth. This will be useful later when speaking to the emergency services.

A useful mnemonic to use when assessing a casualty is '**AMPLE**':

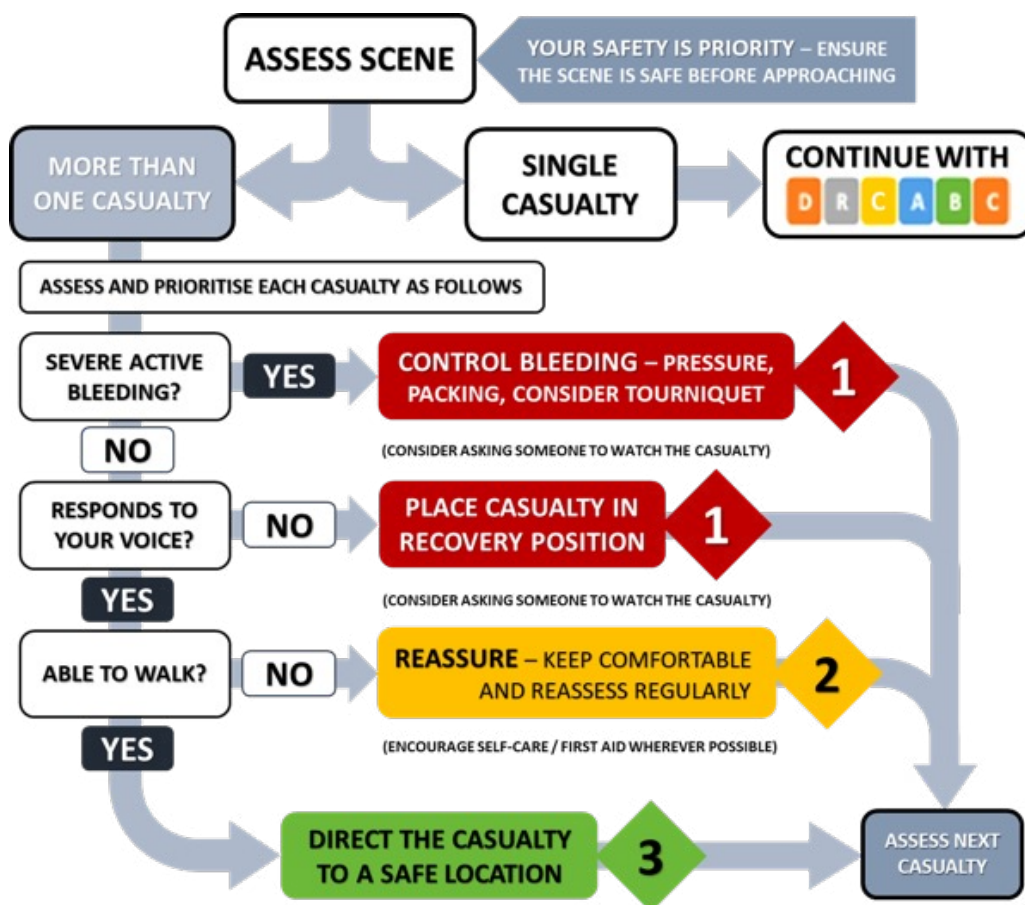
<b>A</b>	<b>Allergies</b>
<b>M</b>	<b>Medications</b>
<b>P</b>	<b>Past Medical history</b>
<b>L</b>	<b>Last ate or drank</b>
<b>E</b>	<b>Events leading up to the illness/ injury</b>

# Who do I treat first?

If there is more than one casualty and you can safely offer first aid, you should first ensure that the emergency services have been called, sharing as much information about the situation with them as you can. The first priority is stopping severe bleeding (see page 61) and, where necessary, putting casualties into the recovery position (see page 25).

The most serious casualties are referred to as category “1” (usually denoted as **RED**), followed by category “2” who require urgent care but not usually life-threatening (**AMBER**), and then category “3” which means they are a walking casualty (**GREEN**). Think traffic lights.

If possible, try to record where the most severe casualties are, and indicate them as such with a suitable method e.g. coloured labels or improvised markers. If there is any possibility of further danger, your immediate action should be to leave the scene and reach a safe place.



► 19. Simplified Triage process for assessing and prioritising more than one casualty

## Moving casualties

Wherever possible, leave the casualty in the position in which you find them UNLESS this prevents you being able to assess and treat a life-threatening problem effectively, or you need to move them away from an approaching hazard – such as fire/fumes or moving traffic.

Always ensure your own safety first. Ideally, use a moving/lifting technique that you have been trained to perform. If not, always try and minimise risk of injury by seeking help first.

# Recovery position

The unresponsive and breathing casualty is at risk if their airway becomes blocked. This can be protected by placing the unresponsive casualty in the recovery position. The airway takes priority over any concern about neck injury. However, if injuries are severe ideally the casualty should be left in the position in which they are found until professional medical help arrives.

If safe to do so, place the casualty in the recovery position as shown in the following sequence:



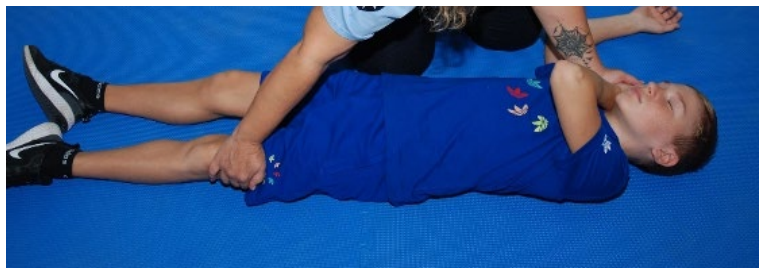
Open the airway



Nearest arm as in 'STOP' sign



Then opposite arm across chest



Hold outside of opposite knee, keeping head supported



Lift knee, foot flat on the ground



Pull knee and hip into right angles



Roll casualty towards you until on their side



Check head position

► 20. Placing a casualty into the recovering position.

## Infant recovery position

If the casualty is an infant, cradle them in your arms with their head tilted slightly downwards and continue to monitor their breathing and level of responsiveness until medical assistance arrives.



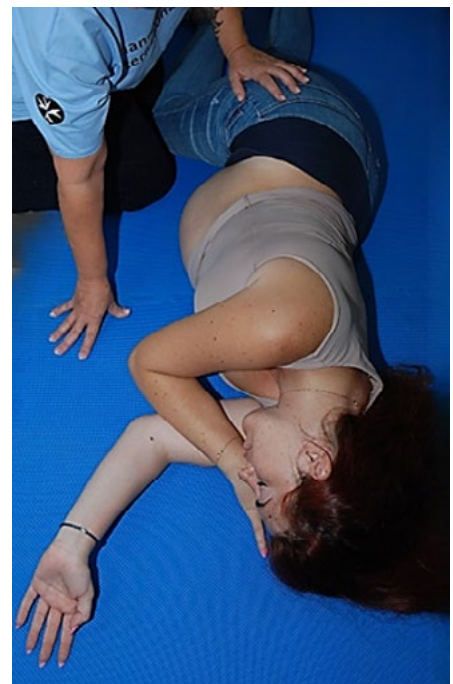
Once the casualty is in the recovery position:

- keep checking that they are breathing
- keep them warm using a blanket or coat

► 21. The infant recovery position

## Pregnancy

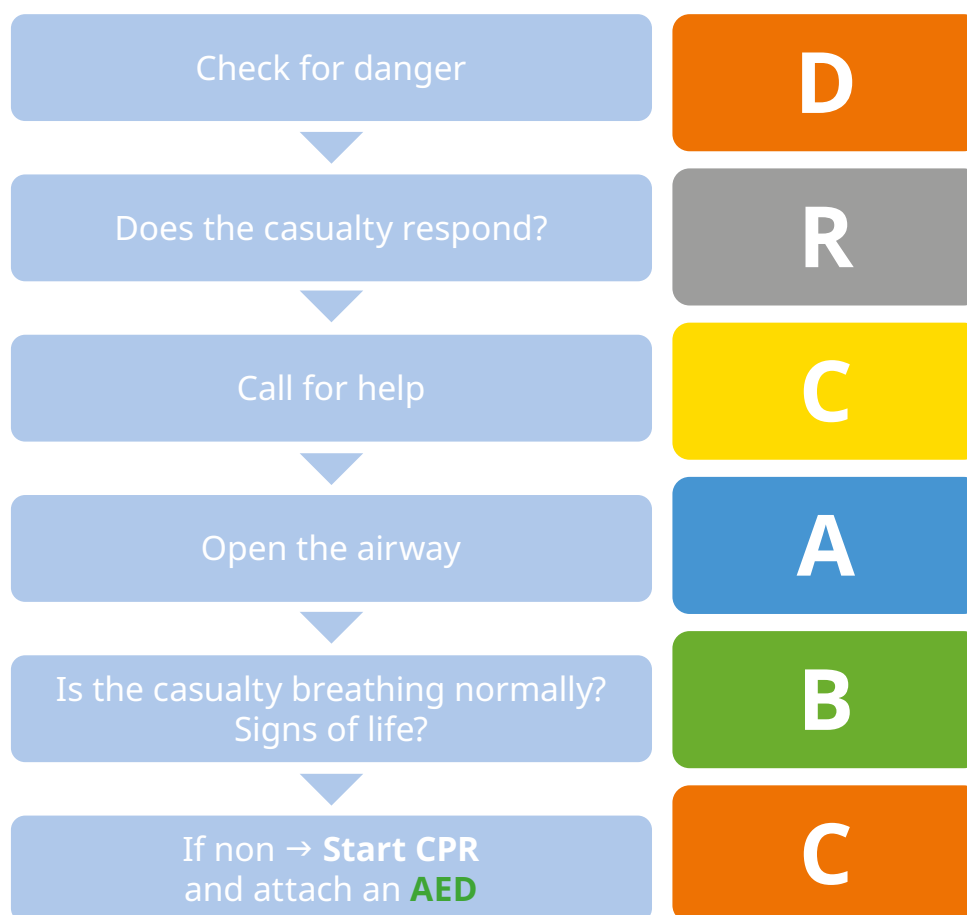
Casualties obviously in late stages of pregnancy should be placed on their **left** side downwards:



► 22. Left side down position

## CHAPTER 3: THE CASUALTY ISN'T BREATHING

In this chapter, we will cover in more detail what to do if your casualty is choking or has stopped breathing. This also follows the **DR-CABC** sequence and introduces the following resuscitation sequence:



► 23. Resuscitation sequence

Whilst assessing a casualty using the **DR-CABC** approach – as described in **CHAPTER 2** - you should intervene as soon as you find a problem, and not move on until you have done so and checked for any signs of improvement following your actions.

### Choking

Choking occurs when the airway is completely or partly blocked. Food is often the cause of the blockage although young children can choke on toys or other small objects they put in their mouths. Signs and symptoms of choking include:

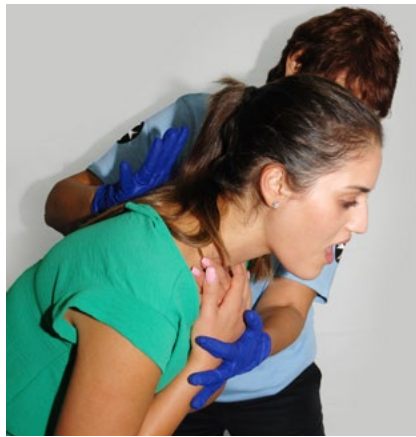
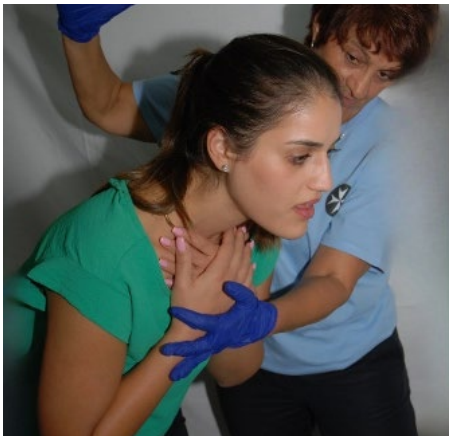
- coughing, wheezing or gagging
- difficulty breathing, speaking or swallowing
- panic
- clutching at the throat
- abnormal breathing sounds
- unresponsiveness

# Choking in Adults

Simple emergency actions may save lives. You should follow the **DR-CABC** approach.

## The actions to take:

- encourage the casualty to cough.
- if this does not clear the object, ask someone to help you and then.
- lean the casualty forwards and give them five firm back blows between the shoulder blades with the heel of the hand as shown in (**see figure 24**).
- if back blows are unsuccessful in clearing the obstruction, try five abdominal thrusts (also known as the “Heimlich manoeuvre”). These are best performed by standing behind the casualty then making a fist with one hand and placing just below the rib cage in the middle. The other hand then grasps the fist from below and together they are thrust upwards and backwards (**see figure 25**).
- five back blows should be alternated with five abdominal thrusts until the blockage is cleared or the casualty becomes unresponsive.



► 24. Back blows



► 25. Abdominal thrusts

## What do you do if the choking casualty becomes unresponsive?

- Support the casualty gently to the floor if they are not already on it and lie them on their back
- Call for help and immediately commence CPR
- Continue CPR until professional help arrives or the blockage is cleared and breathing restarts

# Choking in Infants and Children

For children the initial treatment is to encourage them to cough. If this fails to clear the object, infants and smaller children should be supported in a head down position. Babies should be laid along your forearm, toddlers and young children across your lap. The child's head should be supported with the palm of the hand, using the fingers of that hand to hold their mouth open. The forearm should be sloping gently downwards to encourage the object blocking the airway to fall out of their mouth. Start with five back blows just as you would in an adult, but more gently (see figure 26).

If this does not dislodge the object, the next step depends on the age of the child:

- **in infants (under one year):**
  - 5 back blows are alternated with 5 chest thrusts. Chest thrusts are similar to chest compressions but delivered at a slower rate (see figure 27)
  - Once the obstruction is cleared check the airway- look in the mouth
- **in children (one year or over):**
  - 5 back blows are alternated with 5 abdominal thrusts using a lower force than for adults (see figure 28)
  - Once the obstruction is cleared check the airway- look in the mouth
  - If the infant or child becomes unresponsive, CPR should be started (see page 34)



► 26. Performing back blows on an infant



► 27. Performing chest thrusts in an infant



► 28. Performing back blows and abdominal thrusts on a child

# Strangulation and Hanging

Strangulation is a constriction or squeezing around the neck. Hanging is the suspension of the body by the neck. The priority must be to release any constriction or pressure upon the neck, lower the casualty if safe or able to do so, and establish an open airway.

- in all cases follow **DR-CABC**
- if casualty is still hanging, try to get them down only if this can be done so safely. This is likely to require at least two adults and may be a significant risk of further injury
- remove anything from around the casualty's neck
- if the casualty is not breathing, start CPR

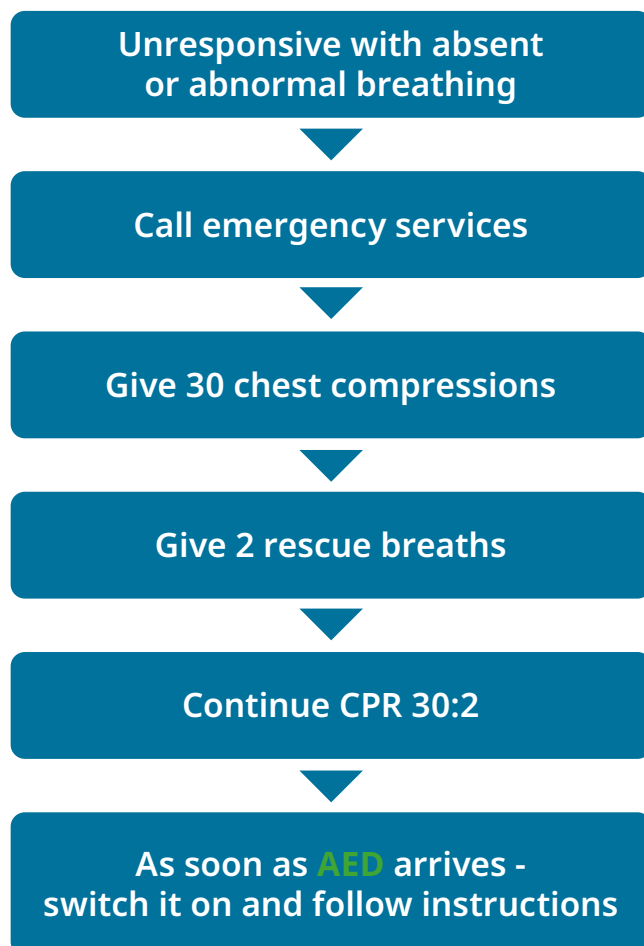
## Performing CPR and Defibrillation: ADULTS

The combination of rescue breaths and chest compressions is called **BASIC LIFE SUPPORT (BLS)** and is a very effective way of saving a life. It follows the sequence shown below:

Learning how to do CPR is one of the top 5 key messages from the European Resuscitation Council guidelines published in 2021.

The purpose of chest compressions is to manually pump blood around the body so that oxygen can reach the brain and heart. The emphasis in cardiac arrest is providing high quality chest compressions with minimal interruption. In addition to this, an Automated External Defibrillator (AED) should be obtained and used as soon as possible.

### BASIC LIFE SUPPORT



► 29. Adult BLS © European Resuscitation Council, 2021

**Remember to call for help as soon as possible 112 / 999**

A casualty will usually experience signs or symptoms of illness before cardiac arrest occurs. Cardiac arrest is therefore potentially preventable with early access to medical care.

The principles which guide first aid in this situation are summarised in the **Chain of Survival**.



### ► 30. The “Chain of survival”

**The key elements of the Chain of Survival are:**

- Early recognition and call for help
- Immediate CPR (with minimal interruptions)
- **AED** used as soon as possible
- Delivery of specialist care

CPR involves a combination of chest compressions and rescue breaths. If you are NOT comfortable doing or are unable to do rescue breaths, perform uninterrupted compressions without pausing.

## Chest compressions

Performing chest compressions is tiring and ideally the person doing so should change-over every 2 minutes. CPR should only be stopped if the casualty starts to show signs of life, when further medical help arrives, or if the provider becomes exhausted.

- Move the casualty onto their back on a firm surface and kneel beside their chest
- Place the heels of both hands on the centre of the chest with your arms straight with one hand on top of the other (**see figure 31**)
- Give 30 chest compressions aiming to achieve a rate of 100-120 compressions/minute
- For each compression firmly press down by 5-6 cm depth fully releasing the pressure between compressions without your hands leaving the chest



► 31. The correct hand position for chest compressions

## Rescue breaths

Following the simple instructions below will ensure effective breaths:

- the ratio of chest compressions to breaths should be **30 : 2** for an adult
- the chest should be allowed to visibly rise and fall with each delivered breath
- use head tilt-chin lift (**see page 18**) to open the airway



► 32. Giving rescue breaths

- a face shield or face mask could make the delivery of breaths more acceptable for the first aider, but is more effective if previously trained in their use
- place your mouth around the casualty's mouth (or over the face mask/shield valve), ensuring you have a good seal and pinch their nose (**see figure 32**)
- make no more than two attempts between sets of compressions - if unsuccessful in delivering breaths re-check, clear the airway and reposition on the next attempt

If you are unwilling or unable to give rescue breaths, then you should **deliver only chest** compressions. The emergency services operator will provide instructions for CPR which should be followed to the best of your ability- put your phone onto external loudspeaker!

## Use of an Automated External Defibrillator (AED)

Use the **AED** as soon as it arrives. Open the case, turn on the device and follow the verbal instructions it gives you. The **AED** monitors the casualty's heart rate and rhythm, and will only let you administer a shock if one is needed. The sooner an **AED** is used, the greater the chance there is of survival.

Remember the international sign for an **AED** is:



► 33. International sign for an AED

## Putting it all together



► 34. The full sequence of Basic Life Support.

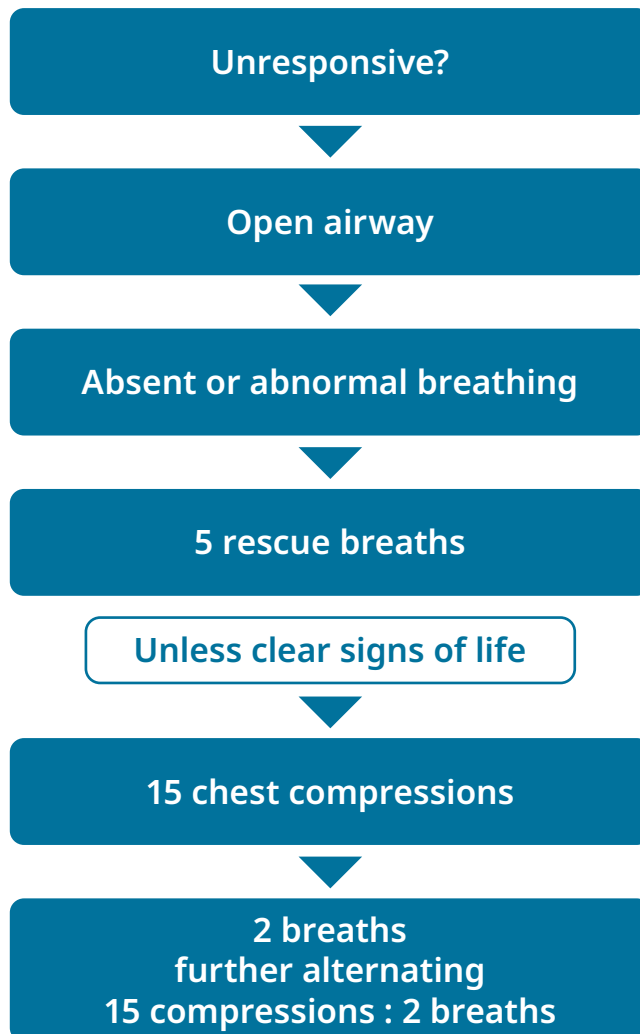
# Performing CPR and defibrillation: INFANTS and CHILDREN

Sometimes, but fortunately very rarely, you may have to carry out basic life support on a child or an infant. The BLS algorithm is shown below:

## PAEDIATRIC BASIC LIFE SUPPORT



SAFE? - SHOUT "HELP"



► 35. Paediatric Basic Life Support algorithm  
© European Resuscitation Council, 2021

**REMEMBER: an infant is less than one-year-old  
and a child is aged one or over**

The same **DR-CABC** approach should be followed for infants, children and adults. When providing CPR, there are two important differences between children and adults: giving rescue breathes, and the rate and position for delivering chest compressions.

## Rescue breaths

In children, a cardiac arrest is most likely to be caused by an initial breathing problem. Therefore, if a child is not breathing normally, **5 rescue breaths** should be given before starting chest compressions. If there is any change in the casualty's condition while doing so, then reassess.

## Chest compressions

In children and infants, **15** compressions are given to every **2 breaths** at a rate of **100 - 120** compressions per minute. There should be minimal interruptions in chest compressions.

### Compressions in infants

- compress the sternum (breast bone) with the tips of two fingers (**see figure 37**)
- the depth of compressions should be approximately 4cm



► 36. Rescue breaths.



► 37. The two finger technique for chest compressions on an infant

## 'Encircling' technique for chest compressions in infants

An alternative technique is to use the encircling technique to provide chest compressions:

- place both thumbs flat, side-by-side, on the lower half of the sternum (**see figure 38**), with the tips pointing towards the infant's head.
- spread the rest of both hands, with the fingers together, to encircle the lower part of the infant's rib cage with the tips of the fingers supporting the infant's back.
- press down on the lower sternum with your two thumbs by approximately 4 cm.



► 38. The 'encircling' technique

## Compressions in children

- place the heel of one hand over the lower half of the sternum.
- lift the fingers to ensure that pressure is not applied over the child's ribs (**see figure 39**).
- position yourself vertically above the casualty's chest and, with your arm straight, press down approximately 5 cm. Put your other hand on the floor to support yourself.
- in larger children, this may be achieved most easily by using both hands (as for CPR in adults).



► 39. Providing chest compressions in children

## Use of an AED in children



**AEDs should not be used for infants (children under one year)**

► 40. AED applied to a child

Paediatric pads should be used if the child is less than eight years old. If paediatric pads are unavailable, use standard adult pads and position one on the front of the chest and one on the back (see figure 41).



► 41. Standard AED pad positioning for a child

## More than one first aider

If you are alone, you will need to provide both chest compressions and rescue breaths as described above. If help is present, you should use others to help perform Basic Life Support. If possible, use:

- one person to provide breaths
- one person to attach and use the defibrillator
- at least one person to perform chest compressions. Because chest compressions are tiring, if available, more than one person can be used for this, swapping as they get tired; ideally every two minutes

As a first aider, if enough people are present to perform all of the roles above, you can stand back from the casualty and direct each person to ensure all elements of basic life support are being performed correctly. Clear communication is key to successful resuscitation.

## CHAPTER 4: IF THE CASUALTY IS UNRESPONSIVE

The level of responsiveness can be difficult for first aiders to accurately assess. A **responsive** casualty has their eyes open spontaneously and will respond meaningfully to a verbal or physical stimulus. An **unresponsive** casualty may or may not be breathing. They may not respond to any stimulus or have a very limited response, if any. It may also be difficult to distinguish between this and where there are no detectable signs of life, which may indicate cardiac arrest or even death. Mild to moderate allergy

### Assessing the level of response

To assess a casualty's level of response, the **'ACVPU'** scale should be used. The ACVPU assessment can be performed quickly and provides a simple measure of the level of casualty's level of response.

- Alert** - the casualty is fully awake with eyes open and responding normally
- Alert but Confused** - the casualty responds but speech or behaviour is confused
- Responds to Voice** - the casualty responds to your voice, such as opening their eyes
- Responds to Pain only** - the casualty will only respond to a painful stimulus
- Unresponsive** - the casualty does not respond to any stimulus

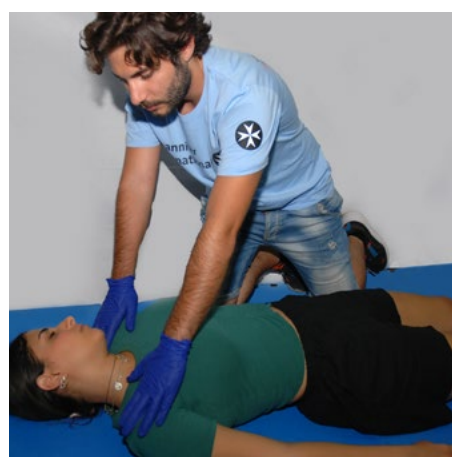
Some casualties are responsive but may appear **Confused**, which is particularly important if it's a change from that individual's normal state and may indicate a cause for concern. This could be following a head injury or may be an early sign of an illness.

Casualties who will respond to your voice are described as **V** on the ACVPU scale. To test their response to voice, you should ask a casualty to obey a simple command. For example, you may ask them to open their eyes. If they do not obey your command you should move on to the next step of the ACVPU scale and assess their response to pain.

A casualty who only responds to a **painful stimulus** is described as **P** on the ACVPU scale. An example of an appropriate painful stimulus would be to squeeze the fleshy area at the front of the shoulder. In response to such a stimulus, a casualty will normally:

- open or screw up their eyes
- move limbs and/or head towards (localise) or away (withdraw) from the stimulus
- talk, shout or mumble

A casualty who does not respond to a voice or painful stimulus is **unresponsive** i.e. **U** on the ACVPU scale.



► 42. Checking level of responsiveness

## Managing a reduced level of responsiveness

Your approach to the unresponsive casualty should still follow the **DR-CABC** assessment.

Remember, during your **DR-CABC** assessment, if the casualty is:

- **Responsive and breathing normally** – place them in a position they find comfortable and move onto assessment of **CIRCULATION**
- **Unresponsive and breathing normally** – place in the recovery position (see page 25) and move onto assessment of **CIRCULATION**
- **Unresponsive and not breathing normally** – immediately start CPR (see page 30)

If the casualty is unresponsive make sure you have called for help, if you have not already done so.

In the rest of the chapter, we will explore specific causes of reduced responsiveness and how to manage these problems.

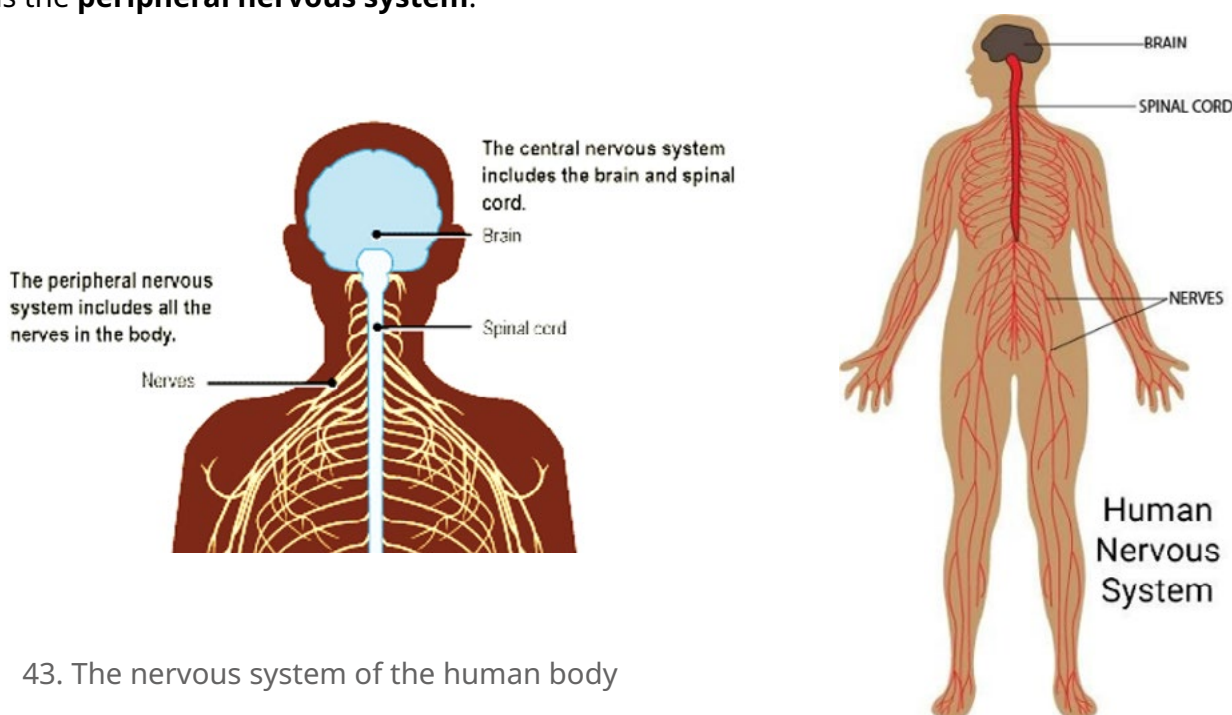
## The brain and spinal cord

The brain is one of the most complex organs of the body. Together with the spinal cord, this makes up what is known as the **central nervous system**.

You do not need to know exactly which functions are performed by which part of the brain, but it is important to know the brain performs a variety of vital bodily tasks.

The brain generates and transmits electrical signals within and between its nerve cells – these allow us to think, make memories, understand speech, experience emotions, make sense of the world around us and gives us our own personality. Some of these signals are sent along nerves in the spinal cord that tell muscles to move; allowing us to walk, talk, pick up a pen or put on a bandage! The signals that are received along nerves to the brain help us to see, hear, balance, experience touch, pain, temperature and vibration.

The way signals are carried to and from other parts of the body, such as our limbs, is known as the **peripheral nervous system**.



### ▶ 43. The nervous system of the human body

As you can imagine, the pathways that help perform these functions are very complicated. The brain is a very fragile organ so is protected by a very hard case- the skull. In order to function properly it must have just the right amount of blood, sugar, oxygen and electrical signals. All of these are finely balanced, and a problem with one or all of these can result in a wide variety of symptoms, and may lead to becoming unresponsive. Therefore, do not automatically assume there is a problem with their brain (although this might be the case!). The next section will describe some common causes of reduced level of responsiveness and how to manage them.

## Causes of reduced level of responsiveness

### Seizures (“fits”)

Some people have seizures sometimes for no obvious reason which are usually controlled by medication, but seizures can also occur as a result of head injury, diseases of the brain, shortage of oxygen or glucose (low blood sugar) or through misuse or withdrawal from drugs or alcohol. Very young children may have seizures as a result of having a fever (high temperature). These can be called “febrile convulsions”. The families of children who have seizures may have medication they can administer to stop them.

The features of a seizure may include:

- the casualty suddenly falls to the ground
- their body may go stiff and rigid
- they may look awake but do not respond
- twitching or violent jerking movements of the limbs may occur
- they may wet themselves
- they may bite their tongue

After a seizure has resolved the casualty may remain confused and drowsy for anything from seconds to minutes, or even hours. This is termed the “**post-ictal phase**”. During this time the casualty may be at risk of airway obstruction or respiratory depression, and may not be breathing properly. Continue reassessing the casualty, so if this occurs, go back to the “**AIRWAY**” step of the **DR-CABC** assessment.

When you are looking after someone who is having a seizure you should:

- follow **DR-CABC**
- not try to restrain the casualty during a seizure
- try to protect their head by removing potential hazards or placing something soft under or beside their head
- not allow anyone to put anything in the casualty’s mouth to keep it open
- call for further medical help if there is no responsible adult present
- once the seizure has stopped, if the casualty remains unresponsive, put them in the recovery position while you wait for help to arrive
- continue to observe the casualty and keep them warm and safe

## Seizures associated with a high temperature ("febrile convulsions")



► 44. Selection of thermometers

► 45. Measuring body temperature

A rapid rise in body temperature may cause an infant or young child to have a fit. This is a frightening experience for the parents but is common and, as long as the seizure is brief, will not be associated with any long-term problems.

### What you should do:

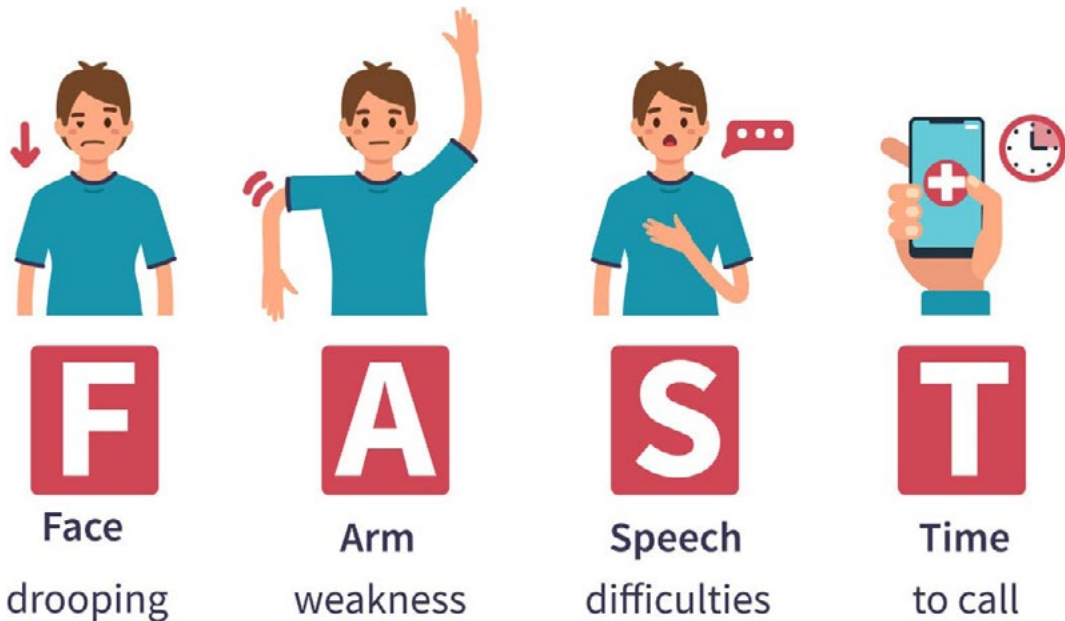
- follow **DR-CABC**
- remove excess clothing and bedding
- seek medical assistance

Once the casualty has recovered, their parents may consider giving them medication to lower their temperature. This is most often achieved with a simple medication such as paracetamol or ibuprofen.

## Stroke

A stroke occurs when the blood supply to a part of someone's brain is suddenly cut off either because a blood vessel has become blocked or because of a bleed into the brain. Early recognition by the first aider and rapid transfer to hospital can make a real difference to the casualty's recovery. The FAST approach can help you to recognise if a stroke has occurred.

### Recognize stroke...act F A S T



► 46. The FAST approach to recognising a stroke

### The typical features of a stroke may include:

- facial weakness (facial droop) on one side
- weakness or altered sensation on one side of the body
- slurred speech or difficulty speaking
- altered or loss of vision
- loss of coordination
- sudden confusion or disorientation



► 47. Example of facial weakness due to a stroke

## What you should do:

- follow **DR-CABC**
- offer reassurance and keep the casualty comfortable
- if the casualty has a reduced level of responsiveness, put them in the recovery position
- call for urgent medical help, explaining the symptoms and “FAST” signs

## Head injury

Another possible cause of a reduced level of responsiveness is following a head injury. Most casualties will recover fully after a head injury. However, afterwards, some may complain of headache, dizziness, visual disturbance, tiredness or feeling sick.

If a casualty has suffered a head injury and becomes unresponsive, this is a sign of a significant and possibly life-threatening injury, such as bleeding in or around the brain. This may be more common or more severe in casualties who take anti-clotting medications, which may also be called “blood-thinners”.

In all instances, follow the **DR-CABC** approach. If the casualty has suffered a minor head injury, was never unresponsive and is still fully alert and has no further symptoms, they may not need any further care other than you completing the **DR-CABC** assessment and ‘head-to-toe’ check.

“**Concussion**” is a term which may be applied following head injury with signs of ongoing confusion or disorientation or unusual behaviour. It is recognised as a potential risk from sports, especially involving contact (e.g. rugby or boxing). It is advised anyone suffering a head injury should be assessed for whether they require more formal evaluation by a healthcare professional.

## Symptoms which may suggest a more serious head injury include:

- unresponsive **at any point** because of the injury
- a penetrating injury (a large open wound to the head)
- any seizure (fit) since the injury
- any ongoing reduction in level of responsiveness, including new confusion
- any vomiting episodes since the injury
- an ongoing headache since the injury
- any weakness or changing sensation of the limbs
- ongoing leak of clear fluid from the nose or ears since the injury
- any loss of memory in relation to the injury
- any casualty who is on any kind of anti-clotting (“blood-thinning”) medication

Recommend a casualty with any ongoing symptoms to get further medical advice, and call for help from emergency services if the casualty has any of the features as listed above.

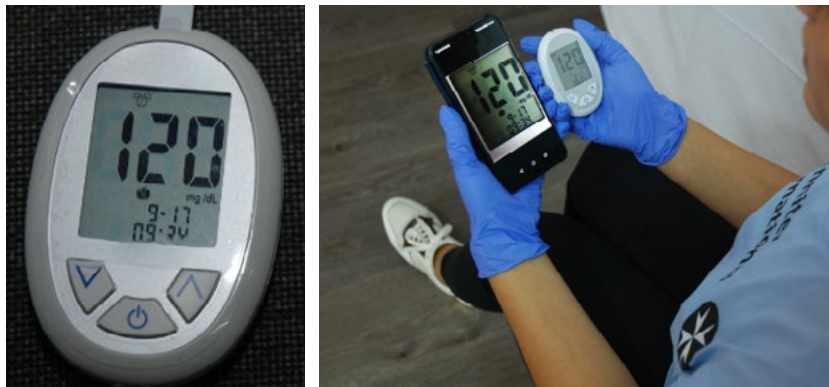
## Diabetic emergencies

Diabetes is a medical condition in which the body does not adequately control its own blood sugar (glucose) level. Diabetes can be diagnosed at any age.

There are two main types of diabetes:

- 'Type 1', which tends to occur in younger casualties and is usually treated with regular insulin injections or with a continuous insulin pump.
- 'Type 2', which is often associated with increasing age or being overweight and may be treated by diet and/or tablets.

Diabetics need to regularly monitor their blood sugar levels and take insulin injections or tablets accordingly. Some diabetics use an implant which allows them to continuously monitor their blood sugar level (see figure 48) for example via their smartphone. Sometimes, a diabetic may get the balance between their blood sugar level and insulin dosing wrong which may result in their blood sugar becoming either too high or too low. Both conditions are potentially serious and need further treatment.



► 48. An example of checking a blood sugar level (and mobile Apps to collect data)

## Low blood sugar ("Hypoglycaemia")

Hypoglycaemia is the term for low blood sugar and may also be referred to as a "hypo". Causes include taking too much insulin, inadequate sugar intake and/or increased exercise.

The features of hypoglycaemia may include:

- rapid onset of symptoms
- confusion, agitation and irritability
- weakness or tiredness
- cold, clammy skin
- aggressive behaviour
- drowsiness which may lead to loss of responsiveness if the condition is untreated

Most diabetics know when they are having a "hypo" and are often able to stop it themselves. This will usually mean taking some sugary food or drink (non-diet), a carbohydrate source such as biscuits.



► 49. Example of a diabetic “Medic-Alert” bracelet

### What to look for:

- some diabetics wear a medical warning bracelet or necklace.
- if you think someone is having a diabetic emergency you will not be able to identify if this is due to a high or low blood sugar unless the casualty has a method of measuring their glucose level.

### What you can do:

- in all cases follow **DR-CABC**
- if they are responsive assist them in taking a sugary snack or drink or their own sugar medication (“glucogel” for example).
  - If they improve quickly, encourage them to take some carbohydrate (such as a sandwich or biscuit) and let them rest.
  - If they do not improve quickly or unable to eat or drink, call for help immediately.
- some casualties may carry an injection (glucagon kit) that they can give themselves, or which a family member can give them when they are having a severe ‘hypo’.
- while waiting, keep checking their level of response.

## High blood sugar (“Hyperglycaemia”)

Hyperglycaemia is the term used when a casualty’s blood sugar is too high. It is usually caused by insufficient insulin, or due to illness such as an infection. The features may include:

- gradual onset of symptoms
- frequent urination and extreme thirst
- confusion, agitation or irritability
- tiredness, lethargy or drowsiness (which may progress if untreated)
- rapid/deep breathing
- headaches/ blurred vision

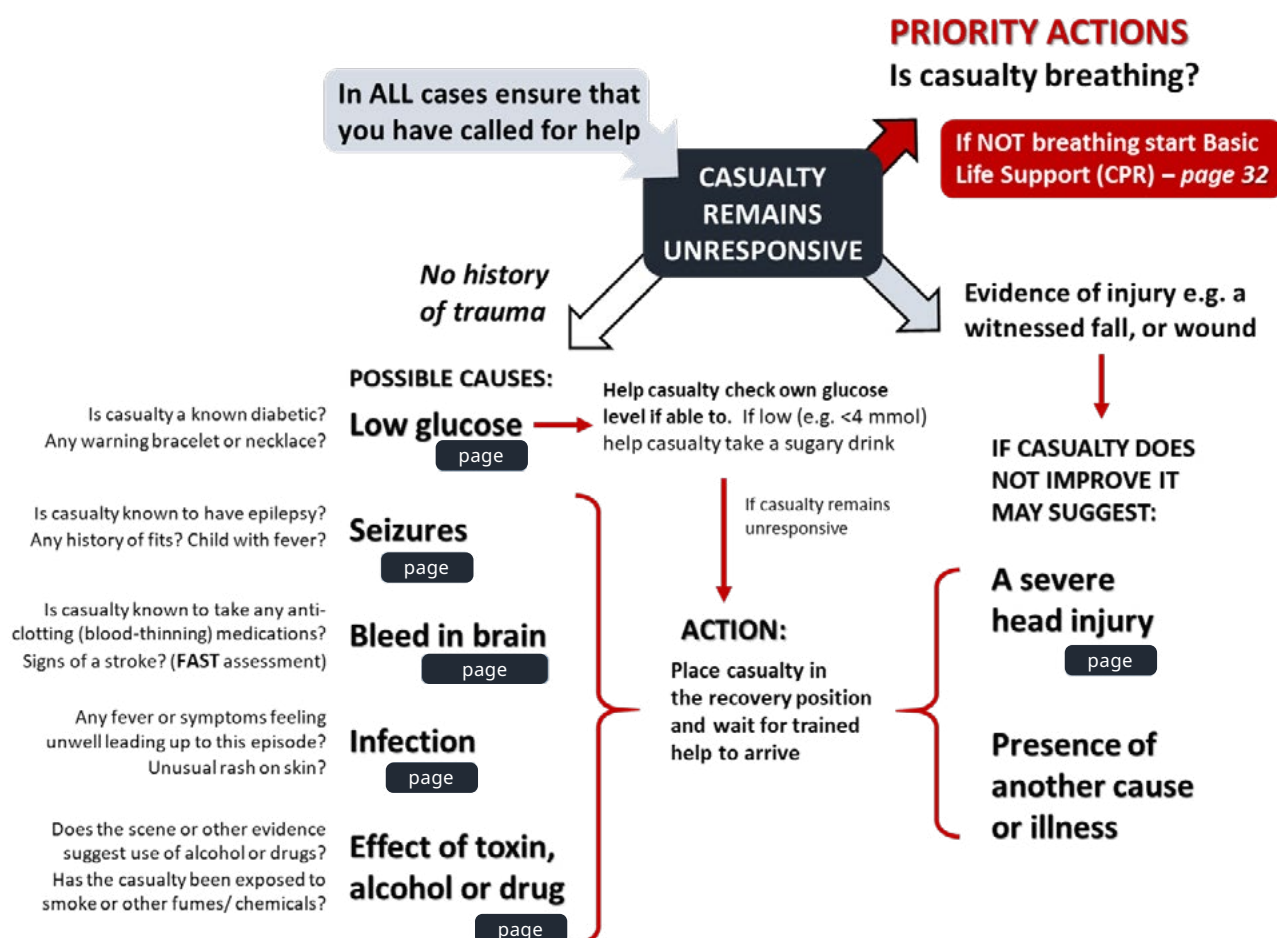
If you think your casualty is suffering one of these episodes you should call for help so that they can be assessed in hospital as quickly as possible.

# I don't know why the casualty is unresponsive

Sometimes you won't know why the casualty is unresponsive. For example, they may have suffered a stroke and because they are unresponsive could not be assessed using the F A S T approach. They may have taken an overdose or sustained an unwitnessed head injury. Identifying the exact cause does not matter - simply follow **DR-CABC** and call for help early.

In all cases, the priorities are to keep the casualty safe and warm, ensure they are not bleeding, their airway is open, position them appropriately and monitor them.

The following system may help to decide between different causes for an unresponsive casualty, and could help to ensure they receive the right care at the right time:



## ► 50. Flowchart for the unresponsive casualty

## CHAPTER 5: “I DON’T FEEL VERY WELL...”

Following **DR-CABC** and, as part of your ‘head-to-toe’ assessment, the aim is to recognise and ensure timely treatment for any other potential life-, limb- or eyesight-threatening problems. There is a wide range of problems a casualty can be suffering from when feeling unwell.

During your assessment you may identify some hints that could indicate why the person is ill, for example the presence of:

- medical warning bracelets
- medicine inhalers or sprays, such as salbutamol (‘blue inhaler’) for asthma
- containers of tablets, or other medications
- insulin pens or other auto-injector devices (such as EpiPens <sup>™</sup>)

You may also be guided towards a possible diagnosis by the situation in which you find the casualty.

In this chapter, we will look at how to initially manage a variety of common medical complaints.

### Headaches

Headaches are not usually associated with a severe underlying condition. They often last between 30 minutes and several hours, and settle spontaneously or with simple pain relief.

The presence of certain ‘**red flag**’ features warrants more urgent medical attention.

#### Red flag signs and symptoms include:

- a headache with a fever and neck stiffness, sensitivity to bright light
- a headache that is present when they wake in morning, or wakes the casualty at night
- a headache with loss or significant change of vision
- sudden onset of “worst headache ever” or described as feeling like being hit on the head
- a new onset or change in headache in those over 50 years of age
- a new onset headache in someone with cancer
- a headache associated with other symptoms such as numbness or weakness in the arms or legs, or new speech disturbance
- a headache triggered or made worse by coughing, sneezing, or bending down



**If casualty has any of the ‘red flags’ features listed above, they should be directed to seek urgent medical attention.**

#### If none of the red flags are present, you should:

- Encourage the casualty to rest, relax and keep well-hydrated
- Advise the casualty to take simple pain relief such as paracetamol or ibuprofen, or any medications they have been prescribed for headaches (such as for migraine)
- Advise the casualty to avoid alcohol and activities which may worsen the headache such as electronic screen use

## Migraine

### ENHANCED KNOWLEDGE

Migraine is a common health condition, affecting around 1 in every 5 women and around 1 in every 15 men. Casualties with migraines usually suffer headaches with a similar pattern of symptoms on each occasion. Such headaches are usually described as a throbbing pain on one side of the head. Casualties often suffer other symptoms such as feeling sick, vomiting and increased sensitivity to light or sound.

Casualties should be encouraged to take their own medication and seek further medical assistance if the symptoms fail to settle, or attacks become very frequent e.g. on more than five days in every month. If the pattern of their headache is different to “normal” for them and they are concerned, they should be advised to seek medical attention straight away.

## Chest pain

There are many reasons why someone may have pain in their chest. Although pain caused by a heart problem is one of the most common serious causes of chest pain, there are many other important and potentially serious causes.

Some casualties may suffer from regular episodes of chest pain, for example a condition called “angina”. If that is the case, they may need assistance to take their own medication.

As a general rule, any casualty who suffers chest pain should be advised to seek further medical assessment. In some cases, you may need to request an ambulance urgently.

### Features which suggest that chest pain might be serious include:

- pain or discomfort often in the centre of the chest and described as a “crushing” pain, heaviness or tightness “like a band” around the chest
- pain that spreads to the neck, jaw, shoulder or arm
- pain with sickness and/or vomiting
- difficulty in breathing or shortness of breath
- feeling faint
- pale, clammy or sweaty skin

Angina is chest pain which is caused by not enough blood being supplied to the muscles of the heart. It is usually brought on by exertion and settles with rest. The pain may spread to the neck or arm and is often described as feeling of heaviness in the middle of the chest. Casualties with angina often have a spray or tablets (“**GTN**”) which they can use to ease the pain. If the pain does not settle with rest and medication, or comes on without exertion, this might be the sign of a more serious condition and urgent medical assessment will be necessary: call for an ambulance.

If the pain persists, and especially if it is associated with the other symptoms listed above, then this may be suggestive of a heart attack (“**myocardial infarction**”) which is when the blood flow to the heart is blocked, causing severe pain and may stop the heart from beating properly. This is a medical emergency which may progress to a cardiac arrest and require CPR and defibrillation. Ideally try to obtain an **AED** if you are trying to help someone in this condition – it may be life-saving.

## If someone is complaining of chest pain you should:

- always follow **DR-CABC**
- sit them still and keep them as comfortable as possible
- ensure that help is on its way, and reassure them
- help them take any medication they normally use for their heart condition (e.g. GTN)
- encourage them to chew 300mg aspirin if available
- be prepared to start CPR and apply an **AED** if the casualty collapses and becomes unresponsive

## Fainting

A 'faint' is caused by a temporary reduction in blood flow to the brain. It may result in a brief episode of being unresponsive. There are lots of reasons for fainting - standing up in a warm environment, dehydration or emotional stress. The main risk is from injury related to the fall.

### When a casualty faints they:

- usually start by feeling hot and light headed
- may complain of 'tunnel vision' or their vision going cloudy/dark
- may slump or fall to the ground

Witnesses usually notice that the casualty has become pale and less responsive. It is important to remember that a casualty may injure themselves on falling. The majority of casualties make a complete recovery without ill effects. If slow to recover, treat them as unresponsive.

### What you can do:

- if they look like they are going to faint help the casualty to the ground as gently as possible and lie them down on their back
- if possible, gently raise the casualty's legs
- sit the casualty up gradually after they have recovered
- check for any injuries from the fall
- if you witnessed the faint, give a clear account to the next medical provider

If the casualty does not become responsive rapidly, you should follow **DR-CABC**.

If the casualty is obviously pregnant and needs to lie down, you should lie them on their left-hand side rather than on their back, with someone supporting them in this position.

### Methods to help prevent a faint:

#### ENHANCED KNOWLEDGE

The ERC guidelines additionally recommend the use of simple physical 'counter-pressure' manoeuvres that may help prevent an impending faint. Consider explaining one of the following techniques to someone feeling unwell with symptoms and a prior history of faints.

- Squatting down, especially with abdominal muscle tensing
- Arm muscle tensing e.g. by pulling gripped hands apart
- Leg pumping/tensing e.g. standing with crossed legs

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## Asthma

Most people who suffer with asthma are aware of their condition and should know how to use their own medication properly. Casualties with asthma may suffer worsening of their breathing called an “asthma attack”. Asthma attacks cause several deaths every day although many of these deaths could be avoided.

### A person suffering from an asthma attack will be:

- short of breath
- wheezing or coughing
- they may tell you that their usual medications are not helping

Without treatment, symptoms can quickly become more serious resulting in them becoming:

- too breathless to speak
- anxious or panicky
- unable to take an effective breath
- less responsive

### What you can do:

- always follow **DR-CABC**
- help the casualty sit upright in a comfortable position and provide reassurance
- advise the casualty to self-administer inhaler medication (most will have a BLUE cap)
- encourage repeated doses of the reliever inhaler until they improve or help arrives
- assist in administration of their medication if necessary, including encouraging the use of a ‘spacer’ if the casualty has one (**see figure 51**)
- make sure help is on its way, continue to monitor and reassure the casualty



► 51. Using an inhaler with a spacer device attached

## ENHANCED KNOWLEDGE

### Chronic Obstructive Pulmonary Disease (“COPD”)

Chronic obstructive pulmonary disease (COPD) is the name for a group of lung conditions that cause difficulty in breathing and include emphysema and chronic bronchitis. It is a common condition that mainly affects middle-aged or older adults especially those who have smoked.

People with COPD suffer from long-term shortness of breath and episodes of severe shortness of breath which are more common in cold weather and often caused by a chest infection. Some may be on oxygen at home. These people may also have inhalers and should be assisted to take theirs if they have one. Some may also have a medication “rescue pack” which they have been given to use in emergencies and they should be encouraged to use this. Casualties with worsening shortness of breath despite their own medication will also need further assessment.

## Infection

Infection can occur when a bacteria or virus enters the body. Most infections will cause minor illness which often recovers by itself. However, severe infections can be life-threatening.

Symptoms depend on the site of infection and severity of reaction by the casualty's immune system. Some people struggle to fight infection because their immune system does not work properly, for example due to recent cancer treatment. These casualties must be seen urgently by a healthcare professional.

There are some general symptoms which can occur from any infection:

- fever (raised temperature)
- 'chills' and shivering
- muscle or joint aches

Features which may suggest more serious infection may include:

- rapid breathing rate
- rapid heart rate
- confusion or agitation
- reduced level of responsiveness

### ENHANCED KNOWLEDGE

#### Sepsis

is a life-threatening reaction to an infection and can happen when your immune system overreacts and starts to damage your body's own tissues and organs.

Casualties with sepsis may develop pale or blotchy skin, or a rash which does not fade to touch or with rolling a glass over it (see figure 52, page 52). They will often be confused or may become unresponsive.

Sepsis may be harder to recognise in babies and young children, people with dementia or those who have difficulty in communicating or accessing healthcare.

In the rest of this section we will describe the treatment of specific infections, but there are some general treatment principles for all casualties with infections.

#### What you can do:

- take the casualty's temperature using a thermometer to identify if they have a fever if available. A temperature above 37.7°C (99.8°F) is considered a fever
- if you are concerned the casualty may have a more severe infection then encourage the casualty to seek urgent medical attention or call for an ambulance yourself
- if the casualty has a fever, encourage them to take their own paracetamol or ibuprofen
- encourage plenty of fluids to stay well-hydrated (aiming to pass clear urine)
- in young children and babies with a fever ensure the parents are aware and seek medical attention

## Chest infection

Signs and symptoms and of a possible chest infection include:

- a cough
- green or brown sputum sometimes mixed with red blood specks
- rapid, or difficulty in, breathing
- chest pain, especially sharp pain which is worse with breathing

In children, the chest may appear to 'suck in' between or below their ribs, or they may use their accessory (neck) muscles when working harder to breathe.

### What you can do:

- Always follow **DR-CABC**
- Help the casualty sit upright in a comfortable position and provide reassurance
- Advise the casualty to self-administer their reliever inhaler medication if they have one
- Make sure help is on its way

## Meningitis

Meningitis is an infection of the protective membranes that surround the brain and spinal cord. It can affect anyone, but is most common in babies, young children, teenagers and young adults especially those living or working closely together. The initial symptoms are often very similar to a simple cold.

The presence of a high temperature (fever) associated with any of the following symptoms should suggest the possibility of meningitis, and urgent medical assistance is vital:

- severe headache
- persistent vomiting
- a 'non-blanching' rash – one that does not fade on pressing, or rolling a glass over the skin (**see figure 52**)
- neck pain/stiffness
- sensitivity to bright light
- increasing confusion, agitation or drowsiness
- seizures

### What you can do:

- always follow **DR-CABC**
- call for medical help as early as possible- this is key to ensuring the best chance of recovery



▶ 52. A non-blanching rash

**Anyone who has been a close contact of a case of meningitis should seek medical advice and may require antibiotics to prevent them developing similar infection.**

## Gastro-intestinal infection

Gastroenteritis is the medical name for an infection of the stomach and bowels and is often due to an infection.

Typical symptoms include:

- vomiting
- diarrhoea (3 or more loose or watery bowel motions in 24 hours)
- abdominal pain or cramps
- high temperature (fever)
- feeling generally unwell

The diagnosis is more likely if other people known to the casualty have also got the same symptoms or there is a history of eating something unusual. If this is not the case, review by a healthcare professional and further tests may be necessary, especially if the symptoms are not settling after a week. "Travellers' diarrhoea" is a common complaint when going away on holiday and usually settles by itself within 3 – 5 days.

### What you can do:

- encourage oral fluids if the casualty is vomiting and/or has diarrhoea in order to achieve rehydration - consider using bought or improvised oral rehydration fluids (**see page 54**)
- encourage good hygiene with regular hand-washing
- remind the casualty not to share cutlery/toilets/towels to avoid spreading the infection
- children who are unable to keep fluids down or have reduced production of urine will  
If there is blood in the vomit or diarrhoea, advise the casualty to seek urgent assessment by a healthcare professional

## Urinary tract infection ("UTI")

Symptoms of a simple urinary tract ("water") infection can include:

- a high temperature (fever)
- lower abdominal pain
- more frequent urination
- painful/ burning/stinging feeling on passing urine
- bloody or discoloured urine
- new confusion, especially in the elderly

Pain in the flank (the sides of the back) together with fever and shivering suggest the possibility of a more complex urinary tract infection, possibly involving the kidney. Casualties with these symptoms should be advised to see a healthcare professional.

## Skin infection

The superficial layer of the skin can often appear red or inflamed due to rubbing or irritation. Infection of the deeper layers of the skin is called '**cellulitis**'.

Examples of this appearance are shown below (see figure 53).

Symptoms of a skin infection can include:

- hot, red, painful or swollen areas of skin
- complaining of pain or swelling in the groin or armpit of the affected limb
- in cases of more serious infections there may be blistering on the surface of the skin

## Treating minor infections – general principles

### What you can do:

- always follow **DR-CABC**
- follow the treatment advice for the specific situation outlined above
- encourage the casualty drink plenty to stay well-hydrated
- encourage the casualty to take medication to help relieve the fever e.g. paracetamol
- if the casualty is not improving or becoming more unwell, advise urgent assessment by a healthcare professional



► 53. A non-blanching rash

## Dehydration

The casualty may have a dry mouth and increased thirst or feel dizzy or light-headed in situations such as gastrointestinal infections or following excessive sweating in hot climates and/or with increased exertion.

### What you can do:

- always follow **DR-CABC**.
- offer carbohydrate-electrolyte drinks, or skimmed milk as an alternative.
- clean drinking water is also suitable, however the World Health Organisation (WHO) suggest an oral rehydration solution (ORS) made up with 6 teaspoons of sugar and ½ teaspoon salt per litre of water. Pre-prepared solutions (such as Dioralyte™, UK) are also available.

## Panic Attacks

Anxiety is a common problem and can lead to a panic attack. Casualties who are having a panic attack may hyperventilate (fast, shallow breathing). Because shortness of breath can also be a sign of serious illness, be careful not to assume that the casualty is having a panic attack. However, they or a relative may confirm that they have had a panic attack before.

If a casualty is hyperventilating they may experience some unpleasant symptoms, such as:

- chest tightness
- very rapid heartbeat
- tingling or pins and needles especially in the lips and hands
- feeling faint
- visual disturbances
- sudden emotional outbursts

As these symptoms can be very frightening in themselves, they often lead to further over-breathing – the vicious cycle of hyperventilation. The aim is therefore to try and restore normal breathing.

### What you can do:

- speak calmly to the casualty, reassure them the symptoms are normal reactions
- find a quiet place and encourage them to sit down, release the tension in their shoulders
- ask them to think about the word “**calm**”

### Breathing exercises

#### ENHANCED KNOWLEDGE

Coach the casualty to take long slow breaths:

“ breathe out...  
breathe in SLOWLY to the count of one elephant, two elephants, three elephants, four elephants...  
hold your breath for the same count of four again...  
breathe out slowly again to the same count ” **...and repeat**

There are many useful helplines and websites or Apps that can provide self-help and advice for people with stress, anxiety or panic attacks.

## Mental health issues

Some casualties will not have a physical illness, but will be suffering from a mental health problem. Like physical health problems, there are a variety of mental health issues that have a wide range of symptoms and signs.

## An approach to helping someone appearing to suffer with a mental health problem

A first aider can offer support and advice by directing the casualty to appropriate sources of help. The majority of people with mental health issues will not pose a risk to the first aider. However, if they are displaying aggressive behaviour, the first aider must first ensure their own safety before offering help.

The features of a person with a mental health problem that may require more urgent care includes:

- very low mood/ depression
- anxiety or panic
- confusion or agitation
- strange behaviour, especially that which is out of character
- suicidal thoughts, or actions

**There are many helplines, advice websites and other self-help resources available and it may be useful to signpost these to casualties.**



- 54. The diverse range of mental health issues

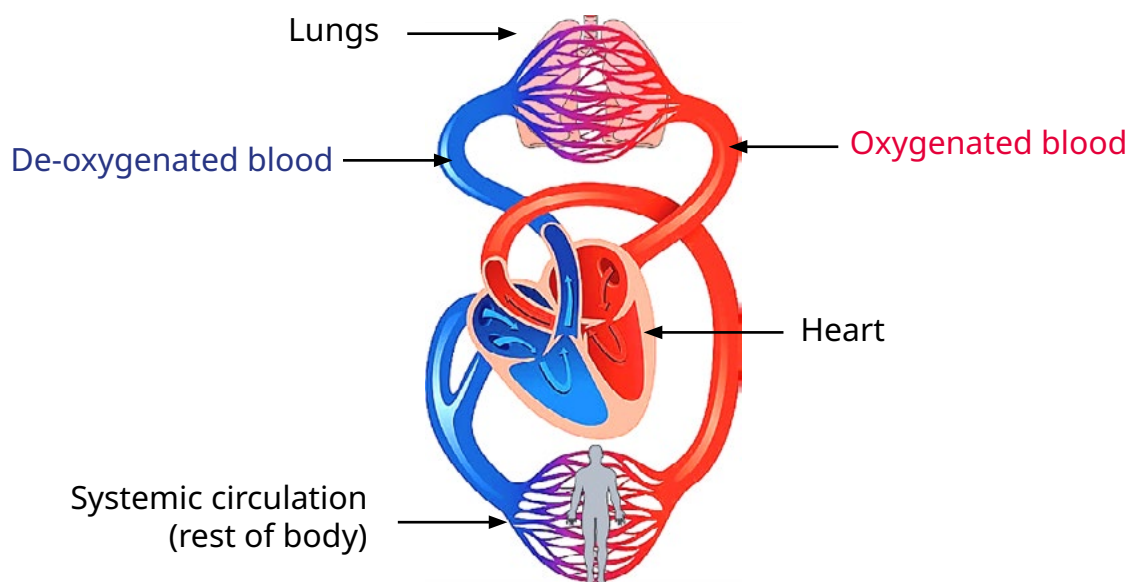
# CHAPTER 6: WOUNDS AND BLEEDING

## Circulation

In order to understand the consequences of wounding and bleeding, it is useful to have a basic knowledge of what makes up the human circulation system. This describes how blood is moved through the vessels of the body, due to the pumping action of the heart. The circulation serves to take oxygen and nutrients to all parts of the body, and remove waste products.

## Heart and Lungs

The heart is a strong muscular organ, around the size of a clenched fist, which pumps blood around the body through the network of blood vessels that make up the circulatory system. It usually takes just one minute for the whole blood volume to be pumped around the body at rest. The heart is divided into four chambers which pump in a coordinated way, causing the blood to flow through a series of valves into the lungs and around the body.



► 55. Simplified figure of the heart and circulation

## Blood

## ENHANCED KNOWLEDGE

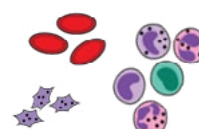
Blood is made up of millions of red cells, white cells and platelets floating in a liquid called plasma. Plasma contains most water with various proteins, salts, enzymes, hormones and nutrient and waste molecules. The haemoglobin in the red cells carries oxygen and gives blood its distinct red colour. White blood cells are larger and help the body fight infection. Platelets are much smaller and are involved in the blood clotting process. An average adult will have about six litres (about 10 pints) of blood in their circulation.

PLASMA

55%

45%

BLOOD CELLS



► 56. Constituents of blood

## Breathing

Everybody needs oxygen to live. As air is breathed in ('**inspiration**') the oxygen is absorbed into blood in the lungs, and 'used' air is breathed out ('**expiration**') carrying the waste products away from the blood in the form of carbon dioxide. In an adult, normal breathing at rest takes place at a rate of around 12 to 16 times a minute. In younger children, it is typically faster - at least 20 times a minute. The brain controls the rate of breathing automatically based upon factors such as the level of oxygen in the blood, due to exercise or from illness. The level of oxygen in the blood can fall due to inadequate breathing, or an obstruction in the airway. If not enough oxygen reaches the brain, or other organs, there is a danger of death.



► 57. Examples of causes of insufficient oxygen in the blood

## Pulse

Each heartbeat represents the pumping movement of blood from the heart. This generates a surge of blood through the circulation system which can be felt in certain places on the body as a pulse. The pulse is most easily felt where an artery is close to the surface of the skin. The main locations are at the wrist ("radial"), the groin ("femoral") or the side of the neck ("carotid"). In very small children and babies, the usual location to feel a pulse is the inside of the upper arm ("brachial").

The usual pulse rate in adults is between 60-80 per minute when at rest. It is typically faster in children, and may be slower in very fit individuals or those on certain types of medications. The pulse rate can change with stress, exercise, illness and injury (for example from blood loss).

Being able to feel for and measure the pulse is not a standard requirement for basic first aid although, if you can, it will allow you to pass this information onto the emergency services.

## Arteries

Arteries are the blood vessels carrying oxygenated blood from the heart to the body tissues and organs. The walls of these vessels are strong and muscular, and the blood moving through them is moving fast and at higher pressure. Where these are nearer the surface of the skin is where you can feel a pulse.



► 58. Brachial pulse in a child



► 59. Carotid pulse in an adult

Arteries divide into smaller vessels, the smallest of which are called capillaries.

## Capillaries

These are the smallest blood vessels entering tissues to supply cells where they give up oxygen and nutrition and collect waste products. Capillaries then join up to become veins as they leave tissues and organs.

## Veins

Veins return blood from the tissues and organs to the heart. They have thinner walls and carry blood slower and at lower pressure. Many veins also contain valves which ensure blood only flows towards the heart.

The combined length of all an adults blood vessels combined would total over 60,000 miles in length – that is twice the distance around the world at the equator!

## External bleeding

Bleeding can range in severity from minor cuts, scratches and grazes to severe bleeding which can be life-threatening. In situations like these, where possible, put on disposable gloves to protect yourself from infection or use improvised coverings to prevent contact with blood. In all cases follow **DR-CABC**. This chapter will only deal with severe bleeding which might result in serious harm. Bleeding from minor wounds are covered in **CHAPTER 10**.

## Failure of circulation

Severe bleeding can lead to failure of the circulation where not enough blood is present to flow around, or the pumping of the heart is not working properly. In either case the casualty may have the following signs or symptoms:

- pale skin, which may be cold and clammy
- a fast and/or weak pulse
- fast, shallow or panting breathing
- nausea and possible vomiting
- restlessness or aggressive behaviour
- the casualty may become unresponsive

### Shock

#### ENHANCED KNOWLEDGE

Shock is a potentially life-threatening condition which occurs when the body cannot supply enough blood to transport oxygen to vital organs such as the brain or heart.

Common causes of shock include:

- Severe bleeding (usually due to an injury)
- Severe infection – which is termed “sepsis” (**see page 51**)
- Severe allergic reactions
- Heart failure for example due to a heart attack
- Severe injury to the spine

Checking for a pulse can be unreliable in a severely injured or unwell casualty and is not recommended as a routine part of first aid. A normally responsive, talking casualty suggests that an adequate circulation is present.

We concentrate on the care of a casualty with severe external bleeding because this is the casualty for whom you can do the most with simple first aid measures. The casualty suffering circulation problems from other causes should be kept in a comfortable position, given appropriate reassurance and observed until the arrival of expert medical help.

Sometimes, for example following severe trauma, a casualty may be suffering from internal bleeding. This is unlikely to be visible from the outside but be visible with features such as:

- signs of bruising or swelling over the chest, pain with breathing
- signs of bruising or swelling, or increasing distension of the abdomen
- a painful or an obviously misshapen pelvis
- pain, deformity or severe swelling to the thighs

First aid measures will not be able to provide much to assist a casualty with internal bleeding, other than offering comfortable positioning, support and reassurance, and ensuring swift medical attention.

## Types of bleeding

If external bleeding is seen it may be useful to distinguish between the different types of bleeding:

- **Arterial** is typically bright red and often spurts from the wound with each pulse. It will be more difficult to control without significant pressure or use of a tourniquet.
- **Venous** is usually darker red as it is carrying less oxygen. Bleeding from a vein can still be severe, but occurs at a slower steadier rate. It is more likely to be controlled by pressure and even simply elevating the affected part may help stop the bleeding.
- **Capillary**. Soft tissues often ooze gradually from the small capillaries. These should be easily controlled by gentle direct pressure and a simple dressing.

## Managing the bleeding casualty

### Minor bleeding

If the casualty has a minor cut, scratch or graze, your priority is to prevent infection.

- If the cut is dirty, rinse it carefully under clean running water if possible then pat it dry with a sterile dressing or clean material; do not use river/stream/lake water
- Clean and dry the surrounding skin whilst protecting the wound
- Cover the wound completely with a sterile dressing or plaster

For more information on caring for minor wounds go to **CHAPTER 11** (see pages 95-109).

### Severe bleeding

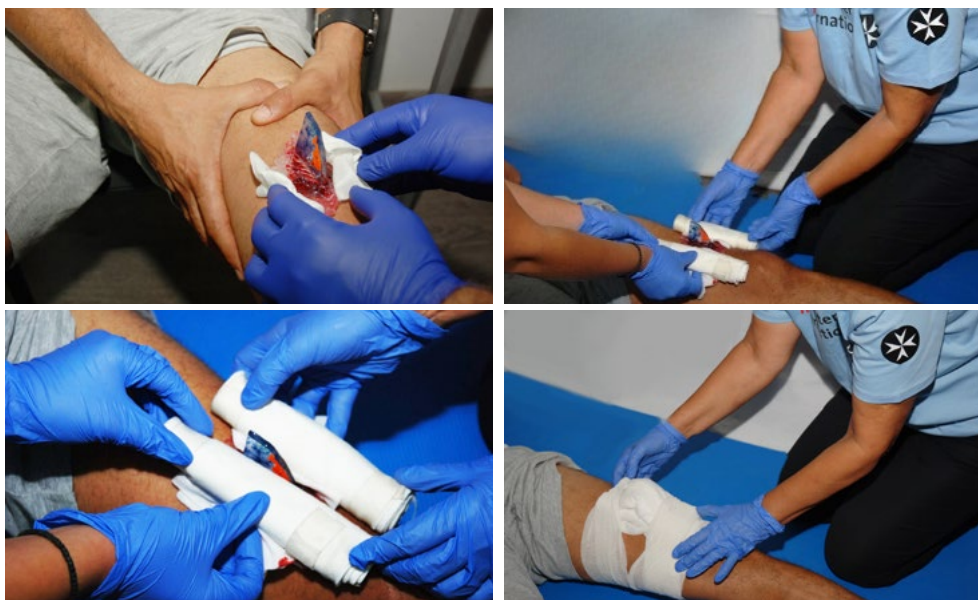
If a casualty is bleeding heavily from a wound (for example a stab wound), the following steps must be taken as some simple interventions may help improve the casualty's condition and make them more comfortable while waiting for further medical assistance.

#### What you can do:

- always follow the **DR-CABC** approach
- expose the wound
- stop the bleeding
- if the casualty has been stabbed in the stomach or chest, place them in the 'W' position (see **figure 60**)
- if an object is embedded in, or protruding from a wound, place padding around it before applying pressure on either side of the object
- do not attempt to remove any embedded object
- if no embedded/exposed object, apply continuous direct pressure over the wound through a specific sterile dressing, or improvised dressing, as close to the bleeding point as possible (see **figure 61, page 62**)



► 60. The "W" position



► 61. Applying direct pressure to a wound with embedded/exposed object

### Other considerations are:

- you may need to apply firm pressure over the wound. A younger person may need to apply their full body weight in order to control very severe bleeding.
- lie the casualty down, elevating the affected body part if possible.
- if bleeding is still not controlled, leave the initial cover/dressing in place and apply another dressing over it and reapply direct pressure.



► 62. Placing a bandage over a wound dressing

### Further measures include:

- if the bleeding is still not controlled apply a haemostatic dressing if one is available (see details below)
- if bleeding from a limb is still not controlled apply a tourniquet around the limb at a position above (nearer to the torso) and as close to the wound as possible
- a second tourniquet may be applied above the first if it has not controlled the bleeding
- advise not to eat any food, but can have sips of water if thirsty
- always offer reassurance and support
- continue to check the casualty's condition, following **DR-CABC**

When bleeding is severe, it can look dramatic and cause distress. If the bleeding isn't controlled quickly, they may lose a lot of blood, develop failure of circulation and become unresponsive. Fortunately, these situations are rare. The important thing to remember is that simple methods can be lifesaving – the priority in all cases is stopping severe bleeding, even before moving on to assess the airway as part of **DR-CABC**. If this is all you can achieve then you have still contributed a great deal to potentially life-saving care and a full recovery later.



▶ 63. Examples of manufactured tourniquets

### ENHANCED KNOWLEDGE

#### Haemostatic dressings

A haemostatic dressing is one which contains additional constituents that actively promote clotting within the wound itself. A range of haemostatic dressings are commercially available and usually carried by paramedics and other pre-hospital care personnel. These should ideally only be used by a person trained in their specific use.



▶ 64. Examples of haemostatic dressings (© CELOX, © SAM, © AxioBio)

## Applying a tourniquet

If there is severe bleeding from a wound or injury to the arm or leg, and the bleeding cannot be controlled by any other means, it may be necessary to apply a tourniquet.

Any tourniquet that has been applied properly will be painful. Despite this, it must not be removed. You will need to reassure the casualty that the tourniquet is doing an important job and that professional help is on its way. A manufactured tourniquet device should ideally only be applied by a person trained in its use.



► 65. Applying a manufactured tourniquet

## Applying an improvised tourniquet

Making and applying an improvised tourniquet is not difficult. All you need are a longish piece of wood or metal (a large spoon or a ruler) and a length of fabric (for example a scarf or tie) which must not be too stretchy. The material also needs to be strong enough that it doesn't snap when tightened.



► 66. Suitable items for making an improvised tourniquet



► 67. Making and applying an improvised tourniquet

## Other tourniquet devices

As well as several different types of the 'Combat Application Tourniquet' (CAT), other novel solutions have been designed to act as an effective tourniquet - such as the "Tourni-Key", a lightweight plastic device that is used with a triangular bandage, or similar material.



- ▶ 68. The "Tourni-Key" developed by citizenAID®

### ENHANCED KNOWLEDGE

#### Limb amputation

Fortunately, most accidental amputations are of fingers or toes, or parts of, and will not be associated with life-threatening bleeding. If the amputated part can be safely retrieved, it should always be sent to hospital with the casualty. Protect the amputated part by wrapping it and then placing it in a plastic bag, which is then immersed in cold water if available. Under no circumstances should the amputated part be placed directly in the water, come into direct contact with ice or be frozen.

Very occasionally severe bleeding is the result of an amputation of part of an arm or leg. In these cases, bleeding should still be controlled using the step-wise approach as described above.

#### Crush Injury

Crush injuries occur when a heavy weight such as building structure falls onto someone and cannot be removed quickly. It is a potential problem in any trauma casualty but can affect as many as 30% of earthquake victims.

Casualties who have been trapped for less than 15 minutes can be released immediately if it is possible to do so safely. Any bleeding should be controlled and the casualty evacuated to hospital as an emergency. In the meantime, follow **DR-CABC**.

When a casualty has been trapped for longer, you should call for urgent assistance and the casualty should only be removed under close medical supervision. You should provide reassurance and support until help arrives.

## Penetrating injury - Stabbings and Shootings

You may be involved in an incident where there has been a shooting or a stabbing, or to come across the scene of such an event. In all cases the priority is **YOUR SAFETY**.

In the event of an incident involving a gun or knife attacker or from a suspect explosive device/ exploded bomb, follow the **RUN - HIDE - TELL** guidance.

**RUN:** to a place of safety. If there is nowhere to go then...

**HIDE:** rather than confront. Turn your phone to silent and barricade yourself in if you can...

**TELL:** when it is safe to do so, inform the police and emergency services by calling **112 / 999**



► 69. - Run Hide Tell

If you believe you are in a situation in which you can safely provide assistance to the casualty, follow **DR-CABC**. In case of external bleeding follow the advice on **page 61**.

- any object sticking out of a wound should be left in place, or supported to stop it moving.
- abdominal wounds may result in protrusion of bowel. In this case **do not** apply direct pressure or attempt to push anything back into the wound. Cover such injuries with a damp clean cloth or dressing, or with cling film – the aim is stop exposed tissue drying.
- stab and shooting wounds to the chest may be left uncovered if they are not bleeding. If they are bleeding, apply a sterile dressing.
- responsive casualties with penetrating abdominal wounds may be more comfortably placed in the 'W' position (**see figure 60, page 61**) until the arrival of an ambulance.

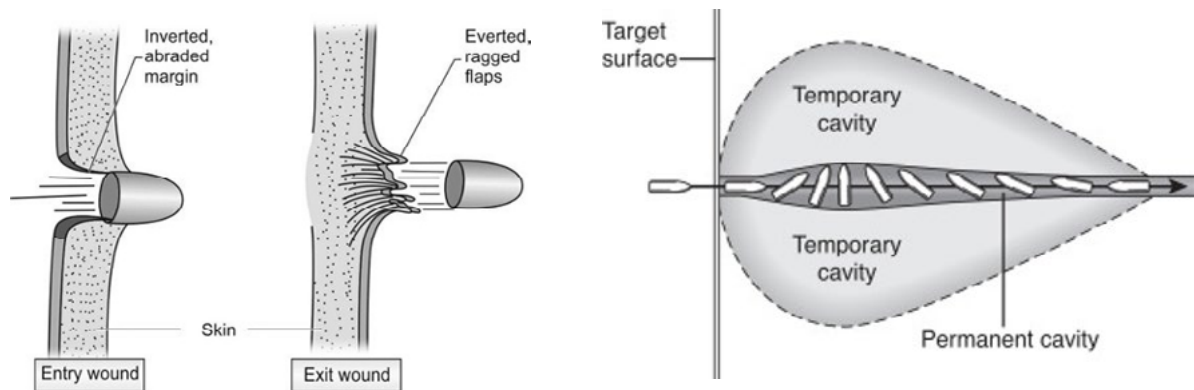
### ENHANCED KNOWLEDGE

#### Stabbing wounds

Knife crime is a serious issue, and one that has increased in some places. Wounds occurring as a result of a stabbing attack will be a combination of incision and puncture wounds, be of varying depth and often in multiple locations. Although upsetting and dramatic-looking the important factor is staying calm, keep yourself safe (from any possible attacker). Control bleeding by putting direct pressure on the wound(s) until further medical help arrives. For further information on stopping bleeding **see page 65**.

## Gunshot wounds

A gunshot wound is caused when a bullet or other projectile goes into or through the body. Even though they may look small, projectiles travel at high speed therefore carry a lot of energy and can cause serious internal damage. They may pass straight through the body or could be deflected by bone making it hard to predict their path. In some cases there are two wounds; an entry and an exit wound. The exit wound is usually larger and more ragged.



► 70. Gunshot wounds

► 71. Cavitation – 'ripple' of pressure wave

## CHAPTER 7: BURNS AND SCALDS

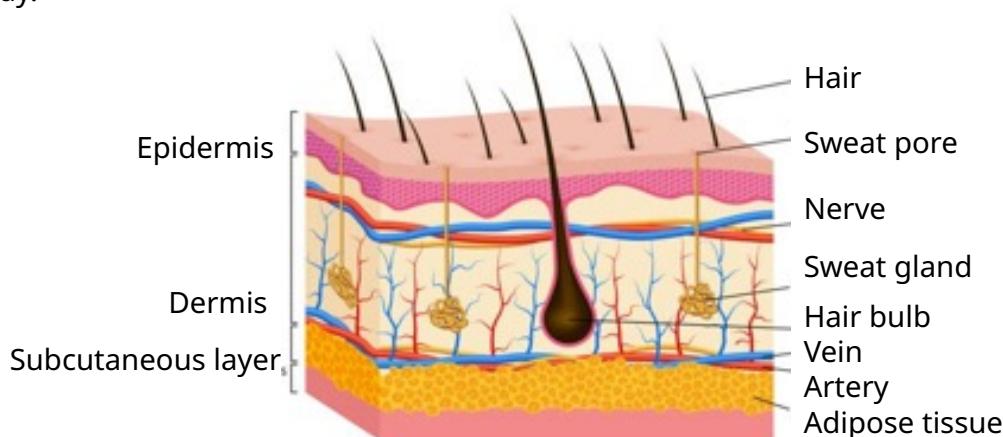
Burns can cause severe damage to skin and, depending on how deep the burn, to body tissues below such as nerves and blood vessels. As the burn damages the body's defensive barrier it can also allow entry of organisms from outside that can lead to infection. If the burn affects the mouth or airways it can also cause swelling and fluid build-up that may lead to difficulty in breathing and being unable to absorb oxygen in the lungs.

Burns are usually caused by a dry heat such as a hot surface or fire but they can also result from repeated friction, extreme cold, acids or other chemicals and electricity. Scalds are caused by a wet heat source, such as hot water or steam. The principles of treatment are the same for both.

### The skin

#### ENHANCED KNOWLEDGE

The outer layer is called the **epidermis** which is waterproof and acts as a protective barrier. The inner layer is called the **dermis** which contains the blood vessels, nerves, muscles, sweat glands and hair follicles. Below the dermis is a layer of fatty tissue, called **subcutaneous**, which provides insulation. It varies in thickness on different parts of the body.



► 72. The different layers of the skin

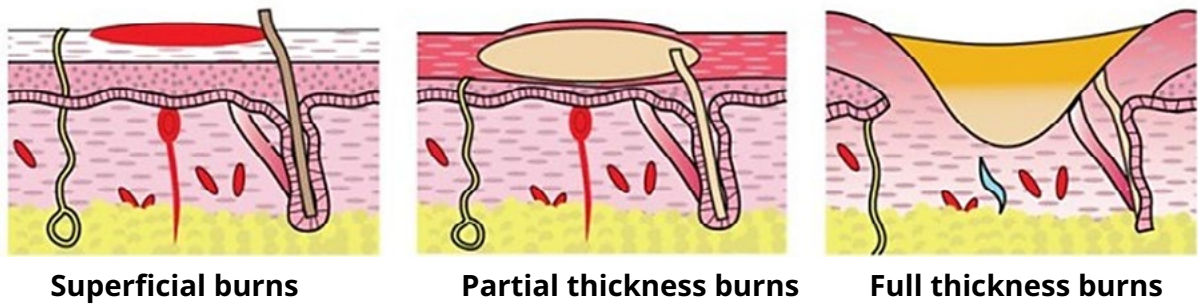
### Types of burns

The three things which are important in deciding about the severity of a burn are the depth, size and location.

#### Depth

- **superficial burns** – involve only the very outer layer of the epidermis and will appear red and swollen. They are usually very painful. Sun burn is an example of a superficial burn.
- **partial thickness burns** – these involve the full epidermis and part of the dermis layer and often form fluid-filled blisters.
- **full thickness burns** – involve the whole dermis and epidermis and may appear pale or even blackened (from charring, called an “**eschar**”).

In adults, the redness of superficial burns, although painful, does not require medical assessment. Superficial burns will gradually heal and usually without any scarring although will still benefit from cooling measures, pain relief and re-hydration.



► 73. Illustrations representing burn depth

## Size

It is useful to estimate the total area of the body that is burnt as the treatment required will depend on this, and the information can be shared with emergency services.

A rough guide to the area of skin that is involved in a burn can be made by remembering that the adult casualty's hand with their fingers together is approximately equal to 1% of their body surface area. There are a number of different methods for estimating the size of a burn which are available, but these require specific training to use accurately.



► 74. Palmar Area to estimate 1% body surface area

## Location

There are several locations where burns may lead to more serious complications. These include airway, face, head and neck, hands, genitals or over joints. Burns in these areas may have more significant cosmetic or life/ function-changing effects.

Casualties with burns to the face may rapidly develop increasing breathing difficulty, particularly when the exposure occurred in an enclosed space or flash burns resulting in inhalation of hot gases or smoke.

## Extent

Together with location it is also important to assess the extent of the burn – for example if the burn is to an extremity, e.g. limb or digit, is it on one surface only, or all the way around ('circumferential')?

Circumferential burns can cause serious complications due to swelling cutting off circulation to the part beyond the burn. Circumferential, or large area, full thickness burns can also restrict movement of vital areas such as the chest wall, preventing effective breathing.

## Treatment of burns or scalds

### Airway burns

Casualties with airway burns may already be experiencing breathing difficulty, have signs of swelling in or around the mouth, or may be coughing up sooty sputum. Urgent medical care is required. The casualty may be best positioned sitting up rather than lying down to help reduce swelling.

### Key principles of burn management:

- always follow **DR-CABC**
- if safe to do so, immediately get the person away from the heat source
- cool the burn ideally with cool (not iced) running water for at least **20 minutes**



#### ► 75. Cooling and covering a burn

- you can remove clothing or jewellery that is near the burnt area but do not try to remove anything that is stuck to the skin
- keep the casualty warm - cooling large burns in children may risk causing hypothermia and appropriate care should be taken

## Cool the burn not the casualty!

- do not use any lotions, ointment or creams on the burnt area
- after cooling, ideally cover the burn area using strips of cling film laid along the limb (**do not** wrap anything around a limb)
- if cling film is not available, cover with a damp dressing or other suitable material
- raise the affected area, such as a hand, if possible, to reduce swelling
- you can advise the casualty to take painkillers such as paracetamol and/or ibuprofen
- the casualty may take small sips of water if they are thirsty
- for large or more serious burns ensure that medical assistance is sought. If you are unsure, it is always safer to make sure the casualty is seen by a health care professional
- (features which might suggest a more serious burn are shown in the box below)
- if there are signs of breathing difficulty – follow the advice shown on **page 27**

For chemical burns, particularly accidental exposure to corrosive substances or a deliberate attack with a chemical (such as acid) follow the advice shown on **page 73**.

For minor burns it may be possible to treat 'at home' and not require further professional medical attention. After appropriate first aid, ask the casualty to continue to keep the burn clean and take pain killers such as paracetamol and/or ibuprofen.

**Advise to seek urgent medical advice if:**

- the wound becomes more painful or smelly
- they develop a fever
- any dressings become soaked with fluid leaking from the wound
- the wound hasn't started to heal within one week

**Burns which are likely to require urgent medical assessment:**

- all chemical and electrical burns
- large or deep burns – any burn bigger than the area of the injured person's hand
- burns that cause white or charred skin of any size
- burns on the face, neck, hands, feet, over joints or genitals
- contaminated burns that may require further treatment
- burns that go around an arm, leg or body (circumferential)
- suspicion or symptoms of airway burns, or has breathed in smoke or fumes
- burns to children under 10 years old

If the casualty's clothes are on fire attempt to extinguish it by instructing the casualty to use the '**STOP - DROP - ROLL**' technique (see figure 76):



► 76. The STOP - DROP - ROLL actions.

## Sunburn

Prolonged exposure to sunlight without adequate protection from clothing or sun cream can lead to sunburn. The affected skin will appear red and may even be blistered. It is typically very painful and sensitive to touch. In this case the aim of treatment will be to cool the burn area and help relieve pain. Mild sunburn may benefit from application of moisturising 'after-sun' lotions.

The majority of cases do not require medical attention. Casualties with more severe sunburn, especially involving blistering, should be advised to seek further advice and babies with sunburn will always require medical assessment. The best approach to sunburn is prevention!

## Chemical Burns

Chemical burns are rare, but serious. Sometimes chemical burns can result from a deliberate attack.

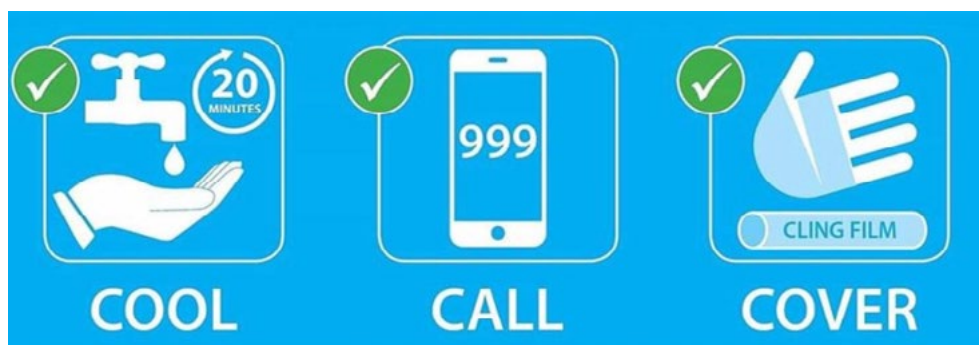
As a first aider it is vital that you do not become exposed to the chemical and suffer injuries yourself. It is advisable to wear protective gloves when dealing with any unknown substance.

### What you can do:

- the first priority is to thoroughly rinse the affected area for **at least 20 minutes**
- if water is not available, any soft drink or other neutral fluid may be used
- take care that the run-off of rinsing liquid does not contaminate more skin (**see figure 78**)
- if you need to remove clothing, ideally it should be cut off rather than pulled over the head
- do not try to remove any clothing that is stuck onto the skin

**ALL chemical burns will require further medical assessment.**

Follow the '**COOL - CALL - COVER**' approach (**see figure 77**).



► 77. Cool - Call - Cover



► 78. Cooling and covering a burn

# Electrical incidents

Most electrical incidents are not life-threatening.

When a serious incident does occur, the electric current can lead to the casualty stopping breathing and their heart to stop pumping properly. The electric current can also cause burns where it enters and where it leaves the body.

## Non-domestic electricity

Contact with high voltage current such as from pylon cables, generating or step-up/down stations or railway supply lines is usually fatal. Survivors will have severe burns.

### What you need to do:

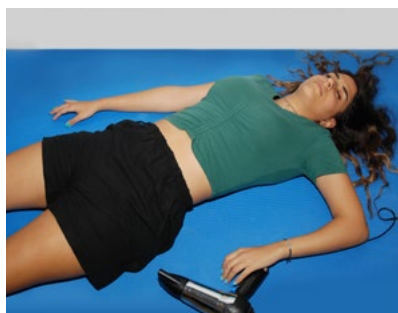
- always follow **DR-CABC**
- your own safety is paramount
- remain at least 20 metres from the source because electricity can arc (pass through the air) up to this distance
- arrange for the power source to be switched off if possible
- only approach the casualty when it has been confirmed it is safe to do so
- continue to follow **DR-CABC**

## Domestic electricity

The electricity supply at home or school can still cause significant injury. Most electrical accidents are caused by faulty appliances, frayed flex or bad wiring, while children are at risk due to inserting objects into power sockets. The presence of water around electrical appliances greatly increases the risk of injury from electrocution.

### What you need to do:

- always follow **DR-CABC**
- always assess the situation for further danger to yourself or others
- if the casualty is still in contact with the electrical source **do not** touch them. If you are able to do so, turn off the source of electricity – either at the socket or main fuse box
- if you are unable to switch off the electrical supply quickly, attempt to remove the casualty from the electrical source. To do so, you may need to stand on a suitable insulating material and use a wooden pole or broom to try and hook them away
- once you are sure that the danger has been removed continue to assess the casualty following **DR-CABC**



▶ 79. Removing the casualty from the electrical source

## Lightning strike

If the victim has been struck by lightning, follow **DR-CABC**.

**Follow these four simple steps:**

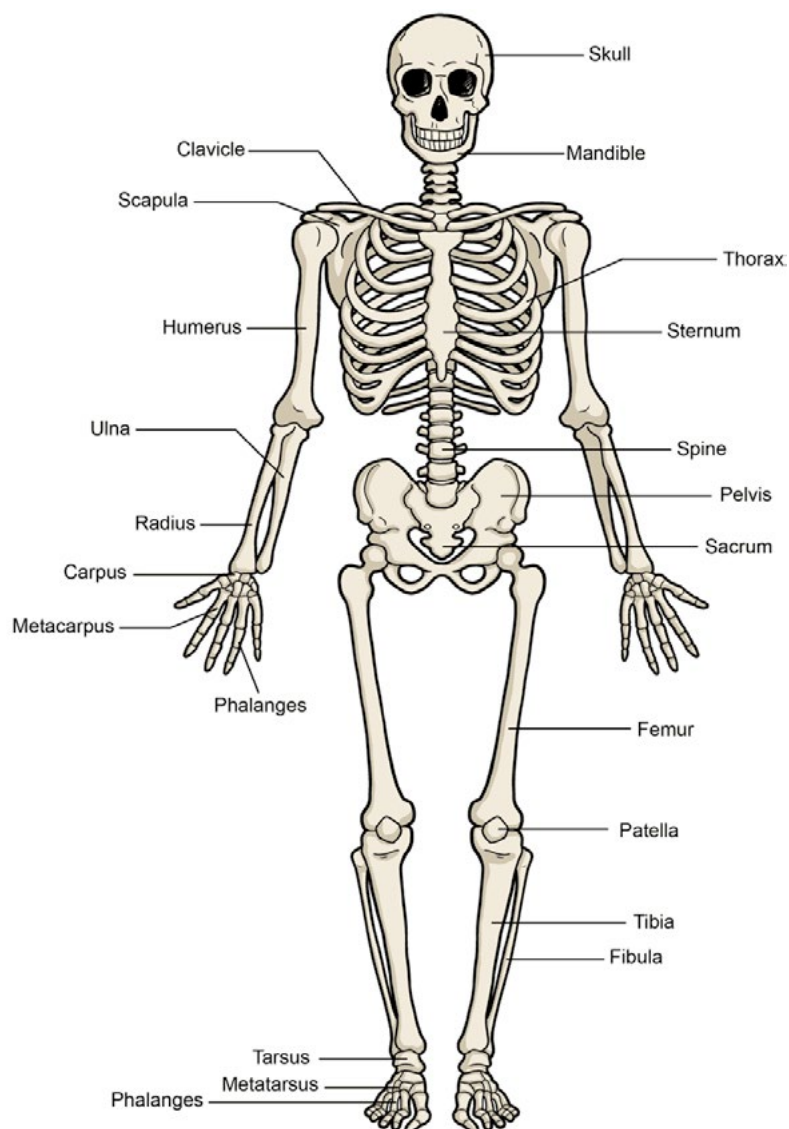
- 1. Call for help**, giving your location – it is safe to use a mobile phone during a storm.
- 2. Assess the situation:** safety is your priority. There will be an ongoing risk of lightning strike to victim and rescuer. If necessary, move to a safer location – **do not** attempt to shelter under an isolated tree or remain in an open field. Injuries such as broken bones or serious bleeding wounds are unlikely, unless the person fell from height as a result of the lightning exposure.
- 3. Respond:** lightning will often cause cardiac arrest. Check for breathing or signs of life. If the casualty is responding then treat other injuries that are common, such as burns. Protect the casualty from hypothermia as they will often be in an exposed, outdoor location in the circumstances.
- 4. Resuscitate:** if the person is not breathing immediately begin CPR with initial rescue breaths and chest compressions. Try to obtain an **AED**. Continue until help arrives, or the casualty starts to show any signs of life.

# CHAPTER 8: BONES, JOINTS AND MUSCLES

## Anatomy

### Bones

The skeleton supports the weight of our body and holds our shape as well as providing the framework that our muscles are attached to, allowing us to move. It also protects vital organs, for example the rib cage around the heart and lungs or skull surrounding the brain. It is made up of over 200 separate bones and makes up around 14% of the total body weight of an adult.



► 80. The human skeleton showing the major bones

### Joints

Where bones meet, they will form a joint, some of which allow movement such as bending or twisting.

### Examples of different types of joint include:

**Hinge joints** – move in one direction much like a door hinge; examples are the knee and elbow.

**Ball and socket joints** – allow forward, backward, sideways and rotating movements; examples being the shoulder and hip.

**Fibrous joints** – which permit very little movement, such as those in the skull.

**Cartilaginous joints** – which permit slight movement, such as in the spine or ribs

**Plane (or gliding) joints** – such as found in the wrist or clavicle (collar bone).

**Pivot** – such as found in the upper spine.



**HINGE (elbow)**



**BALL AND SOCKET (hip)**



**PIVOT (spine)**

► 81. Examples of different types of joint

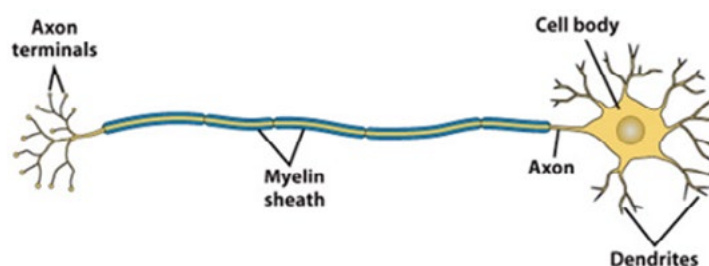
### Muscles

Muscles are attached to the bones of the skeleton by tendons. They move body parts through contracting or relaxing. Muscles often work together to act at joints to coordinate movement.

There are two types of muscles: voluntary muscles are those that are controlled by thinking about them such as muscle which moves our arms and legs; and involuntary muscles which work automatically without thinking about them such as heart muscle or those in the gut.

### Nerves

Nerves carry messages between the brain and the body. There are different types of nerves – motor for controlling muscles and sensory which transmit sensations such as touch or pain. Every person's body contains billions of neurones. There are about 100 billion in the brain and 13.5 million in the spinal cord.



► 82. A neurone (cell of the nervous system)

If a nerve is damaged then the messages that are normally transmitted by that nerve may be interrupted. Effects of a nerve injury might include weakness of a muscle, loss of pain sensation or tingling feeling to an area of the body.

# Bone, joint and soft tissue injuries

## Fractures



A fracture is the medical term given to a break or crack in the bone. A fracture is described as “open” when it is associated with a wound connecting to the outside through the skin. Open fractures may cause serious damage to other (‘soft’) tissues and blood vessels. Where there is no wound it is called a “**closed**” fracture.

In the elderly or frail, bones are weaker and may break more easily. As a result, fractures may occur with less force than would be needed in younger people. Even falling from standing may be enough to cause serious injury. This issue has been termed “**Silver Trauma**”.

Pain is the most frequent symptom following an injury. Sometimes there is an obvious bend or other deformity, or there may be bruising, swelling and tenderness. The casualty will usually be reluctant to allow the limb to be moved.

### What you can do:

The role of the first aider is to provide simple treatment and reassurance. In general, this will involve supporting/ immobilising the affected limb in the position the casualty finds is the most comfortable.

## Soft tissue injuries



Soft tissue injuries (sprains or strains) can be just as painful as fractures. A strain usually describes an injury to muscles and tendons. A sprain usually involves the ligaments between bones and around a joint. They are most commonly seen at the ankle and knee joints. A more extreme form could involve a tear or ‘rupture’ of a ligament or tendon, usually resulting in loss of movement function and severe pain and swelling.

### What you can do:

The general principles for initial treatment will be to elevate, rest and ice the affected joint. Encourage the casualty to take appropriate pain relief.

## Dislocation



Dislocation occurs when one of the bones moves out of its normal position in a joint resulting in deformity, pain and an inability to move that joint normally. No attempt should be made by the first aider to return the joint to its normal position.

### What you can do:

Support the limb in the most comfortable position possible for the casualty, and which minimises movement of the affected joint. Professional healthcare assessment and treatment will usually be required, so ensure the casualty has access to further medical care.

**The general aims of treatment for a fracture, sprain or joint injury are to:**

- support and protect the injured body part e.g. apply a splint
- **DO NOT** attempt to straighten a suspected fractured bone
- cover the wound if there is one
- reduce swelling and pain by applying something cool such as frozen peas wrapped in a towel or a cold pack

The generic first aid treatment for soft tissue or joint injuries can be summarised as PRICE:

**P**ain relief – encourage the casualty to take a simple painkiller

**R**est the injured part

**I**ce or a cooling pack to the injured part

**C**omfortable support

**E**levate the injured part

► 83. The PRICE approach

Ice should not be applied directly to the skin to avoid cold injury. Place crushed ice in a plastic bag, or use an ice pack, and wrap this in a thin towel before applying to the injured area.

Wounds should be treated as described in **CHAPTER 6**.

If the casualty becomes unresponsive, follow **DR-CABC**.

## Shoulder and arm injuries

The casualty with a shoulder or upper limb injury will usually find that the most comfortable position is holding the arm against the front of the body with the elbow bent. The arm should therefore be supported in this position using a sling. A triangular bandage is best used to create a sling although slings can also be improvised.

## Hand and Finger injuries

A check should be made for deformity by comparison with the other hand. Bracelets and rings should be removed before more swelling occurs where this can be achieved without undue distress and either a 'broad arm', or ideally a 'high arm' sling (see figure 86, page 84) applied for comfort. Wounds should be cleaned, covered with an improvised dressing and if necessary pressure applied or the limb elevated to control bleeding.

## Placement of slings

The casualty should hold their injured arm across their chest, supported by the other arm. The base of the triangular bandage should be placed parallel with the side of the casualty.

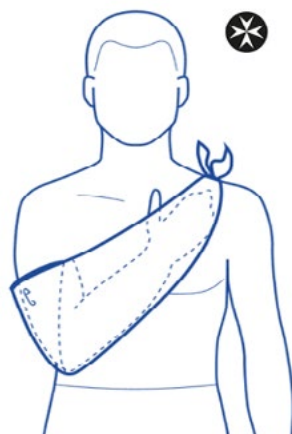


► 84. Initial positioning of a triangular bandage for an upper limb sling

Next, the upper “end” of the sling is pulled behind the casualty’s neck towards the other side and tied at one side (not at the back) of the casualty’s neck to the other “end” which has been lifted upwards. Finally, twist and tuck the point of the bandage to hold it in place.



► 85. Tying the sling in place



► 86. A completed ‘broad arm’ sling with illustration of alternative ‘high arm’ sling



► 87. Improvised sling using a belt



► 88. Corner of shirt pinned to collar



► 89. Hand tucked into shirt between buttons



► 90. Sleeve button attached front button hole

## Leg injuries

The most common leg injuries are of the ankle and knee and often result from sport. These are usually sprains or strains but fractures do occur. Keep the leg in a comfortable position. This can be done by resting it on cushions or some other form of soft comfortable support.

Hip fractures are the most common leg fractures in the elderly, sometimes as a result of a fall. The injured leg may appear shorter and the foot turned out (see figure 91). The injured leg should be supported in a comfortable position.



► 91. Casualty with possible fractured hip bone



► 92. Applying a 'figure-of-eight' bandage to secure the feet first



► 93. Placing soft padding between ankles and knees before applying a bandage at knees.

## Sprains

Lower limb joints – usually the ankle joint - are the most commonly sprained and the casualty may be unable to walk due to discomfort and swelling – assistance such as crutches may help but need to be measured and applied by an experienced practitioner. Casualties unable to walk or bear weight on the affected limb will require further medical assessment.

Follow the advice for soft tissue and joint injuries shown above and on **page 78 and 79**. Bandages or supports are not routinely recommended in the first aid management of sprains.

## Muscle pain

Muscles aches or stiffness for a few days after significant exercise is normal. It can affect people of all fitness levels, particularly after trying a new activity or pushing themselves a bit harder than usual. The casualty may be encouraged to stretch and relax the affected muscles, and use regular pain relief medications if necessary. This pain will settle with rest and no further action is required.

## Spinal and neck injuries

The spinal cord is a collection of nerves which connect the brain to the limbs and torso. The greatest risk if someone has a neck or back injury is that their spinal cord will be damaged. If this happens, they may become paralysed from the point of injury downwards. The bones of the spine (the vertebrae) protect the spinal cord.

Spinal injuries are most commonly associated with high levels of force but may also occur with relatively minor trauma in the elderly, such as a simple fall from standing. You should be aware of the possibility of a spinal injury especially if someone has:

- fallen from a height (for example a ladder) e.g. more than 2 metres
- fallen in an awkward position (such as while doing gymnastics)
- dived into a shallow pool and hit their head on the bottom
- fallen from a moving vehicle or horse
- been a pedestrian hit by a motor vehicle
- been involved in a high-speed motor vehicle collision, especially if not restrained
- been a cyclist or motorcyclist involved in a vehicle collision
- been hit by, or collided with a heavy object impacting on the head, neck or back
- had a significant blunt injury to the head or face
- a penetrating/ stabbing injury to the spinal area

In practice, the majority of neck and back injuries are relatively mild and result from minor incidents, such as an awkward or sudden movement not involving any of the mechanisms listed above. These injuries usually require no more than reassurance and pain relief.

**What to look for:**

- pain in the neck or back
- tenderness over the spine
- unusual steps or irregularity in the shape of the spine
- loss of strength and/or control of the limbs – the casualty may not be able to move their arms or legs
- loss of sensation or abnormal sensations in the limbs such as burning or tingling
- bladder or bowel problems following the injury
- breathing difficulty following the injury

**What you need to do:**

- Always follow **DR-CABC**

**If the casualty is unresponsive because of a head injury, be aware of the risk of a potential spinal injury and protect the spine appropriately**

**If the casualty is responsive and NOT confused:**

- reassure them
- if the casualty is able to get out of their vehicle, assist them to do so.
- Follow **DR-CABC**, call for help
- ask the casualty to keep their head as still as possible
- the application of a cervical collar by a first aider is NOT recommended

### If the casualty is unresponsive:

- Follow **DR-CABC** taking care to move the head and neck as little as possible – the technique for this is called '**log-rolling**' where the casualty is turned carefully in a coordinated manner by a group of at least four first aid responders.
- check the airway and breathing:
  - if the casualty is **breathing normally**, leave the casualty in the position in which you find them until further help arrives.
  - if the casualty remains unresponsive and is **not breathing normally**, the casualty will need to be rolled onto their back as carefully as possible to avoid causing further injury. The priority will always be keeping the airway open.
  - If the casualty remains unresponsive and is not breathing, start CPR (**see page 30**).

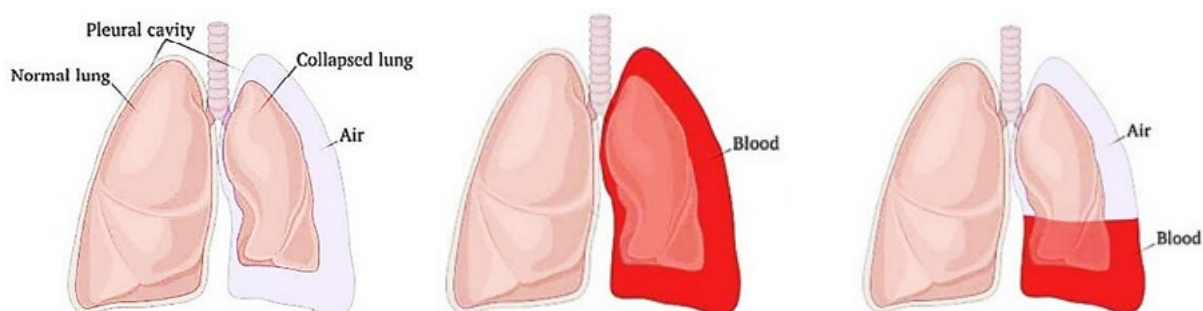
While waiting for help to arrive, keep checking their breathing and level of response. If the casualty is uncooperative or confused, attempts to force the casualty to keep their neck still must be avoided. Allow the casualty to find their own comfortable position and avoid restraining them. If their condition deteriorates, follow **DR-CABC**.

## Chest wall injury

Injuries to the chest can damage the muscles and ribs. The common signs and symptoms of a chest wall injury are swelling and/or bruising, and pain - especially on movement, breathing deeply or coughing.

Although these injuries can be extremely painful, in young people they are usually not dangerous and simple pain relief is all that is required. Those with more severe injury may have difficulty breathing, feel short of or unable to get breath, or be coughing up blood.

Casualties with any breathing difficulty should be directed to urgent medical assistance. Any obvious deformity (abnormal dents or asymmetrical shape) may suggest a more serious injury. More severe symptoms will be present if multiple ribs are fractured, or internal injury with bleeding (a "**haemothorax**"), collapse of the lung (a "**pneumothorax**"), or both – see below:



- 94. Pneumothorax (air)      ► 95. Haemothorax (blood)      ► 96. Haemo-pneumothorax (both)

All casualties complaining of significant chest pain after a fall should be encouraged to seek further medical assessment, especially for suitable pain relief and to help avoid secondary complications. If the casualty deteriorates or becomes unresponsive always follow **DR-CABC**.

Casualties with chest injuries should ideally be managed sitting up if comfortable to do so, as this may help their breathing. If the recovery position is necessary, they should ideally be placed with the injured side downwards.

## Open chest wounds

Some injuries to the chest may result in something called an '**open**' wound. This means there is a hole from the outside into the inside of the chest. This is a potentially life-threatening injury requiring urgent professional medical assistance. Follow **DR-CABC**, calling for help early.

The ERC guidelines currently recommend NOT to put anything onto the wound that will block up the hole in the chest initially. The wound should be left exposed to drain freely. Special ('**occlusive**' or '**vented**') dressings are available that allow the wound to drain and prevent air movement back in. Apply these if you are trained and equipped to do so.

## Facial bone fractures

Fractures to the bones of the face occur from a direct blow. They may involve the nose, cheeks or jaw bones. The main risk is blockage of the airway from swelling, or obstruction by blood or loose teeth.

Facial injuries may be associated with head or neck injuries. In all cases follow the **DR-CABC** approach.

If a facial injury is identified during the 'head-to-toe' assessment, recommend the casualty seeks further medical advice.

## Fractured pelvis

Casualties complaining of pain or tenderness in the area of the pelvis or hips following a significant trauma mechanism may have suffered a pelvic fracture. There may also be bleeding from damage to organs within the pelvis as a result of the fracture. Causes of pelvic injury include vehicle accidents, falls and crushing.

### What you can do:

Always follow **DR-CABC**. Urgent medical assistance should be sought and the casualty kept still and comfortable. **Do not** move the casualty unless they are risk of further harm. Binding of the lower legs may help to immobilise the legs and stabilise a pelvic injury. Specifically designed **pelvic binders** should only be applied by appropriately trained medical personnel.



► 97. Lower leg binding for pelvic injury.

## CHAPTER 9: THE EFFECTS OF THE ENVIRONMENT

The human body is designed to work best at a steady temperature of around 37°C (98.6°F). Body temperature is regulated by the brain which automatically adapts to hot or cold conditions. We also control our body temperature through behaviours such as our choice of clothing or by altering our environment (heating or air conditioning). Extremes of heat or cold can cause harm, and the very young or elderly are at greatest risk.

### In hot conditions

The body loses heat through sweating and evaporation from the surface of the skin. Blood vessels near the skin get larger to help lose more heat – this is why our faces look red when we get too hot or exert ourselves. We may also breathe more quickly and more deeply.

### In cold conditions

The body will sweat less and the blood vessels near the skin get smaller to restrict external heat loss. The hairs on our skin may rise – which can appear as ‘goose pimples’. We may shiver to generate heat from our muscles. We may also slow our breathing, or breathe more shallow to reduce heat loss.

The environment also affects how we may care for casualties either as the cause of a medical condition, or alter the way a casualty is managed for example keeping them warm and sheltered following an injury.

## Heat illness

If the body gains more heat than it can lose, the body temperature will continue to rise. This can occur due to hot weather, physical activity, or a combination of both.

If the body temperature rises too far above the normal range, organs in the body stop working properly. This is called heat illness, and can range from mild to severe and life-threatening (which may be referred to as ‘**heat stroke**’). Early recognition and active cooling is essential.

### Exertional heat illness (EHI)

#### ENHANCED KNOWLEDGE

The spectrum of conditions that may be termed ‘heat cramps’ to ‘heat exhaustion’ occur due to over-heating from physical effort. Factors such as clothing, adequate rest and hydration, build-up training (conditioning), the weather and situation (e.g. enclosed working or poor ventilation) can all contribute to the risk of EHI.

### Climatic (non-exertional) heat illness

Without adequate acclimatisation (process of adjusting to a new climate), or an opportunity to cool the body, together with poor hydration, being in a hot environment can lead to developing climatic heat illness even without physical effort. Older or frail persons, or those unable to modify their environment (think of babies in cars in hot weather) are most at risk.

In both situations, devices such as a **Wet Bulb Globe Thermometer (WBGT)** can be used to measure potential ‘heat stress’. This takes into account sunshine, humidity and wind speed to calculate a risk index, and used to guide safe levels of activity during hot weather.

## **Simple measures may be life-saving and may prevent the casualty's condition worsening.**

### **In the early stages of heat illness casualties will usually:**

- feel hot and thirsty, tired or light-headed
- experience cramping in the limbs and abdomen
- sweat excessively, or they may get pale, clammy skin

### **What you should do:**

- move them to a cool, shaded place
- remove unnecessary clothing
- cool their skin by water spraying, fanning or cold packs
- If they are able, encourage the casualty to drink cool water

Most casualties will improve rapidly with cooling, but if their condition progresses, the casualty may become confused, disorientated or agitated, may collapse and become unresponsive or experience seizures. If a method is available to measure core temperature, a reading above 40 °C is likely to represent severe heat illness.

### **If you have to help someone with severe heat illness you should:**

- always follow **DR-CABC**
- move the casualty to a cool, shaded place if not already done so
- if you can, remove all clothing from the casualty down to at least underclothes
- ideally, if the casualty is responding normally and appropriate facilities are available, bathe them in cold or icy water making sure that their head is well above water

## **STRIP SOAK / SPRAY FAN**

- alternatively – if facilities are not available to soak/ immerse - reducing their temperature as rapidly as possible by applying cool water by spray and fanning them to increase evaporation
- if available, place cool (ice) packs over their body, especially in armpits and groins
- if they are fully responsive, encourage them to drink cool fluids
- cool actively until the measured core temperature falls below 39 °C (if able to measure)

## **Rapid cooling is the most important treatment for heat illness**

## Problems associated with cold

Cold weather or immersion in water may make it impossible to keep the body warm enough. If the body temperature drops too low below normal range, this is called hypothermia.

Casualties can also suffer a severe localised cold injury called frostbite. It usually affects the extremities such as the toes, finger, nose or earlobes and can cause severe damage to these parts of the bodies if left untreated. A less severe cold injury is called frostnip.

## Hypothermia

Hypothermia is usually mild. Severe hypothermia is rare but can be life threatening. Hypothermia is more likely when the casualty has been exposed to cold for a long period, the wind is strong ("wind-chill factor") or they are wet. People who are immobile, medically unwell or intoxicated are also at increased risk of hypothermia.

**The first sign of hypothermia is usually shivering, followed by:**

- confusion or disorientation
- slurring of speech
- loss of coordination

As the casualty becomes colder and hypothermia worsens, they will become more confused, unresponsive and ultimately could suffer a cardiac arrest.

**What you should do:**

- always follow **DR-CABC**
- if possible, move the casualty to warm shelter, out of any prevailing wind
- remove their wet clothing
- cover the casualty (including the head) with warm dry clothing and blankets or place them in a sleeping bag
- if they are responsive, offer hot drinks and high energy food; do not give alcohol
- if you have them, put heat packs or hot water bottles on the casualty's body but not in direct contact with skin (to avoid causing burns)

**DO NOT use the body of a warm person to warm up someone else with hypothermia - as all that will happen is that the warm person will end up cold as well too!**

## Frost nip and frostbite

As the temperature drops, exposed areas of the body, usually the face, ears and nose are cooled more quickly than covered areas. This cooling of the skin can cause two conditions known as frost nip and frostbite.

## Frost nip

Frost nip is freezing of the superficial skin causing cold, numb areas. Skin may appear pale/ yellowish and feel stiff but underlying tissues remain flexible. These areas should be covered to aid local warmth. Frost nip is completely reversible and shouldn't lead to blisters or permanent damage. However, it can lead to frostbite if not cared for appropriately.



► 98. Frost nip

## Frostbite

Frostbite is the freezing of deeper tissues. The more severe the frostbite, the deeper the tissue affected. The fingers and toes are most commonly affected.

### Signs of frostbite include:

- “pins and needles” or loss of sensation in the affected areas
- “wooden” digits (fingers or toes) with reduced movement
- loss of colour of affected skin
- mild swelling of the affected areas
- blistering (usually a late development)

### What you should do:



► 99. Frostbite

- move the casualty to a warm, dry place
- check for signs of hypothermia (**see page 82**)
- rewarm and cover the affected parts
- replace wet with dry clothing or warm the whole casualty – for example by removing them from the cold or wind and placing them in a sleeping bag
- do not vigorously rub or massage frozen skin as this can be harmful
- do not burst any skin blisters
- not allow the casualty to get cold again
- seek further medical advice

# Drowning

Water can pose a serious threat to life, even for the most confident of swimmers. Water-based activities such as swimming, canoeing and sailing are fun and exciting hobbies. However, the environment in which they take place is potentially dangerous.

The most important risk is drowning which occurs due to being submerged. This may go unnoticed, even with people nearby. Young children are particularly at risk, and most incidents occur in natural water bodies such as ponds, rivers, lakes or the sea.

Drowning is also one of the most common causes of accidental death in young people, and is often associated with alcohol consumption. Hypothermia is also associated with drowning.

**DO NOT attempt to enter the water  
to try to rescue the casualty**

Remain alert near water. However, special training, skills and equipment are required to recover a drowning casualty. Do not overestimate your ability and become a second casualty.

## If you see someone apparently struggling in the water:

- call for help straight away – ring **112 / 999**
- if they are responsive and it is safe to rescue them, encourage the casualty to a safe place at the edge of the water and assist their recovery from it – get down on one knee, or lie down, so that you don't fall in
- if there is a life-ring, or other public rescue aid equipment nearby, read any instructions and throw it to the casualty (if not, throw anything that will float)
- if they become exhausted, advise the casualty to try and lay backwards to float and preserve their energy – **'Float to Live'**
- if they are unresponsive you may not be able to help until trained assistance arrives



## ▶ 100. The drowning chain of survival

Once the casualty has been removed from the water:

- if the casualty is **responsive**:
  - remove their wet clothes, get them dry and keep them warm
  - remember that the casualty may have suffered a neck injury if there is a history of diving into shallow water
  - follow **DR-CABC** and complete the 'head-to-toe' assessment (**see page 22**)
- if the casualty is **unresponsive**:
  - start chest compressions and continue CPR (**see page 30**)
  - check and open the airway and give **five initial rescue breaths**
  - casualties may have swallowed large amounts of water – be prepared to turn them onto their side to keep their airway clear
  - remember to ask a second responder to try and obtain an **AED**

## Fires

Fire poses a threat to humans from both its direct and indirect effects. Direct contact can cause burns directly or set fire to clothing. Smoke from the fire can cause injury through inhalation. Toxic fumes can be created by fire and can also cause poisoning. Fire also damages the environment around it. Such damage, for example to a roof of a house, can cause injury due to collapse and objects falling on to a person.

If you are unable to safely access or move the casualty **AVOID** entering the environment. Wait for appropriately trained and equipped help.

If you need to escape from a burning building, leave your personal belongings and take the most direct route following the emergency exit signs.

### What you should do:

- always follow **DR-CABC**
- if the fire is out, ventilate the area by opening all doors and windows
- if still burning, exit the area or room and ensure fire doors are closed behind you, as they are designed to slow the spread of the fire
- if you are able to safely access the casualty, continue to provide first aid
- if you are able to, move the casualty to a place of safety and continue to provide first aid

Follow the guidance shown **CHAPTER 1, pages 9 and 10**.

# CHAPTER 10: DRUGS AND POISONS

This chapter covers the general approach to recognising and treating a suspected poisoning incident involving a single casualty.

## Definitions

### Poison

Defined as any substance capable of causing temporary or permanent damage to the organs and the functions of the body or mind.

### Medicine

Substance that can be helpful in normal quantities but harmful if too much is taken. The term **drug** is usually used for substances that are not used for the treatment of injury or illness and may be referred to as 'misused' or 'abused'. Some medicines fall into both groups. For instance, paracetamol is effective when taken at the correct dose to treat pain but in excess can lead to liver damage and severe illness.

### Toxin

#### ENHANCED KNOWLEDGE

Substance that is poisonous to an organism, generally referring to something produced by plants or animals to protect themselves but may also be created by artificial processes.

Other common examples of potentially harmful drugs or poisons include alcohol, tobacco smoke, solvents and some glues, certain plants, berries or mushrooms, household chemicals and insect or animal toxins (for example bee or wasp stings or snake venom). Certain drugs can be taken intentionally for their stimulant, depressant or hallucinogenic effects and can be termed 'recreational'. These may include cannabis, heroin and other opiate-like drugs, amphetamines or cocaine and various types of sedatives or hypnotics ("sleeping tablets"). An excess of these drugs can lead to more significant effects such as unresponsiveness, slowing breathing and failure of circulation.

### Routes of exposure

People may be exposed to potentially harmful substances accidentally or intentionally by several routes:

**Inhalation (breathing)** – such as smoke, gases or fumes.

**Ingestion (swallowing)** – poisonous plants, medicines.

**Absorption (through skin or eyes)** – chemicals such as pesticides.

**Injection** – animal and insect bites or stings, injecting drugs.

# Poisoning or intentional overdose

You might have to help when someone has taken an overdose or has been poisoned. There are a few simple actions which will help in this situation:

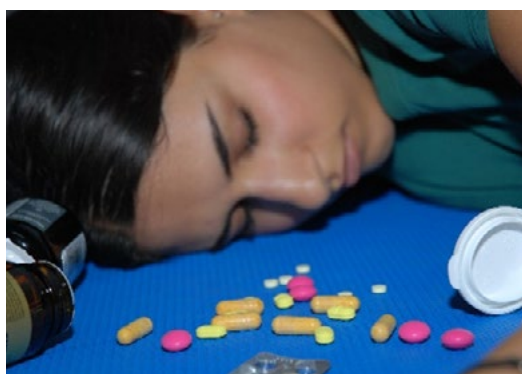
- always follow **DR-CABC**

## What else can you do?

- if you need to do rescue breaths use a pocket mask or face shield to protect yourself from exposure to a potentially harmful substance
- if they are responsive, reassure the casualty that help is coming
- call for help – **112 / 999** and give as much information as you can (note section 'taking a history', **see page 23**)
- **do not** attempt to make the casualty vomit but support them if they do
- if safe to do so, keep a sample of the suspected poisonous substance or the container label (or medical packaging for example)
- continue to observe and re-check the casualty while waiting for further medical help

## Things you might see:

- needle marks or scars from injection of drugs
- scabbing and redness around the nose in inhalational drug use
- drowsiness due to sedatives or strong painkillers
- agitation, unusual behaviour, sweating in stimulant or hallucinogen use
- remember the 'head-to-toe' assessment (**see page 22**)



- ▶ 101. Always examine the scene for potential causes

# Household chemicals

Most cases of ingestion of household chemical such as bleach or other cleaning products occur in young children who are not aware of the potential hazards. Occasionally they are taken as a means of self-harm, for example anti-freeze.

## What you can do:

- if the casualty is drowsy, they should be placed in the recovery position and in all cases urgent medical advice should be sought.
- do not attempt to induce vomiting.
- empty containers in the vicinity may indicate the substance taken if the casualty does not or cannot tell you what they have taken. All the available information and the substance container, if available, should be handed on to responding health care professionals (there is no need to keep samples of vomit).

**Other considerations:**

Depending on the substance abused, clues to chemical ingestion may include signs of burns around the mouth, abdominal pain, vomiting, drowsiness and seizures.

Advanced life support is only very rarely needed in this situation, but if it is and you are concerned that the casualty has been exposed to, or ingested, a corrosive substance then a face mask or shield must be used to ensure that you do not also become contaminated.

Casualties who have ingested a substance with delayed action such as paracetamol may initially show no physical signs. Urgent medical attention is still vital and should be called even if the casualty says they will decline treatment.

Poisoning with plants, berries and mushrooms is uncommon, but the same approach should be taken and where possible a sample or photograph of the plant should accompany the casualty to hospital.

# CHAPTER 11: COMMON MINOR PROBLEMS

## Bites and stings

### Animal bites

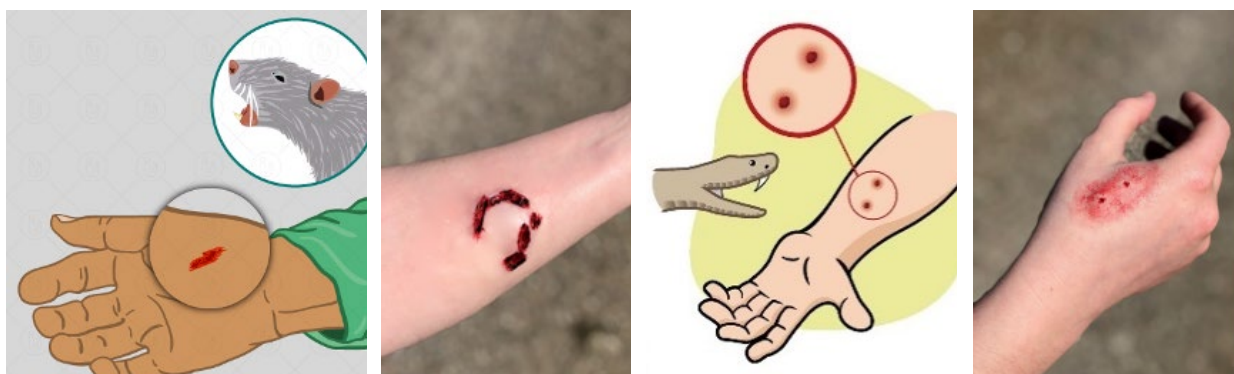
Bites can damage soft tissues and may be further complicated by infection. In some cases injection of a toxin may occur (see **CHAPTER 10**). You will need to treat any bite that breaks the skin to try and reduce the risk of infection.

#### What you should do:

- Always follow **DR-CABC**
- Stop bleeding (see page 61)
- External irrigation of the wound with water
- Pat dry and cover the wound with a sterile dressing, if available
- Advise the casualty to seek further medical assistance

**DO NOT try to catch a potentially harmful animal or insect but consider taking a photograph if it is possible to do so safely and from a distance.**

If the animal bite has punctured the skin and there is bleeding, the casualty will likely require antibiotics. The geographical location and circumstances may also suggest the risk of tetanus (soil or manure contaminated) or other endemic infections such as rabies, as well as the potential effects of a venom or toxin depending on the animal and species. Casualties should be advised to seek medical help, unless it is an uncomplicated insect bite or sting.



► 102. Typical animal bite/sting wounds

### Human bites

If a bite wound has been caused by another person and has broken the skin and caused bleeding, there are additional risks that should be considered. **'Blood-borne'** viruses such as Hepatitis B or HIV may be transferred through such wounds. Further medical advice and a full risk assessment is essential as further treatment and follow-up may be required.

So-called **'fight bite'** wounds from human teeth onto the back of knuckles are a common occurrence as a result of interpersonal violence. If suspected, advise the casualty to seek further medical attention urgently. The reason for this is the requirement for antibiotic

treatment to help reduce the risk of a potentially serious infection to the fingers joints.

## Insect stings

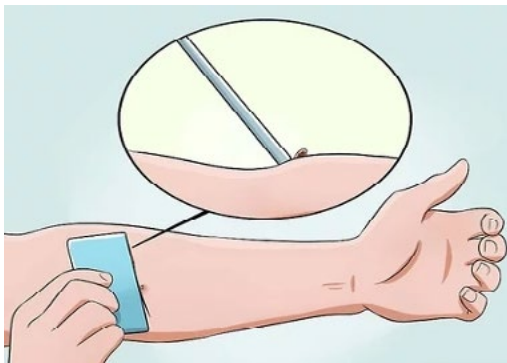
Insect stings such as from bees, wasps and hornets, can be frightening and painful but are usually not dangerous. Pain is often the first symptom followed by mild localised swelling and redness. If the pain and swelling persist or worsen rather than improving, medical advice should be sought.

Sometimes stings can generate a severe allergic reaction called '**anaphylaxis**' (**see page 100**) so it's important to look out for this (see below) and get medical help quickly if necessary.

### What you need to do:

- if you can see the sting, brush or scrape it off sideways. Don't use tweezers to try and pull it out as you could squeeze more toxin into the wound or only partially extract an embedded insect
- recommend simple pain relief and the use of antihistamine medications (tablet or skin creams)
- put a cool pack on the bite or sting, or under cold running water, to reduce the swelling
- raise the part of the body that's affected
- observe closely for any signs of airway or breathing problems especially if the sting was to the mouth or throat. Sucking an ice cube or sipping cold water may provide symptom relief in this case
- Continue to follow, and repeat **DR-CABC** as required

If you notice any signs of a severe allergic reaction (**see page 100**) call for emergency medical help. Assist the casualty in the use of their own adrenaline auto-injector if they have one.



▶ 103. Bee sting removal

## Tick bites

Ticks are small, spider-like creatures which feed on the blood of birds and mammals, including humans. They vary in size, usually between 1mm to 1cm long. They are usually found in woodland and grassland, often in known distinct geographical locations.

Ticks may carry diseases such as Lyme disease and should be removed as soon as possible. Using tweezers or a tick remover gently grasp the tick as close to the casualty's skin as possible and then pull the head upwards using slow, steady pressure. **Do not** tug as it may separate, leaving the head embedded in the skin.

Advise the casualty to seek further medical advice for further assessment as they may require specific medication.



▶ 104. A tick feeding & removing a tick

## Other bites and stings

Scorpion stings and bites from some species of spiders can cause serious illness and may even be fatal. Bites to the mouth and throat may cause swelling that obstructs the airway, and the casualty should also be observed for the development of an allergic reaction. Pain, redness and swelling will occur at the site of the sting. A cold compress may be applied. The casualty should be advised to seek medical assessment, or an ambulance should be called if the casualty becomes unwell. Follow **DR-CABC** in this case, while waiting for help to arrive.

## Snake bites

Each year there are around 2 million cases of snake venom entering the skin following a bite ('**envenomation**') and up to 100,000 deaths worldwide. All known or suspected snake bites must be treated as potentially life-threatening and medical aid should be sought urgently.

**DO NOT TRY TO CATCH THE SNAKE!**

**Instead try to get a photo, or document some identifying features**

Symptoms usually begin immediately - certainly local to the bite itself - but in some cases may be delayed for an hour or even longer after the person has been bitten. Bite marks may vary from obvious puncture wounds to scratches or may be almost invisible. However, not all bites result in envenomation and may be from a defensive rather than a predatory strike. It is important to reassure the victim if they remain symptom-free.



► 105. Some examples of European venomous snakes: Left: Adder (*Vipera berus*), Middle: Asp Viper (*Vipera aspis*), Right: Nose-horned Viper (*Vipera ammodytes*)

**The signs and symptoms may include any combination of the following:**

- pain, swelling, bruising or minor bleeding at the bite site (sometimes delayed)
- headache, feeling faint, dizziness
- confusion and loss of responsiveness
- abdominal pain, nausea and vomiting
- blurred vision, floppy/ heavy eyelids
- difficulty in speaking or swallowing
- limb weakness or numbness
- difficulty in breathing
- increased sweating or salivation

**What you can do:**

- follow **DR-CABC**
- call **112 / 999** for an ambulance
- lie the casualty down and ask them to keep still
- wash the wound with clean water before covering
- apply a bandage firmly, starting at the fingers for an arm bite (or at the toes for a leg bite) and wrap all the way to the top of the limb (**see figure 106**) - this can reduce the spread of the venom toxin **but must NOT act as a tourniquet or cut off the blood supply to the end of the limb**
- immobilise the bandaged limb
- make a note of the time of the bite and when the bandage was applied
- reassure and stay with the casualty until further medical help arrives

**DO NOT attempt to 'suck out' the venom  
or apply a tourniquet!**



- 106. Applying a pressure bandage and immobilising a limb following a snake bite

## Allergic reactions

Allergic problems are very common, generally mild and usually require no more than symptomatic treatment. They may range from 'hay fever' (seasonal) to more severe reactions to specific substances or foods e.g. nut allergy. Ideally the cause should be identified and avoided: it may be something as trivial as a change in washing powder! Occasionally, someone may be experiencing a reaction to their prescribed medication.

The casualty may already know what causes the reaction for them, and may carry appropriate anti-allergy medications or an adrenaline auto-injector for administering to themselves (e.g. an "EpiPen™"). Simple measures can help a casualty suffering from an allergic reaction.

### Mild to moderate allergy

The features include:

- swelling of the skin, particularly the face or around the eyes.
- a red, raised itchy rash ('**hives**') - the medical name is "**urticaria**". The raised edges of the rash can be felt when running the tips of the fingers over the area (**see figure 107**).



- 107. A rash due to an allergic reaction

### What you can do:

- always follow **DR-CABC**
- stop the exposure to the potential cause (for example stop taking the antibiotic) and advise the casualty seeks review by their usual medical practitioner
- encourage the casualty to take their own anti-allergy medication or seek the advice of a pharmacist
- if any airway swelling or breathing difficulty develops re-assess according to **DR-CABC**
- if you are concerned the casualty is becoming more unwell, call for help (**112 / 999**)

### Severe allergic reactions

A severe allergic reaction, known as 'anaphylaxis', is potentially life-threatening and must be treated as a medical emergency.

The casualty may show signs of shock (**see page 60**) and become unresponsive, or may even suffer a cardiac arrest.

#### Typical features include:

- Difficulty in breathing and/or high-pitched or noisy breathing ("stridor")
- Tight chest and/or wheezing, cough
- Swelling to the mouth and/or tightness of the throat and difficulty swallowing
- Difficulty speaking and/or hoarse voice
- Abdominal pain/cramps
- A widespread rash then cold, pale skin
- Clammy/ sweaty skin
- Casualty may become unresponsive

### What you can do:

- assist the casualty to self-administer their own adrenaline auto-injector, if they have one, or administer this on their behalf if they are unable to do so and you know how to (illustrated instructions are usually written on the device)
- help the casualty to lie in a position of comfort. If they feel faint, lie them down and raise their legs
- if there is no improvement after five minutes, a further adrenaline auto-injector can be administered, if available
- continue to follow **DR-CABC**
- call for help (**112 / 999**)
- ensure the casualty receives emergency medical care
- if the casualty deteriorates and stops breathing, start CPR (**see page 30**)



▶ 108. Facial swelling and skin appearance due to an allergic reaction



- ▶ 109. Administering an adrenaline auto-injector

## Managing wounds

Stopping severe bleeding is one of the first three priorities of first aid  
Immediately following **DANGER** and **RESPONSE**, then **CALL** for help

**For guidance on severe external bleeding see page 61**

### Types of wounds

#### Bruise

A bruise (or '**contusion**') is the result of a direct blow causing damage to small blood vessels under the skin which then leak a little blood into the tissues. A bruise can occur rapidly after an injury or take a few days to emerge (the longer the bruise takes to show at the surface, the deeper the injured tissue).

Elderly people and those taking anti-clotting medication ("blood thinners") are more prone to bruising or those bruises being larger with a less severe injury.

#### What you can do:

Bruising can be lessened by elevation and cooling. Place a cold compress over injured soft tissue for 20 minutes after an injury to reduce the blood flow and hence the extent of any bruising. If the swelling continues to expand, the casualty may need medical assessment.



- ▶ 110. A typical bruise

## Abrasion

Abrasions or 'grazes' occur when the outer layer of skin is rubbed off, often due to the friction from a scraping or sliding mechanism. The skin will appear raw and inflamed, and will often be contaminated by dirt or with embedded grit or other material such as glass.



### What you can do:

▶ 111. A typical abrasion

As with any wound follow **DR-CABC**, checking for any active bleeding. Advise gentle external cleaning initially - particularly if this can be done with running water - to allow any loose dirt or other contamination to be rinsed off. Then cover the wound with an appropriate dressing.

## Incision

An incision is a cut to the skin caused by a sharp implement such as a knife or edge of broken glass. The incision may extend down to deeper tissues by cutting through muscles, tendons, blood vessels, nerves and even solid organ structures below.

### What you can do:

Follow **DR-CABC**, checking for any active bleeding. If so, follow the advice on **page 61**. Firm pressure and elevation should stop the bleeding in most cases. For example, if the cut is to your hand or arm, raise it above your head or if the injury is to a leg or foot, lie down and raise the affected area above the level of your heart.



▶ 112. An incised wound

If the bleeding is not controlled, and the incisional wound is to a limb, a tourniquet should be applied (**see pages 63-65**). If bleeding is controlled, cover with an appropriate dressing. Remember that wounds can extend deeper than is visible or involve injury to other anatomy and should be assessed by professional medical help.

## Laceration

Lacerations are tears of the surface of the skin and soft tissues usually caused by blunt trauma from a rough object or a fall. These are distinguished from an incision which should appear as a 'clean cut'. Deeper lacerations can also occur, such as to abdominal organs.



▶ 113. A skin laceration

### What you can do:

Follow **DR-CABC**, checking for bleeding. Wounds can look wide open and ragged, and there may be visible underlying structures such as tendons or bone. There may also be dirt and other contamination in the wound, including foreign bodies such as glass. If the bleeding is controlled effectively, consider gentle external cleaning or rinsing under running water before covering the wound. If there is active bleeding, follow the advice on **page 61** and as for incisional wounds.

### Puncture wound

A puncture wound is typically a small diameter or narrow hole which can be deep, depending on the cause or object involved. This may include animal bites or a penetrating injury from a sharp pointed object (such as standing on a nail) or from a stabbing weapon. The path this item has taken should be a straight line although it can be hard to predict, being determined by both the direction it took, but also by the position of the casualty's body at the time.

### What you can do:

Follow **DR-CABC** in all cases. There may be no active bleeding at all, and the wound may even be quite hard to see at all. In some cases, the object responsible may still be embedded. If so, **do not** try to remove this. Instead cover the wound with an appropriate dressing.



► 114. A puncture wound

Puncture wounds by their nature will be difficult to irrigate to remove all possible dirt or other contamination. For this reason it is likely that professional medical assessment and further care will be required. Investigations such as x-ray may be required. Antibiotic medications are also likely to be necessary.

## General wound care advice

Use of a self-adhesive sterile dressing will usually allow a minor wound to heal by itself in a few days after which the dressing can be removed. If the wound is a small superficial graze, it may be left open to air to dry out and heal by itself.

Professional medical help should only be required if bleeding is difficult to control or the casualty takes anti-clotting (blood-thinning) medications, there is a high risk of infection or you think the wound is already infected. In the case of a higher-risk wound, casualties who are not sure about whether they have immunity for tetanus (previous vaccination) should also seek appropriate medical advice or check with their usual medical practitioner. Tetanus vaccination may be necessary with contaminated wounds, within 48 hours of the injury.

### Wounds that may be higher-risk include:

- those where you cannot stop the bleeding
- bleeding is bright red or comes in spurts ('**pulsatile**')
- loss of sensation beyond the wound
- contaminated wounds (dirt, bodily fluids)
- foreign body in the wound (e.g. glass)
- complex wounds to the face
- caused by an animal or human bite

### Signs of an infected wound include:

- swelling, redness and increasing pain
- pus forming in/around the wound
- feeling unwell, or developing a fever
- swollen glands e.g. the neck, armpits or groin

### Blisters

Blisters usually occur from repeated friction on the skin (for example when the skin rubs against the inside of a new shoe). Blisters may also occur as a result of burns. The damaged tissue leaks a clear fluid that builds up beneath the skin which forms the raised blister.

If a blister forms, keep the area clean and dry. There is no clear evidence whether to or 'de-roof' a blisters. If the blister has already burst, clean the area but leave the 'roof' of the blister in place and cover with a soft plaster or padded dressing.

If there are no signs of infection, such as those listed for wounds as above, no other specific treatment is advised other than protecting the area and allowing it to heal by itself. Signs of infection may include increasing redness around the blister, and/or yellow or green pus forming within it. If there are signs of infection, seek further medical advice.



► 115. Example of a skin blister

### Foreign objects in a wound

A foreign object is anything that might get stuck into or under the skin from an injury. This may include wood splinters, thorns or spines, slivers of glass or metal. **Do not** attempt to remove well-embedded foreign objects such as pieces of glass or grit from a wound. Surface contamination could be gently brushed/swept away, or irrigated with clean water.

Retained objects can increase the risk of infection and may need to be removed by a healthcare professional using sterile equipment. Trying to remove these without suitable experience, training or equipment may also worsen the injury or its complications. The wound should simply be covered and further medical assistance sought.

If there is a large protruding object in the wound, you may need to build up padding around the object to stabilise it before applying a dressing (**see figure 61, page 62**).

## Ear, Nose and Throat (ENT) problems

### Ear pain

Ear pain, discharge or loss of hearing can develop from many different conditions such as infections, following air travel (from pressure changes), due to a cold or influenza, or when objects have become stuck in the ear canal. If appropriate, advise the casualty or parent to seek advice from their own doctor, walk-in urgent care centre or local emergency department.

## Objects in the ear canal

Young children are particularly prone to putting small objects into their ear (and nose).

**Do not** try to remove a foreign object from the ear canal unless it is clearly visible and easily retrievable, you have training and the correct equipment to do so. Failed attempts may push the object further in or cause additional injury to deeper structures such as the ear drum.

## Sore throat

Most sore throats are often due to a mild infection such as a common cold which is caused by a virus and therefore would not benefit from treatment with antibiotics. Advise adequate fluid intake and softer food may also help. Regular pain-killer medications will help including anti-inflammatory sprays. Sometimes a sore throat causes swelling at the back of the throat which may prevent swallowing of fluids or medications, or may progress to obstruct the airway. If there are signs of airway obstruction follow the **DR-CABC** approach.

Signs that may signify a more serious throat problem include being unable to swallow (for example own saliva), hoarse or croaky voice, difficulty in talking or any difficulty in breathing.

A sudden pain in the throat associated with eating, followed by being unable to swallow properly may be due to obstruction from a piece of food – called a ‘bolus’. If this, or any other swallowing problem leads to choking you should follow the advice in **CHAPTER 3**.

## Nosebleeds (“epistaxis”)

Nosebleeds are not usually a sign of anything serious. They are common, particularly in children, and most can be easily treated with simple first aid measures. They are also more common and may be more prolonged in those receiving anti-clotting medications (“blood-thinners”) or with raised blood pressure. In children they are usually the result of minor trauma.

### What you can do:

- ask the casualty to sit down and lean forward, with the head tilted forward
- pinch their nose firmly just above the nostrils for at least 10 minutes continuously
- the casualty can try holding a cool-pack (e.g. a small bag of frozen peas wrapped in a tea towel) on the top of the nose which may help reduce the blood flow and stop the bleeding
- once the bleeding has stopped, ask the casualty to:
  - not blow or pick their nose/ scabs
  - avoid hot drinks or alcohol
  - avoid any heavy lifting or strenuous exercise for at least 24 hours
- If the bleeding has not stopped, then pinch the nostrils for a further 10 minutes and then check again, if still bleeding then try for a third continuous period of 10 minutes

When to seek further emergency care:

- the nosebleed lasts longer than 30 minutes, or otherwise appears excessive
- the casualty swallows a large amount of blood that makes them vomit
- the bleeding started after a head injury
- the casualty starts feeling weak or dizzy
- the casualty is having any difficulty in breathing



► 116. How to help stop a nose bleed

## Dental problems

### Toothache

Toothache is usually the result of a decaying tooth. It may also be a sign of an abscess, a collection of infection below the tooth, or of infection of the gum beside the tooth. The pain experienced may be made worse by higher sensitivity to hot or cold food or drinks.

If an infection is present and worsens it can cause swelling to that side of the face and/or neck. The casualty should be advised to visit a dentist. In some cases, a more severe infection may require urgent medical attention, particularly if the casualty is feeling unwell or has a high temperature.

### Tooth injuries

If an adult (permanent) tooth has been knocked fully out ('avulsed') try to avoid touching the root. Clean the tooth under cold running water for no more than 10 seconds. Wrap it in cling-film or place in a container with oral rehydration solution or milk. Advise the casualty to attend their dentist- intact teeth can often be re-implanted. Casualties may even be able to do this themselves at the scene with appropriate guidance. If the tooth socket is bleeding get the casualty to rinse out with cold water, and control bleeding by biting against a damp compress.

For 'knock-out' tooth injuries to "baby" (non-permanent) teeth in children **do not** try to re-implant the tooth – it may damage the healthy tooth below.



► 117. Treatment for a dental injury

# Eye injuries and foreign objects in the eye

Many accidents involve eye injuries that can range from more common, minor problems such as a '**corneal abrasion**' to more serious, potentially eyesight-threatening issues.

## The signs and symptoms to look for are:

- pain or redness in the eye or eyelid
- visible wound to the eye or around the eye
- any affected vision
- discomfort or sensitivity to light
- watering/tearing

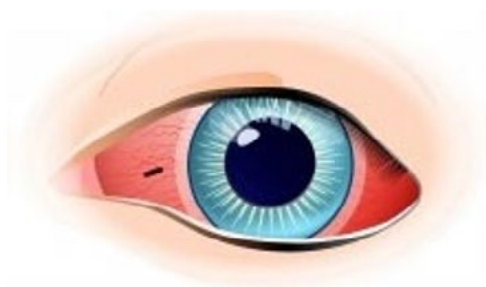
It is important that the casualty avoids rubbing their eye to prevent further damage.

## If you think there might be something in the eye you should:

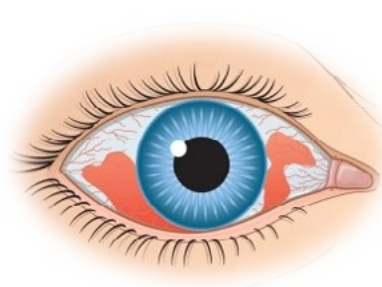
- look for any wounds, handling gently
- **do not** attempt to wash out the eye if the foreign object appears to have penetrated the eyeball
- if you can see something on the surface of the eye, attempt to dislodge it by washing it out (irrigating) gently with clean water (ideally a specific eye-wash fluid from an eye-safety station)
- when irrigating, pour over the inner corner of the eye with the casualty's head tilted or laid injured side downwards, so as to avoid causing any spill and then issues with the opposite eye (**see figure 120, page 108**)
- if this doesn't help seek further medical assistance

## If there is a bruise, a cut or an embedded foreign object in or around the eye, you should:

- Tell the casualty to try to rest and stay still
- Protect the eye if possible with a specific pad/cover (taking care not to put any pressure onto the eye)
- Tell them to seek urgent medical assistance



▶ 118. Penetrating eye injury



▶ 119. Non-penetrating eye injuries

**If the casualty has a chemical in their eye, such as an acid, commence irrigation immediately with any available water-based fluid. If plain water is not available, even soft drinks will do – anything that will dilute and rinse.**

If a **chemical** has got into the eye(s) you should:

- irrigate the eye as quickly as possible with a large volume of clean running water for at least **10-20 minutes**, tilting the head with the affected eye facing downward (to avoid contamination of the other eye).
- some working areas have specific 'eye wash stations' or 'pods' and these are ideal for first aid treatment.
- tell the casualty to seek urgent medical assistance.
- call for help (**112 / 999**).
- if in doubt, always follow **DR-CABC**.



▶ 120. 'Washing-out' (irrigating) an eye

## Back pain

Back pain, particularly lower back pain, is a very common problem affecting over 80% of people at some point in their life. It usually improves within a few weeks but can sometimes last longer or keep coming back. Back pain can have many causes, although often gets better on its own. A common cause of back pain is an injury like a pulled muscle. Sometimes medical conditions, such as a slipped disc, can cause back pain.

Back pain does not usually require treatment as an emergency, unless it is the immediate result of a fall from height or other serious accident.

### What you should do:

- ask the casualty to be less active but try to continue with routine daily activities
- avoid strenuous activities
- advise doing some gentle stretches
- advise not to stay in bed or laid flat for long periods of time
- consider appropriate pain relief medication and local agents/creams
- try a heat pack (or hot water bottle) wrapped in a tea towel to relieve muscle spasms

### 'Red flag' features:

If the casualty is experiencing severe back pain with any of the following symptoms, they should be advised to seek urgent medical attention:

- a high temperature or there is a lump or swelling in the back
- pain, tingling, weakness or numbness in either or both legs
- numbness or tingling around the genitals or buttocks
- any change of bladder or bowel function
- associated with chest or abdominal pain
- it started after a significant injury, such as a car accident or a fall from height

## Abdominal injuries

Any casualty complaining of significant pain in the abdomen following trauma, especially associated with signs of a failure of circulation (**see page 60**) or vomiting, will require urgent medical assistance. For example, the specific abdominal injury from falling onto the end of the handle-bars of a bicycle is an often under-appreciated mechanism and can lead to life-threatening organ damage.

Seek urgent medical advice if you have any concerns. Always follows **DR-CABC**.

## Testicular pain

Males with severe pain in the groin and specifically the scrotal/ testicle region, whether following an injury or not, may have a condition called “**testicular torsion**” which is where the testicle becomes twisted and therefore starved of its blood supply. This is a medical emergency.

If the condition is not operated upon quickly, within around 6 hours, the testicle may become irreversibly damaged. Although the casualty suffering from this may be too embarrassed to mention it, they should be encouraged to tell a responsible adult or someone else they trust and seek further professional medical help by with an appropriate emergency care service, such as a hospital emergency department.

## Childbirth

Childbirth is a natural process and the vast majority of cases will proceed normally without intervention. Therefore, if you encounter a woman who is in labour you should assist her to reach her planned birth unit. If the birth is imminent you should call **112 / 999**.

In all circumstances, if the casualty becomes unwell, collapses or becomes unresponsive follow the **DR-CABC** approach. Remember to position a responsive and obviously pregnant female tilted onto her LEFT side (**see figure 22, page 26**), facilitated by something acting as a wedge to support this position – which can be your own kneeling legs if necessary in an emergency while you are providing first.

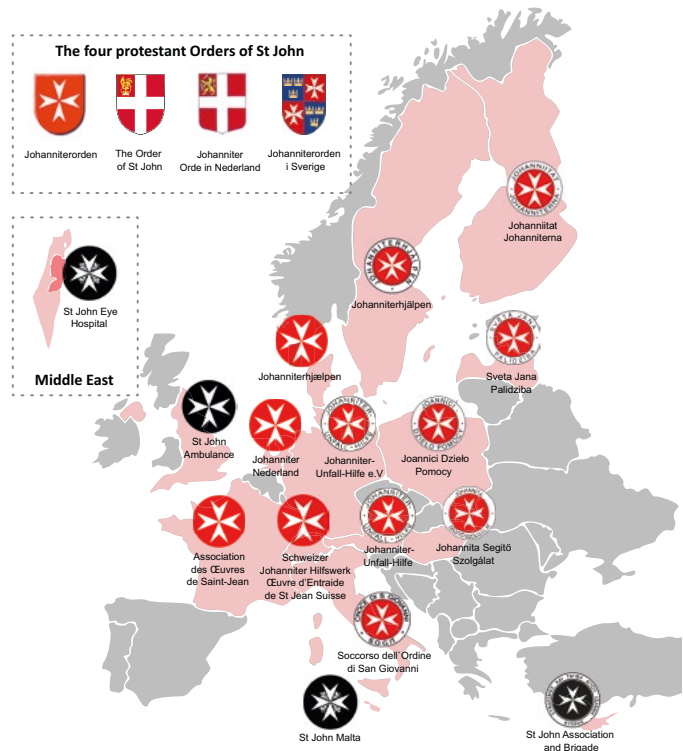
# About JOIN

Johanniter International (JOIN) is the partnership of the four protestant Orders of St John and their national charities. Our member organisations, based in Europe and the Middle East, work in close cooperation and are supported by more than 100,000 volunteers. They serve humanity with medical services and first aid, social care, international aid, disaster relief and youth work. The services of JOIN member organisations are open to everyone. Core to our values is our Christian heritage which underlines our work.

JOIN central office in Brussels advocates the interest of the St John charities towards European and international bodies and facilitates international projects and working groups.

**For further information please contact our Brussels office at [join.office@johanniter.org](mailto:join.office@johanniter.org)**

**or [www.johanniter.org](http://www.johanniter.org).**



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