

# Outdoor Activities First Aid Course



We will teach you what  
to do until this arrives!

## 100% Ancient Forest Friendly Publication

Greenpeace have highlighted the destruction of ancient forests (rainforests and beautiful old woodlands) to make wooden products and paper. These ancient woodlands are irreplaceable yet there is an alternative.

This manual is printed on low chlorine recycled paper.

*“If we don’t act now, the terrible irony is that our great grandchildren will only know of our ancient forests through the pictures in books printed on paper that contributed to their destruction”*

Graham Lester George  
Chair, Writers Guild of Great Britain.

**marlin**training

38 Lyndhurst Road  
Birmingham  
B24 8QS

Tel: 0845-226 7785

Fax: 0845-226 5368

Email: [stuart@marlintraining.co.uk](mailto:stuart@marlintraining.co.uk)

Web [www.outdoorfirstaid.co.uk](http://www.outdoorfirstaid.co.uk)

[www.marlintraining.co.uk](http://www.marlintraining.co.uk)

### Copyright Notice

All rights are reserved. No part of this publication may be reproduced in any form (including photocopying or storing it in any medium or photographic means and whether or not transiently or incidentally to some other use of this publication) without the written permission of Marlin.



This manual is printed on recycled paper.

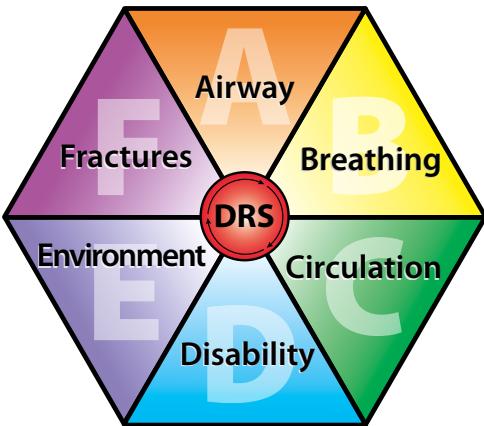
© Marlin 2010

# Contents

☉ Preface .....	1	☉ E- Environmental Problems .....	54
☉ Contents .....	3	The Effects of the Weather .....	54
☉ Introduction .....	4	Cold Injuries .....	55
Learning Methodology .....	5	Prevention of Hypothermia .....	55
The Primary Survey .....	5	Hypothermia .....	56
Continuity of Care .....	5	Immersion Survival .....	57
Search and Rescue Dogs Association (SARDA) .....	6	Immersion Shock .....	57
Search Methods .....	7	Hypothermia .....	58
Helicopter Rescue .....	8	Immersion (or Trench) Foot .....	58
☉ First-Aider Safety & Hygiene .....	9	Frost Bite and Frost Nip .....	59
Scene Assessment .....	10	Response to High Altitude - Mountain Sickness .....	60
Protective Equipment .....	11	Heat Exhaustion .....	62
Communicable Diseases .....	12	Heat Stroke .....	63
Protection for the First Aider .....	13	Thermal Burns .....	65
Pocket Mask .....	13	☉ F- Fractures .....	66
☉ Communication and Delegation .....	14	Fractures and Dislocations .....	66
☉ Communication and Delegation .....	14	Physical Assessment - Checklist .....	67
Advance Preparation for Outdoor Trips .....	14	Fractures - Anatomy and Physiology .....	68
Incident Management .....	15	Fractures - Splinting .....	69
Emergency Action Plan .....	16	Chest Injuries .....	71
Communicating with Patients .....	17	☉ Treating Other Injuries .....	72
In Case of Emergency (ICE) .....	17	Crush Injuries .....	72
Patient Assessment — Remote Settings .....	18	Sprains and Strains .....	73
Recovery Position (Modified Spinal Recovery Position) .....	19	Suspension Trauma .....	74
Initial Assessment — Trauma (Spinal Injury) - .....	20	Eye Injuries .....	75
☉ A- Anatomy .....	22	☉ Treating Illness .....	76
The Respiratory System .....	23	Blisters .....	76
Upper Airway Structures .....	23	Secondary Assessment - Illness .....	77
The Mechanism of Breathing .....	26	Coronary Heart Disease .....	78
Responsive, Choking Child .....	28	Angina Pectoris .....	78
Responsive, Choking Adult .....	29	Heart Attack .....	79
Oropharyngeal Airways .....	30	Stroke .....	80
Endotracheal Airways .....	31	Allergic Reactions, Insect Bites and Stings .....	81
Resuscitation- Child .....	32	Asthma .....	82
Resuscitation - Adult .....	33	Epilepsy .....	83
The Chain of Survival .....	34	Diabetes .....	84
Application of Resuscitation in the Outdoors .....	35	Leptospirosis (Weil's Disease) .....	85
☉ First Aid Kits .....	36	Lyme's Disease .....	86
Uses of First Aid Materials .....	38	Ingested Poisons .....	87
Moist Wound Healing .....	38	Food Poisoning .....	88
Medications .....	38	Absorbed Poisons .....	89
☉ Circulatory Problems - Bleeding and Shock .....	39	Inhaled Poisons .....	90
☉ Bleeding .....	39	Injected Poisons .....	90
Direct Pressure .....	40	Log Roll for a Face-Down Patient .....	92
Elevation Sling .....	41	Spinal Roll - multiple rescuers .....	93
Pressure Points /Impaled Objects .....	42	Moving a Patient .....	94
Internal Bleeding/Nosebleeds .....	43	Leaving a Patient to Fetch Help .....	94
Wound Closures/Tourniquets .....	44	Sedan Chair .....	95
☉ Shock .....	45	Split Rope Carries .....	95
Physiology of Shock .....	45	Polythene Bag Stretcher .....	95
Types of Shock .....	45	Accident Record .....	97
Hypovolaemic Shock .....	46	☉ Appendix 1 - First Aid Report Form .....	98
Cardiogenic Shock .....	47	☉ Appendix 2 - Rescue Request Form .....	99
Other types of Shock .....	48	☉ Appendix 3 - The Sticky Plaster Mystery .....	100
☉ D- Disability .....	50	☉ Appendix 4 - First Aid Quiz .....	102
Disability - Head Injuries .....	50	☉ Index .....	104
Disability - Spinal Injuries .....	52	☉ Bibliography .....	106
Cervical Collar .....	53		
Clearing a Possible C-Spine injury .....	53		

# Patient Assessment

## Patient Assessment — Remote Settings



### Danger

Stop, look, listen and think!  
 Safe to approach?  
 Put on protective barriers.  
 Triage. Medic Alert Tag?  
 What backup is required?

### Response AVPU

“I’m trained in first aid. Can I help you?”  
 Alert - fully responsive  
 Voice - “Open your eyes!”  
 Pain - tap collar bone or pinch ear  
 Unresponsive - no response (*Unresponsive*)  
 Do not shake a patient as this may aggravate any injuries.

### Shout for Help

If alone, continue assessment.

### Airway

Inspect the mouth for blockages.  
 Open the airway with the head-tilt, chin lift.



### Breathing

Look, listen and feel for no more than 10 seconds.  
 Check for no more than 10 secs - if you are unsure whether breathing is normal act as if it is **not** normal. (*Breathing*)



### Dial 999 or 112

Send a bystander and tell them to come back.  
 If you are alone put the patient in recovery position and go to the phone immediately. On your return, check breathing again.

### Circulation

**Bleeding:** If the patient is breathing then they have a heartbeat. Check the whole body systematically for bleeding and control any bleeding found.

**Shock:** Signs of shock include pale, cool and clammy skin and slow capillary refill. Assure airway and keep patient warm.

### Disability

What is the patient’s level of consciousness? Is there any evidence of head or spinal injury? If so keep still and do not roll to recovery unless their airway is compromised.

### Environment

If you are outdoors protect the patient from the elements. Insulate from cold and protect from heat. Remember if cold to insulate from the ground.

### Fractures

Are all the major bones intact? Check carefully and splint if necessary.

### Reassess

Keep checking airway, breathing and circulation, and that any bleeding has not restarted. Place in recovery position if injuries would not be made worse or if you have to leave the patient to fetch help yourself



## Recovery Position (Modified Spinal Recovery Position)

Imagine the scenario. You are out in the hills, your friend has fallen a long way and may have a spinal injury. There is no-one around to fetch help and you have no reception on your mobile phone. You need to put your patient into recovery before you fetch help. In this modified recovery position the patient's own hand supports their head and stabilises the spine both during the roll and in the final position. In this position the total neck movement has been shown to be less than half that of a standard recovery position.

**Hand under head** Kneel by the patient and gently tuck their near side hand under their head.

**Prepare to roll** If you are outdoors prepare suitable ground insulation and a survival bag. Place in position before you start to roll.

**Hand by face** Move the patient's far hand over and place it by their face, the back of their hand against their cheek.

**Hold shoulder** Hold the patient's opposite shoulder with your hand ready to roll.

**Lift knee** Grasp the outside of the patient's opposite knee and lift it firmly

**Roll patient** Using the patient's shoulder and knee, carefully roll the patient towards you with as little movement of the spine as possible. Once the patient is past the halfway point lean them on your knees so they will not roll any further or fall back.

**Raise knee to 90°** Raise the patient's knee to 90°. This stabilises the position and also stops them rolling onto their front which can restrict breathing

**Protect patient** If you are outdoors protect the patient from the elements.

**Reassess** Keep checking airway, breathing and circulation, and that any bleeding has not restarted.

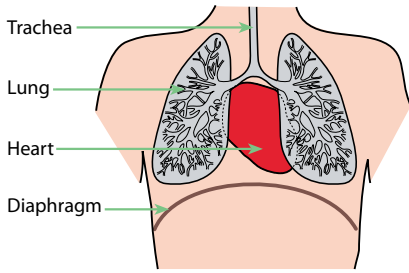
**Fetch help** Go and get help immediately. You may wish to consider leaving a note with the patient stating where you have gone in case they are found first.



If the patient has to be kept in this position for more than 30 minutes he should be turned onto the opposite side unless there are injuries that would be made worse by doing this.



## The Diaphragm



The diaphragm is a dome shaped sheet of muscle found directly below the lungs. It divides the thoracic cavity from the abdominal cavity and only has one hole in it, through which the oesophagus and all the major vessels pass.

The diaphragm serves to seal the lower edge of the pleural cavity, and also acts as the major muscle in breathing.

## The Mechanism of Breathing

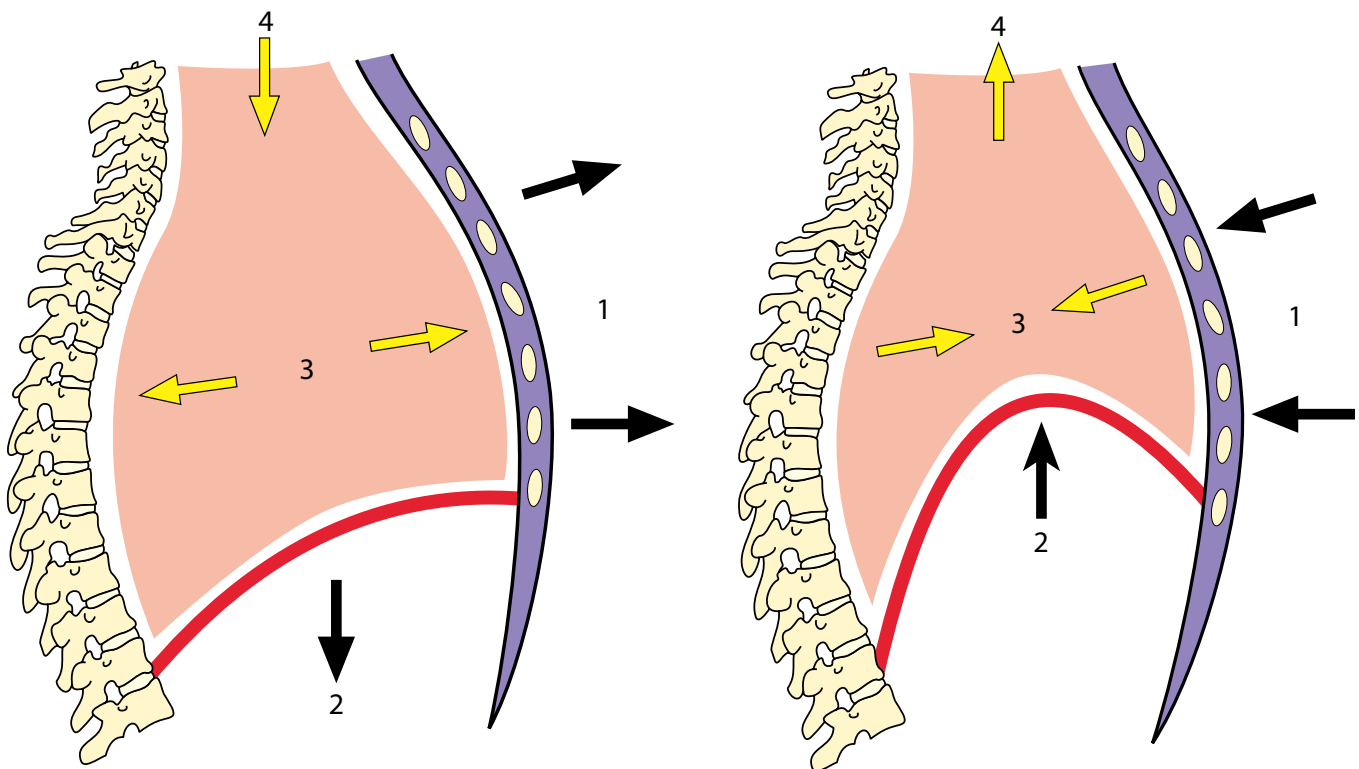
Breathing is controlled by the movement of the intercostal muscles between the ribs, and the diaphragm.

### Inspiration

When we breath in, or inhale, the intercostal muscles contract, which pull the ribcage upwards and outwards. At the same time the diaphragm also contracts and flattens downwards. As a result the volume of the chest is increased and the lungs expand. This causes a negative pressure and as a result, air is sucked into the lungs through the mouth and nose.

### Expiration

When we breath out, or exhale, the diaphragm and the intercostal muscles relax. The chest moves downwards and the diaphragm relaxes upwards back into its relaxed dome shape. As a result the chest volume is reduced, the lung pressure rises and air is forced out of the mouth and nose. Inspiration is therefore the active part of the breathing cycle (when the muscles contract) and expiration is passive.



### Inspiration

1. Ribs raised
2. Diaphragm depressed
3. Lungs expand
4. Air drawn in

### Expiration

1. Ribs return
2. Diaphragm relaxes
3. Lungs contract
4. Air expelled

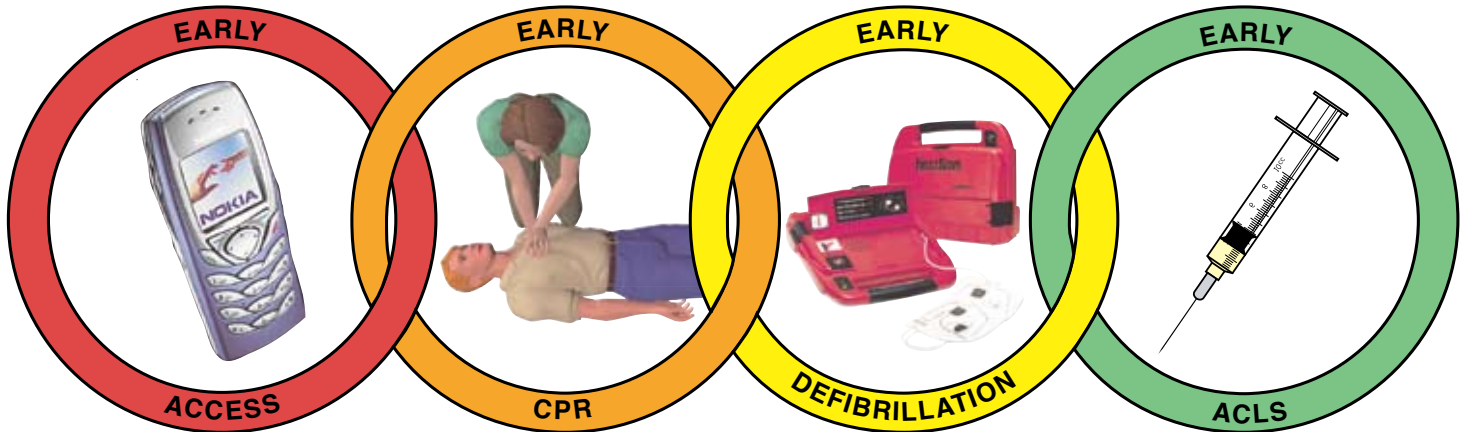
## The Chain of Survival

### CPR stands for:-

*Cardio* (heart)  
*Pulmonary* (lungs)  
*Resuscitation*

The human brain will be irreversibly damaged if it is deprived of oxygen for more than 3 - 4 minutes at normal body temperature (this time will be extended if the body is hypothermic, ie. too cold). The other organs are not quite as sensitive, but they will all eventually die without oxygen. It is therefore vital that a patient without breathing or circulation is treated as soon as possible.

It is important to understand that CPR alone will not restart a non-beating heart. CPR merely keeps the body oxygenated until further help arrives, therefore it is absolutely essential to get back up help on the way as soon as possible. This principle is known as the "Chain of Survival" and consists of the following four parts:-



### Early Access

The emergency services must be activated as soon as it is determined that a patient is not breathing to ensure help is on its way. However, there are a couple of exceptions to this rule (see page 25).

### Early CPR

CPR, or cardiopulmonary resuscitation, needs to be started immediately that it is obvious that a patient has no circulation. It should not be stopped unless the first aider is physically unable to continue; is replaced by another trained rescuer or is told to stop by a doctor.

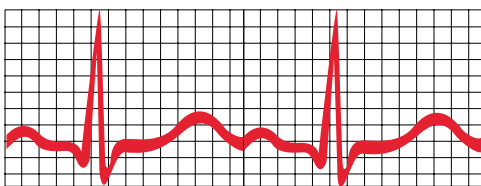
### Early Defibrillation

Bystander CPR is extremely useful, but it cannot restart the heart alone. Therefore, it is only a stopgap measure to keep the brain oxygenated until a defibrillator arrives.

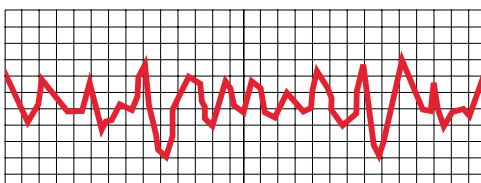
Between the time that the heart stops beating effectively and it dies it takes on one of several rhythms. One of these rhythms is called ventricular fibrillation, in which the heart simply quivers ineffectively. A defibrillator, works by passing a current through the heart, which temporarily interrupts the fibrillation with the hope that when the shock ends the heart can resume beating normally. However, defibrillation can only treat a heart in ventricular fibrillation and not any of the other abnormal rhythms, so it should not be looked upon as a miracle cure.

### Early Advanced Cardiac Life Support (ACLS)

ACLS consists of intravenous drugs, such as epinephrine (adrenaline) and anti-arrhythmic agents, such as lignocaine, at the scene. Treatment in an intensive care unit, once the patient reaches hospital, is also indicated to prevent brain damage.

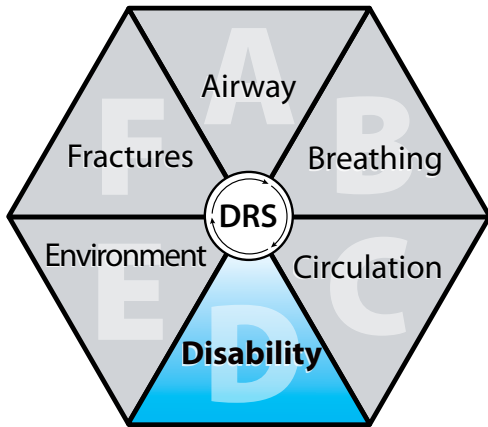


*Normal Heartbeat*



*Ventricular Fibrillation*

## Disability - Head Injuries



### Signs and Symptoms

- ⊕ cuts or bruising to the scalp
- ⊕ visible fractures or deformity to the skull
- ⊕ period of unconsciousness
- ⊕ loss of memory
- ⊕ abnormal behaviour
- ⊕ leakage of watery fluid from nose or ears
- ⊕ convulsions

Six signs that distinguish a major head injury from a minor one:-

- ⊕ indentation in the skull,
- ⊕ blood or clear fluid draining from the ears or nose (don't forget that blood from just the nose could be just a simple nose bleed),
- ⊕ abnormal eyes - the pupils may be of unequal size or may respond unequally to light (sunlight or torch - both pupils should become smaller equally when exposed to light); get the patient to count your fingers and follow your fingers from side to side and up and down,
- ⊕ bruises behind the ears or under the eyes (panda eyes);
- ⊕ a very slow pulse (under 40 beats per minute);
- ⊕ changes in levels of consciousness (prolonged unconsciousness of five minutes or more is a sign of brain injury)

Head injuries are probably the most common cause of death in outdoor accidents. They are either caused by falling objects such as rocks or ice, or by a fall in which the head is struck against a hard object such as when canoeing. Car accidents are still one of the major causes of head injuries where 70% of all injuries involve the head. In cases of head injury remember that there may also be neck and spinal injuries and treat all cases of head injury as potentially life threatening. In a location where EMS is not immediately available it is important to try to assess the seriousness of the injury. The cause is obviously important in aiding this assessment. There are two basic types of head injury: skull fracture and brain injury, which may be seen separately or together.

### Skull Fracture

The bones of the skull are broken or cracked by a blow to the head. There is usually a good chance of accompanying brain injury.

### Brain Injuries

There are a whole spectrum of brain injuries, from minor concussion to major bleeding within the skull:-

**Concussion** (or 'brain shaking") There is a temporary loss of use of some part of the brain, resulting in symptoms ranging from confusion to loss of consciousness. There is often a loss of memory of events before and after the injury occurred. Some of the signs of shock may also be present.

**Contusion** This is a more severe injury where the brain is bruised by colliding with the inside of the skull. The additional damage adds to the signs of shock, and there is often an altered conscious level, depending on the severity of the injury. Breathing is often noisy and bubbly and there may be weakness on one side of the body. You might also notice that the eyes tend to turn to one side.

**Compression** This may occur directly as a result of a depression in the skull or indirectly as a result of bleeding within the skull. It is particularly dangerous since the excess pressure on the brain, damages the delicate brain tissue. There is often some degree of twitching or convulsions, a slow full pulse, pupils which dilate frequently and unequally, a flushed face indicating a raised temperature, noisy breathing and a weakness or paralysis on one side. The level of consciousness falls as the compression rises.

### Levels of Consciousness

In cases of head injury in an isolated environment you can monitor changes in levels of consciousness during your secondary assessment. You can simply monitor the level consciousness using the AVPU mnemonic learned earlier:-

- Alert** Alert, rational, fully aware of place and time and all that is going on around him.
- Voice** The patient obeys commands when spoken to.
- Pain** The patient is aware of painful stimulus.
- Unresponsive** The patient is unconscious and responds to neither vocal commands or pain.



## Burns

### Types of Burn:-

**Dry Burn** - caused by dry heat, flames, hot objects or friction, eg. rope burn.

**Scald** - caused by steam, hot drinks or hot fat.

**Electrical Burn** - caused by low or high voltage electricity.

**Cold Burn** - caused by cold environment (frostbite), freezing metal or liquid gases.

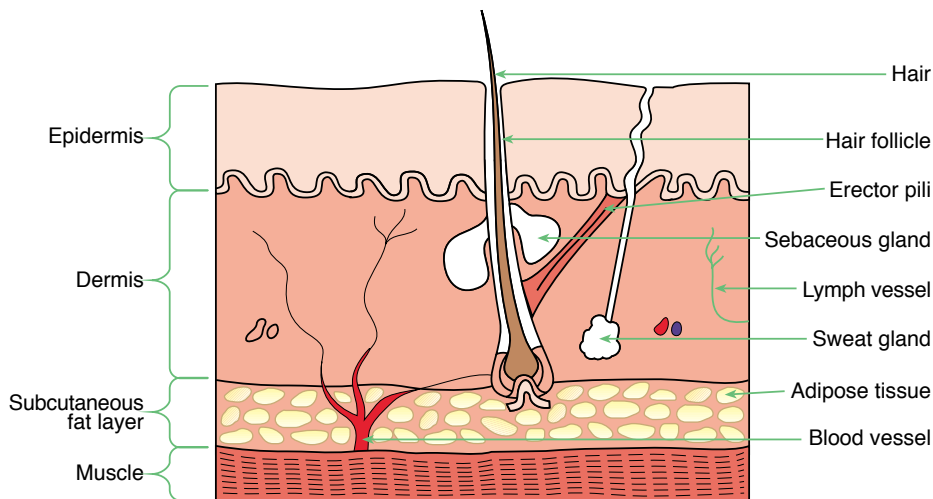
**Chemical Burn** - caused by industrial chemicals, caustic soda or bleach.

**Radiation Burn** - overexposure to UV light or sunlamps (causing sunburn or snow blindness) or radioactive sources.



### Tip:-

*The flat of the patient's hand is roughly 1% of the total body area which gives you a way of making an estimate of the size of the patient's burns.*



The skin is the largest organ of the body and consists of two layers: the epidermis and the dermis which lie on top of the subcutaneous fat. Its function is to protect from injury and infection, control the body's temperature and prevent excess water loss. The outer layer of the epidermis is constantly being shed with new cells moving up from the dermis to replace them. House dust consists mostly of dead cells from your epidermis! The dermis contains structures that give the skin its characteristic appearance such as hair follicles, sweat glands, oil (sebaceous) glands, blood vessels and nerve endings.

Burns are described by the layers of the skin that have been damaged:-

#### Superficial Burns

Superficial burns (previously called first degree) occur when only the superficial part of the epidermis has been injured, eg. mild sunburn. The skin is red but not blistered. These burns take 5-10 days to heal.

#### Partial Thickness Burns

Partial thickness burns (previously called second degree) occur when the burn penetrates through the epidermis and into the dermis. Blisters will form on the skin, which will be moist and mottled white to red. These burns take at least 2 weeks to heal and usually leave scarring.

#### Full Thickness Burns

Full thickness burns (previously called third degree) extend through the dermis and into the underlying layers. The burned area is often dry and charred or chalky white in colour. You may be able to see clotted blood vessels or underlying fat showing through. Because the nerve endings have been burned away the burned area may be without feeling, although surrounding areas of second degree burns may be extremely painful. Full thickness burns do not heal and skin grafts are needed.

#### Life-threatening Burns

Burns are often serious but the following guidelines will help you to determine how critical the burn is and whether you need emergency services backup:-

- ⊕ full-thickness burns on hands, face, airway, genitalia
- ⊕ more than 10% full-thickness burns
- ⊕ more than 25% partial-thickness burns
- ⊕ burns complicated by fracture or other major soft tissue injury
- ⊕ smoke inhalation
- ⊕ age - younger than 5 or older than 55
- ⊕ infection and toxic shock

## Suspension Trauma

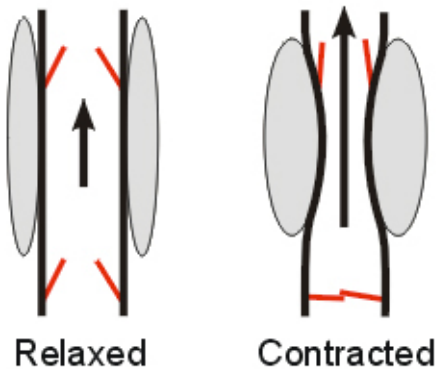


Suspension trauma is a perfectly natural reaction caused by the body being held in an upright position. It will happen to everyone, and you do not need to be ill or injured - simply standing still and unable to fall over.

Our blood supply and heart cannot cope very well with standing up - gravity pulls blood into the tissues of our legs, and the heart cannot suck it back. 60% of our blood volume can pool in our legs, remember 30% blood loss can be catastrophic and life threatening. However in normal circumstances the muscles in our legs squeeze blood vessels and push blood back to the heart, however if we hang in a harness then the blood pools in our legs, our blood pressure to the brain falls, and we faint. Normally this would work and blood would flow back to the brain once lying down, however if you are in a harness once unconscious the situation worsens.

### Signs and Symptoms

- ⊕ feeling faint
- ⊕ history of hanging in a harness
- ⊕ onset of shock - cold, pale clammy skin and weak, rapid pulse
- ⊕ unconsciousness



### How long have you got?

If your legs are perfectly still, then you can start feeling the first signs of shock in as little as three minutes. The average is between five and twenty minutes. You will faint a few minutes after that, and if you are not allowed to lie down straight away then your brain can start to die a few minutes later.

In a worst case scenario you can be dead in less than 10 mins, however the time can be variable with young children being immune (their bodies are just too short!) and older people suffering first. However if you are suspended in a harness death is often much quicker than this since once you faint, you lose control of your airway and if your body is upright you can choke on your tongue and suffocate in a matter of seconds.

### Treatment

#### Initial Assessment

**D R S A B C D E F**

#### Lower to ground

As soon as possible lower the patient to ground

#### Do not lie down

Try not to lie the patient down. Instead keep them sitting for at least 30 mins. If you lie them down 60% of their blood volume returns to their core. This can overflow the heart and cause it to stop.

#### Use airway

If you have a Guerdal airway and the patient is unconscious insert it to maintain an airway whilst keeping the patient in a sitting position.

#### Give Oxygen

If available give 100% oxygen

#### Send for Help

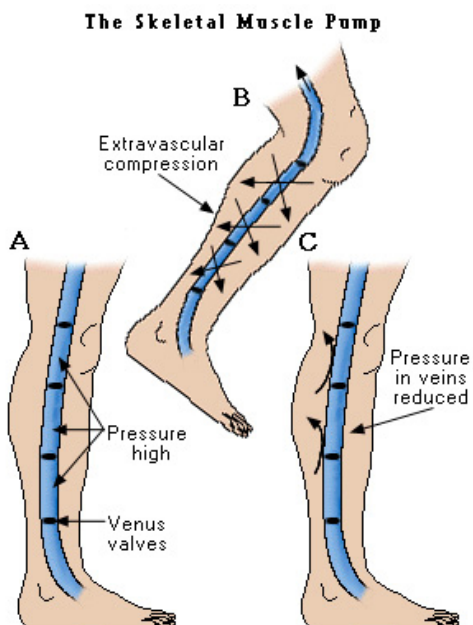
Send for medical assistance

#### If the patient has only been suspended for a couple of minutes

**Transport lying down** Major reflow problems to the heart are unlikely to occur.

#### If the patient has suspended for longer than a couple of minutes

**Transport sitting up** You probably know more about this than most paramedics. Ensure that the patient is kept sitting up during transport or on a bed reclined to no less than 30°. Be insistent as this position is completely opposite to all normal first aid treatments



## Lyme's Disease



Deer Ticks



### Signs & Symptoms

- ⊕ fatigue
- ⊕ chills and fever
- ⊕ headache
- ⊕ muscle and joint pain
- ⊕ swollen lymph nodes
- ⊕ a characteristic 'bull's-eye' skin rash, called *erythema migrans*



Erythema Migrans Rash

### Tick Removal

There are many methods for tick removal:

- ⊕ Do not burn it off as it will hurt you more than the tick.
- ⊕ Do not pull off -this leaves the mouth parts embedded
- ⊕ Noxious substances such as insect spray and alcohol will remove the tick but probably not before it has vomited into the wound which increases the transmission of any infection. Do not cover with petroleum jelly or sun screen since this suffocates the tick!.

Two methods work well:-

- ⊕ Use a dog tick remover available from pet shops. It is a metal or plastic strip with a V-groove at one end. This slips under the tick mouth parts and levers the tick out.
- ⊕ Unscrew anti-clockwise - it works! Their mouth parts are so orientated that this works

Tick bites can transmit many infections from tick typhus in Africa to Rocky Mountain spotted fever, ehrlichiosis in North America, and tick-borne encephalitis in Europe. Lyme's disease is a common bacterial infection transmitted by ticks across the northern hemisphere. It is characterised by a spreading red rash, often with a red leading edge and pale centre, at the site of a tick bite

Lyme disease is caused by an infection from a micro-organism (*Borrelia burgdorferi*), itself transmitted by a bite from the wood tick, a blood-sucking parasite which normally lives on deer. The wood tick is found in many areas, particularly in forests where deer are common. A tick will settle anywhere on a human body, but prefers warm, moist and dark places like the crotch or armpits. When the tick has found a suitable place on the body, it sticks in its probe to draw up blood, exposing the patient to the risk of infection. Lyme's disease is often difficult to diagnose because its symptoms and signs mimic those of many other diseases. The fever, muscle aches, and fatigue of Lyme's disease can easily be mistaken for viral infections, such as the flu. Joint pain can be mistaken for rheumatoid arthritis, and neurologic signs can mimic those caused by other conditions, such as multiple sclerosis. At the same time, other types of arthritis or neurologic diseases can be misdiagnosed as Lyme's disease.

### Treatment

#### Initial Assessment



#### Take Vital Signs

Pulse, respirations, temperature, colour and BP.

#### Medical History

Use SAMPLE to ask suitable questions. Has the patient been bitten by a tick.

Remove tick as soon as possible. Use a tick remover or unscrew ticks anticlockwise.

#### See Doctor

Where the skin is infected, skin/soft tissue is red, inflamed and tender seek treatment from a doctor as antibiotics are necessary.

### Avoidance of Lyme's Disease

- ⊕ Avoid tick-infested areas, especially in May, June, and July.
- ⊕ Wear light-coloured clothing so that ticks can be spotted more easily.
- ⊕ Tuck trouser legs into socks or boots and shirt into trousers.
- ⊕ Tape the area where trousers and socks meet so that ticks cannot crawl under clothing.
- ⊕ Spray insect repellent containing DEET on clothes and on exposed skin other than the face, or treat clothes (especially pants, socks, and shoes) with permethrin, which kills ticks on contact.
- ⊕ Wear a hat and a long-sleeved shirt for added protection.
- ⊕ It is unlikely that you will contract Lyme's disease if you remove the tick within 24 hours. Remove all ticks promptly.
- ⊕ Walk in the centre of paths to avoid overhanging grass and brush.
- ⊕ Check out the Lyme Disease Action(UK charity) website at: [www.lymediseaseaction.org.uk](http://www.lymediseaseaction.org.uk) for the latest info.