Taekwon-Do First Aid
And
Injury Management

Essay for IV Dan Grading – February 2008
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INTRODUCTION

This thesis discusses basic first aid principles and management of common Taekwon-Do injuries. It acts as a reminder of the key principles that can be understood by most Taekwon-Do practitioners whom already have a basic knowledge in sports first aid. It is designed to be a manual that can be used as a quick reference and can be added in the first aid kit. It is not, however, a replacement for first aid courses, as formal first aid training is vital in implementing effective management.

The minimum requirement at all training sessions and tournaments should be the presence of a person with formal first-aid and cardiopulmonary resuscitation (CPR) training such as the Head Instructor or St John's, whom are usually present at tournaments.

Injury management involves identifying, treating and recovering from injury. It includes emergency procedures, first aid and injury rehabilitation. A serious injury needs to be evaluated as soon as possible using the appropriate first steps, D.R.S.A.B.C.S (Danger, Response, Send for Help, Airway, Breathing, Circulation, Severe bleeding) to determine its severity. CPR should be implemented if required.

The 'golden hour' is the first hour after the patient was injured. A patient with severe, life-threatening injuries has a much better chance of survival if he or she makes it to a hospital Emergency Department within this hour. Thus prompt calling for an ambulance is often a life-saving action within this hour.

If emergency treatment is not needed, T.O.T.A.P.S. (Talk, Observe, Touch, Active Movement, Passive Movement, Skill Test) is an effective tool for further assessment. The P.R.I.C.E.D. procedure (Protection, Rest, Ice, Compression, Elevation, Diagnosis) should be followed for soft tissue injuries (bruises, strains and sprains) and the patient should avoid H.A.R.M-ful factors (heat, alcohol, running, massage) within the first 72 hours. The injury should ideally be assessed by a health professional.

Injury management aims to prevent additional pain or discomfort to the patient and minimise the consequences of the injury. Correct management speeds up recovery and reduces the likelihood of ongoing problems. Effective management is especially important for children, as they are still growing and developing. Injuries that are not managed appropriately can lead to problems later in life. The early, accurate diagnosis by a health professional of any injuries such as fractures that may involve active bony growth plates or joints is important, as failure to detect these injuries may lead to permanent deformity.

Ideally, they should return to training or competition when the injury is completely rehabilitated, so to avoid further injury. Health professionals such as sports doctors and physiotherapists are important in helping with the rehabilitation process.

Successful initial management of Taekwon-Do associated emergencies requires anticipation and thorough preparation. Preparation includes personnel, training and equipment consistent with the potential severity of injury associated with the activity, the environment and the participant population. Regarding travel advice, see your travel centre, the travel doctors and your family doctor for medical / travel insurance, specific medical advice, a suitable first aid kit, immunizations and medications that you may need on your travels.

Finally, I hope you find this thesis useful and an easy reference. Please remember that if you have any serious concerns about your patient, call an ambulance immediately!!

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1. IMMEDIATE INJURY MANAGEMENT

The immediate response to an injury is D.R.S.A.B.C.S. This will allow you to identify and deal with the initial life-threatening conditions before commencing treatment of non-life-threatening injuries. If there is impairment in breathing or the pumping of the heart, then emergency procedures must be instigated to sustain life via Cardio Pulmonary Resuscitation (CPR). Preserve life by effective resuscitation until further medical assistance arrives.

1.1 Priority Action Plan

D	*Danger*	To yourself, bystanders and the patient
R	*Response*	Conscious or unconscious (shake & shout)
S	*Send for help*	Seek professional medical assistance : Call 111
A	*Airway*	Open the airway (head tilt / chin lift / jaw thrust) Clear obvious obstructions
B	*Breathing*	Check breathing (look / listen / feel)
C	*Circulation*	Check for a carotid (neck) pulse → If no pulse, start CPR → Chest compressions at 100 per minute / 30:2 ratio
S	*Severe bleeding*	Check for and control severe bleeding Cover with a blanket to prevent heat loss

If the patient is able to respond coherently to your questions then the above is likely to be ok

<u>Helpful tips</u>

- Always wear *disposable medical gloves* to protect yourself

Information you require when *calling an ambulance*:

- Phone number
- Street address / suburb / city
- Number of patients
- Injuries if known or type of medical problem

- *Do not shake infants or patients with suspected cervical (neck) spinal injury*
- If a neck or spinal injury is suspected and the player is conscious, do not move them, leave them in the position in which you found them and call for an ambulance immediately

- Any unconscious athlete or any athlete who complains of numbness, weakness, paralysis or neck pain should be assumed to have cervical spine injury until proven otherwise. Manage as for a head injury with possible severe neck injuries. Always protect the spine from untoward movement especially if they are unconscious. Do not move the neck forwards or backwards or twist in any way.

- Immobilization is best managed with the patient on their back on a firm, flat surface with the head and neck maintained in a neutral position by manual in-line immobilization until an appropriately fitting semi-rigid collar can be applied.
- Support the head and maintain this position at all times until further medical assistance arrives. Do not at any stage let the head go.

- If the patient has a suspected spinal injury, the headgear can remain in place during transport and removed in the controlled setting of an emergency department. The patient should not be transported from the training area until the ABCs and the spine have been stabilized.

- *Maintain an open airway, open the airway via head tilt and chin lift*
- Avoid head tilt if trauma to the neck is suspected, instead use jaw thrust

- *Look, listen and feel for breathing for up to 10 seconds*

- If breathing and there are no major injuries, place them in the recovery position, maintain an open airway and monitor for continued breathing

- If breathing is required and a protective breathing device is unavailable, cover the patient's mouth with a makeshift guard e.g. a light handkerchief
- Place the patient on their back on a firm surface
- Look in the mouth for any obstruction, vomit or other material and remove it
- Maintain the head tilt / chin lift position
- Pinch the patient's nostrils and make a good seal around the patient's mouth
- Give two effective breaths, and watch the rise / fall of the chest
- Mouth-to-nose technique may be used if the mouth cannot be opened or if there are injuries to the mouth

- *Check the carotid (neck) pulse for no more than 10 seconds*

- If pulse is present but breathing is absent, give 1 breath every 5 seconds

- If pulse is absent, place them on their back and start chest compressions
- Place the heel of the hand on the lower half of the sternum
- Depress the sternum approximately 1/3 the depth of the chest
- Aim for a compression rate of 100 per minute
- Ensure you are kneeling perpendicular to the patient when commencing CPR

CHEST COMPRESSIONS

	Compressions : Breaths	***Depth (approx)***	***Compress with***
Adult (age 8+)	30 : 2	4-5cm	two hands
Child (age 1-8)	30 : 2	2.5-4cm	one hand
Infant (age < 1)	30 : 2	1.3-2.5cm	two fingers

- *Reassess every minute (approximately 4 cycles) for signs of circulation*

- *Continue CPR until their pulse and breathing has been restored OR an ambulance officer or other health professional takes over responsibility OR you are exhausted*

- *If the history of the incident suggests that severe bleeding is a possibility :*
    - Carry out a rapid survey of the patient
    - Check head and neck, lower spine area, trunk, arms and legs
    - Place clean dressing on wound and apply pressure i.e. push
    - If an arm or leg is injured, elevate i.e. lift it up high
    - Lay patient down
    - If there is a lot of bleeding → Call an ambulance
    - Maintain pressure and elevation
    - Further management of bleeding is described in later sections

1.2 Position

Place the patient in the most appropriate position to ensure maximum ease of breathing and adequate blood circulation. There are four commonly used positions :

Recovery position

For unconscious patients, whom are breathing, have airflow at the mouth and do not have spinal, pelvic or major fractures

For conscious patients whom are suffering from shock due to fluid loss

Lay them on their back and elevate their feet 30° (50cm) above the ground with support

DO NOT elevate their feet if they have spinal, pelvic or leg fractures

Shock position

Half-sitting position

For conscious patients +/- with medical conditions

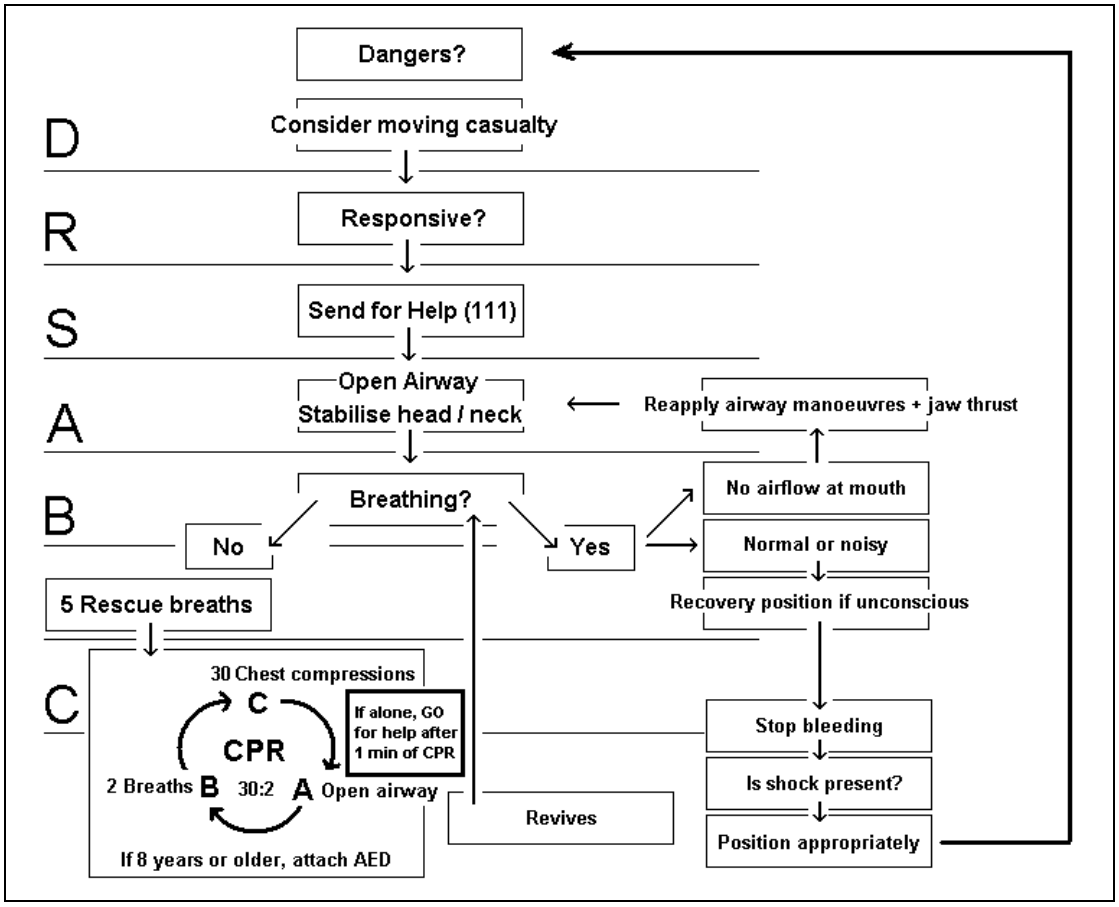
As-found position

Provided they have an open airway, this position is used most often for spinal or pelvic injuries, and any major fractures where movement would seriously increase tissue damage

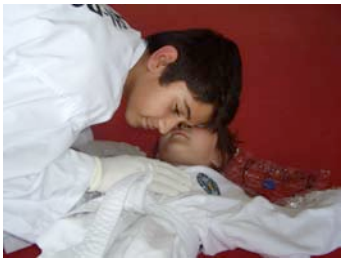
1.3 Collapse algorithms

The following are algorithms from the New Zealand Resuscitation Council :

1.3.1 *Child basic life support*



Airway (open / clear)



Breathing (look, listen, feel)

Give 5 rescue breaths

Circulation (neck pulse)

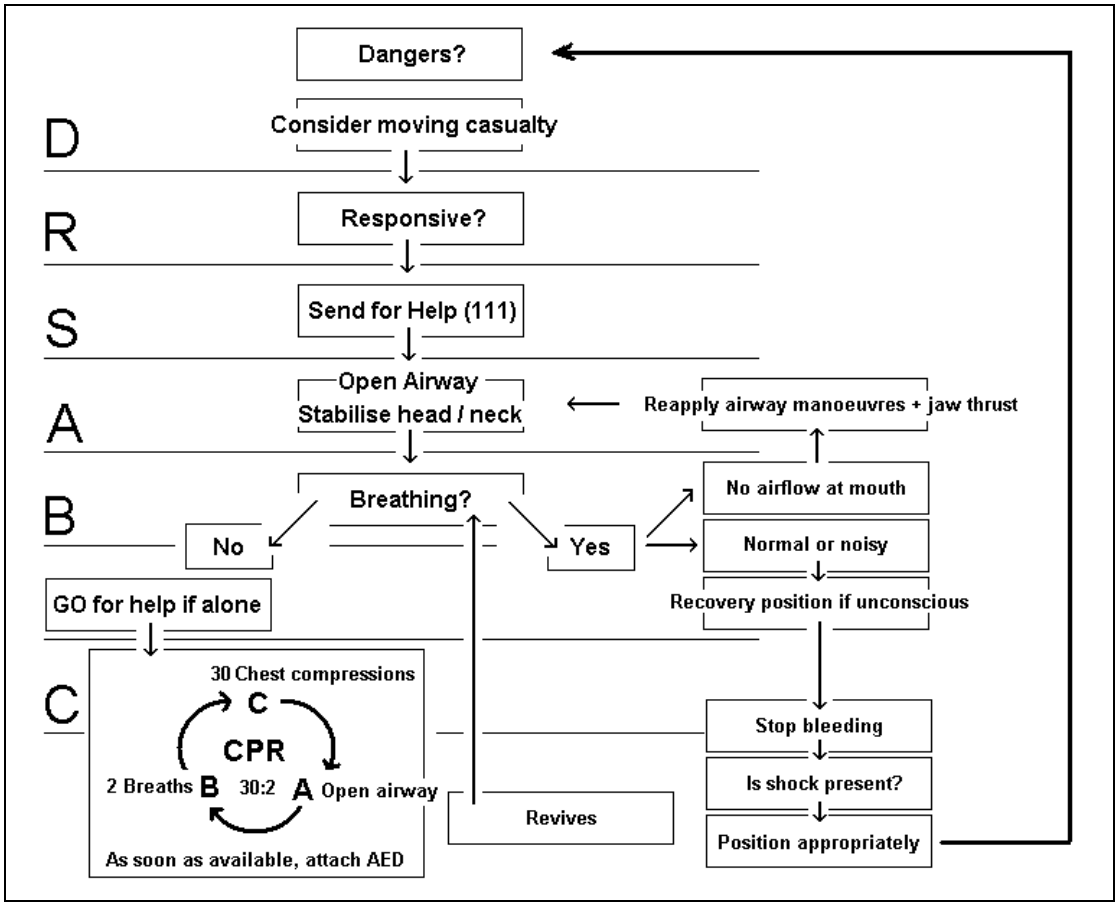
Compression (1 hand)

Recovery position

Helpful tips

- Children are more likely to suffer from respiratory arrest (impairment in breathing) rather than circulatory arrest (impairment of the heart pump)
- If they are not breathing, give 5 effective breaths before checking for a pulse
- For infants, use mouth-to-nose or mouth-to-nose and mouth technique
- In infants check the brachial (inside arm and above the elbow) pulse
- Compression techniques for infants and children are similar to those used for adults
- Use 1 hand compression technique for ages 1-8 and 2 fingers if age < 1 year
- Continue CPR for 1 minute then if you are alone, GO for help

1.3.2 *Adult basic life support*



Jaw thrust in neck injury

Breathing (look, listen, feel)

Circulation (neck pulse)

Compression (two hands)

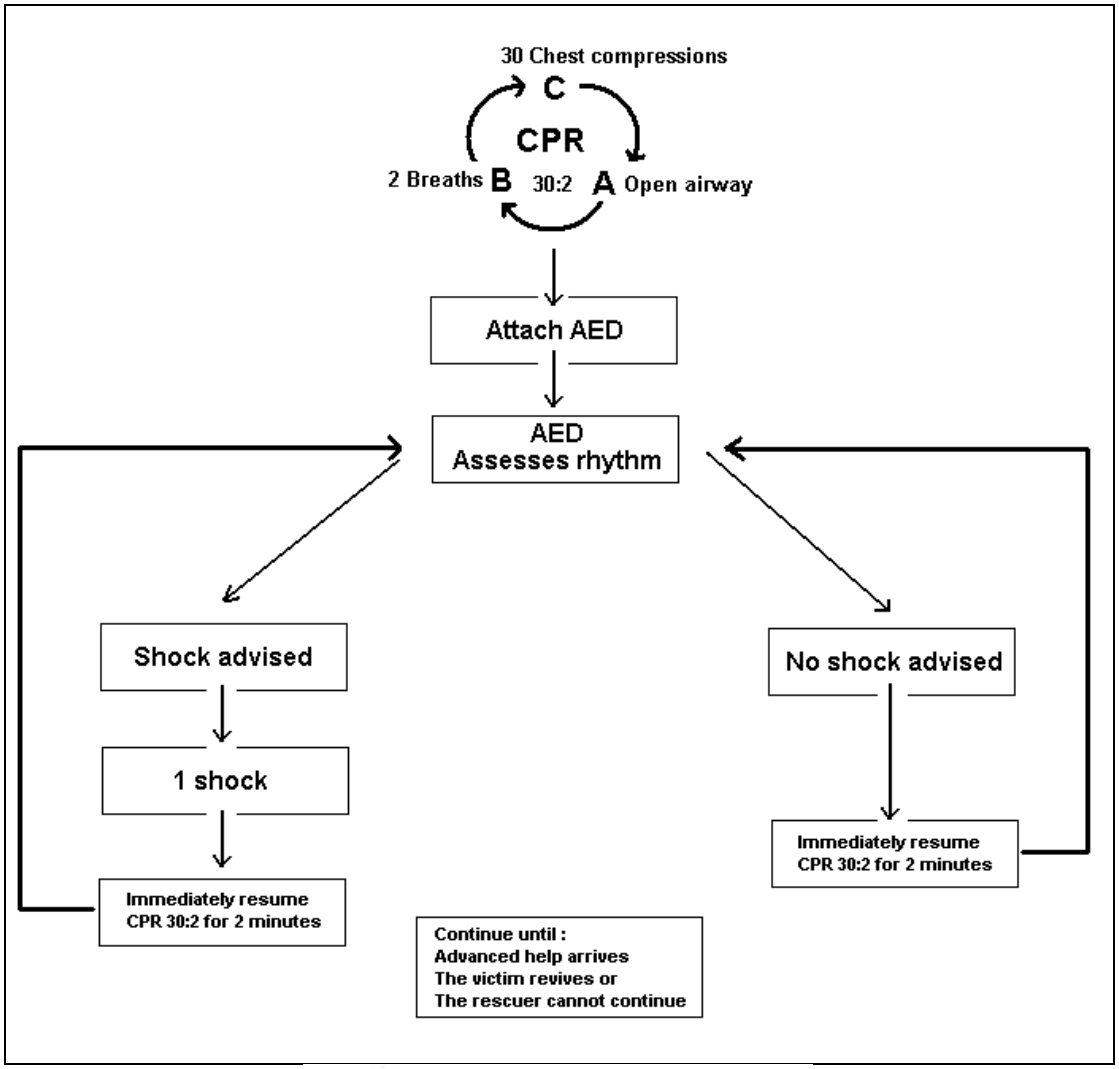
Recovery position (if no spinal injury)

Keep headgear on (if spinal injury)

Helpful tips

- In adult collapse, primary heart rhythm disturbances causing sudden circulatory arrest is common, a defibrillator is the only treatment, thus dialing 111 and calling an ambulance is an early priority
- Start effective CPR as soon after the circulatory arrest as possible
- Compressions needs to be controlled and uninterrupted except for defibrillations
- Use both hands, place the heel of the lowest hand on the lower half of the sternum
- Depress the sternum approximately 1/3 the depth of the chest i.e. 4-5cms in adults
- Compression : Ventilation ratio is 30:2 i.e. 30 compressions to 2 breaths
- Rate of chest compressions is 100 per minute
- Ensure frequent change-over of the person performing CPR i.e. every two minutes as it is physically demanding

1.3.3 *AED (Automatic External Defibrillator)*



Helpful tips

- AEDs (Automatic External Defibrillators) are machines used solely for defibrillation
- Continue CPR until an AED is available from e.g. the ambulances, public venues
- The AED machine guides the operator through the process
- Knowledge of setting up and using the AED is essential
- Once attached to the patient, the defibrillator monitors the patient's heart rhythm
- It automatically advises when a shock should be given i.e. for a shockable rhythm
- It delivers a *single* shock and allow immediate resumption of CPR (with-out a pulse check) for two minutes before the next re-analysis
- Keep well clear of the patient when the shock is being delivered
- There are paediatric pads available for children under 8 years old
- Do not apply AEDs to infants < 1 year old

2. ASSESSMENT OF INJURY (T.O.T.A.P.S.) :

After assessment with DRSABCS the following T.O.T.A.P.S. assessment procedure should be used. A focused history and understanding of the mechanism of injury will help guide the search for associated injuries and co-morbid complications that may not be apparent initially.

Signs and symptoms include pain, swelling, tenderness, bruising, limited movement and difficulty doing daily tasks.

Talk:
- How did it happen?
- Where does it hurt?
- How did you land : twisted, straight?
- Did you feel clicking or locking, or hear noises?
  - Clicking, locking or grating noises could indicate bone and cartilage injury
  - Snap, rip, tear or giving way could indicate muscle, tendon or ligament injury
- What kind of pain?
  - Throbbing could indicate arterial or circulatory involvement
  - Burning or searing with pins and needles could indicate nerve involvement
  - Pain on movement could indicate muscle or ligament damage, or tension through scar tissue from previous injury
- Any other questions relevant to the suspected condition

Observe:
- Look for signs of injury and compare with the opposite side
  - Bones – general alignment, deformity or unusual shape
  - Soft tissues – contours, shape, note any swelling
  - Colour – redness (inflammation), pale or bluish (diminished circulation)

Touch:
- Lightly touch the area and be mindful of patient comfort
- Is the injured area tender to touch? Warm?
- Touch away from the injured area and work towards it
- What is the extent of the painful area?
- Try to locate the exact site and relate it to a particular structure

Active Movement:
- Ask them to move the injured part gently until restricted by pain
- Significant restriction indicates serious injury

Passive Movement:
- If active movement is achieved, proceed to gentle movement of the injured area to the point of pain or restriction and if possible through a full range of motion (ROM)
- Return to training should not be considered unless pain-free full ROM is evident

Skill Test:
- If none of the above procedures has resulted in pain proceed with skill testing
- Ask them to stand unaided
- Ask them to walk, jog and carry out specific skills related to the injured part
- Return if pain free and observe for further problems

If an injury is identified the patient should be removed from the activity and treated. The guidelines do not apply for assessment of head injuries / concussion or suspected spinal injury. In the case of suspected spinal injury, the patient must be kept lying flat and immobile until professional assistance is available.

3. INJURY MANAGEMENT :

Following on from immediate assessment and management, this section is divided into several areas at providing basic information necessary to undertake the on-field assessment and management of the athlete.

The main areas are:

3.1 Control of bleeding and shock

3.2 Hard tissue injuries (fractures and dislocations)

3.3 Soft tissue injuries

3.4 Environmental conditions

3.5 Specific injuries

3.6 Medical conditions

3.1 CONTROL OF BLEEDING AND SHOCK

Aim to reduce the risk of cross infection and prevent further loss of blood. Bleeding can occur internally or externally, ranging from common abrasion, cut or incision to the more severe cut, laceration or penetrating wound.

3.1.1 Shock

Shock is a life-threatening condition caused by injury or illness, which reduces the blood supply to the tissues of the body. As a result the body does not have enough circulating blood and thus inadequate circulating oxygen to vital organs and can result in organ failure. Generally in trauma, shock is generally the result of low blood or fluid volume.

Shock must be recognized quickly and managed without delay. Severe shock can be difficult to reverse if a patient does not receive medical treatment within an hour of onset. Shock will be present in most serious first aid situations. The body compensates by reducing blood flow to the non-vital parts (skin, arms, legs, stomach and intestines) in order to maintain an adequate supply to the vital organs. The restriction of blood to the non-vital organs provides most of the signs and symptoms of shock.

<u>Signs and symptoms of shock</u>

- Pale, cool and clammy skin
- Rapid and shallow breathing
- Weak and rapid pulse
- Nausea
- Thirst
- Anxiety
- Dizziness or feeling faint
- Decreasing level of consciousness

<u>Management of shock</u>

- DRSABCS
- Call an ambulance
- Determine the level of consciousness
- Reassure the patient
- Determine and treat the cause of shock
- Lie the patient flat, in the recovery position or the shock position
- Maintain the patient's temperature with sufficient blankets to prevent heat loss
- Insulate the patient from the ground
- Do not over heat as this would draw blood away from the vital organs
- Do not give the patient anything to drink or eat or smoke

<u>Shock position</u>

- Place in the shock position if the patient is conscious and suffering from shock
- If injured, consider whether you will aggravate the injury by moving into this position
- Lay the patient on their back with a blanket underneath
- Providing the patient does not have spinal, pelvic or leg fractures, elevate their feet approximately 50cm above the ground and support them
- This reduces unnecessary blood flow to the legs and increases the amount of blood available to the vital organs

3.1.2 External bleeding

- Always wear disposable medical gloves
- Ensure DRSABCS
- Lay or sit the patient down and rest the injury
- Check that there is no dirt etc in the wound
- Flush these out with normal saline or clean water
- Apply clean, ideally sterile dressing and covering
- Apply direct and firm pressure to the wound
- Maintain pressure until a clot forms, this normally takes from 5 to 15 minutes

- Cover wound entirely with a clean pad
- Bandage firmly and apply direct pressure
- Check pulse below the area bandaged if a limb is involved, if pulse absent, loosen the bandage
- Elevate, support and immobilize the injured part
- Treat shock

If the bleeding continues, apply a further dressing over the top of the first dressing until the required pressure is achieved to stop the bleeding. For a wound of this severity, refer to a doctor or hospital to have a full assessment undertaken.

3.1.3 Internal bleeding

- This is usually invisible and very difficult to detect immediately
- The bleeding may be into an organ, tissue or body cavity
- Any one of the symptoms and signs of shock may accompany internal bleeding

Indications of internal bleeding

- Pain or tenderness over or around the affected area (esp. abdominal injuries)
- Swelling (especially legs and arms)
- Coughing (from lung injuries) or vomiting blood
- Blood in the urine or faeces or discharging from the ears or nose (after a head injury)

Other indicators may be the

- History of the incident (e.g. blow with a fist)
- Location of the contact (e.g. blow to the kidneys, kick to the thigh)

Management

- Monitor DRSABCS, call an ambulance
- Lay the patient down and advise them not to move
- Elevate the legs as per shock position
- If the patient commences to vomit, place them in the recovery position
- Once vomiting is finished, raise their feet (if injuries allow) as per shock position
- Loosen clothing around the neck, chest, waist
- Provide reassurance and warmth by covering with blankets
- Monitor ABCS regularly
- Undertake a complete examination and appropriately treat any injuries
- If becomes unconscious, ensure airway is open and check breathing
  → Place in recovery position

3.1.4 Body substances

- Always wear disposable medical gloves (if they are not available, use plastic bags)

- Avoid direct contact with blood or any other body fluid
- If blood comes into contact with your skin / eyes, flush immediately with cold water
- Cover any cuts, grazes or other open wounds on your own skin first
- Have the injured person apply pressure to the wound themselves if possible
- Wash your hands thoroughly after dealing with the patient
- It is preferable that all sports first aiders are vaccinated for Hepatitis B
- Blood contaminated items and blood spills can be cleaned by soaking them in a solution of one part bleach in ten parts water

3.2 HARD TISSUE INJURIES (FRACTURES AND DISLOCATIONS)

A bone may be broken (fractured) by a direct or indirect force. A direct force is produced by an impact and an indirect force by twisting when one end of the limb is rotated. Fractures are usually associated with extensive soft tissue injury with resultant bleeding and swelling of tissues. In some cases, bony fragments may be forced into organs, causing more bleeding, and occasionally major blood vessels and nerves may be damaged. Open fractures communicate with the surface of the skin and with the air and may become infected.

3.2.1 Fractures

Types of fractures

- Closed fracture – where the skin surface is intact around the fracture site
- Open (compound) fracture – where a break in the skin occurs associated with it
- Complicated fracture – where the fractured bone penetrates adjacent organs or causes damage to nerves or blood vessels
- Greenstick fracture – in children, the bones are more flexible and may not break completely when force is applied to them
- Stress fracture - this occurs as a result of repetitive loading on a particular bone without adequate chance to recover, the patient complains of pain and tenderness over a particular area, an appropriate sports or bone doctor (orthopaedic surgeon) should evaluate this

Signs and symptoms

- Severe pain at or near the site of the injury
- Tenderness and irregularity on examination
- Soft tissues may become swollen and bruised
- Patient may report that they heard the sound of bone breaking
- The limb may appear deformed or bent (angulated)
- Movements are either restricted or abnormal
- Movement may produce a grating sound (crepitus)
- Loss of function, discolouration and/or circulatory problems
- If there is major bone fractures or multiple fractures, blood loss will be severe and the patient may become shocked, the amount of blood loss can be life-threatening

Management

- DRSABCS should identify any complications, call an Ambulance
- Control any external bleeding using direct pressure
- Do not press over the site of the fracture or over any wound in the case of an open fracture, and do not push the protruding bone back into the wound
- Cover exposed bones and open wounds with sterile saline-soaked dressings ASAP
- Splint in the most comfortable position and ensure to minimize any, or all movement
- Do not attempt to realign any deformed fractures, just splint in that position
- Rolled-up blankets, clothing, wood or adjacent body parts can be used as splints
- Securely fasten the splint in place by bandages above and below the fracture site
- Extend the splint beyond the next joint of the fracture site (above and below)
- Stabilise the splint by padding between the splint and the affected limb
- Firm bandaging to secure the splint but not so tight as to restrict blood flow
- Support upper limb fractures in a sling, extra padding may be applied at fracture site, and further stabilization achieved by securing the sling to the chest with bandages
- Where possible, a fractured limb should be slightly elevated to minimize bleeding and swelling of adjacent tissues
- Do not attempt to move a patient unless the fractured limb is securely immobilised

Splinting a fracture can assist in controlling the patient's pain, any internal bleeding and soft tissue damage. This also assists in preventing a simple or closed fracture from becoming an open or complicated fracture.

3.2.2 Spinal injuries

<u>Mechanisms of injury</u>

- Any soft tissue damage to the head, neck or face from a punch or kick

- Direct or indirect external force applied to the spine
- Deceleration forces against the mobile parts esp. neck and lower back

Assess for spinal cord damage

- If conscious, check and examine for:
    - Loss of movement or sensation in the limbs
    - Pins-and-needles in the lower limbs
    - Pain in the spinal region
    - Feeling of limb stiffness, clumsiness or heaviness
    - Possible associated injuries at or below the level of paralysis

- If unconscious the breathing may be diaphragmatic and the pulse slow

Management

- Aim to minimize damage and ensure that further injury does not develop
- If unconscious, be aware of the possibility of spinal injury
- Treat the patient where they are lying
- Do not initiate or permit any unnecessary movements
- DRSABCS and call an ambulance
- Open airway using the modified jaw thrust technique
- If necessary, commence rescue breathing and/or CPR
- Control any bleeding by direct pressure
- If shocked, cover with a blanket to keep warm
- Immobilise and support patient by placing rolled up clothing, blankets and other stabilizing objects alongside the trunk
- Support the neck with your hands, this provides stabilization
- If movement of the patient is absolutely necessary, use the log roll technique

3.2.3 Fractures of the skull

Assessment

- If the patient has received a blow to the head, consider fracture of the skull
- They may be unconscious or have a decreased level of consciousness
- Pupils may be of unequal size
- Complaints of nausea and possible vomiting
- Deformity of the skull
- Clear fluid may leak and discharge from the ear or nose, may indicate fracture
- Skull fracture is often associated with injuries or fracture of the spinal column

Management

- DRSABCS
- If conscious, seek urgent medical assistance or call an ambulance
- Do not bandage the skull or probe or examine the skull for evidence of fracture, as this may cause damage to the underlying brain
- Control any bleeding but do not apply direct pressure to the fractured area
- If unconscious or showing decreasing levels of consciousness
    - Monitor and maintain ABC and place in recovery position
    - Call an ambulance
- If clear fluid is discharged from the ear or nose, cover area lightly with a clean pad, but do not insert a plug into any of these spaces

3.2.4 Fractures of the facial bones and jaw

Jaw fractures

Assessment

- Complaints of jaw pain and the jaw is tender and painful on movement

- There may be tearing of soft tissue and teeth may be broken or missing
- Deformity of the jaw bone may be seen or felt on gentle palpation
- May appear to drool because of difficulty in swallowing saliva

Management
- DRSABCS
- Control any bleeding by direct pressure using a clean pad
- Sit the patient forward to allow any saliva to drain
- Do not bandage the jaw, as support is not required and it may cause airway obstruction
- Call an ambulance

Facial bone fractures

Assessment
- Tenderness with swelling and bruising at the site of the fracture
- Facial asymmetry or obvious deformity of the facial bones or loss of teeth
- Associated head and cervical spine injuries should be excluded
- Suspect a blowout fracture if the trauma has been in the region of the eye
    - The eye is forced into the delicate bones at the back of the eye socket
    - Typically presents with a peri-orbital haematoma, protruding or sunken eye, double vision on upward gaze, loss of eye movement and minor facial numbness especially over the cheek and upper lip

Management
- DRSABCS
- Maintenance of the airway is important
- Clear any dislodged teeth or tooth fragments
- If conscious, sit patient leaning forward
- If unconscious, place in the recovery position with head tilt and jaw support
- Control any bleeding
- Call an ambulance

3.2.5 Fractures of the upper limb

Collarbone fractures

Assessment
- Often caused by a fall, especially on an outstretched arm, or a blow
- Pain at the fracture site and an obvious deformity of the bone
- Movement of the arm is usually painful
- Patient prefers to resist movement and support the limb with the other hand

Management

- Best treated in sitting position
- Place injured arm across the chest with the hand pointing to the opposite shoulder and support at the elbow
- Place a sling around the injured arm and secure at the neck with the knot tied away from the site of the fracture
- Ensure that the patient is comfortable and that the sling is secured to the patient's clothing to prevent unnecessary movements
- Call an ambulance if an open or complicated fracture is suspected

Upper-arm fractures

Assessment

- Often the result of a fall
- Unable to move arm in a normal manner
- Elbow injuries may be associated with damage to one of the major nerves and cause loss of sensation to part of the lower arm

- Manage as per collarbone fractures (above)

Forearm fractures

Assessment

- Result from falls onto an outstretched hand
- It may be associated with fractures of the wrist
- Patient usually supports the injured arm with the other hand

Management

- Support the arm across the chest
- Apply a sling under the limb and tie at the neck
- Manage as per collarbone fractures (above)

Hand and finger fractures

Fracture / dislocation of the fingers is common

The hand is usually swollen and there may be extensive bruising

Movement of the fingers may be restricted and attempts at movement are painful

Management

- Gently cover the hand with a padded bandage
- Use 'buddy taping', the uninjured digit provides additional stability
- Support the arm in a sling
- Elevate the arm towards the shoulder on the uninjured side and secure with a second bandage tied across the body
- Seek medical assistance

3.2.6 Fractures of the ribs and breastbone

Assessment

Injuries to the chest often result in fracture of the ribs and/or breastbone, which may be associated with injury to the underlying organs

Symptoms are dependent on the extent of the injury

- Single rib fracture – localized sharp pain which may be made worse by breathing

- Multiple rib fractures – difficulty breathing and may have signs of a flail chest

Management
- DRSABCS
- Place in a half-sitting position with the arm supported on the injured side
- Apply a sling with the knot tied over the uninjured site
- Call an ambulance

Flail chest (serious injury - two or more ribs are broken in two or more places)

Assessment
- Obvious difficulty breathing with shallow breaths
- Part of the chest will be sucked inward as the patient breathes
- Lips and face may become blue and show signs of shock

Management
- DRSABCS, call an ambulance immediately
- Place patient ASAP into a position that allows maximum ease of breathing
- If conscious, half-sitting position, leaning toward the injured side
- If unconscious, recovery position, lying on the injured side
- Monitor vital signs esp. the breathing, if breathing becomes too shallow, assist with mouth-to-mouth respirations
- Treat for shock if necessary

If help is delayed
- Place a thick dressing (same size as the flail segment), on top of the injury
- Secure the dressing to the chest so that the flail segment will not move as the patient breathes. Do not bandage too tightly.
- Stabilise the arm on the injured site to prevent unnecessary movement

3.2.7 Fractures of the lower limbs

Pelvic fractures

Assessment
- Usually pain which may be made worse by attempting to walk
- Unable to walk and prefers to lie on the uninjured side
- Pelvis is tender to gentle pressure
- If the bladder is perforated, the patient may have blood-stained urine
- May appear shocked

Management
- DRSABCS, call an ambulance
- Place the patient on their back and raise their legs slightly by placing a pillow or other soft object under their knees
- Treat for shock

If help is delayed
- Bind the ankle and knees together firmly with bandages
- Place padding between the legs to provide support

Femur (thigh-bone) fractures

Assessment
- Often associated with considerable internal blood loss and signs of shock
- Pain at the site of the fracture with associated deformity of the bone
- Rotation of the fractured limb with the foot and lower part of the leg pointing outwards may occur

Management
- DRSABCS, call an ambulance
- Keep in the position found
- Provide support to the fractured limb with soft padding
- Do not attempt to straighten the leg if it is deformed or bent
- Treat for shock
- If it is an open fracture, cover the broken ends with a clean dressing
- Splinting and movement of the patient should be left to the ambulance officers

If help is delayed
- The limb will require splinting prior to moving the patient
- Place splint along the injured side of the body, from the armpit to the foot
- Place padding between the legs to support the injured limb
- Secure the splint with several broad bandages tied firmly around the splint and both legs, tie a bandage around the ankles and under the feet
- Secure the upper end with one or two bandages tied around the chest

Kneecap fractures and knee injuries

Assessment
- The knee can be injured by twisting movements
- Trauma to the knee area may result in tearing of the various knee ligaments
- Fracture of the kneecap may occur in a fall when the patient lands on their feet
- The kneecap may dislocate to the side of the knee during violent exercise
- Painful knee joint and the patient resists movement
- Often swelling and the knee may lock
- If the kneecap is fractured, there is extreme pain and a snap heard
    - An obvious deformity may be seen

Management
- DRSABCS
- Do not try to straighten the knee
- If the kneecap is dislocated, do not try to manipulate it back into place

- If necessary, lay the patient down and support the leg with soft padding
- Cold compresses may be applied to reduce swelling
- Call an ambulance

Lower-leg fractures

Assessment
- Usually localized pain with deformity at the fracture site
- If only one of the two bones (tibia, fibula) is broken, weight-bearing is still possible and the fracture may be overlooked or misdiagnosed as a sprain

Management
- DRSABCS
- Support the leg with soft padding and make the patient comfortable
- Do not try to reposition the bone or straighten the leg if it is bent
- Treat the patient for shock
- Call an ambulance

If help is delayed
- Support the fractured limb by securing it to the uninjured leg with broad bandages
- Secure the bandages above the fracture site and around the feet in a figure of 8

Foot-bone fractures

Assessment
- Usually pain, there may be swelling and bruising with tenderness of soft tissues

Management
- DRSABCS
- If there are no wounds, remove shoelaces, leave the shoe in place (act as splint)
- Remove the shoe if excessive swelling occurs or there is bleeding needing treatment
- Elevate the leg
- Seek medical assistance

3.2.8 Dislocation of bone

Assessment
- This often results in tearing of ligaments and other supporting joint structures
- It may be associated with muscle spasm which may result in deformity of the limb and prevent the bone from returning to its normal position
- Dislocations commonly occur in the finger, shoulder and knee joints
- Usually pain and tenderness with swelling at the joint
- The joint will be immobile and the limb or finger will appear deformed
- Signs and symptoms of a dislocation and fracture are similar
- Some dislocations may be associated with a fracture of part of the involved bone

Management
- Do not try to relocate the bone to its normal position (risk of further injury)
- Support the area of dislocation
- Injuries to the hand may be supported in a sling
- Otherwise, rest the injured limb on a soft surface such as a pillow
- Seek medical assistance
- For dislocations of the shoulder, elbow or knee, call an ambulance

3.3 SOFT TISSUE INJURIES

Injuries lead to damage of soft tissues (muscle, tendons, ligaments, skin), causing swelling, which can inhibit healing and cause pain and muscle spasm. Bruising is bleeding in the soft

tissue beneath the skin and is often accompanied by pain, swelling, tenderness and is followed by blue / purple discolouration.

Muscle strain occurs when the muscles are stretched excessively or muscle fibres are torn. Vigorous muscle activity without adequate warm-ups often results in muscle strain. There is usually pain and tenderness in the affected muscle and normal movement will be painful.

Joint sprain occurs when sudden stress results in tearing of ligaments and other supporting structures of the joint. Ligaments may be only partially torn and will heal in time; in serious cases surgical repair may be required. Joint sprain is most commonly associated with damage to the ligament of the various bones of the ankle and heel. The joint appears swollen, is tender to gentle pressure and pain is made worse by movement.

Proper treatment will help to relieve immediate symptoms and speed up recovery. An effective way of reducing the amount of bleeding at the site of injury is to apply the P.R.I.C.E.D. procedure immediately and avoid H.A.R.M-ful factors for the first 72 hours.

3.3.1 P.R.I.C.E.D. Procedure :

Protection
- Avoid further injury to the tissues and prevent additional injury to the patient
- Remove the patient from that location, may need to advise against further participation
- Protect against stress by taping, bandaging, splints, slings and using crutches

Rest
- Rest reduces further damage thus stop activity as soon as the injury occurs
- Avoid as much movement of the injured part as possible and avoid weight-bearing

Ice
- Ice cools the tissues and reduces pain, swelling and bleeding
- Wrap ice in a damp towel and place onto the injured area
- Hold the ice pack firmly in place with a bandage
- Apply ice for 15-20 minutes every 2-3 hours for the first 48 hours

Compression

Firm bandaging helps to reduce bleeding and swelling. Bandage the injury between ice treatments.

Ensure that it is not so tight that it cuts off circulation or causes tingling or pain.

Elevation
- Elevation of the injured area helps to stop the bleeding and reduce swelling
- Raise the injured area as much as possible e.g. on a pillow

Diagnosis
- Consult a health care professional, if you are worried about the injury, or if the pain or swelling gets worse or there is no significant improvement within 48 hours
- Attempt gentle exercise after 24 hrs and seek early physiotherapy for these injuries

3.3.2 Avoid H.A.R.M-ful factors

Avoid the following H.A.R.M-ful factors within the first 72 hours after an injury:

- **Heat**

- ncreases bleeding within the injured tissues
- Avoid hot baths and showers, saunas, hot water bottles, heat packs and liniments

- **Alcohol**
  - Increases the bleeding and swelling at the injured site and delays healing.
  - It masks the pain of an injury and its possible severity and can delay patients in seeking treatment early

- **Running**
  - Running or vigorous exercise of the injured part can cause further damage
  - Activity should not be resumed within 72 hours unless approved by a health professional

- **Massage**
  - This can cause an increase in bleeding and swelling
  - Should be avoided in the initial stages of an injury
  - If the injury is massaged within the first 72 hours, it may take longer to heal

Increased bleeding and swelling consequently lengthens recovery time. If the RICE treatment is completed correctly, the pain and swelling should reduce and movements will be less painful. Commence rehabilitation of injuries with early active range of movements despite swelling with gentle movements then gentle exercise if injuries allow, keeping all movements within the limits of pain and never force any movement.

3.3.3 Compression bandaging – General principles

- Position patient where you can bandage without lifting the injured part all the time
- Ensure patient is comfortable, in a relaxed and natural position
- Support where possible e.g. with a towel
- Use a 10-15cm bandage for ankle, knee, hamstring, shoulder
- Use a 5cm bandage for elbow, wrist, thumb
- Work from the bottom up (distal to proximal) in a spiral pattern (helps the blood flow)
- Ensure a two-thirds overlap with the bandage and no creases
- Bandage firm but not tight (two fingers should fit underneath), allow for some swelling
- Fasten the end with a safety pin or adhesive tape or tuck in the free end

When bandaging hands and feet ensure you can see the tips of the fingers or toes so you can test whether the bandage is too tight. Lightly squeeze the nail and look for colour returning quickly when you release the pressure. If too tight, loosen the bandage. Re-check at regular intervals.

<u>Watch out for the following signs and symptoms</u>
- Absent pulse below the bandage
- Swelling of the limb below the bandage
- Cold, pale or blueness of the fingers or toes
- Complaints of numbness and tingling of the fingers or toes
- Complaints of pain at or below the level of the bandage

Manage by loosening the bandage and re-check for the above signs and symptoms

3.4 ENVIRONMENTAL CONDITIONS

It is important to be aware of environmental factors that can have a significant effect on the athlete's performance and, in severe cases, cause illness. Management involves preventing these factors from having such an adverse effect.

3.4.1 Heat (hyperthermia)

Heat is produced by exercise. If the heat generated is not able to be released, the body temperature rises and symptoms of heat illness develop.

Prevention of heat illness

Use simple measures such as avoiding adverse weather conditions and ensure that the athlete wears the appropriate clothing for the weather. Ensure that they drink sufficient fluids prior to, during and after training sessions and competition. In hot conditions, ensure sun protection.

Management

Mild (heat cramps)
- Feeling weak and tired
- Painful muscle spasms and tightening
- Usually mildly to moderately dehydrated
- Body temperature is normal e.g. 37°C

→ Gradually stretching out the involved muscle
→ Try massaging
→ Encourage drinking water or sports drinks
→ Rest in the shade

- ***Moderate (heat exhaustion)***
    - Sweating profusely, pulse and breathing may be rapid
    - Generalised weakness, headaches, dizziness, feeling unwell
    - Loss of appetite, nausea and vomiting
    - Usually normal level of consciousness or is confused
    - Body temperature up to 39°C

  → DRSABCS, cease all exertion and rest, move to a cool and shaded area
  → Lie the athlete down, cool them and supply ample water to drink
  → If they are unable to take oral fluids they require urgent medical attention

- ***Severe (heat stroke)***
    - Medical emergency and can be fatal
    - May be confused, delirious and lose consciousness
    - May have stopped sweating and thus unable to get rid of excess heat
    - Body temperature often exceeds 39°C
    - Uncoordinated, seizures, coma

  → Call an ambulance immediately, place them in the shade and remove clothing
  → Apply ice packs to the armpits, groin and neck
  → Spray or sponge their skin with cold water, fan if possible
  → If conscious, offer sports drinks and plenty of fluid – at least 1L in the first 30 mins
  → Continually monitor and regularly record their vital signs

3.4.2 Cold (hypothermia)

This occurs when the body loses more heat than it can generate resulting in the lowering of the body's central core temperature, the physical effects are noticeable at temperatures below 35°C. The body attempts to counteract this by generating heat by shivering and by shutting

down the blood circulation to the limbs giving the blue and purple appearance. Hypothermia is often irreversible when the body temperature drops to 27°C.

Risk factors

- Inadequate warm-ups
- Not being active or appropriately covered up whilst not training or competing
- Becoming chilled after any activity following exhaustion
- Lean body mass or poor fitness and not appropriately acclimatized
- Extreme fatigue or exhaustion beyond their limits
- Inadequate protection from the elements

Prevention of hypothermia

- Wear appropriate clothing
- Cancel the activity or seek shelter if the weather deteriorates
- Plan activities appropriate to the athlete's fitness level
- Avoid dehydration and rapid cooling off after exercise
- Appropriate warm-ups

Management

Aim of treatment is to prevent further heat loss and slowly increase body temperature

- ***Signs***
    - Cold feet and hands
    - Shivering
    - Increased respiration and pulse rate
    - May be uncoordinated and unaware of their problem

  → Remove them from the cold environment
  → Apply extra clothing or some form of insulation from the elements
  → Encourage having a warm drink and warm food
  → AVOID ALCOHOL

3.5 SPECIFIC INJURIES

3.5.1 HEAD INJURIES

Head injuries are common and should always be treated seriously as there may be fractures with associated damage to the brain or obstruction of the airway. Medical attention is advisable for any patient who has received a head injury and all patients who have been unconscious, even for a short time, MUST be taken to hospital for assessment.

Injury to the brain may be temporary and result from shaking of the brain (concussion) or may be due to bleeding into or around the brain (cerebral compression) and causes localized destruction of brain tissue, if not treated urgently it will often result in death.

Cerebral compression

If unconscious or appears drowsy and loses consciousness again, consider that cerebral compression has occurred (this may occur some hours or even days after the incident). As the pressure within the skull increases, the pulse is initially rapid but becomes slow and breathing is laboured. The pupils become unequal in size. The patient does not respond to painful stimuli. Management includes DRSABCS, place in the recovery position, monitor level of consciousness and call an ambulance.

Concussion

Concussion is common and is a type of minor head injury. It may be caused by a direct blow to the head, face, neck or elsewhere on the body with an 'impulsive' force transmitted to the head. It may occur with or without loss of consciousness, thus the patient does not need to be knocked out to be concussed. It results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. Resolution of the clinical and cognitive symptoms typically follows a sequential course. A reasonable approach in the absence of medical advice is to stand down for a minimum period of three weeks and return to training or competition when symptom free (unless medical clearance is gained).

Categories of concussion

- *Simple concussion* – progressively resolves without complication over 7-10 days
- *Complex concussion* – persistent (>10 days) symptoms either at rest or with exertion

Management

If unconscious, assume the presence of a head injury or spinal injury and manage accordingly → DRSABCS, position appropriately and call an ambulance

If conscious, exclude the presence of a spinal injury, monitor the level of consciousness and seek urgent medical attention.

Assess severity
Inspect their facial expression, followed by an assessment of their orientation, recall and attention and observation of their gait - 'hear them talk, see them walk, and look in their eyes'.

Indications for urgent referral to Hospital

- Prolonged loss of consciousness (more than 5 minutes)
- Development of increasing headache, nausea and vomiting
- Unequal pupils, convulsion, changing neurological signs

The 'Sideline Concussion Check' is distributed by ACC SportSmart. It provides useful information on how to manage concussions and has cards containing concussion advice to give to the athlete. The following is an edited version suitable for Taekwon-Do.

IF CONCUSSION IS SUSPECTED - *Check for symptoms and signs*

Does the player report any of these symptoms?

- Headache, nausea, double or fuzzy vision
- Balance problems or dizziness
- Pupils appear different in size
- Sensitivity to light or noise
- Feeling sluggish, groggy or dizzy
- Ringing in the ears
- Concentration or memory problems

If the athlete reports any of these symptoms they should not return to training

Does the athlete show any of these signs?

- Appears to dazed or stunned
- Is confused, forgets movements
- Unsure of match, score or opponent
- Moves clumsily, answers questions slowly
- Loses consciousness (even temporarily)
- Shows behaviour or personality change
- Forgets events prior to or after impact

If yes, ask the following questions

ORIENTATION

- What tournament are we at? Who were you sparring?
- What colour were you? What round is it?
- Who did you spar before? Did you win that spar?

ANTEROGRADE AMNESIA *(forgets events after impact or collision)*
Choose three of the following words, ask the athlete to repeat these now and to remember them for later : Girl, dog, green, blue, house, cat, fish, boy, tree, chair, red

RETROGRADE AMNESIA *(forgets events prior to impact or collision)*

- Which sparer scored most recently?
- What do you remember just prior to the impact or collision?
- Do you remember the impact or collision?

CONCENTRATION
Ask the athlete to do the following :

- Repeat the days of the week backward (starting with today)
- Repeat these numbers backward :

6-3 (3-6 is correct) 4-1-9 (9-1-4 is correct)

WORD LIST MEMORY
Ask the athlete to repeat the three words you chose earlier

An incorrect response should be considered abnormal. Symptoms may worsen with exertion. The athlete must stand down for a minimum of three weeks AND should not return to training or competitions until symptom free AND with a medical clearance.

CONSULT A DOCTOR FOLLOWING A SUSPECTED CONCUSSION

If the condition or symptoms of the athlete dramatically changes seek immediate medical advice. In the event of an emergency dial 111.

CONCUSSION ADVICE (Give to athlete)

The first 24-48hours

Signs to watch for

Problems could arise over the first 24 hours. You must go to a hospital at once if you :

- Have a headache that gets worse
- Are very drowsy or can't be woken up
- Can't recognise people or places
- Pass out or have a blackout
- Vomit more than three times
- Behave unusually or seem confused
- Are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak arms or legs, or are unsteady on your feet
- Slur your speech

The person looking after you needs to get you straight to hospital or phone for an ambulance (111) if they notice any of the above signs. Don't hesitate. Remember it is better to be safe.

Sleeping

It is important not to go off to sleep in the first four hours. After that a normal night's sleep in needed, at the normal times. Sleep must also be normal with turning, rolling and shifting, and no loud snoring. If the sleep seems strange in any way, then they should be roused till they can say a word or two, then let them go back to sleep. The next morning they must able to wake up, like they usually do. If they cannot be woken normally, then medical help should be sought.

If there is any worry about the severity of a blow, it is safest on the first night to gently rouse the sleeper, every two hours during the night, to answer yes or no to simple questions.

Drinking

Do not drink alcohol or take sleeping pills for at least 48 hours.

Driving

Do not drive for at least 24 hours. You can drive again when you stop feeling giddy and you feel well enough. Talk to your doctor.

Pain relief

It is safe to take Paracetamol such as Panadol for the headache. Don't take tablets containing Aspirin or Disprin for the next four days. This type of medicine can make you bleed more from cuts or bruises (internal and external).

Returning to training or competitions

You must stand down for a minimum of three weeks AND you should not return to training or competitions until you are symptom free AND you have medical clearance. This way you'll return 100% and ready for training or competitions.

For return to training guidelines click onto :

www.acc.co.nz/sportsmart Keyword : Concussion

CONSULT YOUR DOCTOR FOLLOWING A SUSPECTED CONCUSSION

3.5.2 EYE INJURIES

Seek medical assistance for eye injuries. Signs and symptoms to watch out for include bleeding, photophobia (discomfort with light), blurred vision, visual loss or disturbances.

Corneal abrasions

- Occurs as a result of a scratch from either a fingernail or foreign body
- Presents with pain, a sensation of a foreign body and blurred vision
- Seek medical assistance.

Eyelid injuries

- Direct trauma to the eyelids may cause a large amount of bruising
- Treat with cold compresses in the first 24 hours
- Check the eye for any signs of injury, lacerations require repair

3.5.3 NOSE INJURIES

Epistaxis (nosebleed)

- Patient sitting upright, head tilted forward and advise to breathe through the mouth
- Direct pinching of the entire soft part of the nose
- Maintain pressure for at least 10 mins
- If not controlled repeat for another 10 mins
- Cold compresses over the bridge of the nose
- Allow blood to drip into a container held in front
- Until the bleeding has stopped – discourage from talking, swallowing, coughing, spitting, sniffing or raising their head
- Clean around the nose with swab moistened with warm water
- When the bleeding stops, tell them not to blow their nose for at least 4 hours and avoid exertion so as to not disturb the clot
- If bleeding continues after 30 mins or if they show signs of shock → Seek medical assistance

Nasal fractures

- Fractures of the nose are caused by a direct blow
- Presents with pain, nosebleed, swelling, crepitus, deformity and mobility of the nose
- Nasal distortion may not be obvious once soft tissue swelling develops
- Initial management is directed towards controlling the nasal bleed
- Lacerations (cuts) and fractures require medical assistance

3.5.4 EAR INJURIES

Auricular haematoma (contusion)

- This injury results from a shearing blow.
- Recurrent contusions result in bleeding and may eventually develop into a chronic swelling, commonly known as 'cauliflower ear'
- An acute haematoma should initially be treated with ice and firm compression
- A pressure dressing is then applied and is carefully packed against the ear to follow the contours of the outer ear and bandaged firmly
- Examine the ear daily to assess progress
- If the haematoma is extensive, seek medical assistance
- Return to contact sports can be immediate, but headgear is required
- Lacerations requiring careful cleansing and suturing → seek medical assistance

Perforated eardrum

- A blow across the side of the head may occasionally injure the eardrum
- Pain, bleeding from the ear or impaired hearing suggest rupture
- These ruptures usually heal spontaneously
- Antibiotic therapy to prevent infection should be given, thus seek medical assistance
- It is important to keep the ear dry while a perforation is present

- A severe blow across the head may fracture the skull and cause inner ear bleeding
- Discharge from the ear may signal an emergency → seek urgent medical assistance

3.5.5 TEETH INJURIES

- A forceful blow can cause a tooth or teeth to be moved
- These teeth should be repositioned to their original site
- Use firm finger pressure and subsequently splint with aluminium foil
- Refer to a dentist

- A direct blow or any force can dislodge a tooth
- There is obvious loss of a tooth from the socket and bleeding due to the trauma
- The tooth may be saved and the critical time is in the first 15 minutes

- Find the tooth immediately
- Carry the tooth by its crown i.e. not at the root
- Clean with sterile saline solution or clean water or use the patient's saliva or ask them to suck it clean under their tongue
- Replace in the original socket as soon as possible
- Splint with a piece of foil moulded over the top of the replaced tooth and neighbouring teeth on both sides
- When the tooth has been implanted properly the patient should bite on a sterile gauze

- If the tooth is not found until after 30 minutes, survival of the tooth is rapidly reduced
- If replacement cannot be carried out or the patient is not fully alert or unconscious → Soak the tooth in the patient's saliva or sterile saline and wrap in plastic or store in a suitable medium e.g. glass jar or plastic bag containing the appropriate solution
- This procedure also applies to fractured tooth fragments
- Refer to a dentist as soon as possible

3.5.6 BLISTERS

- Caused by friction
- An area of skin is inflamed with fluid collected under the skin
- The skin may be torn, exposing a raw area

- Prevention : Apply tape to areas that are likely to be affected e.g. ball of the feet
- Management : Cover blisters with an adhesive dressing

3.5.7 CRAMP

- Painful contraction of muscles associated with exercise
- It may occur if the muscles are not 'warmed up' before beginning exercise or if salts are lost through the body through sweating, vomiting or diarrhoea
- Presents with sharp, severe pain associated with muscle spasm

Management
- Stretch the affected muscle groups
- Grasp the limb firmly and exert gentle pressure in the direction opposite to the muscular contraction, the muscle will slowly stretch back into a normal length
- Prevent further cramps by massaging the affected area
- Fluid replacement e.g. water or sports drinks

3.5.8 WINDING

- It is a type of cramp that affects the diaphragm, the main muscle of breathing
- A blow to the central or upper part of the abdomen causes stimulation of the nerve fibres of the solar plexus which results in diaphragmatic spasm
- This condition is only temporary

Assessment
- The patient is unable to breathe in and has difficulty speaking
- They hold their mouth wide open, gasping and their chest does not move

Management
- DRSABCS
- Assist the patient to sit slightly forward
- Gentle massage to the upper abdomen may reduce spasm
  → Avoid if suspect internal injuries
- If symptoms persist, call an ambulance

3.6 MEDICAL CONDITIONS

It is important to be aware of certain medical conditions to help you manage them more effectively. Thus athletes and students should let their coaches or Instructors know if they have any medical conditions and their current treatment regime.

3.6.1 Chest pain (angina / heart attack)

Assessment

- Due to narrowed heart (coronary) arteries, which can be severe or totally occluded
- Thus leading to decreased oxygen supply to the heart muscle and can lead to death of a segment of heart muscle

- Symptoms of central chest pain (heavy pressure, tightness, crushing pain or unusual discomfort, feel like indigestion), pain in throat or neck, pain down arm and/or in shoulder, nausea and vomiting, pale skin, difficulty breathing, profuse sweating, anxiety and rapid and/or irregular pulse

- A heart attack is a life-threatening condition, symptoms usually lasts more than 15 minutes and may result in heart failure or cardiac arrest

Management

- DRSABCS
- Help them take their medication that they usually use to relieve it i.e. GTN spray
- Encourage rest and provide reassurance
- If conscious, support them in the half-sitting position
- Call an ambulance if it does not settle after 15 minutes OR if it is a new pain

3.6.2 Asthma

Asthma results from narrowing of the smaller airways in the lung that can be become further obstructed by the production of excess mucus. Narrowing is due to muscle spasm which may be triggered by an allergic reaction, associated with airways infection, or exercise-induced

Assessment

- Difficulty breathing and wheezing on breathing out
- Anxious and distressed
- Blueness of the lips, hands and feet (severe cases)
- Unable to speak whole sentences because of difficulty in breathing (severe cases)

Management

- DRSABCS
- Provide reassurance and calm the patient
- Sit patient and lean them slightly forward
  → If possible across a chair or table
- Help them take their medication i.e. ventolin inhaler

- Regularly assess their vital signs every 10 minutes
- If the attack is prolonged and not relieved by medication → Call an ambulance

3.6.3 Loss of consciousness (LOC)

Assessment

- LOC is a medical sign that may result from a number of conditions including diabetes, epilepsy, fainting, head injury, heat-stroke, hypothermia

- Changes in the level of consciousness can vary from a brief clouding of mental activity to a deeply unconscious (comatose) state with no response to stimulation

- Assess three activities : eye opening, speech and movement
- Conscious – alert, eyes open spontaneously, coherent speech, purposeful movement
- Unconscious – closed eyes, no speech, no movement
- Semi-conscious – evaluate level of consciousness, first by verbal stimulus and if unsuccessful, by attempting to rouse them using a painful stimulus e.g. sternal rub (using your knuckles), pressure on the fingernail with a flat instrument (pen or pencil)

Management
- DRSABCS
- If breathing, place in recovery position (except in spinal injury)
- Keep warm by covering with blankets, but do not apply direct external heat
- Monitor vital signs regularly every 5 minutes
- Call an ambulance and do not leave the patient

3.6.4 Fainting

Assessment
- Fainting is a brief LOC caused by a temporarily inadequate blood supply to the brain
- Most last for a few secs and are followed by a spontaneous and complete recovery
- It may occur in association with emotional stress, severe pain, exhaustion, lack of food, excessive heat, sudden changes from a lying down to a standing position or standing motionless for prolonged periods

- Before a faint, the patient may feel light-headed, dizzy or have blurred vision
- Following the faint, the pulse may be slow and weak, but usually returns to normal rapidly if the patient is lying flat

Management
- DRSABCS

If feeling faint
- Lie them on the floor
- Loosen any tight clothing about the neck, chest and waist
- Provide reassurance

If fainted
- Check for any injuries, if they have spinal injuries – do not move them
- If on their back – raise their legs about 30°
- If on their side – roll onto back and elevate legs
- Remain with them
- Once they have recovered sufficiently – gradually raise them to the sitting position
- If not conscious and alert within 1 minute
  → Place in the recovery position and call an ambulance
  → Monitor ABCS regularly and do not leave an unconscious patient

3.6.5 Overbreathing (hyperventilation)

Assessment
- Emotional overbreathing may be triggered in response to psychological stress
- Overbreathing lowers the level of carbon dioxide in the blood. This interferes with the normal breathing process and may temporarily result in a number of symptoms

- The patient is overanxious and distraught
- There may be facial numbness and tingling in the hands and feet
- The hands may turn inwards in a claw-like fashion
- The attack may be very dramatic

Management
- Sit the patient down
- Reassure the patient constantly and firmly
- Ask them to match your breathing rate – normal rate and depth
- Seek medical assistance – some serious medical conditions look like hyperventilation

3.6.6 Epilepsy (seizures)

Assessment
- Epilepsy is a disorder in which recurring seizures result from disturbed electrical / chemical activity in the brain
- Patients usually carry a Medic Alert bracelet or disc

- Seizures vary from an *absence seizure* (momentary period of unconsciousness associated with staring, blinking, or upward rolling of the eyes) to a *tonic clonic seizure* (body stiffens briefly, then regular muscle contractions begin, causing shaking of the body)

Tonic clonic seizures
- They may experience an aura or warning e.g. unusual sounds, smells and feelings
- Then lose consciousness and fall to the ground
- A hoarse cry may be uttered
- Lost of bladder and bowel control
- Appear blue if the airway is blocked
- Usually over within 4 to 5 minutes with consciousness slowly regained
- In recovery, they may feel confused and sleepy

Management
- DRSABCS
- Do not restrain patient (a seizure cannot stop once it has begun)
- Keep calm and reassure others
- Minimise danger from surroundings e.g. clear any hard or sharp objects
- Put something soft under the patient's head
- Protect the cervical spine if the seizure is unwitnessed or occurs following trauma
- Remove glasses and loosen any clothing that is making breathing difficult
- Protect and maintain airway
- Place in recovery position, most recover spontaneously
- If seizures are repeated or prolonged (> 10 minutes) → call an ambulance
- Those with seizure for the first time require medical assessment

3.6.7 Diabetes

Hyperglycaemia (high blood sugar)

Assessment
- This occurs in untreated diabetics and those who have taken insufficient insulin
- The condition may progress to diabetic ketoacidosis (DKA)
- Usually develops slowly and is unusual to be encountered as a first aid emergency

- Breathing is heavy and difficult
- The breath may smell sweet or musty
- There may be excessive thirst
- Decreased level of consciousness may develop

Management
- DRSABCS
- If conscious, place in half-sitting position and reassure
- If unconscious, place in the recovery position
- Call an ambulance

Hypoglycaemia (low blood sugar)

Assessment
- This occurs if a treated diabetic has taken too much insulin or has eaten insufficient food for the dose of insulin taken, then the blood glucose will fall to dangerously low levels
- Low levels may also occur if diabetics exercise strenuously or unexpectedly without increasing their food intake
- It may worsen rapidly, if untreated, it may in a short time result in loss of consciousness and death

- They may feel weak or faint
- There may be sweating
- May feel nauseated and may vomit
- Limbs may tremble
- If untreated, they may become confused and later lose consciousness
- Seizures may occur
- Prolonged or severe hypoglycaemia will result in death of brain cells

Management
- DRSABCS
- If conscious and able to swallow, give sugary foods, fizzy drink or fruit juice
- If unconscious, place in recovery position, monitor ABC and call an ambulance

4. PROFESSIONAL ADVICE AND REHABILITATION

Ideally, seek health professional advice early on to ensure effective treatment and rehabilitation of injuries. Health professionals includes physiotherapists, sport doctors, bone doctors (orthopaedic surgeons) and rehabilitation experts whom are skilled and experienced in sports injury and care and can help make the recovery process as effective as possible.

Ensure that they help you fill out an ACC form, so that you can get your treatment subsidised or in some cases fully subsidised. They will assign you a case manager and help you with any loss of income and help in your home if required.

Rehabilitation is the process that restores the injured person to their previous level of physical functioning that they had prior to the injury. It is important to discuss any limitations on specific sports training required for rehabilitation, as well as suitable training alternatives. A thorough rehabilitation process is important because it decreases the risk of future or recurrent injury.

Rehabilitation aims to first restore the functional abilities (strength, flexibility, endurance, speed, proprioception) and then restore the sport-specific abilities (e.g. jumping, kicking, throwing). Psychological factors such as regaining confidence to return to training or competitions may need to be specifically addressed.

5. RETURN TO COMPETITION

The athlete can consider returning to training or competition when rehabilitation has been successful. In some cases, an athlete will find it difficult to come to terms with their injury and will deny that they are unfit to continue. This needs to be managed with care so that athletes only return when they are ready to do so.

Ideally, return to competition when the injury is fully recovered, as returning too soon can worsen the injury and delay full recovery. A graded return to activity provides the ideal means for this. If the following criteria are satisfied, athletes should be able to return to competition safely:

Return to Competition Criteria

- No pain, swelling and stiffness of the injured part
- 90-100% pain-free range of motion
- 90-100% of the pre-injury strength
- 90-100% of the muscular and cardiovascular endurance
- 90-100% balance and proprioception
- The ability to perform all the skills and movements
- Adequate confidence to face the psychological demands

Assessment of these variables can be done by comparing the results of simple fitness tests with pre-competition data or by consulting health professionals such as sport scientists and physiotherapists who can give specific tests. A score within 10% of that achieved when fit is acceptable for return to competition.

Please note that there is a natural sensation of discomfort associated with damage to muscle, ligament, tendon or bone. Failure to observe this or to mask it with drugs (such as painkillers) in order to return to training or competition sooner, is likely to result in further damage and an even longer, complicated period of rehabilitation. Thus painkillers should not be used to enable an injured athlete to return before they are ready.

6. PROTECTIVE EQUIPMENT

It is advisable to use protective equipment to protect against injury. It must provide the protection intended, fit well, be comfortable and not interfere with the activities i.e. it should not restrict movement. They must be worn consistently to gain maximum benefit i.e. during training as well as competition.

Advice on selecting protective equipment

- Purchase equipment of reputable quality (ITFNZ approved if possible)
- Do not use worn-out, damaged or defective equipment (check condition regularly)
- Avoid radical customisation as this may reduce the effectiveness
- Avoid sharing equipment between different-sized athletes

Mouth-guards

- Should be worn during sparring training and it is compulsory in competition
- It reduces the risk of injuries occurring to the athlete's teeth
- A properly fitted mouthguard can absorb force from an impact, cushion contact between the upper and lower teeth and keep the upper lip away from the sharp edges of the teeth These actions can reduce dental and soft tissue injuries such as dislocations of the jaw
- Complaints such as nausea, breathing and speech difficulties can be overcome through correct fitting and a period of adaptation
- Customised mouth-guards have been shown to absorb greater impacts than 'boil and bite' mouth-guards; however both will provide adequate levels of protection
- Ensure they are not shared (risk of transmission of diseases such as hepatitis)

Headgear

- Headgear should be well fitting and comfortable to wear
- They have been shown to reduce the force magnitude and increase the time of impact, and reducing the risk of injury
- They prevent lacerations (cuts) and abrasions to the scalp and ears

Bracing and Taping

- Used to support joints by providing external restriction to large ranges of joint motion and by providing increased proprioceptive feedback to the muscles and ligaments

- Tape has limited effectiveness in providing protection as the support it provides is reduced after 20 minutes of exercise owing to sweating and stretching of the tape
- Tape needs to be applied correctly to be effective

- Specially designed braces with appropriate support should be considered
- Braces are reusable, easy to apply and remove, provide more support than tape
- An athlete whose joint does not have the strength required for the training or competition should not be encouraged to continue using only strapping tape to compensate for the joint insufficiency

Padding

- Chest protection for women and "boxes" for men is advisable
- It has impact absorption qualities and thus minimize the effects of contact on soft tissues
- Shin guards help in reducing the impact of forces and thus reduce the risk of bruises

7. FIRST AID KITS AND COURSES

First aid kits

In many situations, you will be required to use materials at the scene in order to carry out first aid. However, a well-stocked first aid kit can be extremely useful by providing purpose-produced material in a convenient presentation. Places suitable for purchasing specific first aid kits includes St John's and the Red Cross.

First aid kits should be made of strong materials, portable, easy to carry, waterproof and dirt resistant, checked and restocked regularly, always accompanied by a first aid manual and be readily accessible in an emergency. Dressings, pads and bandages have many uses in first aid and a variety of these should be available.

Dressings

- Used to cover wounds or areas of tissue damage and to protect the wound from further injury or infection before the application of a bandage
- Place in direct contact with broken skin and should ideally be sterile
- Do not use if the package containing the sterile dressing is torn or broken or beyond its expiry date as it may introduce bacteria into the wound, resulting in infection
- Avoid cotton-wool dressings as these would adhere to the surface
- Non-adhesive material such as gauze or linen may be used
- It acts to control bleeding and thus reduce blood loss
- Fully cover the wound with the dressing edge reaching beyond the bleeding site
- Do not touch the wound before you apply a dressing
- Avoid contact of sterile dressing with un-sterile surfaces before placing on the wound

Bandages

- Used to support pads and dressings and assist in controlling bleeding
- Provide support for injured limbs by preventing unnecessary movement, lessening pain and reducing the likelihood of further injury
- Used to secure fractured limbs to splints, thus allowing the safe transport of patients

Triangular bandages

- Used as dressings, pads, padding or slings
- Provide support and if used for this purpose e.g. sling, secure this with a reef knot

Roller bandages

- Made from strips of material and they come in different widths
- Elasticised or crepe bandages are most suitable
- Used to make a simple spiral dressing
- Useful for bandaging wounds on limbs that do not extend across a major joint
- Start bandaging at the extremities first e.g. wrist or ankle and bandage upwards

The collar and cuff

- Useful for fracture of the upper arm or an injured hand
- Should not used if the patient has an injured wrist
- Loop a narrow bandage around the wrist of the injured arm twice
- Gently tighten by pulling the two ends together
- Gently elevate the injured arm against their chest
- Tie the bandage ends together around the neck

First aid courses

Both the Red Cross and St John's provide suitable first aid courses. St John's has recently added a sports related course. Both can be booked on an individual or group basis. It is definitely worthwhile attending these courses with regular refreshers to continually update your skills and knowledge.

8. REFERENCES

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