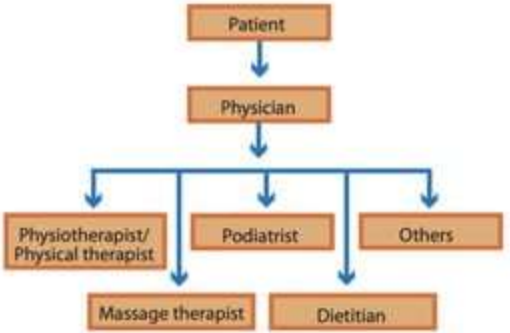
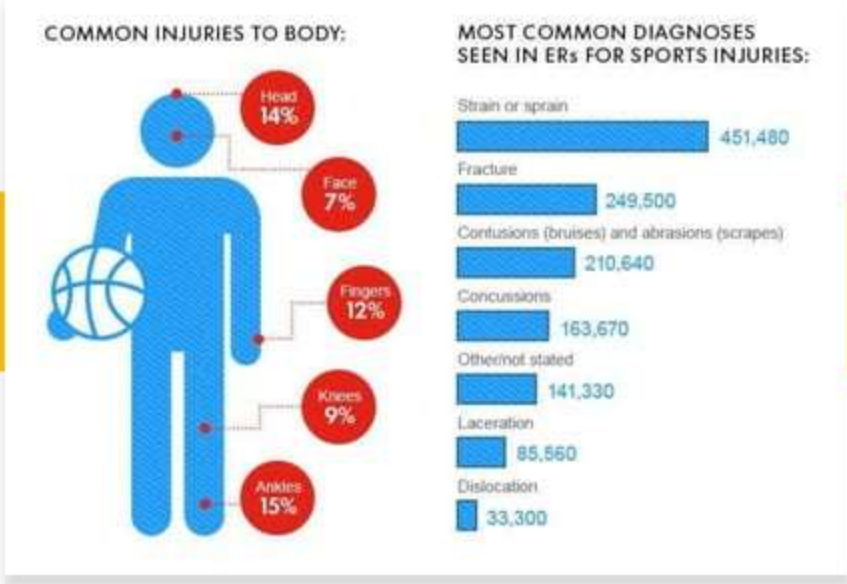
31st May 2020
7 pm to 8 pm

Webinar on Prevention



Traditional approach vs Sports Medicine approach



Prone area of Injury

Site	Acute injuries	Overuse injuries
Bone	Fracture Periosteal contusion	Stress fracture 'Bone strain', 'stress reaction' Osteitis, periostitis Apophysitis
Articular cartilage	Osteochondral/chondral fractures Minor osteochondral injury	Chondropathy (e.g. softening, fibrillation, fissuring, chondromalacia)
Joint	Dislocation Subluxation	Synovitis Osteoarthritis
Ligament	Sprain/tear (grades I–III)	Inflammation
Muscle	Strain/tear (grades I–III) Contusion Cramp Acute compartment syndrome	Chronic compartment syndrome Delayed onset muscle soreness Focal tissue thickening/fibrosis
Tendon	Tear (complete or partial)	Tendinopathy (includes paratenonitis, tenosynovitis, tendinosis, tendinitis)
Bursa	Traumatic bursitis	Bursitis
Nerve	Neuropraxia	Entrapment Minor nerve injury/irritation Adverse neural tension
Skin	Laceration Abrasion Puncture wound	Blister Callus

Classification of Sports Injury

BRUKNER AND KHAN. CLINICAL SPORTS MEDICINE 3E

Pain

Joint & Ligaments

Muscles including tendons & fascia

Neural structure

Pain

- Somatic: pain from musculoskeletal structure
- Radicular: nerve injury pain
- CNS: pain due to central nervous system abnormalities
- Visceral: from the organ

Clinical condition mislead with Sports Medicine

Bone and soft tissue tumors

Osteosarcoma
Synovial sarcoma
Synovial chondromatosis
Pigmented villonodular synovitis
Rhabdomyosarcoma
Osteoid osteoma
Ganglion cyst

Rheumatological conditions

Inflammatory monoarthritis
Inflammatory polyarthritis
Inflammatory low back pain (e.g. sacroiliitis)
Enthesopathies (e.g. psoriatic, reactive arthritis)

Disorders of muscle

Dermatomyositis
Polymyositis
Muscular dystrophy

Endocrine disorders

Dysthyroidism
Hypercalcemia

Vascular disorders

Venous thrombosis (e.g. deep venous thrombosis, axillary vein thrombosis)
Artery entrapment (e.g. popliteal artery entrapment)
Peripheral vascular disease

Genetic disorders

Marfan's syndrome
Hemochromatosis

Granulomatous diseases

Tuberculosis
Sarcoidosis

Infection

Osteomyelitis
Septic arthritis
Shingles

Regional pain syndromes

Complex regional pain syndrome type I
Fibromyalgia/myofascial pain syndrome

Technique	Injury
Excessive wrist action with backhand Service contact made too far back (i.e. ball toss not in front)	Extensor tendinopathy of elbow Flexor tendinopathy of elbow
Insufficient body roll Low elbow on recovery Insufficient external rotation of the shoulder	Rotator cuff tendinopathy
Shooting at the water too early (backward dives)	Lumbar spine injuries
Incorrect handlebar and seat height Toe-in/toe-out on cleats	Thoracic/lumbar spine injuries Iliotibial band/patellofemoral syndrome
Bar position too far in front of body in clean phase/jerk phase	Lumbar spine injuries Sacroiliac joint injury
Grip too wide on bar in bench press Toes pointing forward on squatting	Pectoralis major tendinopathy Patellofemoral syndrome/medial meniscus injury
Elbow 'dropped' Poor hip drive	Medial elbow pain Thoracic/lumbar spine dysfunction
'Blocking' on step phase	Sacroiliac/lumbar spine injuries, patellar tendinopathy, sinus tarsi syndrome
Incorrect foot plant	Patellar tendinopathy Sinus tarsi syndrome Fibular stress fracture
Too close on take-off Late plant	Lumbar spine injuries (e.g. spondylolysis) Ankle impingement Talar stress fracture Shoulder impingement
Anterior pelvic tilt Poor lateral pelvic control	Hamstring injuries Iliotibial band friction syndrome
Mixed side-on/front-on action	Stress fracture pars interarticularis
Opening up too soon Dropped elbow 'hanging'	Anterior shoulder instability Medial collateral ligament sprains elbow Osteochondritis radiocapitellar joint Rotator cuff tendinopathy
Excessive hyperextension on landing Tumble too short (not enough rotation)	Stress fracture pars interarticularis Anterior ankle impingement
Change from bow side to stroke side	Stress fracture ribs
Poor turnout 'Sickling' en pointe	Hip injuries Medial knee pain Stress fracture second metatarsal

Biomechanics & Injury

COMMON INJURIES IN FOOTBALL PLAYERS

Traumatic injuries

Concussions

Overuse injuries

Heat injuries

FRACTURE

Common Cricket Injuries

AC Joint Injury
Bicep Tendinitis
Bulging Disc
Knee Bursitis
Achilles Tendon Rupture
Bursitis Shoulder
Calf Muscle Tear
Chondromalacia Patella
Corked Thigh
Degenerative Disc Disease
Shoulder Dislocation
DOMS
ACL Injury
Adductor Tendinopathy
Anterior Ankle Impingement
Low Back Pain

Common Basketball Injuries

Ankle Sprains
Jammed Fingers
Knee Injuries
Deep Thigh Bruising
Facial Cuts
Foot Fractures

Hockey

- AC Joint(shoulder)
- ACL strain or tears
- Clavicle / Collar Bone fracture
- Concussions
- MCL strain or tears
- Muscle Strain
- Shoulder Dislocation

Badminton

Tennis elbow
Golfer's elbow
RSI/Wrist tendonitis
Wrist Strain
Rotator cuff tendinopathy
Rotator cuff **injuries**
Ankle Sprains
Jumper's knee

Boxing

- Concussion
- Facial injuries: cuts, broken bones in the nose
- Wrist sprain
- Hand fractures
- Finger sprain
- Boxer's knuckle
- Bennett's fracture
- Dislocated shoulder
- Back pain
- Neck pain
- Achilles tendinopathy
- Strain injuries in the shoulders, neck, back, knees, calves and feet

Volleyball

- Rotator Cuff Tendinitis
- Finger Injuries
- Ankle Sprains
- Patellar Tendinitis
- Anterior Cruciate Ligament (ACL) Injury
- Low-Back Pain
- Jumper's knee

Swimming

- Irritation and inflammation in the shoulders.
- Rotator cuff tendonitis or tears.
- Shoulder impingement syndrome, which is a result of pressure on the rotator cuff muscles from part of the shoulder blade when the arm is lifted overhead.
- Tears in the cartilage around the shoulder socket.
- Neck and low back pain.
- Bicep tendonitis.

Weightlifting

- Knee Injuries
- Back Strain
- Shoulder Tension
- Neck and Spine Stress

Martial arts

Concussion

Head/Eyes/Ear/Nose

Neck

Extremities

Skin

Tennis

- **Tennis** Elbow
- Rotator Cuff Tears
- Stress Fractures in the Back
- Patellar Tendonitis (aka Jumper's Knee)
- Ankle Sprains

Table tennis

- Ankle Sprain
- Knee Injury
- Tennis Elbow
- Shoulder Pain
- Calf Strain

TYPES OF SPORTS INJURY

Acute :-

An injury that occurs suddenly such as a sprained ankle caused by an awkward landing is known as an acute injury. E.g, Acute tenosynovitis of wrist extensors in canoeists.

Chronic :-

Chronic injuries are caused by repeated overuse of muscle groups or joints. Poor technique and structural abnormalities can also contribute to the development of chronic injuries, e.g. March fracture in soldiers.

Overuse injury :-

These are caused by excessive and repeated use of the same muscle, joint or bone.

Soft tissue injury

- Muscle sprains, Strains and Bruises

Hard tissue

- Joints and Bones
- Dislocated joints
- Fractured bones

Most common sports injuries in upper limb.

❑ Shoulder complex :

- Rotator cuff injury
- Shoulder dislocation
- Fracture clavicle
- Bicipital tendinitis or rupture

❑ Elbow :

- Tennis elbow
- Golfer's elbow

❑ Wrist :

- Wrist pain
- Carpal tunnel syndrome

HAND:

- Mallet injury
- Baseball finger
- Jersey thumb

Most common sports injuries in LOWER limb

- HIP
- Quadriceps strain
- Hip pain
- Groin pain due to adducter strain

- KNEE JOINT
- Jumpers knee
- Fracture patella
- Knee ligaments injuries
- Meniscal injuries.

- LEGS
  - Calf muscle strain
  - Hamstrings sprain
- Ankle injuries
  - Ankle sprain
  - Injury to Achilles tendon

- Foot
- March fracture
- Jones fracture

Injury Prevention Check List

Warm up	Stretching	Taping & bracing	Protective equipment	Equipment as per sport
Surface	Training	Recovery	Psychology	Nutrition

Warm Up

- Warm Up are the exercises done prior to sports
- It is of 2 types
  - General exercises e.g. jogging
  - Specific exercise (appropriate movements for the particular sport or activity)

Warm Up

The possible benefits of warm up include :

- Increased blood flow to muscles
- Increased delivery of oxygen to muscles due to increased break down of oxyhemoglobin
- Decreased vascular resistance
- Reduced muscle viscosity lading to smoother muscle contraction
- Increased speed of nerve impulses
- Enhanced metabolism

Warm Up

- Decreased number of injuries due to increased range of motion (ROM)
- Decreased stiffness of connective tissue leading to decreased likelihood of tears
- Increased cardiovascular response to sudden strenuous exercise
- Decreased sensitivity of muscle stretch

Warm Up

- There are no data to prescribe the intensity and duration of warm up
- This allows athletes to determine their own warm up regimen
- However one guideline is to produce some mild sweating without fatigue
- The effect of warm up lasts approx. 30 min, so it is important not to warm up early.

Stretching

- Basic principles of stretching :

  - warm up prior to stretching
  - stretch before and after exercise/sport
  - stretch gently and slowly
  - stretch to the point of tension but not pain

Stretching

- How does stretching prevent injury?

  - Joints and muscle become stiff as a result of inactivity , over activity and injury

  - Increased flexibility attained through stretching may decrease musculotendinous injuries and alleviate muscle soreness especially in sports that have a high intensity of

  muscle-tendon stretch-shortening cycle

  e.g. : football and basketball

Stretching

- Types of stretching :

  - Static stretching

  - Ballistic stretching

  - Proprioceptive neuromuscular facilitation stretching

Stretching

- Static stretching:

  - the stretch position is assumed slowly and gently held for 30-60 sec and relaxed

  - the athlete should not experience any discomfort.

  - Static stretching produces least amount of stretch and is the safest method to increase flexibility.

Stretching

- Ballistic stretching:

  -the muscle is stretched to near its limit, then stretched further with a bouncing movement.

  - stretching a muscle against increased tension heightens the chances of injury, hence not commonly used

  - it is particularly used in gymnastics ballet and dance under appropriate training where maximum ROM is advantageous

Stretching

Proprioceptive Neuromuscular Facilitation Stretching(PNF) :

- Performed by alternating contraction and relaxation of both agonist and antagonist muscles
- PNF stretching may produce greater flexibility than other stretching techniques
- Major disadvantage is tendency to overstretch
- Performed under supervision.

Taping and bracing

- Taping(or strapping) and bracing are to used to restrict undesired, potentially harmful motion and allow desired motion.
- Indication for the use of taping and bracing:

1. prevention- used as a preventive measure in high risk activities

e.g. basketball player's ankles

2. rehabilitation- used as a protective mechanism during the healing and rehabilitation phases.

Taping and bracing

- Taping :
  - restrict undesired motion
  - good tape should be adhesive strong and nonirritant
  - suitable joints for taping are ankle , wrist 1st metatarsophalangeal etc
  - taping may enhance proprioception besides mechanical support.

Taping and bracing

- Complications of taping :
  - reduced circulation due to tight taping
  - skin irritation
  - failing of support when the material material threshold is exceeded

Taping and bracing

- Bracing:

  - provide mechanical support and prevent undesired motion.

  - Athlete can put brace by himself/herself

  - slipping during use, weight of the brace, sizing are the major disadvantages

Protective equipment

- They shield various body parts against injury without interfering with sporting activity.
- They can also be used on return to activity after injury to prevent direct contact with the injured part
- Protective equipment include helmets, face shields, knee pads, shin pads, shoulder pads, wrist guards gum shields gloves etc

Equipment as per Sport

- Equipment should be used according to the capacity of the athlete.

  e.g. children should use junior racquets for tennis, smaller bats for cricket

- Equipment should be sport specific.

  e.g. using running shoes for football will lead to injury of forefoot.

- A defective equipment can lead to injury.

Environmental factors & Surface

- Extreme cold and hot weather can cause injury to sportsmen.
- Extreme heat can produce heat cramps and heat prostration.
- Extreme cold may cause frostbite and hypothermia
- Uneven, wet, icy surfaces cause falling, collision, sliding of the players.
- Athletes must be aware of signs of hypothermia, heat prostration
- They must be well prepared for the extreme weather with appropriate clothing and training.

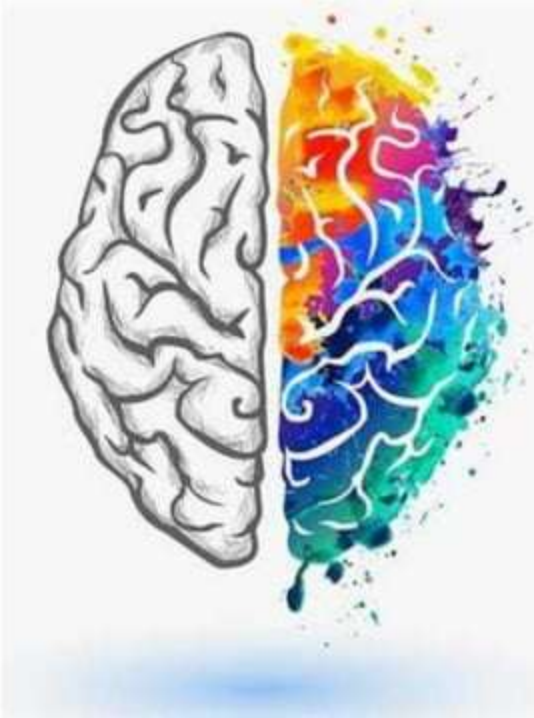
Appropriate training

- This includes giving sport specific training towards improving performance in the given sport.
- There should be adequate rest between competitions
- Training must be according to individual needs as every individual differs in their skill, power, strength, food habits, tolerance etc

Recovery

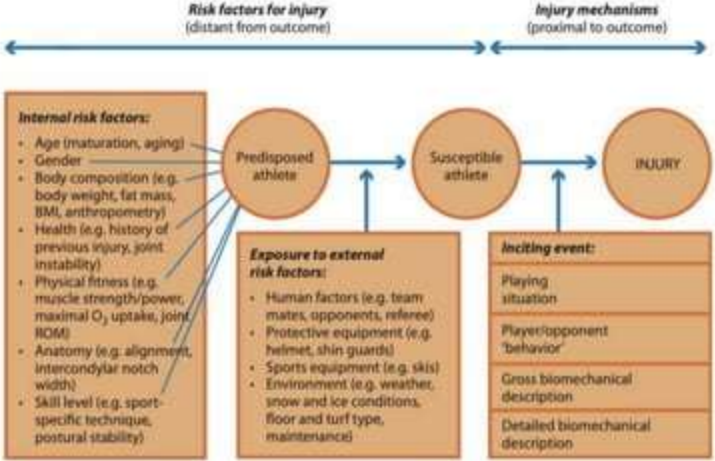
Psychology

- Excessive psychological arousal can result in decrease in sporting performance and increase the risk for injury
- Loss of concentration can predispose to injury by giving athlete less time to react
- Under arousal can also predispose to injury



Nutrition

- Inadequate repletion of glycogen occurs due to under nutrition causes a reliance on fat and protein stores resulting in protein breakdown which in turn leads to soft tissue injury.
- Intense training causes skeletal muscle breakdown which is exacerbated by inadequate protein intake.
- Inadequate hydration may compromise blood flow to working muscles increasing susceptibility to injury.
- Inadequate intake of micro nutients like calcium, phosphorus result in altered bone metabolism resulting in injury.



BRUKNER AND KHAN. CLINICAL SPORTS MEDICINE 3E
Ref. 1

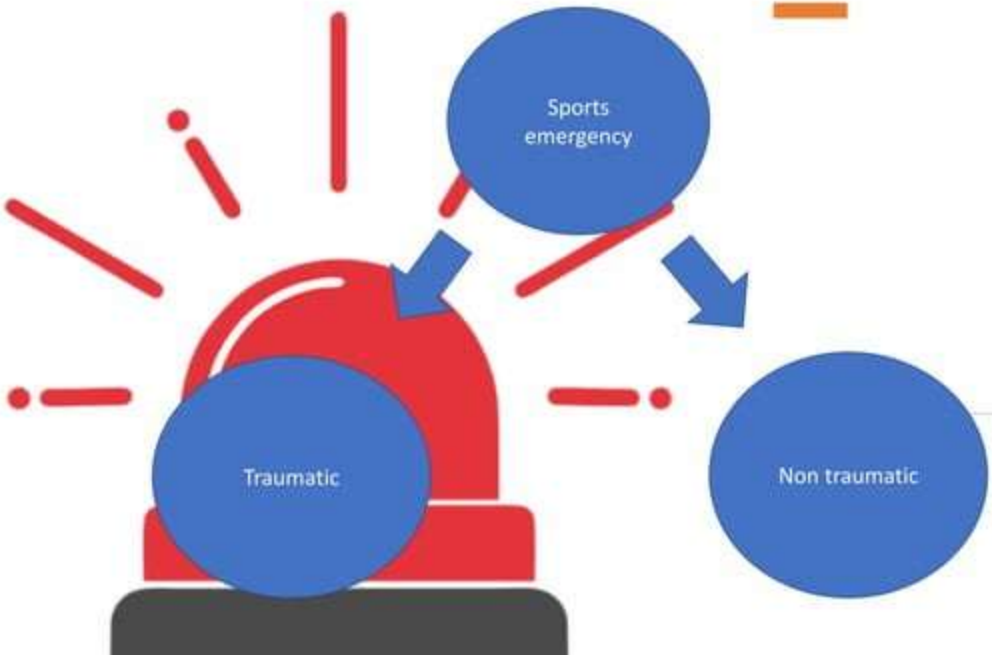
Injury causation model based on the epidemiological model of Meeuwise & modified by Bahr & Krosshaug

Treatment Layout

- minimizing extent of injury (RICE)
- immobilization and early mobilization
- therapeutic drugs, including glyceryl trinitrate (GTN), sclerosing therapy, glucosamine
- heat and cold
- electrotherapeutic modalities
- extracorporeal shock wave therapy

- manual therapy
  - — joints
    - – mobilization
    - – manipulation
    - – traction
  - — muscles
    - – softtissuetherapy

    MET
    - — neural
    - —stretching
- acupuncture
- dry needling
- hyperbaric oxygen
- surgery.


Sports emergency
Traumatic
Non traumatic

Traumatic

- Head injury
  - severe
  - minor
- Spinal cord injury
  - cervical
  - thoracic
  - lumber
- Thoracic injury
  - Flail chest
  - Haemothorax
  - Tension pneumothorax
  - Cardiac tamponade
  - Cardiac contusion

- Abdominal injury Ruptured viscus (e.g. liver, spleen, kidney, bladder, pancreas, bowel)
- Multiple fractures (particularly femoral or pelvic fractures)
- Blood loss

Non traumatic

- Cardiac
  - Coronary artery disease
  - Arrhythmia
  - Congenital abnormality
  - Hypertrophic cardiomyopathy
- Hyperthermia
- Hypothermia
- Cerebrovascular accident
- Hypoglycaemia
- Hyponatremia

- Respiratory
  - Asthma
  - Spontaneous pneumothorax
  - Pulmonary embolism
- Allergic anaphylaxis
- Drugs

  Cocaine, morphine

- Other
  - Vasovagal (fainting)
  - Postural hypotension
  - Blood pooling post exercise
  - Hyperventilation
  - Hysteria

First Aid

- ফার্স্ট এইড কথার অর্থ হলো ফার্স্ট হেল্প বা প্রথম সহায়তা injured মানুষের প্রতি
- ফার্স্ট এইড শুরু হয় যখন খেলোয়াড় injured হয় তখন থেকে মেডিকেল চিকিৎসা শুরু হওয়া পর্যন্ত
- ফার্স্ট এইড দেয়াতে ভুল হলে খেলোয়ার এর প্রাণ পর্যন্ত যেতে পারে

তাই জেনে নিতে হবে সঠিক ফার্স্ট এইড কি ভাবে দেওয়া যায়

Five ‘P’s in First Aid

- Preserve life
- Protect the unconscious
- Prevent injury or illness becoming worse
- Promote recovery
- Procure medical aid

Managing Sports Injury

- Checklist
  - what is the injury? (Diagnosis)
  - what should I do for it? (Treatment)
  - how did it happen? (Cause)
  - how do I stop a recurrence? (Prevention)

Three levels of injury priority

First priority

injury that pose an immediate threat to life

airway obstruction / cardiac arrest / uncontrolled bleeding

Second priority

urgent injuries that are potential threats to life or limb

head injury / spinal injury

serious limb injury with blood vessel / nerve injury

Third priority

mild limb injuries – sprain / strain

cuts and bruises

PRICED (What to do)

- PREVENT – prevent further injury. This may mean stopping the game, and/or removing the player from the field
- Rest – stop using the injured part, or you could risk further damage
- Ice – apply ice locally until the skin is numb, or for about 20 min. reapply when the skin is back to its normal temperature. Use a barrier between ice and skin (eg wet tea towel, not plastic). Ice reduce pain, bleeding, swelling and muscle spasm
- Compression – compress with a wide elastic bandage, wrapped about 10 cm above and below the site of injury. This reduces swelling
- Elevation – raised the injured body part above heart level. This helps the drainage of fluid from damaged tissues
- Diagnosis – if the injury does not settle quickly, seek professional help. Don't waste time to diagnosed that what happen to the athlet

What not to do
do not HARM

- Heat - no hot application. No hot bath, saunas or spa. No to any kind of heat rub
- Alcohol – no alcohol for first 24 hours
- Running - avoid exercises and running of that part
- Massage – don't do any kind of massage

any kind of this activities could promote further bleeding & swelling

RED FLAGS
When it is Emergency

- Head injury – see for the loss of consciousness or persistent headache
- Breathing problem
- Neck pain
- Abdominal pain
- Blood in urine
- Fractured or suspected fractured bone
- Serious joint or ligament injury
- Joint dislocation
- Eye injury
- Deep wounds and/or persisting bleeing
- Injuries associated with severe pain
- Any doubtful injury

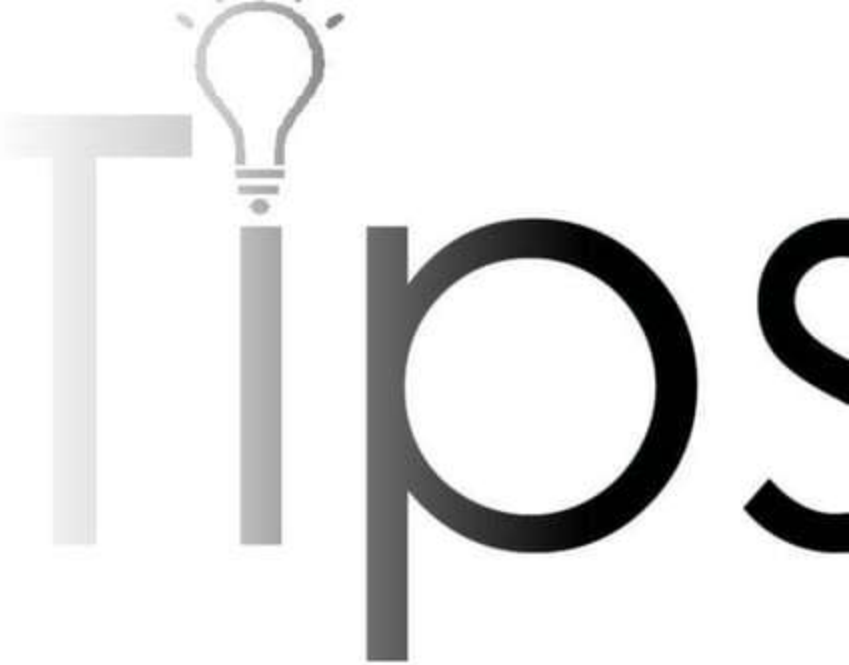
CHECKLIST – go back to field

- Full pain free movement of the injured part
- Full strength in the injured part
- Full co-ordination
- Good endurance

Use protective gear like guards, taping, head gear etc to protect from re injury

Some tips

- Cuts, Scrapes & Bleeding : stop the bleeding by direct application of pressure
- The Bloody Nose : tilt backward of the head block the nostril by cotton or by firm pinch
- Strain & Sprain : immobilize, ice, compression and elevation



- Heat injury : (it can be life threatening) in heat injury athlete may collapse symptoms prior to collapse –

  dry hot skin without sweating (not always)

  confusion

  dizziness

  chills on the chest

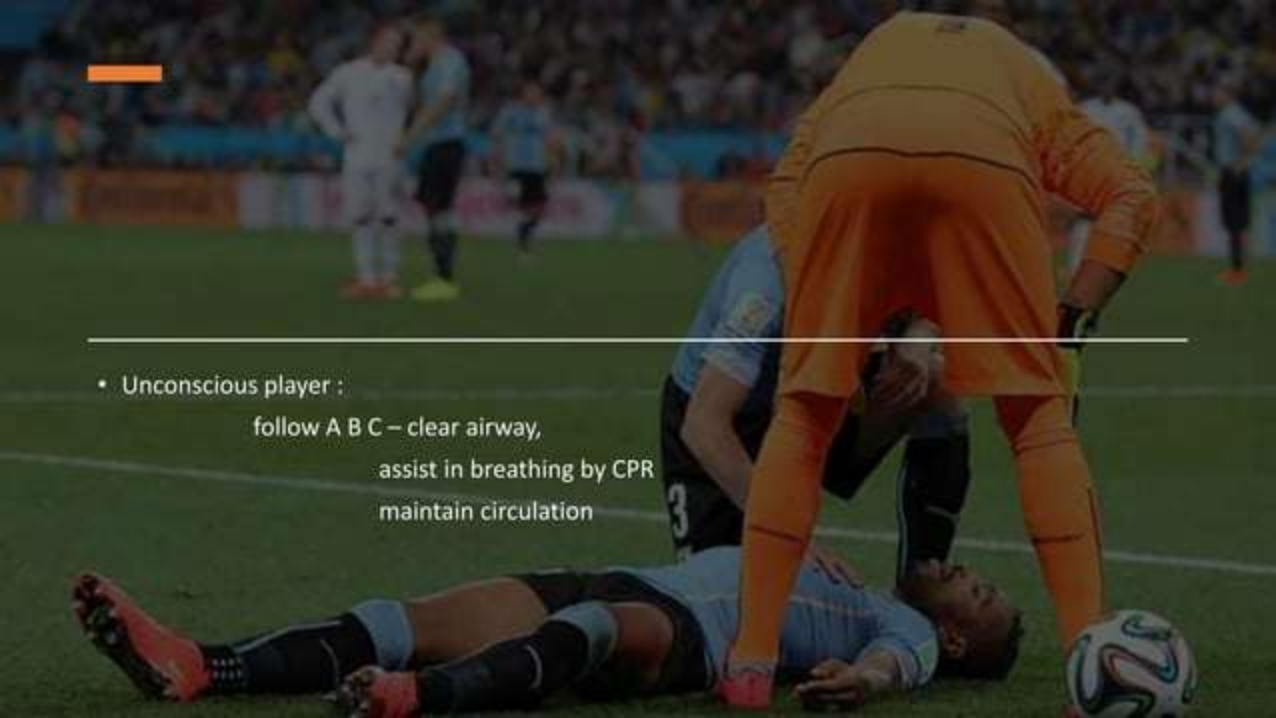
what to do then :

remove clothes

cool by packing body with ice, towels, or douse with cold water

give cool liquid by mouth

seek medical help



- Unconscious player :

  follow A B C – clear airway,

  assist in breathing by CPR

  maintain circulation

First Aid Kit

Checklist for sideline supplies

- Ice chest with ice bags & ice cups
- Wraps
- Splints
- Crutches
- Knee immobilizer
- Backboard with cervical collar
- Table
- Water & cups

Checklist for Medical kit

- 1 ½" athletic tape
- Tape scissors
- 1" athletic tape
- Skin scissors
- Elastic tape
- Tweezers
- Pre-wrap
- Nail clippers
- Assorted foam
- Pocket knife
- Skin lubricant
- Sterile applicators
- Two 6" wrap

Checklist for sideline supplies

- Squeeze water bottles
- Stretchers
- Telephone
- Medical kit
- AED
- Emergency locator forms

Checklist for Medical kit

- Tongue depressure
- Two 4" ace wraps
- Razor
- Assorted band-aids
- Plastic bags
- Tape adherent
- Alcohol
- Tape remover
- Betadine
- 4x4 sterile gauze pads
- Antibacterial ointment
- Roll gauze
- Hydrogen peroxide
- Telfa pad

Checklist for Medical kit

- Sterile eye wash
- Finger & wrist splints
- Contact lens solution
- Shoulder sling
- Steri-strips
- Pen light
- Tooth preserving pack
- Analgesic balm
- Moleskin
- Special items for athletes for special medical condition like diabetes, asthma & menstrural cycle

BASIC LIFE SUPPORT

check for **D** anger

S end for help

check **R** esponse

check **A** irways

check for **B** reathing

give **C** PR

apply a **D** efibrillator

Danger

Check for Danger (Hazards/Risks/Safety?)

- to you
- to others
- to casualty

For example; electrical wires, gases, aggressive relatives, water, etc.

Remove yourself and the casualty to an area of safety

Response

Check the casualty for a response.

Use the COWS Method

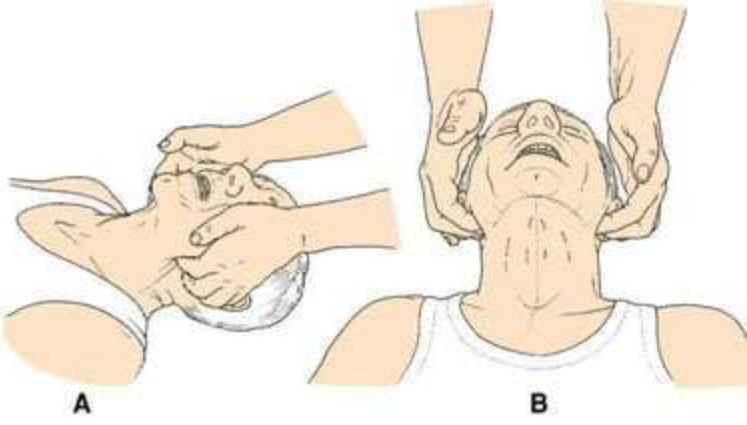
- **C** an you hear me?
- **O** pen your eyes
- **W** hat is your name?
- **S** queeze my hand

Gently squeeze shoulders
(i.e. the trapezoid muscle)

If casualty is unresponsive call for help.

Send for Help

- Police 100
- Fire 101
- Ambulance 102
- Disaster management 108



Airway

Check the airway is open and clear of obstructions.

Use a head tilt, chin lift to open the airway.

Use a jaw thrust for patients with suspected spinal cord, head, neck and facial trauma. (usually done on patients with a GCS < 8. Not recommended for unexperienced people).

Airway

In an unconscious patient, the tongue is the most common cause of obstruction.

Also check the airway for blood, vomit & any other foreign materials.

If breathing begins place in recovery position.

Breathing

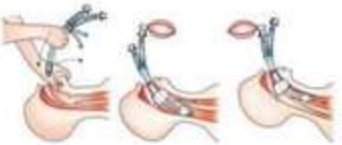
Look, listen and feel for breathing, up to 10 seconds.

- is chest rising and falling?
- can you hear or feel air from mouth or nose?

In Australia it is no longer recommended to deliver rescue breaths but rather continue straight to CPR.

CPR should be the chief priority.

In clinical situations use a face mask to administer the breaths.



Clear the airway

Esophageal tracheal Combitube

CPR

If no signs of life – unconscious, not breathing and not moving, start CPR (cardiopulmonary resuscitation)

CPR involves giving;
30 compression and 2 breaths
100 compressions per minute

(useful tunes for compression rate are *Staying Alive* by the Bee Gees, *Another one Bites the Dust* to name a few)

The recommended point of compresions is the midline over the lower half of the sternum.

CPR Continued....

Remember to push hard and fast, straight arms.

Revival checks conducted every 2 minutes (look for pulse & signs of life)

Should swap person doing compressions every 2min (so they don't become tired and perform ineffective compressions)

CPR Continued....

Doing CPR on Infants

use two fingers instead of using hands to deliver compressions.

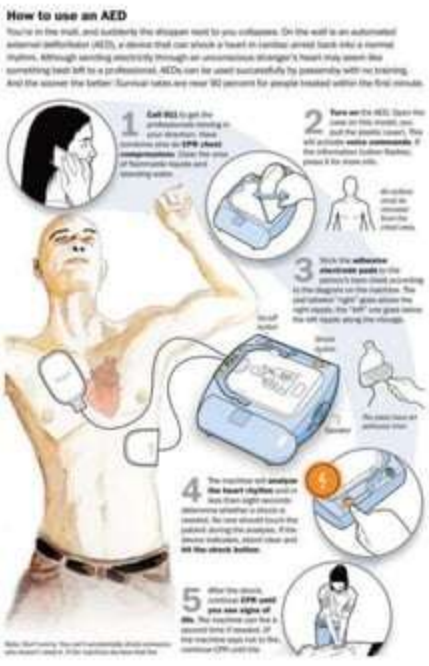
Give 30 compression & 2 breaths

100 compressions per minute

when delivering breaths do not overdo the amount, as you may cause a lung to rupture.

You should check for vital signs every 2 minutes.

CPR should continue until the return of spontaneous circulation or you are relieved by a qualified professional.



Automatic External Defibrillator

Apply a Defibrillator

If Defibrillator is available, apply and follow voice prompts.

Remember when shocking to get everyone to stand well back.

Keep checking for signs of life.

Airway Management

Oropharyngeal Airway (guedels)

Nasopharyngeal Airway

Endotracheal tube

Laryngeal mask

Thank You