



Sports Science: Topic Big Pictures

Exam Unit (R180)

Reducing the Risk of Sports Injuries and Dealing With
Common Medical Conditions

Topic Area 1: Different Factors Which Influence the Risk and Severity of Injury



1.1 Extrinsic Factors:

Risks which are **outside of the body** and are **related to the sports activity**

1.1.1 Types of Activity:

Different sporting activities can influence types of injury

1.1.2 Coaching/Leading:

- Knowledge of techniques / rules
- Experience
- Communication
- Supervision
- Ethical behaviour

1.1.3 Environment:

- Weather/ temperature
- Human interaction
- Other participants
- Officials
- Spectators
- Playing surface (natural and artificial) and surrounding area

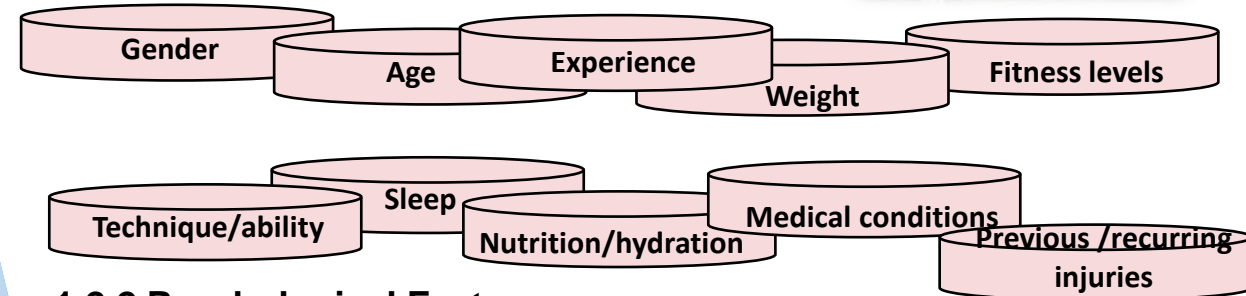
1.1.4 Equipment:

- Protective equipment
- Performance equipment
- Clothing
- Footwear

Sport Psychology

1.2 Intrinsic Factors:

1.2.1 **Individual variables** are factors which can be used to identify risks, they include:



1.2.2 Psychological Factors

Motivation

The desire/drive to do something and move toward a goal.

Arousal

An energised state that can help or hinder performance.

Anxiety

A feeling of being nervous or worried

& Stress

Confidence

The level of self-belief a performer has.

Aggression

Behavior against another person / object with intent to harm

1.2.4 Mental Strategies

Selective Attention

Imagery

Mental Rehearsal

1.2.3 Reasons for Aggression

- Level of performance
- Retaliation
- Pressures to win (performer /coach/spectators)
- Decisions of officials
- Performance enhancing drugs

DIRECT
Intentionally trying to foul / hurt someone

CHANNELLED
A forceful act within the rules but with a secondary aim of injuring the player.

Topic Area 2: Warm Up and Cool Down Routines



2.1.1 Key components of a Warm Up:

Pulse Raising

Exercises that slowly increase heart rate and body temperature: jogging around the pitch before a game of football

Mobility

Exercises that take the joints through their full range of movement (ROM): a footballer performing arm swings and hip circles.

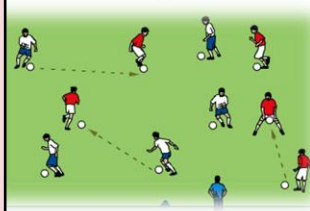
Dynamic Stretching

Dynamic stretches linked to the specific sport: 'open and close the gate' and groin walk before football.

Skill Rehearsal

Rehearsing common movement patterns and skills which will be used in the activity such as dribbling drills for football

READY



2.2.1 Physiological Benefits of a Warm Up:



Increase in muscle temperature

Increase in heart rate

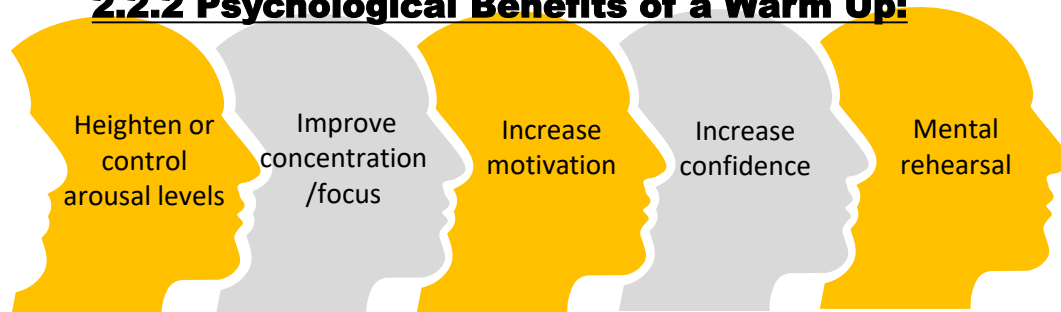
Increase in blood flow & oxygen to muscles

Increase in flexibility of the muscles and joints

Increase in pliability of the ligaments and tendons

Increase in the speed of muscle contraction

2.2.2 Psychological Benefits of a Warm Up:



Heighten or control arousal levels

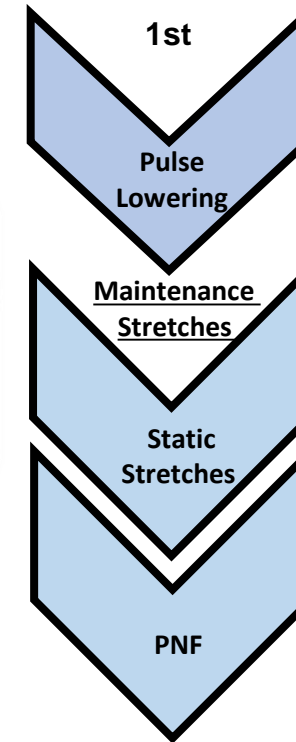
Improve concentration /focus

Increase motivation

Increase confidence

Mental rehearsal

2.3 Key components of a Cool Down:



Exercises which gradually lower your heart rate and reduce temperature back to normal.



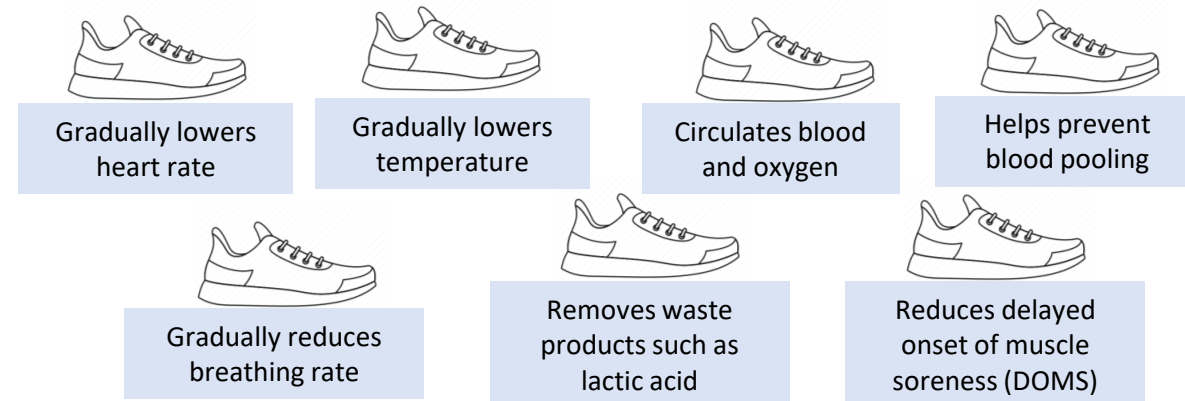
Stretches lengthen and relax the muscles after exercise.

Proprioceptive Neuromuscular Facilitation

- 1.Stretch the muscle
- 2.Push back against force
3. Stretch further
- 4.Repeat!



2.4 Physiological Benefits of a Cool Down:



Topic Area 3: Different Types and Causes of Sports Injuries



3.1 Acute Injuries

What are they?

- **Sudden** trauma
- **Immediate impact** and **pain**
- Usually **swelling** is caused
- Loss of function
e.g. being hit by a tackle in rugby, being hit by a ball in cricket (Sprains and strains are the most common)

Signs and symptoms of concussion include dizziness, headache, confusion and loss of consciousness

Possible links the onset of dementia and Alzheimer's

These occur when a bone is forced out of the joint



Occur when skin is scraped usually against a rough/hard surface

Occur when layers of skin are torn usually by a sharp object

Occur when skin has been knocked usually from a fall

Occur when skin has been rubbing (friction) usually over a long period of time

REMEMBER

Ligaments: Bone to bone

Tendons: Muscle to bone

Cartilage: – Between bones at joints to stop rubbing

Concussion –
Collision or knock to the head

Head Injuries

Soft Tissue
muscles, tendons and ligaments
Hard Tissue –
Bones (and teeth)

Soft / Hard Tissue

A partial or complete break in bone head

Fractures

-Open
-Closed

Torn muscle or tendon

Strains

Skin Damage

Sprains

-Abrasions/ grazes
-Cuts/ lacerations
-Contusions (bruises)
-Blisters

-Torn Ligaments
□ Anterior Cruciate Ligament (ACL)



3.2 Chronic Injuries

What are they?

- Also known as **overuse** injuries
- Caused by continuous stress and **repetitive movement**
- Tend to **develop gradually** over **a period of time**
- Symptoms can include a dull ache, swelling pain when performing

3 Main Types:

- Achilles
- Rotator cuff
- Patellar

3.2.2 Tendonitis

When a tendon **becomes inflamed** usually due to overuse.



3.2.3 Epicondylitis:

Caused by **repetitive sporting actions** especially in golf and tennis.

2 Types:

- Lateral epicondylitis (Tennis elbow)
- Medial epicondylitis (Golfers elbow)



CHRONIC



3.2.4 Shin Splints

Occurs after a lot of running and causes pain and swelling in the tibia (shin bone)



3.2.5 Stress Fractures

Tiny cracks that form in the bone due to continuous stress

Topic Area 4: Reducing Risk, Treatment and Rehabilitation of Sports Injuries and Medical Conditions



4.1 Measures that can be taken before and during to reduce risk and severity of injury /medical conditions

before and during to **reduce risk and severity of injury /medical conditions**

conditions

Safety Checks:

- Risk assessments, level of risk
- Control measures for the removal of hazards and reduction of risks
- Characteristics of the individual/group
- Group size

Reducing the Risk of Sports Injuries & Medical Conditions:

- Medicals
- Screening
- National Governing Body (NGB) policies

Emergency Action Plans (EAP):

- Emergency personnel
- Emergency communication
- Emergency equipment



Defibrillator



SALTAPS On-Field Assessment Routine

S	See
A	Ask
L	Look
T	Touch
A	Active
P	Passive
S	Strength

DR ABC

D	Danger
R	Response
A	Airway
B	Breathing
C	Circulation

PRICE Therapy

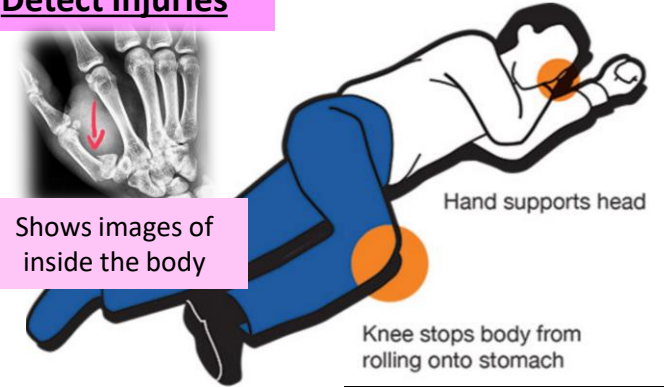
P	Protect
R	Rest
I	Ice
C	Compress
E	Elevate

Use of X-Rays to Detect Injuries



Shows images of inside the body

Recovery Position



Hand supports head

Knee stops body from rolling onto stomach

Treatments and Therapies:

Some injuries may require **no movement** to help them prevent further damage

Cast / Splint / Sling

Ultrasound

Involves passing high frequency sound waves into soft tissue. Can be helped to guide injections.

Electrotherapy

Immobilisation

Treatment / Therapy

Massage

For minor strains & sprains. Helps reduce swelling /increase recovery. Should only be used in the subacute phase of injury i.e. 72 hours after the injury has occurred

Different Psychological Effects of Dealing with Injuries and Medical Conditions

-How can treatment make athletes feel?

-How can long-term rehabilitation make them feel?

Support

Some injuries may require support to help them heal or to allow a player to perform










Kinesiology Taping / Neoprene / Bandaging

Ibuprofen

Painkillers

Topic Area 5: Causes, Symptoms and Treatment of Medical Conditions



	 <p>Asthma A respiratory condition that makes it difficult to breathe.</p> 	<p>Diabetes A medical condition; blood sugar levels to become too high. Type 1 and Type 2 are affected by age and lifestyle. Type 1 is not so much.</p>	<p>Epilepsy A medical condition that affects the brain and causes seizures/fits.</p>	<p>Sudden Cardiac Arrest (SCA) Occurs suddenly, causes the heart to stop working.</p>	<p>Hypothermia Occurs when the body temperature becomes too low.</p>	<p>Heat Exhaustion Caused by overheating of the body.</p>	<p>Dehydration Caused when the body loses more fluid than is consumed and is unable to function properly.</p>
<p>Cause</p>	<ul style="list-style-type: none"> • Environment-pollen, temperature changes, animals • Exercise intensity, performed indoors/outdoors 	<p>Type 1 – the body is unable to produce insulin Type 2 – the body does not produce enough insulin, or insulin does not work properly (<i>Insulin helps manage blood sugar levels</i>)</p>	<ul style="list-style-type: none"> • Severe head injuries • Anxiety/stress • Tiredness/lack of sleep 	<ul style="list-style-type: none"> • Underlying genetic heart conditions • Intense physical activity • Sudden trauma 	<ul style="list-style-type: none"> • Body temperature drops below 35°C • Prolonged exposure to cold/wet conditions 	<ul style="list-style-type: none"> • Body temperature of 38°C or above • Strenuous physical activity • Not enough water intake 	<ul style="list-style-type: none"> • Loss of bodily fluids
<p>Symptoms</p>	<ul style="list-style-type: none"> • Coughing • Wheezing • Shortness of Breath • Tightness in the chest 	<ul style="list-style-type: none"> • Increased thirst • Urinating more often • Extreme tiredness • Weight loss • Cuts take a long time to heal 	<ul style="list-style-type: none"> • Eyes – for example, staring blankly and fluttering • Mouth – for example, biting tongue and random noises • Limbs – for example, stiffness and jerking movements 	<ul style="list-style-type: none"> • Unconscious • Breathing difficulties 	<ul style="list-style-type: none"> • Shivering • Blue lips/skin • Slurred speech • Tiredness/confusion • Slow breathing 	<ul style="list-style-type: none"> • Excessive sweating • Headache/ dizzy • Being very thirsty • Feeling or being sick • Rapid pulse and/or breathing 	<ul style="list-style-type: none"> • Feeling thirsty • Fatigue • Dark yellow urine and infrequent urination • Dry mouth/lips
<p>Treatment</p>	<ul style="list-style-type: none"> • Reassurance • Inhaler/Nebuliser 	<ul style="list-style-type: none"> • Insulin /glucose • Lifestyle changes • Diet • Exercise 	<ul style="list-style-type: none"> • Anti-epileptic drugs (AEDs) • Ketogenic diet 	<ul style="list-style-type: none"> • Defibrillators • Lifestyle changes 	<ul style="list-style-type: none"> • Remove wet clothing/wrap in blankets and cover head • Give a warm and sugary non-alcoholic drink 	<ul style="list-style-type: none"> • Move to a cool place/cool their skin • Get them to drink plenty of water 	<ul style="list-style-type: none"> • Drink plenty of water • Rehydration sachets 

Important Info Regarding Diabetes: Hypo**g**lycaemia (Hypos) - low blood sugar

Hypo**e**rglycaemia - high blood sugar