OCR Cambridge National – Sport Science – R041 Reducing the risk of sports injuries – LO1

Factors affecting the risk of injury:
Extrinsic (risk that comes from outside of the performer)

1. **Type of activity** – Contact sports will present an increased injury risk.

Contact sports	Non-contact sports
Boxing	Swimming
Rugby	Volleyball
Martial arts *i.e. karate/judo*	Table Tennis
Fencing	Gymnastics

2. **Coaching or supervision** – The skills and actions of a good coach will maintain performer safety.
- Poor or incorrect coaching of techniques may cause mild/severe injuries. *i.e. a forward roll.*
- Ineffective communication skills may lead to unclear instructions or fail to highlight the risks involved. *i.e. poor instructions when coaching a rugby tackle.*

3. **Correct application and adherence of the activity rules/regulations** - Rules and laws in sport are not just there to ensure fair play, they are also designed to protect participants.
- Number of players on the pitch
- Misuse of equipment
- Use of protective equipment. *i.e. shin pads.*

3. **Environmental factors** – These factors are highly variable and may change throughout the course of a match or training session.

Weather: Athletes working for a long time in very hot or very cold conditions can cause injury.

Playing surfaces and surrounding areas: All playing areas should be safe and free from hazards. Pre match checks by officials support this. Users should be inducted into how to use equipment safely.

Other participants: Often injury can occur as a result of dangerous play by others taking part. The open nature of sport can make gameplay unpredictable.

5. **Equipment:** Modern sports equipment is lighter and more durable enabling a better performance from participants.

Protective equipment: Compulsory items are worn by individuals for player safety and to prevent injury. *i.e. gum shield.*

Performance equipment: These are the items needed to play the sport. Technological advances have improved performance using new materials & latest designs. *i.e. Tennis racket & footballs.*

Clothing/footwear: This will protect and assist performance.

6. **Safety Hazards** - All dangers should be fully assessed and measures put in place to limit the risk of injury.
- **Risk assessments** - This is a process where hazards are identified.
- **Safety checks** – This is a duty of a coach/sports leader.
- **Emergency action plans** – Plans for evacuation and fire assembly points must be made clear to participants.

Intrinsic (risk that come from within your own body)

1. **Physical Preparation** – Factors that can affect the risk of injury:

2. **Individual Variables** – Training should be set at the right level and account for strengths and weaknesses. Injuries can be prevented by:
- Gender
- Age
- Flexibility
- Nutrition
- Sleep
- Previous or reoccurring injuries

3. **Psychological Factors** – Mental factors that encourage performers to be in the right 'frame of mind' to perform well.
- **Motivation** – drive to do something well.
- **Aggression** – Intention to cause harm to others.
- **Arousal** – Level of activation of a performer.
- **Anxiety** – Negative emotional state with feelings of worry.

4. Poor Posture – Injuries due to; Poor stance/gait, sitting position, lack of exercise, physical defect, fatigue, clothing or footwear.

5. Sports injuries relating to posture -
- Pelvic tilt: Excessive sitting causing the muscles of the pelvis to get tight.

Scoliosis

Lordosis

Kyphosis

OCR Cambridge National – Sport Science – R041 Reducing the risk of sports injuries – LO2

Physical benefits of a warm up:

- **Warming the muscles** – The ligaments and tendons around the joint become more pliable.
- **Increases body temperature** – Gentle activity raises the body's core temperature.
- **Increased flexibility** – Muscles and joints are taken through a full range of motion.

- **Increase in heart rate** – This response is stimulated by adrenaline.
- **Increased blood flow** – The increase in oxygenated muscles prevents fatigue related injuries.
- **Increased speed of muscle contraction** – This occurs due to improved elasticity of muscle fibres.

Psychological benefits of a warm up:

- **Heighten or control arousal levels** - (e.g. 'get in the zone') This will settle an athletes nerves.
- **Improve concentration/focus** - Efficiently focusing attention on task-related cues (narrowing)
- **Increases motivation** – Helps athletes feel more energised.
- **Mental rehearsal** – A popular method of preparation. Involves the athlete imagining themselves performing prior to competing.

Key components of a warm up:

Stage 1 - Pulse raiser: Involves gentle jogging, running or skipping designed to slowly increase heart rate.

Stage 2 – Mobility: Exercises to move joints through a full range of motion. *i.e. arm swings or ankle rolls.*

Stage 3 – Dynamic movements: Related movements that involve a change of speed and direction. *i.e. zig zag runs.*

Stage 4 – Stretching: Developmental movements in order to stretch the major joints/muscles of the body. *i.e. open and close the gates.*

Stage 5 – Skill rehearsal/sport specific phase: Involves specific skills to the event being completed. *i.e. a tennis player would work on forehand, backhand, service and volley movements.*

Physical benefit of a cool down:

- **Reduces soreness and stiffness** – Stretching helps prevent the joints/muscles becoming sore and stiff.
- **Stops blood pooling** – keeps blood circulating and slowly returns.

- **Removes lactic acid** – Continuing gentle movement reduces the build up of this waste product.
- **Gradually lowers the heart & breathing rate** – This allows the body to transition back to resting state.
- **To reduce core temperature and circulate blood and oxygen** – This repays the oxygen debt within the body.
- **Improves flexibility for next workout** – Recovering muscles will be the most pliable and this is where gains in suppleness can be achieved.

Key components of a cool down:

Stage 1 - Pulse lowering:
The first part is light aerobic work.
i.e. Gentle jogging and walking.

Stage 2 - Stretching:
The second part is gentle stretching exercises of all the major joints and muscles of the body.

Specific needs which a warm up/cool down must consider:

Characteristics of the group:

- Size of the group/Age of performers
- Experience levels/Fitness levels
- Medical condition or existing injuries

Suitability of the exercises suggested:

- Related to the activity
- Gradual

Environmental factors:

- Weather conditions
- Inside or outside
- Facilities available

OCR Cambridge National – Sport Science – R041 Reducing the risk of sports injuries – LO3

Acute and Chronic injuries:

Acute injuries occur as a result of sudden trauma to the body. Results in immediate pain, swelling and a loss of function.

i.e. a bad tackle in football leading to knee ligament damage.

Chronic injuries occur over a period of time. These are associated with repetitive/continuous use. *i.e. tendonitis, shin splints, tennis elbow.*

How to respond to injuries and medical conditions in a sporting context:

- **SALTAPS** on-field assessment routine (See, Ask, Look, Touch, Active, Passive, Strength)
- **R.I.C.E.** (Rest, Ice, Compress, Elevate)
- **Stretching and massage** – This therapy can increase the health of muscle and connective tissue.
- **Taping, bandaging, splints, slings** – Can support the injured area.

- **Hot and cold treatments.** *i.e. heat pack, freeze spray.*
- **Emergency procedures -** Emergency first aid should only be administered by trained personnel.

Emergency Action Plans (EAP) - This is a document which outlines the procedures in event of an emergency.

- Emergency personnel. *i.e. first responder, first aider, coach.*
- Emergency communication. *i.e. telephone, emergency numbers, emergency services.*
- Emergency equipment. *i.e. first aid kits, evacuation chair.*

Types, causes and treatment of common sports injuries:

Soft tissue injuries are the most common in sport and include **sprains** and **strains** of muscles, tendons and ligaments.

Contusion (bruise): An area of the body where blood vessels have been damaged under the skin/tissues. These are often caused by a fall or direct impact.

Treatment – Rest, Ice, Compression, Elevation

Abrasions (Grazes and Cuts):

This is damage to the skin caused by scraping against a playing surface. Open wounds can carry an infection risk and if cuts are deep, medical attention may be required to apply stitches.

Blisters: After friction, layers of skin can become separated and form a pocket of fluid between them. Treatment: Rest, bandages.

Overuse injuries are chronic (overuse of a particular part of the body)

Tendonitis is the overuse of tendons in the body. Both **golfers elbow** and **tennis elbow** affects the tendons that attach muscles to the elbow joint. These become inflamed, sore and painful. Treatment – Rest, oral medication or surgery.

Shin Splints: Repeated overuse of the tibialis anterior resulting in tenderness and inflammation around the shin. Excess weight, inadequate footwear and poor technique can cause this.

Treatment includes:

- Rest + Ice the shin to ease pain and swelling
- Take anti-inflammatory painkillers

Concussion: Trauma or injury to the brain. It is caused by a direct blow to the head. Treatment – Immediate medical attention.

Cramp: A sudden involuntary muscle contraction (over shortening) due to an imbalance of water/salt. Treatment – Stretching or massaging the affected muscle area.

Fractures: Partial or complete break of bone from sudden trauma. *i.e. an awkward fall.*

1. Closed fracture - The surrounding skin is unbroken.
2. Open fracture – Considerable damage to the surrounding tissue. Bone will break through the skin.

Treatment – Immobilise and seek urgent medical services.

Injuries realted to children:

Severs disease:
This is inflammation of a growth plate in the heel.

Osgood Schlatter's disease:
Knee pain in growing children. Will subside once they stopped growing.