L2 Cam Nat in Sports Science

Reducing the Risk of Sports Injuries – EXAM

Key Facts & Need to Know Sheet

Ways this resource can be used – it provides an overview of the key information you 'need to know' for your exam. Add your own examples as you progress through the unit, highlight areas of strength and focus or complete at the end of the unit to highlight areas of revision in preparation for the exam. Green, Orange and Red highlighting could be used or Ticks, Crosses or Question Marks to identify each of the areas.

LO1 – Understand different factors which influence the chance of injury

EXTRINSIC FACTORS

- TYPE OF ACTIVITY – different activities present different risks. For example, contact sports often involve impact injuries (fractures, dislocations, concussion, strains and sprains) whereas non-contact sports are often associated with overuse injuries (tennis elbow, shin splints, stress fractures and golfer shoulder). Activities such as gymnastics and dance are often linked to strains and sprains.
- COACHING SUPERVISION
    - Poor/incorrect coaching techniques. For example, a rugby coach who shows a young player the wrong tackling technique could put their safety in jeopardy.
    - Ineffective communication skills.
    - Adherence to rules and regulations. These are in place primarily to keep performers safe. For example, the high tackle rule in rugby is there to ensure players heads are not targeted. Netballers must have short nails and long hair tied back.
- ENVIRONMENTAL FACTORS
    - Weather – Rain, snow, heat, fog and even thunder and lightning can all present issues which increase the chance of injury. For example, a waterlogged pitch could increase the chance of a late tackle or slip causing injury. In some parts of the world there is the constant danger of lightning strikes. Extreme heat can also cause dehydration and heat exhaustion.
    - Playing Surface/Performance Area and Surrounding Area -
    - Other Participants – Injuries caused by contact with opponents. For example, high and late tackles. Heavy punches in boxing or car to car contact in formula 1 which causes drivers to crash.
- EQUIPMENT
    - Protective Equipment – shin pads in football, gum shields and head guards in rugby, helmets and padding in cricket and helmets in cycling are all designed to increase safety and decrease injury. However, if they are not worn, do not fit or are faulty this could cause an increase in the chance of injury.
    - Performance Equipment – various types of equipment can cause injury. Hockey sticks, cricket balls, climbing harnesses are just some examples
    - Clothing/Footwear suitable for playing surface/weather conditions/specific sport or activity – suitable clothing and footwear should always be worn. If they are absent, do not fit or faulty this can increase the chance of injury. For example, not wearing studded boots could cause a slip when playing football.

- SAFETY HAZARDS
    - Risk Assessments – these should be in place for all activities, facilities and equipment. If these have not been completed something which can cause an injury, for example, a faulty piece of equipment, could occur.
    - Safety Checks – safety checks should be completed on all facilities and equipment with a record kept. Before matches this is the responsibility of the officials (e.g. referee) or training sessions the coach. If these checks are not done an injury could occur
    - Emergency Action Plans – these can help to decrease/increase the severity of an injury depending on whether certain things are in place. EAP's should include details of personnel (e.g. first aider), communication (e.g. phone to contact) and equipment (e.g. first aid kit)

INTRINSIC FACTORS

- PHYSICAL PREPARATION
    - Training – this needs to be at the right level and for the correct period of time. Too hard or too long and injury could occur for the performer in the form of overuse injuries (shin splints/tennis elbow) or acute injuries (strains/sprains)
    - Warm up – a proper warm up needs to be completed or injury could occur. This helps the performer to prepare physically (increase blood flow to the muscles, increase body temperature) and mentally (increase focus and concentration).
    - Cool down – a proper cool down needs to be completed or injury could occur. This helps the performer to recover from physical activity and ensure they are in the best condition for the next session (returns body to resting levels, removes waste products such as lactic acid and prevents muscle soreness and stiffness)
    - Fitness levels – better fitness levels decrease the risk of injury. If a performer pushes themselves beyond what they are capable of they could suffer an injury.
    - Overuse – too much physical activity or using the incorrect technique could cause an overuse injury. For example, a tennis player continuing to train when injured with tennis elbow.
    - Muscle imbalances – overusing some muscle groups at the expense of others. For example, a weight lifter not distributing their weight evenly resulting in an injury to muscles on one side of the body (strain)
- INDIVIDUAL VARIABLES
    - Gender – females are more flexible than men
    - Age – the human body is more flexible when younger, while strength increases with age to approx. 30 before decreasing. Our ability to recover from injury is increased when we are younger and takes longer as we get older.
    - Flexibility – poor flexibility increases the chance of injury. For example, a hockey player with poor flexibility could strain their hamstring when reaching for the ball
    - Nutrition – the correct diet helps a performer have the right amount of energy not to injure themselves. A marathon runner should eat plenty of carbohydrates to avoid fatigue
    - Sleep – can help the body recover. A lack of sleep could cause a lack of concentration which could increase the chance of injury. For example, a boxer may suffer a blow to the head if their reactions are delayed due to being tired during training.

    - Previous/recurring injuries – these can increase the chance of an injury recurring. For example, a runner who has sprained an ankle is more likely to do so again.
- PSYCHOLOGICAL FACTORS
    - Motivation – the right motivation will ensure the performer is focused when playing/training and so decreases the chance of injury. Poor motivation could lead to mistakes/a lack of focus and increase the chance of injury.
    - Aggression – over aggression could lead to injury to the performer or an opponent. For example, a late tackle/being out of control in football could injure both the performer and their opponent.
    - Arousal/Anxiety Levels - this could lead to a skill technique not being performed correctly which causes injury.
- POSTURE AND CAUSES OF POOR POSTURE
    - Poor stance/gait – bending your knees or hunching when standing
    - Sitting positions – slumping/slouching on the sofa rather than sitting upright
    - Physical defects – muscles weaken around an injured area
    - Lack of exercise – lack of core muscle strength means less support; being overweight puts greater strain on posture
    - Fatigue – tired muscles or those which tire easily will be unable to support the skeleton effectively
    - Emotional factors – peoples posture is often reflected in their mood e.g. when people are sad they often have their head and shoulders down rather up which affects posture
    - Clothing footwear – wearing ill-fitting/shoes with heels can affect posture
- SPORTS INJURIES RELATED TO POOR POSTURE
    - Pelvic tilt – a common condition where the pelvis tilts either forwards (anterior) or backwards (posterior)
      Lordosis - the inward curvature of a portion of the lumbar vertebrae
    - Kyphosis - the extreme curvature of the upper back also known as a hunchback
    - Round shoulder – a condition caused by poor posture where the shoulders are pushed up and forward
    - Scoliosis - a lateral (side-to-side) curve in the spine

LO2 – Understand how appropriate warm up and cool down routines can help to prevent injuries

THE PHYSICAL BENEFITS OF A WARM UP

- Warming up muscles/preparing the body for physical activity
- Increase in body temperature, heart rate, flexibility of muscles and joints, pliability of tendons and ligaments, blood flow and oxygen to the muscles and the speed of muscle contraction

THE PSYCHOLOGICAL BENEFITS OF A WARM UP

- Heighten or control arousal levels – this is important as under or over arousal can cause injury through increased anxiety or an over confidence or lack of concentration
- Improve concentration or focus – get the performer mentally ready and 'in the zone'
- Increase motivation – the desire to do well
- Mental rehearsal – this is where a performer visualises (sees/imagines) their performance

KEY COMPONENTS OF A WARM UP

- Pulse raising activities – these increase the heart rate and body temperature, increasing oxygen flow to the muscles. Jogging, cycling and skipping are good examples of pulse raisers)
- Mobility exercises – these take joints through their full range of movement. They help to increase flexibility and include hip circles, arm swings and walking lunges
- Dynamic movements – changes in speed and direction. Slalom runs and sprint shuttles, ladder and hurdle work
- Stretching – dynamic stretches linked to sport e.g. open and close the gate, squats
- Skill rehearsal phase – rehearsing common movement patterns which will be used in the activity (e.g. dribbling/shooting/heading drills in football)

THE PHYSICAL BENEFITS OF A COOL DOWN

- Helps the body to return to a resting state
- Gradually lowers heart rate and body temperature
- Circulates blood and oxygen
- Reduces breathing rate
- Removes waste products such as lactic acid
- Reduces the risk of muscle soreness and stiffness
- Aids recovery by stretching muscles – lengthening and strengthening muscles for next use

KEY COMPONENTS OF A COOL DOWN

- Pulse lowering – exercises which gradually lower heart rate and reduce body temperature e.g. light running/jogging
- Stretching

SPECIFIC NEEDS A WARM UP AND COOL DOWN MUST CONSIDER

- Characteristics of the individual/group
    - Size of group
    - Age of participants
    - Experience of participants
    - Individual fitness levels
    - Any medical conditions participants may have
- Suitability as preparation for a particular activity/sport
- Environmental factors (e.g. weather/temperature if outdoors, available facilities)

LO3 – Know how to respond to injuries in a sporting context

ACUTE AND CHRONIC INJURIES

- Acute Injuries – caused as a result of sudden trauma to the body (hard rugby tackle, cricket ball to the head). Result in immediate pain, usually swelling and loss of function

- Chronic Injuries – also known as overuse injuries following consistent stress on an area (shin splints, tennis elbow). These injuries tend to worsen and appear over time often due to incorrect technique or insufficient rest

TYPES, CAUSES AND TREATMENTS OF COMMON SPORTS INJURIES

- Soft Tissue Injuries – such as strains and sprains. Often caused by sudden impact or over-stretching. Sprain – sudden twisting/wrenching of a joint resulting in immediate pain and swelling. Strain – pulling or stretching a muscle to a damaging degree.
- Overuse Injuries – such as tennis elbow. Caused over time by poor technique or lack of rest
- Fractures – open and closed. Open fracture when the bone breaks through the skin. Closed fracture occurs inside the body. Often caused by sudden impact results in swelling and immobility.
- Concussion – a trauma to the brain caused by a sudden or repetitive impact. Dizziness, sickness, blurred vision, headaches are all side effects.
- Abrasion – such as grazes or cuts which can be minor or more serious. Often caused by impact with a surface, object or opponent. Graze – a removal of the top layer of skin. Cut – where the skin is completely broken by something sharp or sudden.
- Contusions – bruises. Often caused by impact with a surface, object or opponent
- Blisters – a build-up of fluid under the surface of the skin. Can be caused by ill-fitting footwear or exercise over a long period of time.
- Cramp – Painful sensations caused by muscle contractions or over shortening. Often the result of exercise over a long period of time and muscle fatigue.
- Injuries related to children –
    - Severs Diseases – inflammation in the growth plate of the heel of growing children. It is painful and is caused by repetitive stress and so common in Active children
    - Osgood Schlatters Disease – inflammation of the patellar ligament in the knee. It causes a large bump just below the knee that eases with rest.

HOW TO RESPOND TO INJURIES AND MEDICAL CONDITIONS IN A SPORTING CONTEXT

- SALTAPS - Used to immediately assess injuries/assess the severity of an injury
    - See (are there obvious abnormalities?)
    - Ask (where/how bad is the pain?)
    - Look (for signs of bleeding, swelling or abnormality)
    - Touch (for signs of heat, tenderness or loss of feeling)
    - Active (movement)
    - Passive (try to move the injured site)
    - Strength (can they weight bare on the injured part?)
- RICE (Rest, Ice, Compress, Elevate)
    - Used to treat soft tissue injuries
    - Most mild strains and sprains heal with "R.I.C.E." (rest, ice, compression, and elevation) and exercise. Moderate sprains may also require a period of bracing. The most severe sprains may require surgery to repair torn ligaments.
- Stretching and Massaging
    - These help the muscles to recover following exercise by;
    - Improving blood flow and oxygen distribution
    - Increasing range of movement at a joint

    - Removing waste products such as lactic acid which causes soreness, stiffness and cramp in the muscles
- Taping, Bandaging, Slings and Splints
    - Taping and bandaging can be used to prevent injury to a muscle or joint or treat/rehabilitate through increasing the stability of that area
    - Splint and Slings are used to immobilise injured sites to either allow the body to heal or prevent further injury. If a fracture or dislocation is suspected splint and slings are often used.
- Hot and Cold Treatments
    - Examples include heat packs and freeze sprays
    - Cooling an injured body part reduces swelling and bruising by restricting blood flow to that part of the body. It also reduces pain.
    - Heat treatments increase blood flow to an injured part of the body and help the healing process. They are used during the recovery process for chronic injuries such as overuse injuries.
- Action Plan to respond to injuries and medical conditions in a sporting context
    - First Aid Kit
    - Qualified First Aider
    - Phone
    - Emergency Contacts

EMERGENCY ACTION PLANS IN A SPORTING CONTEXT – procedures and actions to be carried out in an emergency

- Emergency Personnel – first responder, first aider, coach – roles and responsibilities
- Emergency Communication – telephone (access/location), emergency numbers, emergency services
- Emergency Equipment – first aid kit (access/location), evacuation chair

LO4 – Know how to respond to common medical conditions

THE SYMPTONS OF COMMON MEDICAL CONDITIONS

- Asthma – coughing, wheezing, shortness of breath, tightness in the chest
- Diabetes – increased thirst, going to the toilet lots, extreme tiredness, weight loss. There are also differences between Type 1 (Insulin-Dependent) and Type 2 (Non-Insulin Dependent)
- Epilepsy - seizures

HOW TO RESPOND TO THESE COMMON MEDICAL CONDITIONS

- Ensure awareness of any participants' medical conditions prior to commencing physical activity – teachers/coaches should have an awareness of any performer with these conditions
- Asthma – performers may need to stop, be reassured and use their inhaler. In some cases, medical support may be needed.
- Diabetes – the performer may need to have insulin given or sugary food drinks (sweets, chocolate, fruit juice). In some cases, medical support may be needed.
- Epilepsy – an emergency care plan must be in place for the performer. This details what should happen in the event of a seizure.
- When to refer the performer onto a professional and how to do so