

Cambridge Nationals Sport Science Unit R180

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

Answers



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Introduction

This revision work-booklet includes topic overview sheets and exam questions.

The topic overview sheets include a range of key information, images and diagrams in order to help you revise each topic. There are lots of gaps within these sheets which you will need to fill in. Lets look at an example.

As you can see, there are gaps in the description of head injuries shown below.

Head Injuries

_____ is normally caused by a blow to the head
Symptoms include headaches, loss of _____ and
slurred _____

You simply need to fill in the gaps in order to complete the definition.

Head Injuries

Concussion is normally caused by a blow to the head
Symptoms include headaches, loss of **balance** and
slurred **speech**

The example below shows that you need to complete the bullet points covering the reasons for aggression:

Reasons for Aggression



After filling in the answers, the bullet points will look like this:

Reasons for Aggression

- Level of performance
- Retaliation
- Pressures to win
- Decisions of officials
- Performance enhancing drugs



You will also be required to answer a number of exam questions throughout the booklet. Read each question carefully and pay close attention to the amount of marks available.





Advice on Correct Technique



Expertise



Contact Sports

The nature of some sports can make them more dangerous than others

High quality coaching can reduce the chance of an injury occurring. Coaches can provide....

Guidance

Support

Instruction

Direction

Knowledge

Coaching/Instruction

Non-contact Sports



Type of Activity

**R180 TA1 - Part 1
Extrinsic Factors
Influencing Injury**



Equipment

Environmental Factors

Weather

Environmental factors can increase the chances of injury taking place in certain sports

Temperature

Human Interaction with officials, spectators and other participants

Playing Surface

Helmet

Shin Pads

Goggles

Gum Shield

Specialist Shoes

Knee Pads

Sports tend to have specific sportswear necessary to carry out activities



Types of Sport Activity

Organise the sports into contact and non-contact

Contact Sports	Non-contact Sports
<u>Rugby</u> <u>Taekwondo</u>	<u>Basketball</u> <u>Tennis</u>
<u>Boxing</u> <u>Football</u>	<u>Netball</u>



Rugby



Taekwondo



Basketball



Boxing



Netball



Tennis



Football

Contact sports have a **higher** risk of injury from physical contact in defence, attacks or **tackles**. This risk can be reduced by wearing **safety** equipment & clothing and officials awarding **penalties** when unruly contact is made.

However, injuries also occur on non-contact team sports like netball including muscle strains and **sprains** such when running or jumping.

In net games like Tennis, the most common injuries are **overuse** injuries from repeated actions and injuries from twisting too quickly.

In individual sports such as gymnastics and dance, the most common injuries occur as a result of **landing** incorrectly or falling. These include sprains and **fractures** in the knee and ankle.

Also, injuries can occur in both contact and non-contact sport through contact with sporting **equipment**.

Fill in the gaps with the following words:

Higher	Overuse	Equipment	Fractures	Sprains
Tackles	Safety	Penalties	Landing	

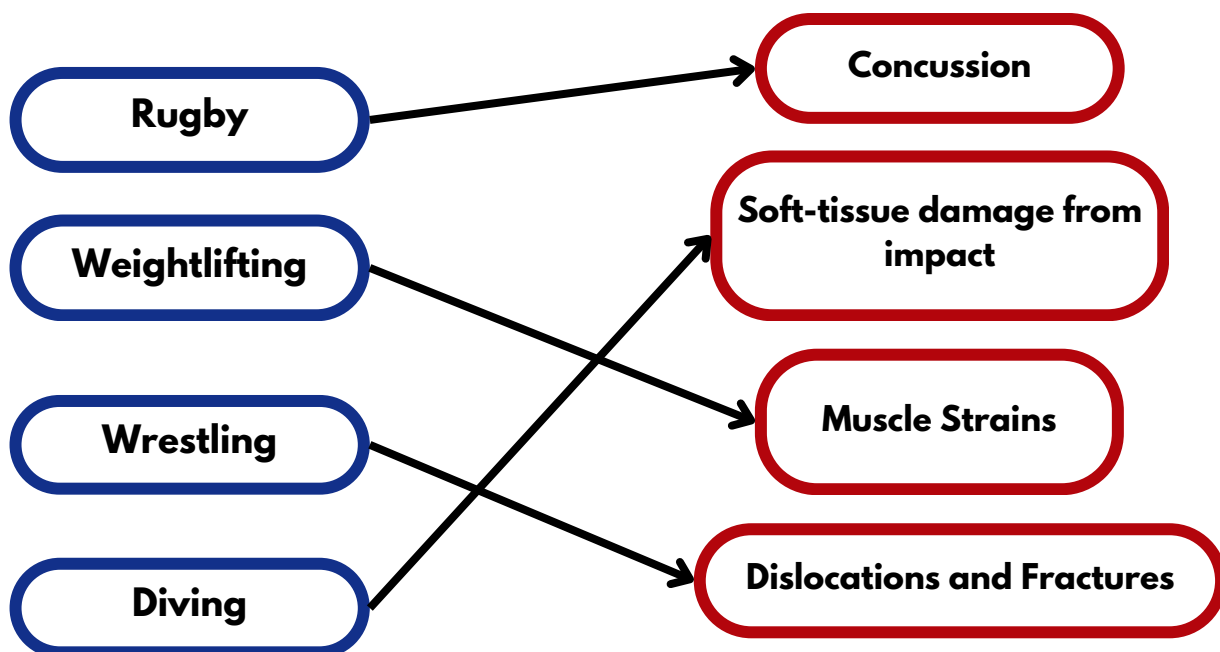


Coaching/Instructing/Leading

Factor	Explained Examples
Technique	<p>Coaching good tackles in football and rugby -</p> <ul style="list-style-type: none">• Avoid injuries by having better timing and accuracy in tackles• Players techniques will be safer for both themselves and their opponents <p>In sports involving jumping, coaches should ensure feet are planted correctly and knees are bent on landing to avoid excess stress on the ankle joint.</p>
Rules and Regulations	<p>It is the responsibility of a coach to check:</p> <ul style="list-style-type: none">• Players know <u>rules</u> and <u>regulations</u>• They wear protective <u>equipment</u> and clothing• They are playing in the correct <u>age</u> group• Players do not play with pre existing <u>injuries</u>
Experience	<p>A more experienced, fully qualified coach can:</p> <ul style="list-style-type: none">• Readily identify risky <u>situations</u>• <u>Foresee</u> injuries for technique and form• Provide advice on correct technique and use of <u>equipment</u> to reduce the risk of acute and chronic injuries
Communication	<p>Instructions needs to:</p> <ul style="list-style-type: none">• Be <u>clear</u> and easy to understand• Cover all <u>safety</u> and technique points• Heard by all performers, especially when coaching <u>large</u> groups.
Supervision	<p>Amount of supervision needed depends on the <u>number</u> of participants and the <u>risk</u> level of activity.</p> <p>Poor supervision includes tidying up whilst participants are still training and no checking form.</p>
Ethical Standards/ Behaviour	<p>Needs to ensure their players:</p> <ul style="list-style-type: none">• Comply with rules and <u>fair play</u>• Reduce the 'win-at-all-costs' <u>attitude</u>• Manage their <u>emotions</u> and self control. <p>They need to also ensure they follow these themselves so participants do not copy aggressive or reckless behaviour.</p>



Match sport to likely injury from poor technique



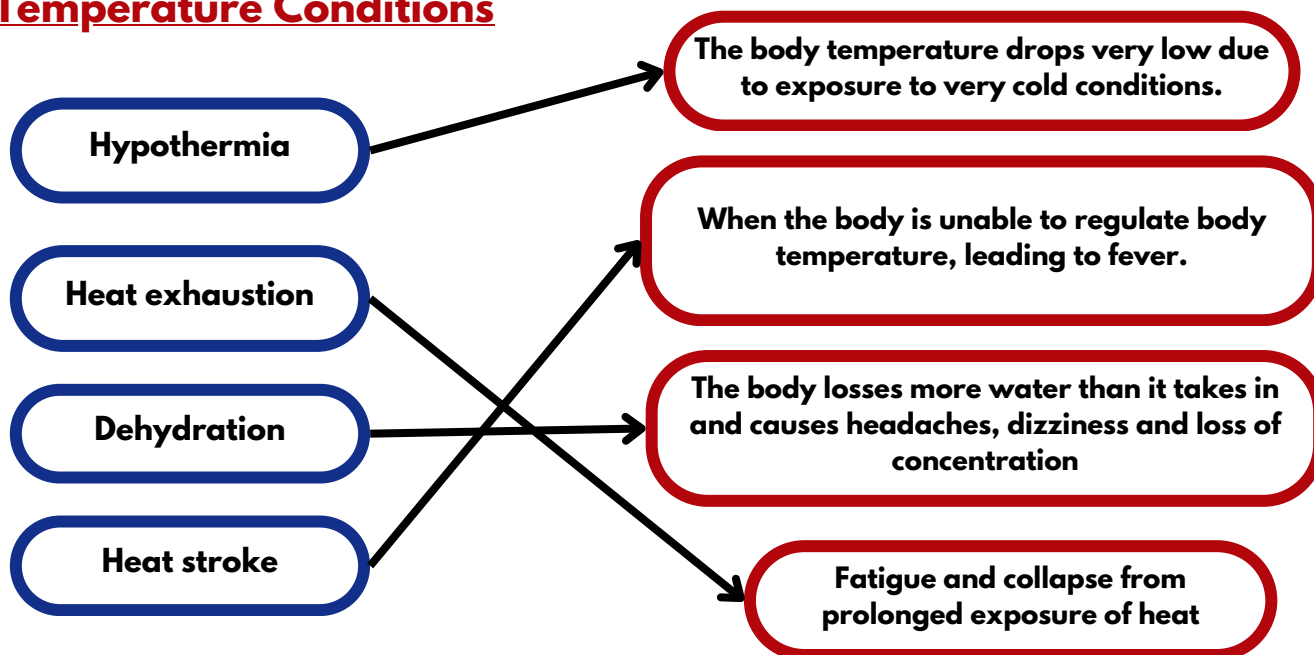
Give an example of tactics that can lead to injury in the following sports

Rugby	A coach could ask their team to go high whilst making a tackle, rather than tackling the legs
Football	A coach could ask their team to slide in whilst making tackles
Netball	A coach could ask their team to push opponents before moving into space
Cricket	A coach could ask a bowler to bowl 'bouncers' in order to intimidate or harm an opponent



Environment

Temperature Conditions



Human Interactions

Officials	Other performers	Spectators
<p><u>Carry out safety checks on surface and surrounding area, and the equipment and clothing of participants.</u></p> <p><u>Interact with coaches, players and spectators to explain decisions.</u></p> <p><u>Needs to effectively communicate in order to avoid friction.</u></p>	<p><u>Team sports involve lots of performers in a space which comes with risks of collisions or fouls.</u></p> <p><u>All need to wear appropriate safety equipment and clothing, including removing jewellery.</u></p> <p><u>Some may behave aggressively or irresponsibly, increasing risk of injury.</u></p>	<p><u>Aggressive supporters can encourage deviance in performers including retaliation.</u></p> <p><u>Standing too close to the court/pitch etc. can increase the risk of injury through collisions.</u></p> <p><u>Good spectators encourage good performance.</u></p>

Carry out safety checks on surface and surrounding area, and the equipment and clothing of participants.

Needs to effectively communicate in order to avoid friction.

Some may behave aggressively or irresponsibly, increasing risk of injury

Standing too close to play area can increase the risk of injury through collisions.

Aggressive supporters can encourage deviance in performers including retaliation.

All need to wear appropriate safety equipment and clothing, including removing jewellery.

Interact with coaches, players and spectators to explain decisions.

Team sports involve lots of performers in a space which comes with risks of collisions or fouls.

Good spectators encourage good performance.



The player surface and surrounding areas need to be checked before play can start.

What are the main hazards in the following images? What should be done in response?



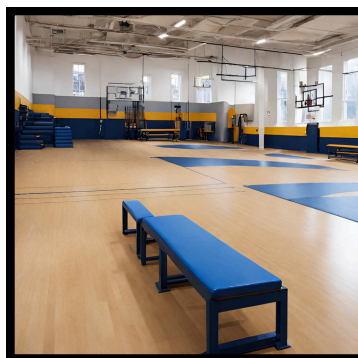
- Wet ground
- The game should be cancelled if it cannot be cleared



- Snowy/Icy ground
- The game should be cancelled if it cannot be cleared



- Extra balls scattered on the court
- Balls should be removed from player area



- Benches in the middle of the gym
- Need to be removed from play area

4G Synthetic Pitches

The 4G synthetic pitch will be a harder surface, especially during the winter months. This can cause a number of problems such as knee injuries when trying to twist at speed or fractures when falling onto the ground. The pace of the game will be quicker on the 4G surface which can lead to more powerful collisions. This will also lead to injuries. The surface will also lead to abrasions such as cuts and grazes.

Winter	Quicker	Abrasions
Powerful	Harder	Knee



Equipment

Organise the equipment into protective, performance, clothing and footwear



Shin pads



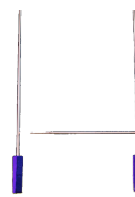
Harness



Sticks
e.g. lacrosse



Gumshield

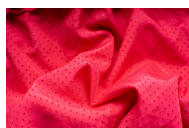


Goal post
padding



Trisuit

Protective	Clothing
<p>To protect lower body during a tackle - <u>Shin Pads</u></p> <p>Protect teeth - <u>Gum Shield</u></p> <p>Protect from head injuries - <u>Helmet</u></p> <p>Protect the eyes - <u>Goggles</u></p> <p>Reduce impact if players collide with equipment - <u>Padding</u></p>	<p>Minimises air resistance - <u>Athletics vest</u></p> <p>Important in gymnastics because they are skin tight so cannot catch on equipment- <u>Harness</u></p> <p>Important in hot weather to prevent overheating - <u>Loose clothing with breathable fabric</u></p> <p>Quick-drying fabric and small pad for protection during cycling - <u>Trisuit</u></p>
Performance	Footwear
<p>Checked for hardness, shape and damage - <u>Ball</u></p> <p>Important when climbing for practicing air-bound moves in gymnastics and diving - <u>Harness</u></p> <p>Checked for damages before uses - <u>Sticks & Bike</u></p>	<p>Needed for playing on astroturf and indoor sports - <u>trainers</u></p> <p>Needed for playing on hard, dry ground - <u>moulded studs</u></p> <p>Needed for wet and boggy pitches - <u>soft ground studs</u></p>



Loose, breathable
fabric



Trainers



Moulded studs



Soft ground studs



Helmet



Ball



Athletics vest



Leotard



Bike



Ski Goggles

1 Markers

1. Which of the following is an extrinsic variable. (1 mark)

- A) Environment - **Correct Answer**
- B) Motivation
- C) Arousal
- D) Mental rehearsal

2. Identify which one of the following is a contact sport. (1 mark)

- A) Swimming
- B) Running
- C) Netball - **Correct Answer**
- D) Tennis



3. Suggest one reason that a 4G synthetic pitch may increase the risk of injury. (1 mark)

One mark for one of the following:

- It is a harder surface than grass, which means falls have a larger impact and more likely to cause injuries
- The pace of games on a 4G synthetic pitch is faster than on grass, making the impact of collisions greater.

Accept other appropriate answers

2 Markers

4. Explain the difference between performance and protective equipment. (2 marks)

Mark One – Performance equipment is a piece of equipment that is needed in order to play an activity.

Mark Two – Protective equipment isn't needed to play an activity, rather it is required to prevent or reduce the risk of injury.



5. Identify a piece of performance and protective equipment in the sport of cricket. (2 marks)

Performance equipment - Bat/Ball (**Mark One**)

Protective equipment - Helmet/Pads/Gloves/Box (**Mark Two**)



6. Describe two ways an official should check the player surface and surrounding area to decrease the risk of injury. (2 marks)

One mark for each of the following, up to a maximum of two marks:

- Check the playing surface for hazardous conditions or debris,
- Check performers are wearing suitable clothing, footwear and equipment,
- Check that on field equipment such as flags and goal posts are secure and padded where necessary.

Accept other appropriate answers

3 Markers

7. State three ways in which the environment can increase the risk of injury (3 marks)

One mark for each of the following, up to a maximum of three marks:

- Wet conditions make a playing surface slippery,
- Cold conditions can cause the playing surface to freeze over/makes the ground harder,
- There might be equipment obstructing areas of the playing surface,
- Hot conditions can cause dehydration which reduces concentration,
- Playing surfaces might have hazards such as glass or wet leaves.

Accept other appropriate answers



8. Outline three ways an experienced coach can reduce the risk of injury (3 marks)

One mark for each of the following, up to a maximum of three marks:

- They will deliver sporting activities in a safe and controlled manner.
- They will be able to ensure that the correct technique is used by participants to reduce the risk of injury.
- They will be able to ensure that equipment is used safely,
- They will know how to deliver clear instructions,
- They will know how to stop potentially dangerous situations.

Accept other appropriate answers



4 Markers



9. Explain two ways in which poor supervision during a sports session can increase the risk of injury (4 marks)

Mark One – Too many participants for the amount of supervision available can lead to poor supervision.

Mark Two – This is because there are not enough people observing what the participants are doing and increases the chance of a dangerous situation being missed.

Mark Three – The coach doesn't have enough experience in leading a group of young participants

Mark Four – This can increase the risk of injury as the might not be able to control the behaviour/ensure they follow instructions.

Accept other appropriate answers/examples

10. Using two practical examples, explain how clothing and footwear can lead to injury in sport. (4 marks)

How clothing/footwear can increase the risk of injury	Sporting Examples
Mark One - e.g. Wearing footwear that is inappropriate for the playing surface	Mark Two - e.g. Wearing running shoes during a rugby game on a grass pitch can increase the risk of slipping
Mark Three - e.g. Loose clothing can catch on other participants or equipment	Mark Four - e.g. Wearing loose clothing whilst playing lacrosse can increase the chance of getting caught on another participants stick and causing injury

Mark Two and Four only awarded if they are correctly linked to Mark One and Three.



Gender

Nutrition

Arousal

Motivation

It is important to know your own strengths and weaknesses so that injuries can be avoided

Events during a match can have an impact on the psychological state of a performer

Age

Previous Injuries

Sleep Deprivation

Anxiety

Aggression

Individual Variables

Psychological Factors

R180 TA1 - Part 2 Intrinsic Factors Influencing Injury

Selective Attention

An elite performer will be able to block out the 'irrelevant information' from the environment

Reasons for High Arousal Levels

1. Increased number of supporters
2. Significance of supporters e.g. family/friends
3. Must win in order to prevent relegation
4. Under pressure to maintain position within a team
5. Media presence

Different mental strategies can be used to control aggression

Mental Rehearsal

Performers practice movements of skill in head so they can ready to perform it

Imagery

Performers create a successful image of an action so they can recall the feel of movements

Direct aggression involves physical contact with others

Reasons for Aggression

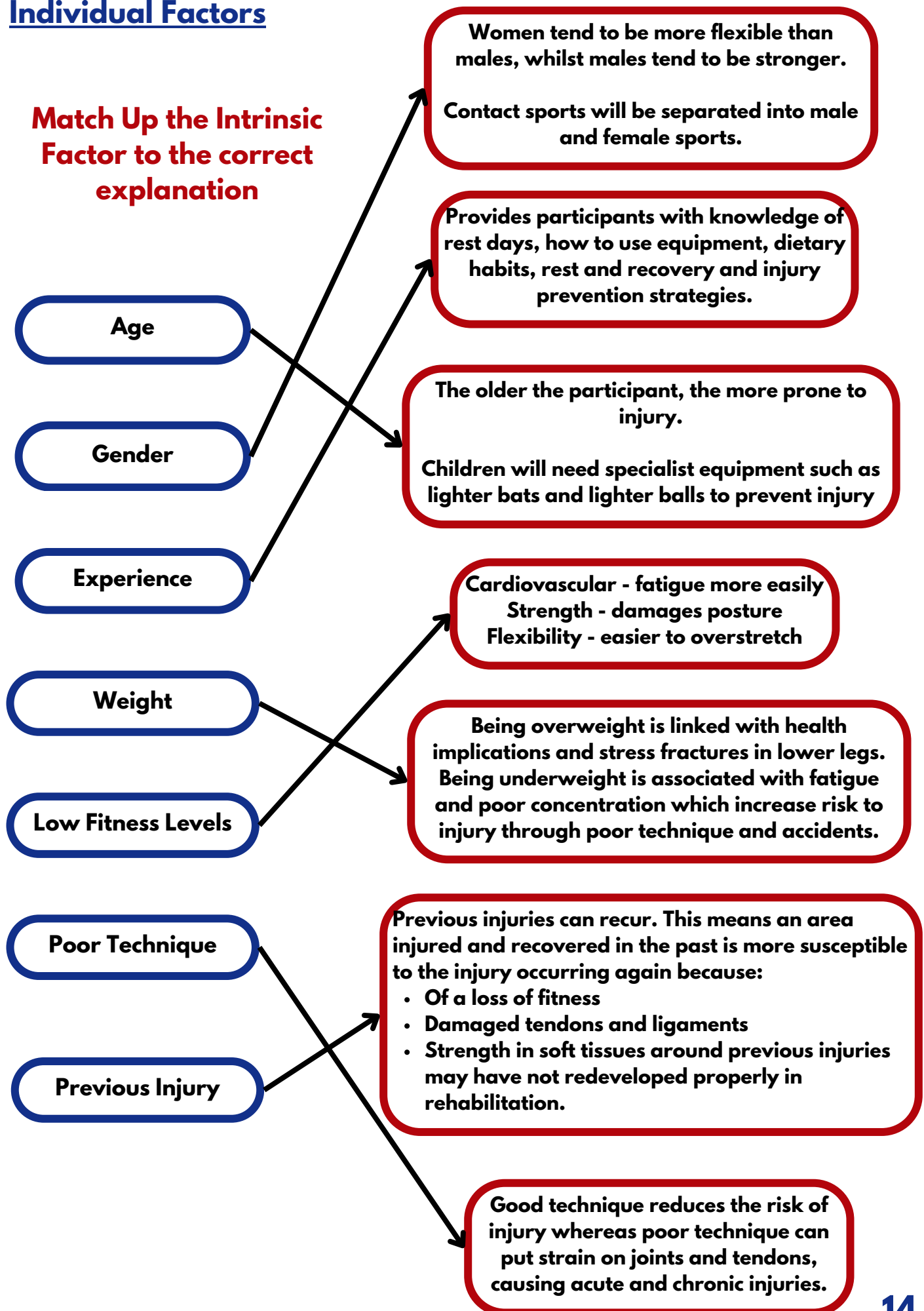
- Level of performance
- Retaliation
- Pressures to win
- Decisions of officials
- Performance enhancing drugs

Channelled aggression is where feelings of aggression are diverted into more positive actions. These feelings are controlled and can be turned off.



Individual Factors

Match Up the Intrinsic Factor to the correct explanation



Fill in the Gaps

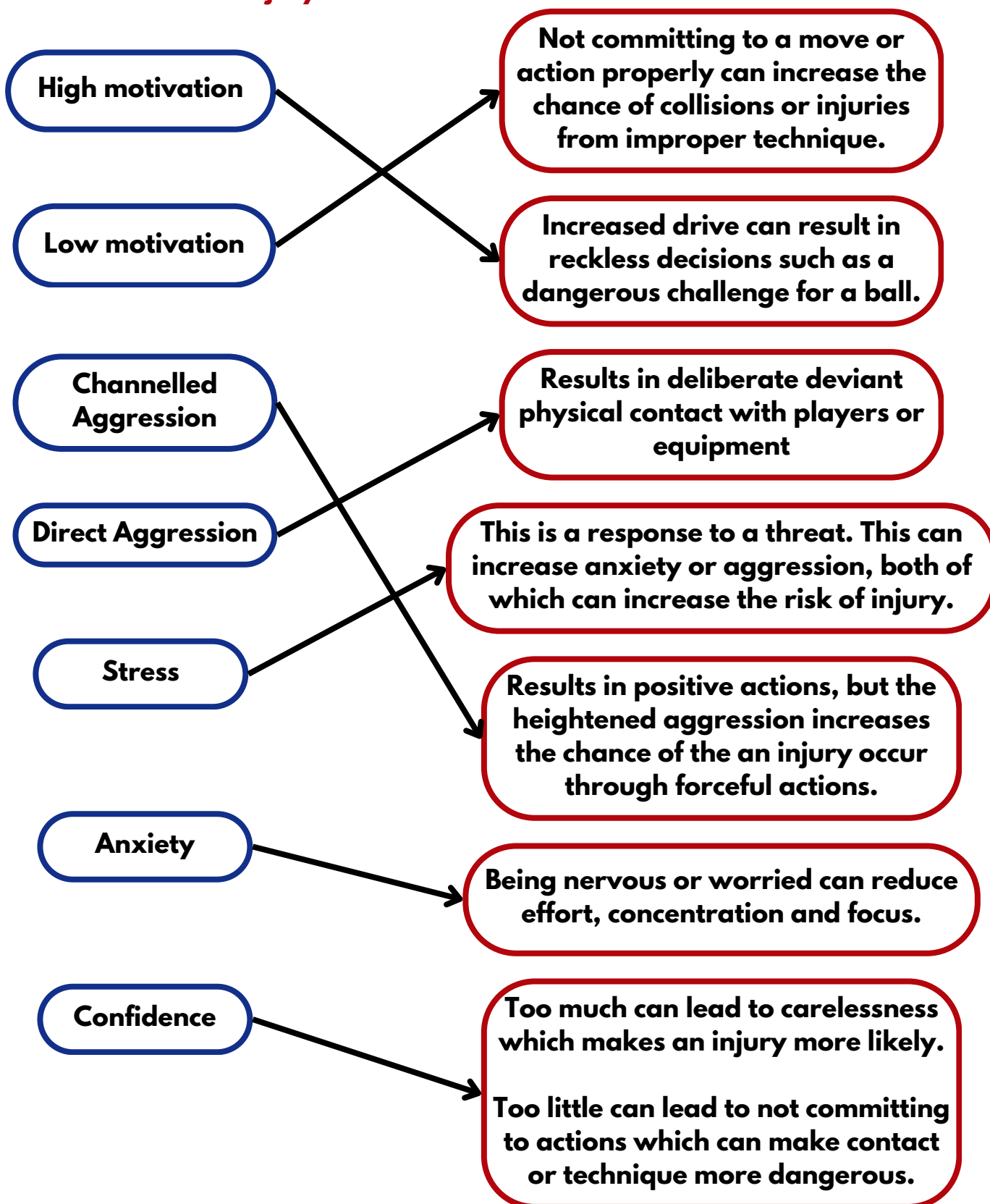
Factor	Explanation
Not enough calories (nutrition)	Not enough calories (or carbohydrates) - insufficient <u>energy</u> to safely complete training or sporting event. This can cause a lack of <u>concentration</u> and focus, increasing the likelihood of technique being poor and making mistakes which leads to <u>accidents</u> .
Too many calories (nutrition)	Consistent overconsumption of calories can lead to excess <u>fat</u> development. This will add additional pressure onto <u>joints</u> , which can make injuries such as stress <u>fractures</u> more likely.
Mineral of vitamin deficiencies in diet (nutrition)	Leads to <u>weak</u> bones and muscles. This makes them more susceptible to injuries such as stress <u>fractures</u> and muscle <u>tears</u> .
Lack of water (hydration)	Lack of water - Leads to <u>dehydration</u> . Symptoms include fatigue, <u>dizziness</u> and lack of concentration which contribute to an increased injury risk through accidents.
Medical Conditions	<p>Medical conditions increase the risk of injury in various ways. This includes <u>pre-existing</u> conditions such as asthma and conditions which develop during exercise such as <u>hypothermia</u>.</p> <p>Information about different medical conditions can be found in Topic Area 5.</p>
Sleep	<p>Sleep is important for:</p> <ul style="list-style-type: none"> • <u>Muscle recovery</u> following intense exercise • Avoiding <u>fatigue</u> during the day <p>Poor sleep can lead to:</p> <ul style="list-style-type: none"> • Fatigue, reduced <u>concentration</u> and irritability, which affects judgement and <u>decision-making</u> which can result in dangerous play. • Lack of muscle recovery, making the more <u>susceptible</u> to injury.



Psychological Factors

Being in the wrong frame of mind increases the risk of injury.

Match up the psychological factor to the correct explanation of how it can increase the risk of injury.



Reasons for Aggression

Factor	Explanation
Level of Performance	<p>Description - <u>Frustration at the result or performance quality of yourself or your teammates.</u></p> <p>Example - <u>Losing a game which you feel that you should be winning.</u></p>
Retaliation	<p>Description - <u>Revenge for a an injustice such as a foul or aggression from another player.</u></p> <p>Example - <u>Punching a player who has fouled you.</u></p>
Pressure to win from performers/coach /spectator	<p>Description - <u>Expectations to do well can increase nerves which may lead to over arousal and aggression.</u></p> <p>Example - <u>The financial incentives from winning can lead to strong emotions, resulting in reckless attempts to win.</u></p>
Decisions from officials	<p>Description - <u>If players believe decisions are unfair, this can lead to frustration and thus aggression.</u></p> <p>Example - <u>If a footballer believes they other team were awarded an unfair penalty, this might lead to excessive frustration for the rest of the game.</u></p>
Performance enhancing drugs	<p>Description - <u>Side effects of steroids include increase aggression.</u></p> <p>Example - <u>A player using steroids might attempt more dangerous tackles.</u></p>

Frustration at the result or performance quality of yourself or your teammates.

Side effects of steroids include increase aggression.

Revenge for a an injustice such as a foul or aggression from another player.

If players believe decisions are unfair, this can lead to frustration and thus aggression.

Expectations to do well can increase nerves which may lead to over arousal and aggression.



1 Marker

1. Which one of the following is generally true? (1 mark)

- A) The older an individual, the more prone to injury - **Correct Answer**
- B) An experienced player has an increased risk of injury compared to an experienced player
- C) A lack of carbohydrates can lead to weak bones
- D) If a player has recovered from an injury, they are less likely to sustain the same injury again

2. Which of the following can be defined as 'a response to a threat'. (1 mark)

- A) Anxiety
- B) Stress - **Correct Answer**
- C) Direct Aggression
- D) Channelled Aggression

2 Markers

3. State two ways the age of a performer can decrease the risk of injury (2 marks)

Mark One - Younger people are more flexible so are less prone to injury

Mark Two - Adults are stronger than younger people, so adults are able to perform more intense exercise without getting injured.



4. State two ways in which the weight of a performer can increase the risk of injury (2 marks)

One mark for each of the following, up to a maximum of 2 marks:

- Being overweight can increase the risk of health complications such as heart disease and strokes,
- Being overweight can increase the risk of stress fractures,
- Being underweight can cause fatigue, which results in reduced concentration levels which increases the risk of accidents and injuries,
- Being underweight can make bones weaker, which increases the risk of fractures.

Accept other appropriate examples



5. Explain the difference between direct and channeled aggression (2 marks)

Mark One – Direct aggression results in physical contact with another person,

Mark Two – Channelled aggression results in feelings being diverted to positive, controlled actions.

6. A referee awards a penalty to a rugby team who were offside. Suggest how this decision could lead to injury (2 marks)

Mark One – The incorrect decision can lead to the opposing team becoming angry/aggressive/hostile,

Mark Two – This can lead to the performers losing control of their actions and technique / becoming more reckless and making dangerous tackles, increasing the risk of injury.

Accept other appropriate suggestions

3 Markers

7. State three mental strategies that can reduce the risk of injury (3 marks)

Mark One – 1. Mental Rehearsal

Mark Two – 2. Imagery

Mark Three - 3. Selective Attention

8. Explain the importance of fitness levels of a performer in reducing the risk of injury (3 marks)

One mark for each of the following, up to a maximum of three marks:

- Low levels of flexibility increases the chance of overstretching a muscle,
- Low levels of flexibility can lead to poor technique which increases the risk of injury,
- Low strength is an indication of weak muscles, which can contribute to poor posture and technique when bearing weight,
- Low levels of cardiovascular fitness can result in fatiguing quicker which can lead to injury-causing accidents.



4 Marker

9. Explain how arousal can increase the risk of injury (4 marks)

Mark One – Arousal can increase the risk of injury if the performer becomes over-aroused,

Mark Two – This can because a performer may become reckless or overly aggressive in their actions,

Mark Three - Arousal can also increase the risk of injury if a performer is under-aroused,

Mark Four – This is because they will lack confidence or motivation, so might not commit to actions such as a tackle which can lead to injury.

Accept other appropriate answers/examples

8 Marker

10. Analyse how intrinsic factors influence the risk of different types of injury in rugby players.

In your response, you should include practical examples.



Level of Response	Guidance
Level 3 (7-8 marks)	<ul style="list-style-type: none">• Detailed knowledge and understanding• Many, well developed points• Well structured and consistent use of appropriate technology• Few if any errors in SPaG
Level 2 (4-6 marks)	<ul style="list-style-type: none">• Good knowledge and understanding• Some developed points• Somewhat well structured and some use of appropriate technology• Occassional errors in SPaG
Level 1 (1-3 marks)	<ul style="list-style-type: none">• Limited knowledge and understanding• Some points but undeveloped• No structure and little to no use of appropriate terminology• Noticeable errors in SPaG



Indicative content likely to be seen within answers, but not limited to this list.

Individual Variables

1. Previous/recurring injuries

- If suffering from previous injury then body/muscles are weaker so more chance of injury
- If carrying an injury tennis players a coach may bandage/tape weak body part for extra support and less chance of injury
- If carrying an injury a coach may rest a rugby player or may perform a less intense warm up/avoid contact.

2. Sleep

- Sleeping too much before a game/competition may cause performer to be tired/lose focus or concentration
- Not sleeping enough before a game/competition may cause performer to be tired/lose focus or concentration and more chance of becoming injured
- A rugby coach recommending a suitable amount of sleep (8 hours) will help their players be fully alert and less chance of making decisions which result in injury.

3. Nutrition

- Eating too much before a game/competition may cause performer to be tired or have reduced levels of concentration
- Eating too little before a rugby game may cause a performer to feel tired and not be able concentrate on the game properly, which increases the risk of making mistakes which result in injury.
- Players or their coach should ensure their players eat before the game and during breaks
- Players could have a nutritionist who is responsible for ensuring they consume a balanced diet to meet the energetic requirements of rugby and remained focused.

4. Flexibility

- Females generally more flexible than males
- If a performer has limited flexibility they are more prone to injury including sprains by overstretching muscles and tendons
- A coach may perform an extended warm up for a rugby players with less flexibility to ensure muscles are warm and elasticated to reduce the chance of injury.

5. Gender

- Males generally stronger than females
- If lifting weights as part of training then females may lift lighter weights during warm up as generally they are weaker.

Other:

6. Psychological – anxiety / concentration / motivation / aggression

7. Experience – knowledge of the rules of rugby

8. Ability – levels of performer

9. Health / medical conditions – fatigue / restricts the number of training sessions they should do in a week



UNIT CHECKLIST

Different Factors which Influence the Risk of Injury

EXTRINSIC FACTORS

Types of Sports Activity:

- How different sporting activities can influence types of injury

☐

Coaching/Instructing/Leading:

- Knowledge of techniques/rules/regulations
- Experience
- Communication
- Supervision
- Ethical Standards/Behaviour

☐

Environment:

- Weather/Temperature Conditions
- Playing surface (natural and artificial) and surrounding area
- Human Interaction
 - Other performers/participants
 - Officials
 - Spectators

☐

Equipment:

- Protective equipment
- Performance equipment
- Clothing
- Footwear

☐

Compare and contrast how different extrinsic factors can influence the risk and severity of injury.

☐

Understand how some extrinsic factors can influence other extrinsic factors or part of the same extrinsic factor.

☐

UNIT CHECKLIST

Different Factors which Influence the Risk of Injury

INTRINSIC FACTORS

Individual Factors:

- Gender
- Age
- Experience
- Weight
- Fitness Levels
- Technique/Ability
- Nutrition/Hydration
- Medical Conditions
- Sleep
- Previous/Recurring Injuries

☐

Psychological factors:

- Motivation
- Arousal
- Anxiety/Stress
- Confidence
- Aggression: Direct and Channelled

☐

Reasons for Aggression:

- Level of Performance
- Retaliation
- Pressure to win
- Decisions of officials
- Performance Enhancing Drugs

☐

Mental Strategies:

- Mental rehearsal
- Imagery
- Selective Attention

☐

Compare and contrast how different intrinsic factors can influence the risk and severity of injury.

☐

Understand how some intrinsic factors can influence other extrinsic factors or part of the same intrinsic factor.

☐



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