



Higher National Unit Specification

General information

Unit title: Pathology and Aetiology of Sports Injury

Unit code: H4Y0 34

Superclass: PJ

Publication date: September 2013

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

This Unit develops understanding of the pathology of tissue healing so that learners are able to subsequently use this information to appropriately treat sports injuries. It also introduces learners to the causes of, classifications and factors that help in reducing the risk, of sports injuries and allows them to develop their knowledge of common sports injuries and how they are managed. This Unit provides underpinning knowledge for the National Occupational Standards in Sports Therapy.

Outcomes

On successful completion of the Unit the learner will be able to:

- 1 Explain the pathology of soft tissue healing.
- 2 Describe the pathophysiology and management of bone injuries.
- 3 Describe the causes of, classifications and risk reduction strategies for, sports injuries.
- 4 Outline the mechanisms of injury, signs, symptoms, prognosis and management of some common sporting injuries.

Credit points and level

1 Higher National Unit credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

Higher National Unit Specification: General information (cont)

Recommended entry to the Unit

This is a mandatory Unit in the Group Awards HNC Soft Tissue Massage/HND Sports Therapy. It is anticipated that learners will have studied some Human Anatomy at SCQF level 6 prior to undertaking this Unit and would benefit from commencing this Unit after achieving the first 2–3 Outcomes of *Sports Therapy: Anatomy and Physiology*. However, entry is at the discretion of the delivering centre.

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Higher National Unit Specification: Statement of standards

Unit title: Pathology and Aetiology of Sports Injury

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Explain the pathology of soft tissue healing.

Knowledge and/or Skills

- ◆ Structure, function and location of different tissue types
- ◆ Immediate effects of soft tissue injury
- ◆ Phases of healing
- ◆ Vascular and cellular changes during healing phases
- ◆ Relationship of healing phases and early management principles: Stop, Ask, Look, Touch, Active, Passive, Strength (SALTAPS); Protection, Rest, Ice, Compression, Elevation, (PRICE); Movement, Ice, Compression, Elevation (MICE); Heat, Alcohol, Return to sport/exercise, Massage (HARM)

Outcome 2

Describe the pathophysiology and management of bone injuries.

Knowledge and/or Skills

- ◆ The process of fracture healing
- ◆ Classification of fractures
- ◆ Management of fractures
- ◆ Complications of fracture healing
- ◆ Other bone injuries

Higher National Unit Specification: Statement of standards (cont)

Unit title: Pathology and Aetiology of Sports Injury

Outcome 3

Describe the causes of, classifications and risk reduction strategies for, sports injuries.

Knowledge and/or Skills

- ◆ Definitions of sports injury
- ◆ Intrinsic factors — anatomical, physiological, individual,
- ◆ Extrinsic factors — training-related, equipment, environmental, psychological, nutritional
- ◆ Injuries to soft, hard and special tissues
- ◆ Classification of injuries by traumatic/overuse, acute/sub-acute/chronic healing phases
- ◆ Factors which reduce the risk of sports injuries

Outcome 4

Outline the mechanisms of injury, signs, symptoms, prognosis and management of some common sporting injuries.

Knowledge and/or Skills

- ◆ Aetiology, signs, symptoms and classification of common sports injuries
- ◆ Management/sports therapy plans for common sports injuries

Evidence Requirements for this Unit

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills across all Outcomes by showing that they can:

Outcome 1

This Outcome should be assessed by closed-book, restricted response questions.

- ◆ describe the structure, function and location of different tissue types (skeletal muscle, tendon, ligament, fascia, bursa, capsule, articular cartilage, meniscal cartilage)
- ◆ describe the process of haemostasis
- ◆ describe the healing phases and their duration (inflammatory, proliferative and remodelling phases)
- ◆ explain the vascular and cellular progression of inflammation
- ◆ describe the effects of early management principles (SALTAPS, PRICE, MICE, HARM) on the process of tissue healing. This must include: vasoconstriction, vasodilation, blood clot formation, fibrin formation, pain, rehabilitation time.
- ◆ identify common complications of soft tissue injury

Higher National Unit Specification: Statement of standards (cont)

Unit title: Pathology and Aetiology of Sports Injury

Outcome 2

This Outcome should be assessed by closed-book, restricted response questions.

- ◆ describe the fracture healing process from haematoma formation through to bone union (osteoprogenitor/osteoblast/osteoclast activity, callus formation, union)
- ◆ identify the methods of fracture classification (open/closed, type (transverse, oblique, spiral, comminuted, segmental, avulsed, impacted, torus, greenstick, stress)
- ◆ describe methods commonly used to manage fractures (reduction, immobilisation internal and external fixation methods)
- ◆ describe common complications of fracture healing (early, late)
- ◆ identify and describe bone injuries other than a fracture (periostitis, bone contusion, tenoperiosteal injury, epiphyseal plate injuries, enthesitis injuries)

Outcome 3

- ◆ define the terms 'sports injury', 'incidence' and 'prevalence' (**closed-book, RR**)
- ◆ identify 'intrinsic' and 'extrinsic' factors in relation to the causes of sports injuries and describe how they may cause injury (individual, anatomical, pathological, training-related, equipment, environmental, psychological, nutritional) (**open-book assignment**)
- ◆ describe the classification of sports injuries according to their tissue type (soft, hard, special), the mechanism of injury (trauma, overuse), stage of healing (acute, sub-acute, chronic) and severity (mild, moderate, severe) (**closed-book, short answer/RR**)
- ◆ describe the likely aetiology of common sports injuries (contusions, DOMS (Delayed Onset Muscle Soreness), strain, sprain, bursitis, tendinopathy, stress fracture, fracture, dislocation, concussion) (**closed-book, short answer/RR**)
- ◆ describe how injury occurrence may be reduced (warm-up/cool down, equipment and clothing, playing surfaces/environment, matching young players by skill and maturation levels, matching physical and intellectual abilities of group, nutrition and hydration, over exertion) (**open-book assignment**)

Outcome 4

This Outcome should be assessed via **an open-book assignment presented in the form of a written portfolio of information and an oral presentation.**

- ◆ describe common sports injuries* in terms of their mechanism of injury, classifications, signs and symptoms
- ◆ outline any medical procedures that may be associated with the injury
- ◆ briefly describe sports therapy treatment modalities that would be used in the management of the injury

*Common sports injuries include fractures, dislocation, subluxation, stress fractures, ligament sprains, traumatic and chronic tendon strains, muscle strains, bursitis, fibro-cartilage tears.



Higher National Unit Support Notes

Unit title: Pathology and Aetiology of Sports Injury

Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This mandatory Unit in the Group Awards HNC Soft Tissue Massage/HND Sports Therapy awards, although it could be delivered concurrently with *Sports Therapy: Anatomy and Physiology* and *Functional Anatomy* it would aid the learner's assimilation of information if it were to commence in the middle part of the course. It provides underpinning knowledge for Prevention and Management of Sports Injuries and a variety of practical first and second year Units.

Outcome 1

- ◆ Structure for connective tissues should make reference to types/arrangement of fibres and cells, blood supply
- ◆ Haemostasis: vascular phase; platelet phase; coagulation phase
- ◆ Vascular cascade: vasodilation and vasopermeability of blood vessels and effects of these
- ◆ Cellular cascade: movement of white blood cells and effects of this
- ◆ Early management principles: Stop, Ask, Look, Touch, Active, Passive, Strength, (SALTAPS), Protection, Rice, Ice, Compression, Elevation (PRICE), Movement, Ice, Compression, Elevation (MICE), Heat, Alcohol, Return to sport/exercise, Massage (HARM)
- ◆ Role of the above principles on the process of healing must include vasoconstriction, vasodilation, blood clot formation, fibrin formation, pain and rehabilitation time
- ◆ Common complications: decreased mobility, weakness, stiffness, loss of function, nerve damage, instability

Higher National Unit Support Notes (cont)

Unit title: Pathology and Aetiology of Sports Injury

Outcome 2

- ◆ Process of fracture healing: blood clot formation, osteoprogenitor/osteoblast/osteoclast activity, callus formation, union
- ◆ Methods of fracture classification — open/closed; type — transverse, oblique, spiral, comminuted, segmental, avulsed, impacted, torus, greenstick, stress
- ◆ Management of fractures: reduction — open and closed; immobilisation — casts, splints; internal fixation methods — plates, pins, screws, nails; external fixation methods — rods, traction.
- ◆ Early complications of fracture healing: vascular injury, visceral injury, haemarthrosis, wound infection, nerve damage, muscle/tendon/ligament damage, skin damage, compartment syndrome, venous thrombosis, fat embolism
- ◆ Late complications of fracture healing: delayed union, non-union, mal-union, joint stiffness/weakness
- ◆ Other bone injuries — periostitis, bone contusion, tenoperiosteal injury, epiphyseal plate injuries, enthesitis injuries

Outcome 3

- ◆ Classification by the type of tissue (soft: skin, fascia, muscle, tendon, ligament bursae, synovium, fibro-cartilage; hard: bone, periosteum, articular cartilage; special: any organs, blood vessels, teeth). Injury classification by trauma or overuse, or by healing phase of tissues: acute/sub-acute/chronic, and severity mild — 1–7 days/moderate — 8–20 days/severe 21+ days.
- ◆ Aetiology of common injuries: general cause of contusions, DOMS, strain (including outline of difference in Grades I, II, III), sprain (including outline of difference in Grades I, II, III), bursitis, tendinopathy, stress fracture, fracture, dislocation, concussion. Understanding should be assessed by closed-book restricted response questions.
- ◆ Definition and causes of intrinsic (age, gender, fitness levels, pathological condition, anatomical deviations) and extrinsic (training related factors, equipment factors, environmental factors, psychological factors and nutritional factors) need to be described together with how these interact to increase the risk of injury.
- ◆ Factors that can moderate injury risk such as appropriate warm-up/cool down, appropriate equipment and clothing, correct playing surfaces, matching players by skill, maturation level, physical and intellectual abilities, appropriate nutrition and hydration requirements and awareness of over exertion need to be covered. This may be related to a particular sport if the learner wants to increase in-depth understanding of an area in which s/he is proposing to work.

Outcome 4

Common sports injuries will include bone injury such as fracture, dislocation, subluxation, stress fracture (rehabilitation required after initial medical management), sprains, strains — tendon and muscle, tendinopathy, bursitis, meniscal injury, injury to the fascia. Ten different injuries across the categories should be researched.

Higher National Unit Support Notes (cont)

Unit title: Pathology and Aetiology of Sports Injury

Guidance on approaches to delivery of this Unit

This Unit will be delivered as one of number of mandatory Units that will provide the learner with underpinning knowledge to work in the field of Soft Tissue/Sports Therapy. The Unit provides underpinning knowledge for a number of the Units comprising the National Occupational Standards (NOS) for Sports Therapy.

It is a first year Unit, and can be delivered concurrently with *Sports Therapy: Anatomy and Physiology* and *Functional Anatomy* as it enhances information in both these Units, although ideally it would commence in the middle of the first year, once the first couple of Outcomes of *Anatomy and Physiology* had been achieved. It provides underpinning knowledge for *Prevention and Management of Sports Injuries*.

The Unit is divided into 4 Outcomes. Some of the information in the first two Outcomes is complex and therefore it would be advantageous if it was supported with lots of visual information in the form of pictures, animations and video clips.

Outcome 3

Definition of sports injury can vary according to the textbook or journal article being read. When comparing like/for like to promote the evidence-based efficacy of a treatment modality/lack of treatment it is necessary for learners to be aware of the definition issues and the difference in the use of the terms incidence and prevalence. A variety of journal article examples should be examined.

Injury classification systems are not consistent in textbooks or research papers and terms are sometimes used interchangeably. Learners are required to understand the different classifications. Examples of injuries to type of tissue structure should be discussed and referenced to whether they are due to trauma/overuse and where they sit in relation to healing phase and possible severity.

Time should be allowed for learners to research and discuss intrinsic and extrinsic causes of sports injuries.

Learners should also research how the risk of injuries can be reduced with reference to particular sports rather than just a list of different factors.

Outcome 4

The purpose of this Outcome is for learners to research a number of common sports injuries where there would be the likelihood of sports therapy treatment modalities being used. It is suggested that learners are given enough time to research a variety of injuries (approximately 10 different types across the categories indicated) and information shared across the group relating to the common injuries for a given sport, given that learners' broad knowledge at this stage will be limited.

Higher National Unit Support Notes (cont)

Unit title: Pathology and Aetiology of Sports Injury

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of instruments of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Outcome 1

Closed-book, restricted response questions.

Outcome 2

Closed-book, restricted response questions.

Outcome 3

Definitions, injury classification systems and general causes of sports injuries should be assessed using closed-book restricted response questions.

Intrinsic and extrinsic causes of sports injuries, their interaction and factors that may help to reduce injury should be assessed as an open-book assignment which allows learners to research areas more thoroughly. It could also be set as a presentation to an '*unknowledgable*' group who would benefit from understanding why injuries occur and how they could be prevented.

Outcome 4

Written evidence can be produced via a project/portfolio. However, it is also suggested that each learner present information to the group on the common sports injuries in his/her designated sport to encourage presentation skills and dissemination of knowledge. Sources of information (including images) should be referenced.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Higher National Unit Support Notes (cont)

Unit title: Pathology and Aetiology of Sports Injury

Opportunities for developing Core and other essential skills

Learners will have the opportunity to develop their *Communication skills, ICT, Problem Solving* and *Working with Others* through the need to access and assimilate complex written and visual information, organise and represent it in closed-book assessments, projects and oral presentations using electronic software and media. There is opportunity for learners to work together to collect, organise and present information for formative assessment.

The Unit provides underpinning knowledge for a number of National Occupational Standards in Sports Therapy.

History of changes to Unit

Version	Description of change	Date

© Scottish Qualifications Authority 2013

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Business Development and Customer Support team, telephone 0303 333 0330.

General information for learners

Unit title: Pathology and Aetiology of Sports Injury

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

In this Unit you learn about the physiological changes that occur in the tissues of the body affected by a sports injury. You will also cover how injuries are classified and look at the reasons why they occur. Finally, you will investigate a range of common sports injuries and how they are managed. This is a mandatory Unit in the HNC Soft Tissue Massage and HND Sports Therapy awards, and it provides you with some of the essential information that will help you to understand and appropriately treat an individual suffering from a sports injury.

In Outcome 1 you will learn about the structure, function and location of skeletal muscles, tendons, ligaments, bursa, joint capsules, articular and meniscal cartilage. You will also study how the body reacts to a sports injury and the process of tissue healing. You will also learn why it is important to carry out specific protocols immediately following a sports injury so that the healing process is not adversely affected in any way. Additionally, you will cover the functional effects of an injury and the healing process. The Outcome is evidenced by a closed-book assessment.

In Outcome 2 you will learn about all of the different types of bone injuries including fractures. As well as identifying the different types of fractures that can occur, you will learn the different methods of how they are treated/managed and the process of fracture healing. You will also cover the early and late complications that may occur in the fracture healing process. This Outcome is also evidenced by a closed-book assessment.

Outcome 3 covers general definitions, causes of sports injuries and how to minimise them and the different classifications. Some of it is assessed by closed-book assessment and some through assignment.

In Outcome 4 you investigate common sports injuries and this is assessed by a project/portfolio assignment and oral presentation.