Higher National Unit specification

General information

Unit title: Functional Anatomy

Unit code: H4XV 34

Superclass: RH

Publication date: November 2014

Source: Scottish Qualifications Authority

Version: 03

Unit purpose

This Unit is designed to provide the learner with a good working knowledge of the musculoskeletal movement system. It provides underpinning knowledge required in the field of Soft Tissue Therapy. It is primarily intended for learners who expect to continue onto employment as a Soft Tissue Therapist or further and higher education in this area.

Outcomes

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

1 Describe planes of movement, regional areas, anatomical directions and movement terminology.
2 Describe the relevance of, and locate, common bony landmarks, endangerment sites, dermatomes and myotomes.
3 Demonstrate an understanding of joint movements and the influence of gravity, levers and resistance on movement.
4 Describe muscle actions, fascicular arrangements and their relationship to movement and power.
5 Demonstrate palpation and contraction of common muscles and identify their attachment points.
6 Demonstrate an understanding of role of posture and core strength on exercise/sports performance.

Credit points and level

1.5 Higher National Unit credits at SCQF level 7: (12 SCQF credit points at SCQF level 7)

Higher National Unit specification: General information (cont)

Unit title: Functional Anatomy

Recommended entry to the Unit

It is anticipated that learners will have studied some Human Anatomy at SCQF level 6 prior to undertaking this Unit. 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: Functional Anatomy

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

Describe planes of movement, regional areas, anatomical terminology and movement terminology.

Knowledge and/or Skills

- Planes of movement
- Regional areas of the body
- Anatomical terminology
- Movement terminology
- Joint actions in different planes
- Axis of rotation

Outcome 2

Describe the relevance of, and locate, common bony landmarks, endangerment sites, dermatomes and myotomes.

Knowledge and/or Skills

- Surface (bony) landmarks
- Endangerment sites
- Dermatomes
- Myotomes

Outcome 3

Demonstrate an understanding of joint movements and the influence of gravity, levers and resistance on movement.

Knowledge and/or Skills

- Movements associated with major regions of body
- Concepts of inner, mid, outer and full range of movement
- Concepts of lever (1st, 2nd, 3rd), fulcrum and effort
- Influence of levers, gravity and resistance on movement

Higher National Unit specification: Statement of standards (cont)

Unit title: Functional Anatomy

Outcome 4

Describe muscle actions and fascicular arrangements, and the relationship to movement and power.

Knowledge and/or Skills

- Muscle contractions
- Muscle actions
- Fascicular arrangements
- Common agonist/antagonist pairings

Outcome 5

Demonstrate palpation and contraction of common muscles and identify their attachment points.

Knowledge and/or Skills

- Palpation techniques
- Muscles
- Tendon attachment points
- Contraction techniques

Outcome 6

Demonstrate an understanding of the role of posture and core strength on exercise/sports performance.

Knowledge and/or Skills

- Causes and effects of postural types (kyphosis, lordosis, scoliosis, flatback)
- Function of the stabilising ligaments and muscles associated with the spine
- Variation in exercise performance resulting from inadequate stabilisation
- Impact of core strengthening exercises and their potential for injury/aggravation of postural issues

Higher National Unit specification: Statement of standards (cont)

Unit title: Functional Anatomy

Evidence Requirements for this Unit

Written and/or oral evidence is required to demonstrate that the learner has met the knowledge and/or skills in these Outcomes. Assessment of this Outcome will be conducted under closed book, supervised conditions.

Learners are required to demonstrate that they can:

Outcome 1

- describe the three planes of movement (saggital, coronal/frontal, transverse) and joint actions that occur in each plane
- identify regional areas of the body (cephalic, axillary, cervical, thoracic, lumbar, sacral, brachial, antebrachial, manus, pelvic, coxal, femoral, patellar, pedal, peroneal, crural)
- describe anatomical terminology (anterior, posterior, medial, lateral, proximal, distal, superior, inferior, superficial, deep, ipsilateral, contralateral, dorsum, palmar, plantar, prone, supine)
- describe movement terminology (flexion, extension, hyperextension, horizontal flexion/adduction, horizontal extension/abduction, abduction, adduction, pronation, supination, plantar flexion, dorsiflexion, rotation, medial/internal rotation, lateral/external rotation)
- describe axis of rotation as it occurs by region

Outcome 2

Learners should demonstrate accurate palpation of a minimum of 17 randomly selected common surface landmarks identified in the list outlined in content and context.

- define, and describe the relevance for sports therapists of, surface landmarks, endangerment sites, dermatomes and myotomes

Outcome 3

- identify the movements associated with major regions of the body
- describe inner, mid, outer and full range in terms of range of joint movement
- describe the leverage system in the human body
- describe how movement can be affected by gravity, lever length and resistance
- describe factors which restrict range of movement at joints

Outcome 4

- describe muscle actions (isometric, concentric, eccentric), and functions (agonist, antagonist, synergist, fixator)
- describe fascicular arrangements (parallel, fusiform, circular, triangular/convergant, unipennate, bipennate, multipennate), their relationship to movement and power, and provide at least one example of a muscle with each arrangement

Higher National Unit specification: Statement of standards (cont)

Unit title: Functional Anatomy

Outcome 5

Learners should demonstrate accurate palpation and contraction of 20 randomly selected muscles identified in the list outlined in content and context. Where tendons are superficial and can be palpated, learners should do so.

- palpate the bellies of selected muscles
- palpate superficial tendons
- identify the attachment points of selected muscles
- instruct client to contract selected muscles and palpate the tissue

Outcome 6

- describe the effects of kyphotic, lordotic, scoliotic and flat-back characteristics on ideal posture
- identify the active and passive structures involved in producing/restricting movement of the spine, shoulder girdle and pelvic girdle
- describe the effects of core strength on exercise/sports performance

Performance evidence is required for part of Outcome 2 and Outcome 5.

Higher National Unit Support Notes

Unit title: Functional Anatomy

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 60 hours.

Guidance on the content and context for this Unit

Outcome 1

All elements of the criteria identified in the Statement of Standards should be achieved.

Outcome 2

Learners should accurately palpate a minimum of 17 randomly selected surface (bony) landmarks from list below. Learners should not know selection in advance:

occipital protuberance; C7, T12, L4;

acromion process; superior, lateral, medial, inferior, scapula borders;

manubrium, body of sternum, xyphoid process of sternum;

greater tubercle of humerus, medial and lateral epicondyles of humerus, olecrannon process;

heads of the metacarpals, proximal and distal interphalageal joints;

ASIS (anterior superior iliac spine), ishcial tuberosity, greater trochanter;

medial and lateral epicondyles of femur, medial and lateral condyles of tibia, head of fibula, tibial tuberosity, anterior border of tibia;

medial and lateral malleolus, metatarsal heads, base of 5th metatarsal, tubercle of navicular.

Outcome 3

Movements in major regions of the body:

cervical/neck — flexion, extension, rotation, lateral flexion; thoraco-lumbar — flexion, extension, rotation, lateral flexion; ribs/thorax — elevation (expansion), depression (collapse);

shoulder (scapulathoracic) — elevation, depression, adduction (retraction), abduction (protaction), upward rotation, downward rotation;

shoulder (glenohumeral) — flexion, extension, abduction, adduction, horizontal flexion/adduction, horizontal extension/abduction, medial/internal rotation, external/lateral rotation;

elbow and forearm — flexion, extension, pronation, supination; wrist — flexion, extension, abduction, adduction; hand — thumb flexion, thumb extension, opposition, thumb adduction, thumb abduction, finger flexion, finger extension, finger abduction, finger adduction;

pelvis — anterior tilt, posterior tilt, lateral tilt

hip — flexion, extension, abduction, adduction, medial rotation, lateral rotation

knee — flexion, extension, lateral and medial rotation of flexed knee

ankle — plantar flexion, dorsiflexion

foot — inversion (supination), eversion (pronation)

toes – flexion, extension

Levers — first, second and third class lever, with an explanation of the fulcrum, effort and resistance in each case and how movement is affected by gravity, changes to lever length and changes to resistance

Factors restricting movement at joints: structure and shape of articulating bones, strength and tension of the ligaments, arrangement and tension of the muscles, apposition of the soft parts, disuse, injury, joint disorders such as osteoarthritis, rheumatoid arthritis.

Outcome 4

All elements identified in the Statement of Standards should be achieved.

Outcome 5

Learners should demonstrate accurate palpation of a minimum of 20 randomly selected muscles identified in the list below. Learners should not know selection in advance:

Hip and thigh: gluteus maximus, gluteus medius, piriformus, psoas major, iliacus, tensor fascia lata, gracilis, adductor longus, adductor magnus, sartorius, rectus femoris, vastus medialis, vastus lateralis, bicep femoris, semi-tendonosis, semi-membranosus,

Lower limb: gastrocnemius, soleus, tibalis anterior, tibialis posterior, fibularis (peroneus) longus

Shoulder joint and girdle: deltoid, latissimus dorsi, pectoralis major, teres major, teres minor, supraspinatus, infraspinatus, subscapularis, trapezius, rhomboids,

Arm: biceps, brachialis, brachioradialis, triceps

Trunk: erector spinae, external oblique, internal oblique, rectus abdominus, quadratus laborum

Superficial tendons that can also be palpated: supraspinatus, pectoralis major, latissimus dorsi, bicep femoris, semitendonosus, patella tendon, tibialis anterior, tibialis posterior, peronus (fibularis) longus, Achilles tendon.

Higher National Unit Support Notes

Unit title: Functional Anatomy

Outcome 6

Core strength relies primarily on effective use of the active and passive structures involved in production/restriction of movement in the spine, shoulder girdle and pelvic girdle. Learners will therefore be expected to develop a knowledge of this complex, including pelvic gender differences, and the key muscles and ligaments, both tonic and phasic, which contribute to stability in all anatomical planes.

Learners should be able to identify the effects of postural issues and the potential results of this on movement and exercise/sports performance.

Guidance on approaches to delivery of this Unit

This Unit is designed to give the learners a good working knowledge of the musculoskeletal movement system. It provides underpinning knowledge for many other Units in the HNC Soft Tissue Therapy and HND Sports Therapy awards, as well as covering elements of National Occupation Standards for Sports Therapy (SFHD528 and cnh522).

The Unit should be delivered of this Unit assessed early in the Award. It is anticipated that it would be delivered concurrently with *Sports Therapy: Anatomy and Physiology and Consultation* and *Basic Objective Assessment* to augment information within those Units.

It is suggested that delivery of this Unit should include as many practical activities as possible in preparation for the assessment of the learners' knowledge and understanding of Functional Anatomy.

Outcome 1

Using accurate terminology is important for those wishing to work in this industry and particularly if trying to communicate with other professionals. This Outcome is necessary to ensure that learners use correct terminology as early in the course as possible. Many practical tasks or, on-line quizzes can be used in order to help learners assimilate this information.

Outcome 2

Learners need to appreciate the different ways in which information about the body can be gathered and used by those who use hands-on work. Dermatomes and myotomes will be used in other Units to gather/support information. It is necessary for learners to know of endangerment sites when working practically. Accurate palpation of all of the identified surface landmarks should be thoroughly practiced before assessment.

Outcome 3

There is the opportunity to incorporate practical gym exercises in the delivery of this Outcome when considering levers and the effect of gravity and resistance on movement. This will be particularly useful for Outcome 4 of *Prevention and Management of Sports Injury*.

Higher National Unit Support Notes (cont)

Unit title: Functional Anatomy

Outcome 5

It is anticipated that palpation of muscles and tendons, and contraction of muscles, should be carried out as if the learner was conducting a clinical physical therapy assessment, this would give learners additional experience for *Clinical Sports Massage* and *Clinical and Team Experience 1* and will provide underpinning knowledge for HND Sports Therapy Year 2 Unit *Clinical Assessment for Sports Injuries*. There should be plenty of opportunities provided for accurate palpation of all muscles outlined in the list before assessment takes place.

Outcome 6

Several links may be made with *Sports Therapy: Anatomy and Physiology* and *Basic Subjective and Objective Assessment.*

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types 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

All Evidence Requirements for this Outcome should be assessed through a closed-book supervised assessment.

Outcome 2

Bullet point 1 should be assessed by closed-book supervised assessment.

Bullet point 2: Learners should demonstrate accurate palpation of a minimum of 17 randomly selected common surface landmarks identified in the list outlined in content and context.

Outcome 3

All Evidence Requirements for this Outcome should be assessed through a closed-book supervised assessment.

Outcome 4

All Evidence Requirements for this Outcome should be assessed through a closed-book supervised assessment.

Higher National Unit Support Notes (cont)

Unit title: Functional Anatomy

Outcome 5

Learners should demonstrate accurate palpation, contraction and identify their attachment points, of a minimum of 20 randomly selected muscles identified in the list outlined in content and context. Where tendons are superficial and can be palpated, learners should do so.

Outcome 6

All Evidence Requirements for this Outcome should be assessed through a closed-book supervised assessment.

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**.

Opportunities for developing Core and other essential skills

There is the opportunity for learners to develop skills in working together throughout this Unit.

History of changes to Unit

Version	Description of change	Date
03	Bullet point added to Outcome 1 in Evidence Requirements.	25/11/14
02	Definition and clarification of the Evidence Requirements for the whole Unit.	24/09/14

General information for learners

Unit title: Functional Anatomy

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.

This Unit will give you lots of practice in functional anatomy, that is, anatomy that is related to the way we move around. The Unit concentrates on the musculoskeletal system (ie bones and muscles). You will need this information to help you assesses clients in a therapy environment and to be able to apply it to movement, exercise and sport. The Unit also introduces you to specific anatomical terminology that you will need to use to communicate accurately with other professionals.

There are six Outcomes.

Outcome 1 covers planes of movement, anatomical and movement terminology. These things are assessed by a closed-book assessment.

Outcome 2 shows how we can use the surface of the body to give us information about things that we can't see within it. You will learn to palpate bony landmarks which are muscle attachment points. Some information is assessed by a closed-book assessment, but there is also a practical palpation assessment.

Outcome 3 covers the movements that happen at joints and the leverage system which demonstrates how we use bones and joints to move. You also look at how gravity and resistance have an effect. There is a closed-book assessment of this information.

Outcome 4 looks at muscle actions, the arrangement of muscle fibres and the effects of the arrangement on movement and power. This is also assessed by a closed-book assessment.

Outcome 5 is very practical in that you will learn to palpate muscles and tendons and the attachment points to bones. The assessment is by practical demonstration.

Outcome 6 looks at postural deviations and what has happened to various muscles in these deviations. It examines the concept of core strength and its effect on movement and exercise/sport.