



Higher National Unit specification

General information

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

Unit code: HE2N 34

Superclass: PE

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Unit purpose

This Unit is designed to equip learners with practical skills and knowledge to enable them to understand the manufacture and servicing of Knee Ankle Foot Orthoses (KAFO).

Learners will gain an understanding of the considerations needed by clinicians to prescribe KAFOs. They will develop a rationale to understand the importance of appropriate manufacturing and servicing within elements of clinical practice in the area of KAFOs in line with COSHH, MHRA regulations, risk assessment, appropriate use of Personal Protective Equipment (PPE) and all necessary health and safety management issues. Throughout this Unit the learner must follow appropriate quality assurance procedures.

On completion of the Unit the learner should be able to prepare, manufacture, review and repair a Knee Ankle Foot Orthosis, of conventional, contemporary (plastic) or hybrid designs, to a prescription, within a workshop setting.

Outcomes

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

- 1 Preparation for Knee Ankle Foot Orthoses manufacture.
- 2 Understand the design of Knee Ankle Foot Orthoses.
- 3 Manufacture of Knee Ankle Foot Orthoses.
- 4 Maintenance and service of Knee Ankle Foot Orthoses.

Credit points and level

2 Higher National Unit credit at SCQF level 7: (16 SCQF credit points at SCQF level 7)

General information (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

Recommended entry to the Unit

Access to this Unit is at the discretion of the centre. However it would be beneficial if learners had completed or working towards the HN Units *Orthotics: Foot Orthotics Orthotics: Ankle Foot Orthotics, Orthotics: Upper Limb and Spinal Orthotics*.

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.

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: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

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

Preparation for Knee Ankle Foot Orthoses manufacture.

Knowledge and/or Skills

- ◆ Prescription identification
- ◆ Prescription interpretation
- ◆ Materials and tools
- ◆ Orthotic terminology
- ◆ Model preparation
- ◆ Medicine and Healthcare Regulatory Authority (MHRA)
- ◆ Health and safety legislation
- ◆ Quality assurance

Outcome 2

Understand the design of Knee Ankle Foot Orthoses.

Knowledge and/or Skills

- ◆ Material types — thermoplastics (polypropylene and polyethylene), metals, leather, foams, padding and strap systems
- ◆ Material properties
- ◆ Material fatigue, stress and failure theory

Higher National Unit specification: Statement of standards (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

Outcome 3

Manufacture of Knee Ankle Foot Orthoses.

Knowledge and/or Skills

- ◆ Manufacture techniques (including draping, side member forming, mounting and finishing)
- ◆ Machine and hand tool use
- ◆ Orthotic knee joint alignment
- ◆ Material fatigue, stress and failure
- ◆ Quality assurance
- ◆ Medical and Healthcare Regulatory Authority (MHRA)
- ◆ Health and safety legislation

Outcome 4

Maintenance and service of Knee Ankle Foot Orthoses.

Knowledge and/or Skills

- ◆ Quality Assurance
- ◆ Procedures of review
- ◆ Repair and replacement of KAFO components and fastenings
- ◆ MHRA regulations
- ◆ Health and safety legislation

Evidence Requirements for this Unit

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

Outcome 1

- ◆ explain how to make sure that a prescription refers to a specific model.
- ◆ describe information contained within a prescription for a KAFO using appropriate terminology and explain what should be done if the prescription or the model is not fit for the manufacturing process.
- ◆ prepare model as specified in the prescription.
- ◆ explain how to make sure that a prescription refers to a specific model.
- ◆ adhere to relevant health and safety procedures, MHRA regulations, quality assurance and line management processes.
- ◆ complete documentation to comply with quality assurance procedures.

Higher National Unit specification: Statement of standards (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

Outcome 2

- ◆ identify material types appropriate to prescription.
- ◆ identify properties of materials key to manufacture, including the advantages and disadvantages of using each type.
- ◆ demonstrate understanding of material fatigue, stress and failure theory.

Outcome 3

- ◆ demonstrate knowledge of the manufacturing techniques applicable to the manufacturing process required.
- ◆ demonstrate appropriate use of hand tools and machinery need to be used during the manufacturing process.
- ◆ demonstrate orthotic knee joint alignment.
- ◆ demonstrate the effect of failure of materials.
- ◆ adhere to relevant health and safety procedures, MHRA regulations, quality assurance and line management processes.
- ◆ complete documentation to comply with quality assurance procedures.

Minimum mandatory requirement of one completed jointed KAFO.

Outcome 4

- ◆ carry out review procedures to determine whether a KAFO is suitable for repair or is beyond repair and requires replacement and this should be carried out in line with quality management guidelines and MHRA regulations.
- ◆ carry out routine repairs to KAFOS, and evidence replacement of components where appropriate.
- ◆ adhere to relevant health and safety procedures, MHRA regulations, quality assurance and line management processes.
- ◆ complete documentation to comply with quality assurance procedures.



Higher National Unit Support Notes

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

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 80 hours.

Guidance on the content and context for this Unit

Guidance on the content and context for this Unit.

This Unit is suitable for either trainee technicians studying KAFO manufacture or technicians working in an orthotic technical environment within the public or private sectors.

This Unit is designed to enable the learner to produce a body of work that will demonstrate their ability to examine different techniques in the production of KAFOs, their construction methods, components and materials. Using them to influence the design and production of both fitting and delivery samples.

This Unit will enable learners to produce finished fit for purpose device(s), which clearly show the production process and development of the device(s).

Learners will investigate various process and production techniques to produce one finished device. The learner will learn the difference between Conventional, Contemporary and hybrid KAFO designs.

Outcome 1 — Preparation for Knee Ankle Foot Orthoses manufacture.

The learner could be given a brief, which requires them to produce a thorough investigation on the preparation of various prescriptions for manufacture.

These could include model selection and production, identification and preparation, component selection and identification, materials and tooling required in production processes.

A minimum of two different prescriptions should be prepared by the learner as part of their evaluation.

Notes, sketches, photographs and prescription printouts could be presented in a log/work book for assessment at the end of the Unit.

Outcome 2 — Understand the design of Knee Ankle Foot Orthoses.

The learners are required to research the different types of materials used in the manufacture of AFOs. They may not use all of the materials at their place of work but they should understand these materials properties and explain their method of manufacture. This will allow learners to demonstrate greater flexibility when developing their own skills.

Higher National Unit Support Notes (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

Outcome 3 — Manufacture of Knee Ankle Foot Orthoses.

Learners are required to manufacture a KAFO to a finished stage, which should be manufactured to one of the KAFO designs explored in Outcome 2.

Devices produced could be model/demonstration pieces or prescribed devices finished to a good industry standard, cosmetically pleasing with no obvious flaws. The finished device should use appropriate construction methods and materials and be produced to a fit for purpose standard of finish with no obvious faults or flaws.

Learners should show a clear understanding of the chosen materials and techniques and use these appropriately within their finished device. Technical notes, prescriptions, profiles and sketches to accompany the final device could be presented in a log book.

The log book could be in the form of text and photographs, prescriptions and/or worksheets.

The module shall be delivered through a mix of work based placement, classroom learning, practical demonstration and self-study.

The structured delivery shall be over 40 hours supplemented by 40 hours of self-directed study.

It is expected that a reflective log book will be maintained throughout this Unit. (The skill of cast rectification is out with the remit of this Unit)

Outcome 4 — Maintenance and service of Knee Ankle Foot Orthoses.

Learners should have awareness of possible variances in KAFO design, outside of the initial KAFOs techniques developed so far. These may include reinforcements, use of transfers, different padding styles, knee joint systems.

Guidance on approaches to delivery of this Unit

Whilst this Unit may be taken as a standalone Unit it has been developed as part of the Rehabilitation Technologies HNC and it is recommended that it should be taught and assessed after the learner has completed the AFO Unit within the orthotics section.

If this Unit is taught as part of the Rehabilitation Technologies HNC opportunities may be taken to link or integrate with other aspects of the Group Award and a thematic approach adopted for both delivery and assessment.

Evaluation could be carried out by learners following either set prescription(s) or investigating and researching different materials, processes and production techniques to design and produce a device that is fit for purpose.

Higher National Unit Support Notes (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

It is recommended that learners should have access to a wide variety of appropriate tooling and materials, learners should be encouraged to (in conjunction with clinical and senior technical colleagues) source and explore alternative processes and manufacturing techniques.

Throughout this Unit the learner must follow appropriate quality assurance procedures, safe and considerate working practices in line with COSHH, MHRA regulations, risk assessment, appropriate use of Personal Protective Equipment (PPE) and all necessary health and safety management issues.

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.

Assessment Guidelines

Outcome 1

Evidence of practical performance could be used to verify the learners' capabilities. A log book and check list for the Outcomes could be used to verify learners' Knowledge and/or Skills items in these Outcomes. The assessor could then sign-off the completed assessment check list. The learner should have an awareness of the line management system within their department to be able to raise any design issues with the relevant person.
Health and safety Quality

Outcome 2

Assessment of this Outcome can be carried out by short question and answer questions and also the learner producing materials that can be used in manufacture.

Outcome 3

Evidence of practical performance could be used to verify the learners' abilities. A log book and check list for the Outcomes could be used to verify learners' Knowledge and/or Skills items in these Outcomes. The assessor could then sign-off the completed check list. The learner should have a basic awareness of the line management system within their department to be able to raise any design issues with the relevant person.

Higher National Unit Support Notes (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

Outcome 4

Evidence of practical performance could be used to verify the learners' abilities. A log book and check list for the Outcomes could be used to verify learners' Knowledge and/or Skills items in these Outcomes. The assessor could then sign-off the completed check list. The learner should have a basic awareness of the line management system within their department to be able to raise any design issues with the relevant person.

This award requires learning within a workshop based environment. There are also knowledge based elements that may be delivered by a variety of modes including: Open Learning, blended learning, and attendance based delivery.

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 are opportunities to develop the Core Skills of *Communication*, *Problem Solving* and *Working with Others* at SCQF level 5 in this Unit although there is no automatic certification of Core Skills or Core Skills components.

The Core Skill of *Communication* may be developed through the production of technical notes which may bring together both visual and written notes. The evaluation in Outcomes 1, 2 and 4, and the reflection in Outcome 3 if produced as a written paper may provide opportunities to develop the written communication component at SCQF level 5.

The Core Skill of *Problem Solving* may be developed through the practical stages in Outcomes 1, 2 and 4 where learners are encouraged to explore techniques, identify problems and devise solutions. In Outcome 3 the skill may also be developed as learners work to produce finished devices, and reflect on what they have achieved.

The practical nature of the workshops and equipment access together with design and component use may mean that learners will have to negotiate access with other learners and work with clinicians in the design(s) election phase of the final device. This may provide the opportunity to develop the Core Skill of *Working with Others* at SCQF level 5.

History of changes to Unit

Version	Description of change	Date

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General information for learners

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

This Unit is designed to enable you to build upon your previous knowledge and skills in orthotic manufacture.

This Unit has four main areas, and each is subject to a separate Outcome.

To begin with you will look at preparation of the KAFO cast ready for manufacture. You will then select the correct materials. You will then take the process forward and manufacture a KAFO. Finally you will be able to identify faults and necessary repairs of a KAFO when the patient returns for a review appointment and carry out any repairs as required.

Overall you are expected to use the knowledge and skills for the Unit to enable you to produce and repair a Knee Ankle Foot Orthosis.

This could help you in the future to develop your knowledge and skills as an orthotic technician.

To complete this Unit successfully you will have to achieve a satisfactory level of performance on one piece of assessed work for each of the four Outcomes. The assessment includes practical hands on workshop practice.

This Unit has been designed as part of the Rehabilitation Technologies PDA but may also be undertaken as a standalone Unit for those interested in developing their skills in lower limb orthotics. This Unit will allow you to evaluate and explore a variety of manufacturing techniques, production processes, produce sample devices to fitting using various techniques and complete sample devices to final delivery.

Techniques explored could include forming, draping, side member forming, component use, tooling and machining.

The assessment for this Unit could be presented in the form of a brief or set prescription from which you will be expected to:

- ◆ evaluate various preparation routes enabling you to produce a thorough investigation on the preparation of various prescriptions for manufacture. These could include model selection and production, identification and preparation, component selection and identification, materials and tooling required in production processes.
- ◆ manufacture of one sample of a prescribed device to finished stage from those prepared in the preparation process above. Device(s) produced could be model/demonstration pieces or prescribed devices produced to a good industry standard, cosmetically pleasing with no obvious flaws. The produced device(s) should use appropriate construction methods and materials and be produced to a fit for purpose standard of finish with no obvious faults or flaws.
- ◆ manufacture a final device, which will incorporate at least two of the materials explored and for which samples have been produced to finished stages above. Device(s) produced could be model/demonstration pieces or prescribed devices finished to a good industry standard, cosmetically pleasing with no obvious flaws. The finished device(s) should use appropriate construction methods and materials and be produced to a fit for purpose standard of finish and delivery with no obvious faults or flaws.

General information for learners (cont)

Unit title: Orthotics: Knee Ankle Foot Orthotics (SCQF level 7)

You will be required to follow appropriate quality assurance procedures, safe and considerate working practices in line with COSHH, MHRA regulations, risk assessment, appropriate use of Personal Protective Equipment (PPE) and all necessary health and safety management issues.