

NCFE

CACHE

Optional unit content

Diagnostic Imaging Support

**NCFE CACHE Level 3 Diploma in Healthcare
Support**

QN: 610/2160/X

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Section 1: introduction

Overview

This document is an extension of the qualification specification for the NCFE CACHE Level 3 Diploma in Healthcare Support (610/2160/X) and contains the Diagnostic Imaging Support optional units for this qualification. The optional unit document must be used alongside the mandatory qualification specification as this contains generic information that is not repeated in the optional units document. Both documents can be found on the qualification's page on the NCFE website.

Tasks have not been provided for these optional units; however, tasks for these units will be available upon request. Please ensure you check the rule of combination (RoC) using the qualification specification.

Support handbook

The qualification specification and optional unit document must be used alongside the mandatory support handbook, which can be found on the NCFE website. This contains additional supporting information to help with the planning, delivery and assessment.

The qualification specification and optional unit document contain all of the qualification-specific information you will need that is not covered in the support handbook.

Reproduction of this document

Centres must ensure they are using the most up-to-date version of this document and the qualification specification; the version number and date can be found within the documents.

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Other support materials

The resources and materials used in the delivery of this qualification must be age-appropriate and due consideration should be given to the wellbeing and safeguarding of learners in line with the centre's safeguarding policy when developing or selecting delivery materials.

Section 2: optional unit content and assessment guidance

This section provides details of the structure and content of the Diagnostic Imaging Support optional units for this qualification.

Diagnostic Imaging Support optional units**DI 1 Prepare medicines and monitor their effects on individuals during radiological procedures (Y/651/3812)**

Unit summary				
This unit is for those who prepare and monitor the effects of medicines for radiological procedures on individuals.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	5 credits	30 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand legislation, guidelines, policies, procedures and protocols relevant to the preparation, supply and administration of medicines and monitoring of individuals	1.1 Explain current legislation, guidelines, policies, procedures and protocols relevant to the preparation, supply and administration of medicines and monitoring of individuals
2. Know about common types of medicines for radiological procedures and their safe use	2.1 Describe common types of medicines , including why they are used and their effects and potential side effects
	2.2 Identify medicines that require specific physiological measurements
	2.3 Describe the common adverse reactions to medicines, how each can be recognised, and the appropriate responses required
	2.4 Explain the different routes used in the administration of medicine
3. Understand procedures and techniques for the supply and administration of medicines for radiological procedures	3.1 Explain the types, purpose and function of materials and equipment needed for the administration of medicines via the different routes
	3.2 Identify the required information from the referral, medicines protocol/imaging protocol or other documentation
	3.3 Explain ways to ensure appropriate timing of medicines from the medicines protocol/imaging protocol or other documentation
4. Be able to prepare for the supply or administration of medicines for radiological procedures	4.1 Apply standard precautions for infection control
	4.2 Confirm the identity of the individual against the imaging referral according to protocol
	4.3 Confirm the details of the correct medicine against the imaging referral and imaging protocol
	4.4 Explain the processes for an individual to receive the information they need before giving valid consent
	4.5 Obtain the individual's valid consent and offer information, support and reassurance throughout as appropriate to the individual's needs and concerns
	4.6 Explain the actions to be taken if an individual does not consent to prescribed medicines
	4.7 Explain when it may be necessary to seek assistance from an appropriate member of staff

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
	4.8 Select, check and prepare the medicines correctly according to the medicines protocol/imaging protocol and medication label/leaflet, following any specific instruction
5. Be able to monitor individuals after the administration of medicines for radiological procedures	5.1 Observe medicine has been supplied or administered to the individual according to the medicine and imaging protocols
	5.2 Report any immediate problems with the individual
	5.3 Monitor the individual's condition during and after the administration of medicines for radiological procedures
	5.4 Complete documentation relevant to the administration of medicine in the individual's record
	5.5 Dispose of part-used administration equipment and part-used medicine in accordance with legal and organisational requirements
	5.6 Explain the process for the following throughout the radiological procedure: <ul style="list-style-type: none"> • obtaining medicines • transporting medicines • receiving and returning medicines • preparing medicines • storing medicines • maintaining relevant records

Range
2. Know about common types of medicines for radiological procedures and their safe use
<p>2.1 Types of medicines must include:</p> <ul style="list-style-type: none"> • contrast media/agents (including iodinated contrast media, gadolinium-based contrast media, barium-based contrast media and gaseous contrast media) • radiopharmaceuticals • muscle relaxants (for example, glucagon, Buscopan) • glyceryl trinitrate (GTN) • beta blockers <p>2.3 Appropriate responses could include:</p> <ul style="list-style-type: none"> • document the incident • escalate to supervising practitioner • alert medical team (for example, resuscitation team) • emergency response protocol <p>2.4 Different routes must include:</p> <ul style="list-style-type: none"> • oral • inhalation • intra-arterial • intravenous • intramuscular • rectal

Range

4. Be able to prepare for the supply or administration of medicines for radiological procedures

4.2 Individual:

Refers to someone requiring care or support; it will usually mean the person or people supported by the learner. Individuals may be neonates, infants, children, young people or adults.

4.4 Valid consent:

Must be in line with agreed UK country definition and could include:

- the individual must have the mental capacity to make the decision
- the individual must have sufficient unbiased information to make an informed choice
- the individual must not be pressured into making a decision and must give consent freely

Delivery and assessment guidance

This unit must be assessed in line with Skills for Health Assessment Principles.

LO4 and LO5 must be assessed in a real work environment (RWE).

DI 2 Understand the administration of medicines for radiological procedures (A/651/3813)

Unit summary				
This unit provides the knowledge and understanding related to the supply or administration of medicines under the direction of a health professional.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	3 credits	28 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand the current legislation, guidelines and policies relevant to the administration of medicines for radiological procedures	1.1 Describe the current, national legislation and guidelines relevant to the administration of medicines
	1.2 Outline the organisational policies for the management and administration of medicines
	1.3 Distinguish between the legislation for patient group directions (PGD) and patient specific directions (PSD) across radiological procedures
2. Understand the roles and responsibilities involved in the administration of medicines for radiological procedures	2.1 Describe the responsibilities and accountability in relation to the administration of medicines
	2.2 Explain the importance of working within organisational policies and procedures in relation to the administration of medicines
	2.3 Explain the importance of working within own area of competence and seeking advice when faced with situations outside own area of competence
3. Understand the requirements and procedures for the administration of medicines for radiological procedures	3.1 Explain the purpose and significance of the information that should be provided on the label/leaflet of a medication
	3.2 Discuss the reasons for the different routes used in the administration of medicine
	3.3 Discuss the challenges encountered with the different routes used in the administration of medicine
	3.4 Describe the type, purpose and function of materials and equipment needed for the administration of medicine within own role and responsibilities
	3.5 Explain the importance of applying standard precautions for infection control and the potential consequences of poor practice
	3.6 Explain why medicines should only be administered following protocols and written instructions
4. Understand the requirements and procedures for ensuring an individual's safety	4.1 Explain the importance of identifying the individual against the imaging referral according to protocol
	4.2 Explain the importance of confirming the medicines to be used according to the medicine protocol and imaging protocol with the person leading the procedure before administering the medicine

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
5. Understand the management of medications used in radiological procedures including safe and secure handling of medicines	5.1 Describe how stock levels are maintained and what action is needed to obtain new stocks when required
	5.2 Explain how to complete the necessary records relating to the administration of medicines used in radiological procedures
	5.3 Describe how to maintain the security of medicines and how related records demonstrate this
	5.4 Explain the importance of keeping accurate and up-to-date records about the administration of medicines used in radiological procedures
	5.5 Explain the importance of completing records fully, legibly and accurately
	5.6 Describe the reasons why medicines are returned to the correct place for storage and longevity

Range
4. Understand the requirements and procedures for ensuring an individual's safety
4.1 Individual: Refers to someone requiring care or support; it will usually mean the person or people supported by the learner.

Delivery and assessment guidance
This unit must be assessed in line with Skills for Health Assessment Principles.

DI 3 Perform intravenous cannulation for radiological procedures (D/651/3814)

Unit summary				
This unit will provide learners with the knowledge and skills of intravenous cannulation for radiological procedures.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 4	6 credits	45 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand current legislation, national guidelines, policies, protocols and best practice that impact on performing intravenous cannulation	1.1 Summarise the current legislation, national guidelines, policies, protocols and best practice guidelines that affect own role in relation to performing intravenous cannulation
	1.2 Explain the importance of working within own role and provide examples of seeking advice when faced with situations outside own role
2. Understand the purpose and functions of intravenous cannulation for radiological procedures	2.1 Explain the anatomy and physiology of the circulatory system in relation to the insertion and maintenance of an intravenous cannula
	2.2 Summarise the indications and reasons for intravenous cannulation
	2.3 Explain the factors that influence the choice of a cannula and the site to be used
	2.4 Explain the preparation and positioning of an individual for insertion of an intravenous cannula
	2.5 Explain the risks associated with the insertion of an intravenous cannula
3. Be able to prepare to carry out intravenous cannulation	3.1 Confirm the activity in line with imaging protocol
	3.2 Implement health and safety measures relevant to the procedure and environment
	3.3 Confirm the individual's identity and obtain valid consent to carry out the procedure
	3.4 Communicate information, support and reassurance to address the individual's needs, preferences and concerns
	3.5 Prepare equipment for intravenous cannulation in line with local policy and protocol
	3.6 Assess and take relevant action for risks identified prior to and during the procedure
	3.7 Seek clinical advice and support when events or risks are outside the scope of own role
4. Be able to carry out intravenous cannulation	4.1 Apply standard precautions for infection prevention and control
	4.2 Maintain an individual's privacy and dignity at all times
	4.3 Reassure the individual and observe them for contraindications during the procedure
	4.4 Prepare an appropriate site for cannulation, using the correct size and type of cannula, checking for contraindications
	4.5 Position and use a tourniquet to engorge the selected vein with blood

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
	4.6 Insert the cannula into the selected vein using the approved technique and confirm correct siting, positioning and patency of cannula
	4.7 Apply an approved dressing to fix the cannula in position
	4.8 Flush the cannula when in situ according to local protocols and guidelines
5. Be able to monitor and report on the intravenous cannulation	5.1 Report any condition or behaviour that may signify adverse reactions to the procedure, in line with local policy and protocol
	5.2 Report and record the cannulation procedure in accordance with agreed procedures
	5.3 Maintain the cannulation site at regular intervals to avoid infection and maintain access
6. Be able to disconnect the vascular access equipment and remove a cannula	6.1 Disconnect and dispose of vascular access equipment
	6.2 Remove a cannula to include: <ul style="list-style-type: none"> • stopping blood flow • stopping bleeding • application of suitable dressing • personal care advice to the individual

Range
2. Understand the purpose and functions of intravenous cannulation for radiological procedures
2.4 Individual: Refers to someone requiring care or support; it will usually mean the person or people supported by the learner.
3. Be able to prepare to carry out intravenous cannulation
3.1 Imaging protocol could include: <ul style="list-style-type: none"> • imaging procedure • radiographic procedure • interventional procedure
3.3 Valid consent: Must be in line with agreed UK country definition and could include: <ul style="list-style-type: none"> • the individual must have the mental capacity to make the decision • the individual must have sufficient unbiased information to make an informed choice • the individual must not be pressured into making a decision and must give consent freely
3.4 Preferences could include: <ul style="list-style-type: none"> • beliefs • values • culture • aspirations • wishes

Range

4. Be able to carry out intravenous cannulation

4.6 **Approved technique** could include:

- aseptic non-touch technique (ANTT)

Delivery and assessment guidance

This unit must be assessed in line with Skills for Health Assessment Principles.

LO3, 4, 5 and 6 must be assessed in a real work environment (RWE).

DI 4 Support individuals to participate in their own healthcare activities to enable radiological procedures (F/651/3815)

Unit summary				
This unit covers the knowledge and skills required to support individuals to participate in their own healthcare activities to enable radiological procedures.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	2 credits	15 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand healthcare activities likely to be undertaken by individuals	1.1 Identify treatments and physical measurements likely to be undertaken by individuals
	1.2 Explain reasons why physical measurements and specimens might need to be taken
	1.3 Describe possible adverse reactions individuals may experience when undertaking their own healthcare activities
	1.4 Explain why preparation is important for an individual undertaking their own healthcare activity
2. Be able to support individuals to prepare for their own healthcare activities	2.1 Establish with others own role in supporting individuals to participate in their own healthcare activities
	2.2 Promote safe storage of supplies
	2.3 Support the individual to prepare equipment and the environment to participate in their own activities
	2.4 Provide the individual and key people with accurate and accessible information about the activities they will use and how materials and equipment should be stored and disposed of
	2.5 Support the individual's understanding of techniques for their own healthcare activities
	2.6 Check the individual's understanding of when to seek advice or take immediate action when carrying out their own healthcare activities
3. Be able to support individuals to participate in their own healthcare activities	3.1 Assist the individual's understanding of when to seek advice or take immediate action when carrying out healthcare activities
	3.2 Promote safe disposal of supplies used for their own healthcare activities
	3.3 Support the individual to record measurements and store records safely
4. Be able to monitor healthcare activities undertaken by individuals	4.1 Monitor the accuracy, timing and outcomes of healthcare activities carried out by the individual
	4.2 Record and report any adverse reactions or other concerns, in line with agreed ways of working
	4.3 Describe action to take if monitoring suggests that the activity carried out by the individual needs to be changed or is no longer needed

Range
<p>1. Understand healthcare activities likely to be undertaken by individuals</p> <p>1.1 Treatments could include:</p> <ul style="list-style-type: none"> • individual replacing their stoma bag • individual using a urinary catheter <p>1.1 Physical measurements could include:</p> <ul style="list-style-type: none"> • individual checking their blood sugar level <p>1.1 Individuals:</p> <p>Refers to someone requiring care or support; it will usually mean the person or people supported by the learner. Individuals may be neonates, infants, children, young people or adults.</p> <p>1.4 Preparation could include:</p> <ul style="list-style-type: none"> • individuals bringing in their own: <ul style="list-style-type: none"> ○ medication for the imaging procedure ○ prescriptions ○ individual consumables
<p>2. Be able to support individuals to prepare for their own healthcare activities</p> <p>2.1 Others could include:</p> <ul style="list-style-type: none"> • team members • other colleagues • those who use or commission their own health or social care services • families • carers and advocates • outside services and organisations • those with power of attorney • line manager • other professionals • others who are important to the individual's wellbeing <p>2.2 Supplies could include:</p> <ul style="list-style-type: none"> • medical dressings • medicines (for example, over the counter medicines, prescription only) • personal protective equipment (PPE) • biohazard equipment • mobility aides
Delivery and assessment guidance
<p>This unit must be assessed in line with Skills for Health Assessment Principles.</p> <p>LO2, LO3 and LO4 must be assessed in a real work environment (RWE).</p>

DI 5 Support the team to facilitate radiological procedures (H/651/3816)

Unit summary				
This unit covers the knowledge and skills required to support the team to facilitate radiological procedures.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	2 credits	15 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand own role and responsibilities in line with current legislation, when supporting the team to facilitate radiological procedures	1.1 Summarise own role and responsibilities in line with: <ul style="list-style-type: none"> • current legislation • national guidelines • policies, protocols and good practice guidelines • local ways of working
2. Be able to inform individuals of pre-procedural arrangements	2.1 Clarify the requirements pre-procedure and communicate with the team and the individual
	2.2 Communicate with the team and the individual for compliance with any required pre-procedure preparation
	2.3 Support the patient with any pre-procedure requirements
3. Be able to assist the team carrying out radiological procedures	3.1 Communicate with the individual as required by the team and share information needed to carry out radiological procedures with the individual and the team : <ul style="list-style-type: none"> • prior • during • after
	3.2 Confirm the identity of the individual
	3.3 Confirm valid consent has been obtained
	3.4 Carry out tasks as required by the team and according to imaging/treatment protocol
	3.5 Carry out tasks within the scope of own competence
	3.6 Communicate information to other team members while maintaining confidentiality
	3.7 Explain how to seek guidance and support, including referring to an appropriate person where issues fall outside own competence or if any adverse events occur, in line with organisational requirements
	3.8 Recognise and respond to changes in an individual's health and wellbeing
	3.9 Collaborate during activities that require teamwork
	3.10 Record information as required in the patient record/radiology information system
4. Be able to inform individuals of post-procedural arrangements	4.1 Clarify with the team the potential side effects of treatment that the individual should be aware of post-procedure
	4.2 Clarify with the team any advice and information to be given to the individual

Learning outcomes (LOs)	Assessment criteria (AC)
The learner will:	The learner can:
	4.3 Gain any necessary authorisation prior to passing on post-procedural information to the individual
	4.4 Communicate information in a way that is sensitive to the needs, personal beliefs, preferences and abilities of the individual
	4.5 Contribute to signposting to relevant agencies post-procedure or transfer of individuals between services, in line with their care plan
	4.6 Confirm the individual's and/or relevant others understanding of general and aftercare information
	4.7 Maintain confidentiality throughout the procedure
	4.8 Record details of the procedure in line with organisational requirements

Range
<p>3. Be able to assist the team carrying out radiological procedures</p>
<p>3.1 Radiological procedures could include:</p> <ul style="list-style-type: none"> • clinical • diagnostic • therapeutic <p>3.1 Team could include:</p> <ul style="list-style-type: none"> • radiologists • radiographers • sonographers • nurses • porters <p>3.2 Individual:</p> <p>Refers to someone requiring care or support; it will usually mean the person or people supported by the learner. Individual may be neonates, infants, children, young people or adults.</p> <p>3.3 Valid consent:</p> <p>Must be in line with agreed UK country definition and could include:</p> <ul style="list-style-type: none"> • the individual must have the mental capacity to make the decision • the individual must have sufficient unbiased information to make an informed choice • the individual must not be pressured into making a decision and must give consent freely <p>3.7 Organisational requirements could include:</p> <ul style="list-style-type: none"> • pre-procedure checklists • pre-procedure safety questionnaires • imaging protocols • post-procedural checklists

Range
<ul style="list-style-type: none"> • protocols and procedures for onward care
<p>4. Be able to inform individuals of post-procedural arrangements</p> <p>4.4 Preferences could include:</p> <ul style="list-style-type: none"> • values • culture • aspirations • wishes <p>4.5 Transfer could include:</p> <ul style="list-style-type: none"> • transfer individuals between departments within an organisation • transfer individuals between organisations • transfer individuals to another clinical area <p>4.6 Others could include:</p> <ul style="list-style-type: none"> • team members • other colleagues • those who use or commission their own health or social care services • families • carers and advocates • outside services and organisations • those with power of attorney • line manager • other professionals • others who are important to the individual's wellbeing
Delivery and assessment guidance
<p>This unit must be assessed in line with Skills for Health Assessment Principles.</p> <p>LO2, 3 and 4 must be assessed in a real work environment (RWE).</p>

DI 6 Principles of anatomy, physiology and physics for radiological procedures (J/651/3817)



Unit summary				
This unit provides knowledge and understanding in relation to anatomy, physiology and physics used for radiological procedures				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	7 credits	45 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand the key physics principles for radiological procedures	1.1 Describe the key features of the following: <ul style="list-style-type: none"> • atom • isotope
	1.2 Describe the features of the electromagnetic spectrum in relation to imaging examinations
	1.3 Differentiate the features of sound waves from those of the electromagnetic spectrum
	1.4 Identify the features of radiofrequency waves and strong magnetic fields
2. Understand the key physics principles of health and safety for radiological procedures	2.1 Describe the processes involved in X-ray production
	2.2 Identify the various features of X-ray interactions with matter and their importance for image production
	2.3 Explain the importance of radiation protection for self, the individual and others in the radiology environment
	2.4 Explain the importance of magnetic resonance imaging (MRI) safety for self, the individual and others in the imaging environment
	2.5 Explain how nuclear medicine safety differs from other areas of imaging and therapy
	2.6 Explain the key aspects of ultrasound and how they relate to safety
3. Understand the structure and functions of the organ systems of the human body for radiological procedures	3.1 Describe the structures and functions of the organ systems of the human body
	3.2 Describe the planes of the body in relation to diagnostic imaging
	3.3 Describe terminology related to the position of the individual for imaging procedures
	3.4 Describe the relationship between the structure and function of the following components of the organ systems: <ul style="list-style-type: none"> • cells • organelles • tissues • organs • organ systems
4. Understand homeostasis in the human body for radiological procedures	4.1 Describe the process of homeostasis in the human body
	4.2 Describe how homeostasis maintains the healthy functioning of the human body
	4.3 Explain how performing radiological procedures may impact homeostasis

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
5. Understand signs and symptoms of physiological disorders that affect organ systems for radiological procedures	5.1 Describe how the signs and symptoms of disease and trauma in the human body result in referrals for radiological procedures
	5.2 Describe how disease and trauma may impact radiological procedures
6. Understand how imaging modalities are used for each organ system of the human body	6.1 Describe the physics processes underpinning image formation and capture for imaging modalities
	6.2 Explain why different imaging modalities are used for organ systems/physiological disorders
	6.3 Identify the imaging modality from an image of an organ system

Range
<p>1. Understand the key physics principles for radiological procedures</p> <p>1.1 Atom must include:</p> <ul style="list-style-type: none"> • structure (for example, electron, proton, neutron, ion) • number • mass • isotope formation
<p>2. Understand the key physics principles of health and safety for radiological procedures</p> <p>2.2 X-ray interactions with matter must include:</p> <ul style="list-style-type: none"> • physics (including the Compton effect, photoelectric effect, scattering and absorption) and how the application of contrast media impacts
<p>3. Understand the structure and functions of the organ systems of the human body for radiological procedures</p> <p>3.1 Structures and functions of the organ systems must include:</p> <p>Skeletal system</p> <ul style="list-style-type: none"> • functions of the skeletal system: <ul style="list-style-type: none"> ○ support ○ protection ○ attachment of muscles ○ storage of calcium ○ production of blood cells • structure of the skeletal system: <ul style="list-style-type: none"> ○ bone: <ul style="list-style-type: none"> ▪ compact and cancellous ○ classification/type: <ul style="list-style-type: none"> ▪ long ▪ short ▪ flat ▪ irregular ▪ sesamoid ○ bones:

Range

- axial and appendicular skeleton
- bones within the axial skeleton:
 - bones of the head:
 - skull (for example, cranium)
 - bones of the neck:
 - cervical vertebrae (atlas and axis)
 - bones of the spine:
 - thoracic vertebrae
 - lumbar vertebrae
 - sacral vertebrae
 - coccygeal vertebrae
 - intervertebral discs
 - bones of the torso:
 - ribs
 - sternum
 - clavicle
 - scapula and pelvic girdle – ilium, ischium and pubis
- bones within the appendicular skeleton:
 - bones of the upper limbs:
 - humerus
 - radius
 - ulna
 - bones of the hands:
 - carpals
 - metacarpals
 - phalanges
 - bones of the lower limbs:
 - femur
 - patella
 - tibia and fibula
 - bones of the feet:
 - tarsals
 - metatarsals
 - phalanges
- characteristics of a long bone:
 - cartilage
 - epiphyseal line
 - medullary cavity
 - periosteum
- types of joints:
 - fibrous (for example, immovable)
 - cartilaginous (for example, slightly moveable)
 - synovial (for example, freely moveable)
- types of synovial joints:
 - ball and socket
 - hinge
 - pivot
 - saddle
 - condyloid
 - gliding

Range

- characteristics of a synovial joint:
 - synovial capsule
 - synovial membrane
 - synovial fluid
 - joint cavity
 - articular or hyaline cartilage
 - ligaments and tendons

Integumentary system

- layers of the skin:
 - epidermis
 - dermis
 - subcutaneous
- structural components of the dermis:
 - papillary and reticular layer – blood capillaries
 - sebaceous glands
 - lymphatic capillaries
 - hair
 - sweat glands
 - sensory and motor nerve endings
 - collagen
 - elastin fibres
- functions of the skin:
 - protection
 - temperature regulation
 - sensation
 - excretion
 - vitamin D synthesis

Muscular system

- major muscles of the body:
 - muscles of the shoulder:
 - deltoid
 - trapezius
 - muscles of the arm:
 - biceps
 - triceps
 - muscles of anterior thorax:
 - pectorals
 - diaphragm
 - muscles of posterior thorax:
 - latissimus dorsi
 - erector spinae
 - muscles of the abdominal region:
 - rectus abdominis
 - obliques
 - muscles of the hip:
 - gluteus maximus
 - iliopsoas
 - muscles of the upper leg:

Range

- quadriceps
 - hamstrings
- muscles of the lower leg:
 - gastrocnemius
 - soleus
- muscle types and characteristics of each:
 - smooth/visceral (for example, involuntary)
 - cardiac
 - skeletal (for example, voluntary)
- muscle action (contraction):
 - sarcomeres
 - actin
 - myosin
- roles of muscles:
 - agonist
 - antagonist
 - fixator
 - synergist
- antagonistic pairs:
 - flexion
 - extension
- muscle fibre types – characteristics of each type:
 - type 1
 - type 2 (A and B)

Nervous system

- structure of the central nervous system (CNS):
 - brain
 - spinal cord
 - co-ordination of voluntary/involuntary activities
- structure and function of the peripheral nervous system:
 - somatic
 - autonomic:
 - sympathetic
 - parasympathetic
- neurons:
 - types of neuron:
 - motor (for example, efferent)
 - sensory (for example, afferent)
 - structure of a neuron:
 - cell body
 - dendrites
 - axons
 - myelin sheath
 - axon terminals
- mechanisms of transmission of an impulse:
 - somatic, sensory and motor nerve pathways
 - spinal reflex arc
 - synaptic transmission

Range**Endocrine system**

- the endocrine system and hormonal control
- the location and function of the hypothalamus and pituitary gland
- the function of key glands for hormone production:
 - pituitary:
 - somatotrophin (for example, human growth hormones (HGH))
 - prolactin
 - LH (for example, luteinising hormone)
 - follicle stimulating hormone (FSH)
 - oxytocin
 - antidiuretic hormone (ADH) (for example, posterior pituitary stores and secretes ADH and oxytocin)
 - thyroid:
 - thyroxine
 - calcitonin
 - ovaries:
 - oestrogen
 - progesterone
 - pancreas:
 - insulin
 - glucagon
 - adrenal gland
 - adrenaline
 - testes:
 - testosterone

Cardiovascular system

- blood vessels:
 - arteries and arterioles
 - venules and veins
 - capillaries
- major structures of the heart:
 - superior vena cava
 - inferior vena cava
 - right atrium
 - tricuspid valve
 - right ventricle
 - pulmonary valve
 - pulmonary artery
 - pulmonary vein
 - left atrium
 - bicuspid/mitral valve
 - left ventricle
 - semi-lunar valve
 - aorta
 - septum
 - pericardium
 - epicardium
 - myocardium
 - endocardium

Range

- circulatory pathways:
 - systemic
 - pulmonary (for example, double loop circuit)
- blood pressure:
 - systolic
 - diastolic
 - normal ranges (for example, measurements)
- structure and function of blood:
 - plasma
 - red blood cells
 - white blood cells
 - platelets

Respiratory system

- passage of air through the respiratory system:
 - mouth/nose
 - pharynx
 - epiglottis
 - larynx
 - trachea
 - bronchi
 - bronchioles
 - alveoli
 - lungs
 - muscles of respiration:
 - diaphragm
 - intercostals
- gaseous exchange/diffusion:
 - removal of waste products
 - control of ventilation:
 - breathing rate
 - respiratory centres of the brain
- cellular respiration

Immune/lymphatic system

- components of lymph system:
 - vessels
 - lymph nodes
 - lymph
- location of major lymph nodes:
 - neck
 - armpits
 - groin
- lymph organs:
 - spleen
 - thymus
 - tonsils
- lymphocytes:
 - T cells
 - B cells

Range

- phagocytes
- immune system and response:
 - pathogens
 - antigens
 - antibodies

Digestive system

- structure and function of alimentary canal:
 - mouth:
 - buccal cavity
 - teeth
 - tongue
 - pharynx
 - epiglottis
 - stomach:
 - oesophagus
 - cardiac sphincter
 - pyloric sphincter
 - small intestine-duodenum
 - jejunum
 - ileum
 - villi
 - large intestine
 - ileocaecal valve
 - caecum
 - colon:
 - ascending
 - transverse
 - descending
 - rectum:
 - anus
 - anal sphincter
- peristalsis (for example, mechanical digestion)
- chemical digestion:
 - absorption
- role of enzymes in the digestive process:
 - amylase
 - protease
 - lipase
- elimination of waste products

Excretory/urinary system

- structure and function of the excretory/urinary system:
 - kidneys:
 - nephrons (for example, afferent and efferent arterioles)
 - ureters
 - bladder (for example, transitional epithelium)
 - urethra (for example, differences in male and females)
- reabsorption
- elimination of waste products

Range**Reproductive system**

- female:
 - ovaries
 - fallopian tubes
 - uterus (for example, perimetrium)
 - cervix
 - vagina
 - ovulatory cycle
- male:
 - testes
 - vas deferens (for example, vas/ductus)
 - seminal vesicles
 - scrotum
 - prostate gland
 - urethra
 - penis

5.1 Disease and trauma could include:

- skeletal system:
 - arthritis (for example, joints)
 - fractures
- integumentary system:
 - skin cancer
 - eczema (for example, skin)
- muscular system:
 - muscle damage such as tears or ruptures
 - muscular dystrophy (for example, muscle contraction)
- nervous system:
 - stroke
 - multiple sclerosis (for example, neuron myelin sheath)
- cardiovascular system:
 - cardiovascular disease (for example, within the heart, blood vessel, adrenal glands)
- respiratory system:
 - lung cancer
 - asthma (for example, bronchioles in respiration)
- immune system:
 - rheumatoid arthritis
 - human immunodeficiency virus (HIV) (for example, lymphocytes T and B cells)
- digestive system:
 - Crohn's disease

6.1 Imaging modalities could include:

- projection radiography (for example, computed radiography/digital radiography) (CR/DR)
- computed tomography (CT)
- magnetic resonance imaging (MRI)
- nuclear medicine (NM or Nuc Med)

Range

- ultrasound (US)
- dual energy X-ray absorptiometry (DEXA)
- mammography
- fluoroscopy (for example, cardiac catheter lab)
- tomography
- positron emission tomography/computed tomography (PET CT)
- positron emission tomography/magnetic resonance imaging (PET MRI)

Delivery and assessment guidance

This unit must be assessed in line with Skills for Health Assessment Principles.

DI 7 Managing digital radiographic images (K/650/5401)

Unit summary				
This unit is about managing digital radiographic images and quality assurance concerning equipment, record keeping and storage for all radiographic imaging modalities.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	4 credits	23 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand the legislation and codes of practice related to the acquisition, storage and communication of radiographic images	1.1 Summarise the current legislation, national guidelines, policies, protocols and good practice guidelines for the acquisition, storage and handling of radiographic images
2. Understand the equipment involved in acquiring, storing and communicating radiographic images	2.1 Explain how radiographic images and records are acquired, stored and made available for viewing
	2.2 Explain why radiographic images must be correctly identified and labelled
	2.3 Explain the types of equipment used to acquire, store and manipulate images
	2.4 Explain the process and procedures associated with image sharing
3. Be able to prepare equipment to process radiographic images	3.1 Confirm that the equipment is in good working order and fully operational prior to use
	3.2 Select image production and reproduction materials or systems appropriate to the modality and the method of image storage
4. Be able to support the quality assurance programme for relevant equipment	4.1 Operate and handle equipment or systems in line with local policy and protocol
	4.2 Explain how to identify and remedy any faults or minimise any damage to equipment and materials

Range
1. Understand the legislation and codes of practice related to the acquisition, storage and communication of radiographic images
<p>1.1 Legislation, national guidelines, policies, protocols and good practice guidelines could include:</p> <ul style="list-style-type: none"> • computed radiography (CR) and digital radiography (DR) • legislation around safe use of radiation • data protection legislation for image acquisition and transfer • physics (for example, how ionising radiation affects tissues, how images are produced) • image formation (for example, ionising and non-ionising radiation, types of storage systems and viewing systems, modality storage versus long-term storage, image manipulation, record management)

Range
<ul style="list-style-type: none"> • information and communication technology (ICT) for image management (for example, radiology information systems (RIS), picture archiving and communication system (PACS), order communications/electronic patient records) • The Ionising Radiations Regulations 2017 (IRR) equipment quality assurance (for example, monitors, viewing conditions, radiation protection, record keeping, doses) • The Ionising Radiation (Medical Exposure) Regulations 2017 (IR(ME)R) operator role: <ul style="list-style-type: none"> ○ data input – modality patient ID ○ checking images ○ recording dose rates ○ sending to/checking images are on PACS ○ checking RIS records ○ recording and storing relevant documents
<p>2. Understand the equipment involved in acquiring, storing and communicating radiographic images</p> <p>2.1 How radiographic images and records are acquired, stored and made available for viewing must include:</p> <ul style="list-style-type: none"> • safe use of digital imaging systems • how PACS works, including Image Exchange Portal (IEP) and other data transfer methodologies <p>2.2 Why radiographic images must be correctly identified and labelled could include:</p> <ul style="list-style-type: none"> • selection of correct patient data across imaging systems • implications arising from incorrect patient data • what to do with incorrect data capture: <ul style="list-style-type: none"> ○ rectification activities for wrong patient or examinations selected <p>2.4 Process and procedures associated with image sharing could include:</p> <ul style="list-style-type: none"> • IEP • burning disks or remote access by external clinicians • role of NHS numbers • use of systems to check identification
<p>3. Be able to prepare equipment to process radiographic images</p> <p>3. Prepare equipment to process radiographic images must include:</p> <ul style="list-style-type: none"> • ensuring availability and accuracy of modality worklists • ensuring the patient record is for the correct examination • workstation quality assurance processes <p>3.2 Modality and the method of image storage must include:</p> <ul style="list-style-type: none"> • the need for image manipulation – assigning to a worklist or checking flagged as urgent • regulatory compliance issues associated with lack of appropriate image capture and digital storage

Range

4. Be able to support the quality assurance programme for relevant equipment

4 Support the quality assurance programme for relevant equipment must include:

- understanding of cassette or DR imaging plate integrity and quality assurance if using CR/DR

Delivery and assessment guidance

This unit must be assessed in line with Skills for Health Assessment Principles.

LO3 and LO4 must be assessed in a real work environment (RWE).

DI 8 Assist in assuring the effective functioning of the radiographic image quality assurance programme (M/650/5403)

Unit summary				
This unit is about quality assurance in relation to digital imaging equipment and procedures. It covers the monitoring and maintenance work required for quality assurance within an imaging department. This unit is designed to be applicable in all environments where radiographic images are produced.				
Assessment				
This unit is internally assessed via a portfolio of evidence.				
Optional	Achieved/not yet achieved	Level 3	4 credits	25 GLH

Learning outcomes (LOs) The learner will:	Assessment criteria (AC) The learner can:
1. Understand the legislation, policy and good practice guidelines related to assuring the safe functioning of radiographic image equipment	1.1 Summarise the current legislation, national guidelines, policies, protocols and good practice guidelines for the safe functioning of imaging equipment and systems
2. Understand procedures and techniques in relation to radiographic imaging equipment quality assurance	2.1 Explain how to prepare and handle quality assurance equipment and materials
	2.2 Explain the optimum frequency of quality control tests on equipment
	2.3 Explain own role in monitoring radiographic equipment
	2.4 Explain how to maintain radiographic image processing equipment
3. Understand the importance of monitoring the image processing procedure for radiographic images	3.1 Explain why the quality of viewing equipment and procedures must be regularly monitored
4. Be able to record and report on the functioning of relevant radiographic equipment	4.1 Record the results of monitoring in line with local policy and procedure
	4.2 Describe how to record where any monitoring reveals actual or potential defects in equipment
	4.3 Describe how to escalate any actual or potential defects in equipment in line with local policy and procedure
	4.4 Store monitoring records in line with local policy and procedure

Range
1. Understand the legislation, policy and good practice guidelines related to assuring the safe functioning of radiographic image equipment
1.1 Current legislation, national guidelines, policies, protocols and good practice guidelines must include:
<ul style="list-style-type: none"> • The Ionising Radiation Regulations 2017 (IRR) • The Ionising Radiation (Medical Exposures) Regulations 2017 (IR(M)ER) • the Medicines and Healthcare products Regulatory Agency (MHRA) magnetic resonance imaging (MRI) equipment in clinical use safety guidelines

Range
<ul style="list-style-type: none"> • The Environmental Permitting (England and Wales) Regulations 2016 • The Control of Electromagnetic Fields at Work Regulations 2016 <p>1.1 Safe functioning of imaging equipment and systems could include:</p> <ul style="list-style-type: none"> • understanding the quality assurance schedule and requirements • visual checks • warning lights • audible signals • notices/information • door latches/openers/interlocks • environmental monitoring
<p>2. Understand procedures and techniques in relation to radiographic imaging equipment quality assurance</p>
<p>2.2 Quality control tests on equipment must include:</p> <ul style="list-style-type: none"> • the role of the quality assurance schedule • how to support compliance <p>2.3 Own role in monitoring radiographic equipment may include:</p> <ul style="list-style-type: none"> • the role of the quality assurance programme: <ul style="list-style-type: none"> ○ visual checks ○ cleanliness/infection control ○ defect spotting – doors, floors, environment, warning lights and signs, audible warning ○ what to do (for example, alert mechanisms) when the equipment operates outside of those limits
<p>3. Understand the importance of monitoring the image processing procedure for radiographic images</p>
<p>3.1 Quality of viewing equipment and procedures must include:</p> <p>The quality assurance of monitors, light sources and viewing conditions.</p>
<p>4. Be able to record and report on the functioning of relevant radiographic equipment</p>
<p>4. The functioning of relevant radiographic equipment must include:</p> <ul style="list-style-type: none"> • record keeping: <ul style="list-style-type: none"> ○ mobile equipment (for example, wheels roll, brakes work) ○ batteries charged ○ hoists maintained against schedule ○ warmers/fridges at correct temperature ○ monitoring equipment and ancillary kit (for example, contrast pumps) <p>4.1 Record the results of monitoring must include:</p> <p>Quality assurance and quality control records.</p>

Delivery and assessment guidance

This unit must be assessed in line with Skills for Health Assessment Principles.

LO4 must be assessed in a real work environment (RWE).

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Appendix A: optional units


The units within this qualification cross over into the various pathways available and therefore do not follow the standard unit numbering of Unit 01, Unit 02, for example, DI 1, DI 2.

 Knowledge only units are indicated by a star. If a unit is not marked with a star, it is a skills unit or contains a mix of knowledge and skills.

Diagnostic Imaging Support optional units

In addition to the units in the table below, the following units also map to the knowledge, skills and behaviours for the Diagnostic Imaging Support pathway of the apprenticeship standard, Senior Healthcare Support Worker ST0217. However, these also cross over into other occupational subject areas and thus the unit details can be found in optional unit specifications for other pathways (as noted).

- AHP 20 Provide support for mobility (T/615/7215) – can be found in the Allied Health Profession Therapy Support optional unit specification
- AN 79 Understand planning and the practical application of health promotion (R/650/5314) – can be found in the Adult Nursing Support optional unit specification

Unit number	Regulated unit number	Unit title	Level	Credit	GLH	Notes
DI 1	Y/651/3812	Prepare medicines and monitor their effects on individuals during radiological procedures	3	5	30	
 DI 2	A/651/3813	Understand the administration of medicines for radiological procedures	3	3	28	
DI 3	D/651/3814	Perform intravenous cannulation for radiological procedures	4	6	45	
DI 4	F/651/3815	Support individuals to participate in their own healthcare activities to enable radiological procedures	3	2	15	



Unit number	Regulated unit number	Unit title	Level	Credit	GLH	Notes
DI 5	H/651/3816	Support the team to facilitate radiological procedures	3	2	15	
DI 6	J/651/3817	Principles of anatomy, physiology and physics for radiological procedures	3	7	45	
DI 7	K/650/5401	Managing digital radiographic images	3	4	23	
DI 8	M/650/5403	Assist in assuring the effective functioning of the radiographic image quality assurance programme	3	4	25	

The units above may be available as stand-alone unit programmes. Please visit our website for further information.