NCFE CACHE

Qualification specification

NCFE CACHE Level 4 Diploma: Healthcare Science Associate
QN: 603/7754/9

Qualification summary

Qualification title	NCFE CACHE Level 4 Diploma: Healthcare Science Associate		
Ofqual qualification number (QN)	603/7754/9	Aim reference	60377549
Guided learning hours (GLH)	615 hours	Total qualification time (TQT)	1200
Minimum age	18+		
Qualification purpose	This qualification is designed for learners who are progressing from T levels or A levels and want to further their studies in the healthcare science sector. The qualification is also suitable for adults who wish to upskill or retrain within the healthcare science sector. This higher technical qualification will give learners the skills, knowledge, and behaviours to meet specific employer needs and industry requirements.		
Grading	Pass/merit/distinction		
Assessment method	Two occupationally relevant simulated project assessments (ORSPA): externally set, internally assessed and externally quality assured. Two controlled assessments: externally set, internally assessed and externally quality assured.		
Work/industry placement experience	In order to demonstrate threshold competency by the end of this qualification, it is highly recommended that learners not already working in the healthcare science sector undertake a period of industry placement of approximately 225 hours.		
Apprenticeship standards	This HTQ content has been aligned with the Level 4 Healthcare Science Associate apprenticeship standard. This HTQ is designed to be delivered as a standalone qualification which is an alternative to the apprenticeship. It does not form part of an apprenticeship.		

Contents

Section 1: introduction

Please note this is a draft version of the qualification specification and is likely to be subject to change before the final version is produced for the launch of the qualification.

If you are using this qualification specification for planning purposes, please make sure that you are using the most recent version.

A higher technical qualification (HTQ) is a prestigious, kite-marked qualification aimed at meeting employers' needs and increasing student engagement in level 4 or 5 technical education. This HTQ content has been aligned with the Level 4 Healthcare science associate apprenticeship standard. For more information about HTQs, please visit www.instituteforapprenticeships.org/higher-technical-qualifications.

This qualification aims to:

- provide the knowledge, skills and behaviours that are needed to enter occupations across the country
- be understood and recognised as high-quality by employers and so have national labour market currency
- give learners confidence that those qualifications are recognised by employers and are perceived to be a credible, prestigious, and distinct pathway

Aims and objectives

This qualification aims to:

- focus on the study of the healthcare science associate within the health and science sector
- offer breadth and depth of study, incorporating a key core of knowledge
- provide opportunities to acquire a number of practical and technical skills

The objectives of this qualification are to provide learners with knowledge, skills and behaviours related to the following themes:

- professional practice and person-centred care
- personal and professional development (PPD)
- health, safety and security
- quality
- audit/service improvement
- research and innovation
- technical scientific services
- clinical care
- leadership

Support handbook

This qualification specification must be used alongside the mandatory support handbook on the qualifications page on the NCFE website, which contains additional supporting information to help with the planning, delivery and assessment.

This qualification specification contains all of the qualification-specific information you will need that is not covered in the support handbook.

Entry guidance

This qualification is designed for learners, looking to retrain or upskill as a healthcare science associate or for learners wanting to carry on studying after T Levels or A Levels.

Entry is at the discretion of the centre.

We recommend learners undertaking the qualification:

- should have achieved GCSE or equivalent in mathematics and English at grade C or above
- could also have achieved a level 3 in a relevant science/healthcare science area (this is preferred but not essential)

Centres are responsible for ensuring that all learners are capable of completing the mandatory knowledge, skills and behaviours and health and safety requirements.

Learners registered on this qualification should not undertake another qualification at the same level, or with the same/a similar title, as duplication of learning may affect funding eligibility.

Achieving this qualification

Diploma

To be awarded this qualification, learners are required to successfully complete all mandatory themes.

To achieve this qualification, learners must successfully demonstrate their achievement of the knowledge, skills and behaviours as required by the assessments for the qualification.

This qualification offers threshold competency to secure employment into the healthcare science associate role. In return, the learner is well-placed to progress into one of over 50 specialist roles within healthcare science and lead to full occupational competence with further support and development post-qualification.

Total qualification time (TQT) and independent learning hours for this qualification

The expectation for independent study (non-guided learning hours) is much greater at level 4 and 5 than for lower-level qualifications. This is reflected in the total qualification time (TQT) which has been set for this qualification. Independent study hours are essential for personal development and reflection, allowing learners to develop transferable skills such as time management, goal setting and self-motivation.

Some examples of activities which can be included in independent learning hours include:

- preparation for assessments
- practising skills
- reading articles/texts from a recommended reading list
- research and inquiry
- watching videos/listening to podcasts

- reviewing recordings/notes from study sessions
- peer activities, including peer feedback, meetings and discussions
- reflection

Progression including job roles

Learners who achieve this qualification could progress to the following:

- employment:
  - healthcare science associate – over 50 specialist roles:
    - cardiographer
    - laboratory support technician
    - phlebotomist
- further education:
  - related apprenticeships
- higher education

Progression to higher level studies

This qualification can be used to support progression to higher education. In order to facilitate this progression, the following approach is recommended:

- centres should engage with relevant/chosen higher education institutes (HEI) to establish accreditation of prior learning (APL) opportunities for their learners
- it is advised that learners undergo a work placement of 225 hours (DBS check may be required) however, this placement should be adjusted in line with the first-year requirements of the learner's HEI of choice

The suggested practitioner training programme (PTP) topic areas that learners may require in addition to this qualification in order to progress onto higher education are as follows:

Life sciences:

- blood sciences, cellular sciences, infection sciences, genetic sciences, transfusion and transplantation sciences:
  - the building blocks of life
  - the science behind the cure

Physiological sciences:

- cardiovascular respiratory and sleep science (CVRS):
  - scientific basis of CVRS
- neurosensory science (for example, audiology, neurophysiology and ophthalmic and vision science):
  - applied physics and measurement
  - applied anatomy, physiology and pathophysiology
  - clinical measurement and treatment

Physical sciences and clinical engineering:

- medical physics technology (for example, nuclear medicine, radiation physics and radiotherapy physics:

- o mathematics, statistics and informatics
- o scientific basis of medical physics
- clinical engineering (for example, medical engineering, radiation engineering, renal technology and rehabilitation engineering):
  - o mathematics, statistics and informatics
  - o scientific basis of engineering: electronics
  - o scientific basis of engineering: basic mechanics

Staffing requirements

Centres delivering this qualification must:

- have a sufficient number of appropriately qualified/experienced assessors to assess the volume of learners they intend to register
- have a sufficient number of appropriately qualified/experienced internal quality assurers to internally quality assure the anticipated number of assessors and learners
- ensure that all staff involved in assessment and internal quality assurance are provided with appropriate training and undertake meaningful and relevant continuing professional development
- implement effective internal quality assurance systems and processes to ensure all assessment decisions are reliable, valid, authentic, sufficient and current - this should include standardisation to ensure consistency of assessment
- provide all staff involved in the assessment process with sufficient time and resources to carry out their roles effectively

Resource requirements

To assist in the delivery of this qualification, centres/learners should have access to the following mandatory resources (the requirements listed for resources are to support both assessments and to allow facilitation of recommended delivery of associated skills detailed in the skills matrix table for skills delivery):

- LIMS simulation
- public engagement groups
- internal policies and procedures (for example, discrimination, safeguarding, health and safety, escalation of concerns)
- national policies (for example, Medicines and Healthcare products Regulatory Agency (MHRA), safeguarding)
- internal service improvement plan
- continuous personal and professional development (CPPD) documentation
- health and safety executives 5 steps to risk assessment document
- presentation software package (for example, PowerPoint)
- data software package (for example, Excel)
- access to appropriate library resources and software
- reference chart (spirometry)
- relevant colour coded waste bins and bags
- sharps bins
- toxic waste bins
- posters (for example, correct handwashing techniques)
- appropriate personal protective equipment (PPE) (for example, aprons, gloves, goggles)
- radiation dosage badge
- blood pressure monitor (manual or digital) and cuffs
- non-invasive blood pressure measurement (NIBP) monitor and cuffs in a range of sizes
- electrocardiograph (ECG)
- peak flow
- spirometer
- pulse oximeter plus a range of probes
- PH meter
- automatic pipette
- glucose meter
- dipstick
- range of thermometers with different probes (for example, tympanic, oral/axiliary, rectal probe) plus plastic probe covers
- lateral flow tests
- flow cytometer

Real work environment (RWE) recommendation

Where the assessment requirements for a qualification allows, it is essential that organisations wishing to operate an RWE do so in an environment that reflects a real work setting and replicates the key characteristics of the workplace in which the skill to be assessed is normally employed. This is often used to support simulation. Use of an RWE is not mandatory for this qualification.

Work/industry placement experience

In order to demonstrate threshold competency by the end of this qualification, it is highly recommended that learners not already working in the healthcare science sector undertake a period of industry placement of approximately 225 hours.

A suitable work placement with an external employer could include:

- laboratory environment (for example, cardiology, histopathology, phlebotomy)
- clinical engineering department (for example, MRI environment, medical equipment management department, radiology department)
- GP practice
- community based rehabilitation services

How the qualification is assessed

Assessment is the process of measuring a learner's skill, knowledge and understanding against the standards set in a qualification.

The assessment consists of 4 components:

- controlled assessments:
  - assessment 1: scenario based written assessment
  - assessment 3: practical assessment
- ORSPA:
  - assessment 2: ORSPA: case study
  - assessment 4: ORSPA: innovation research presentation

One resubmission is allowed for each ORSPA, but the grade will be capped at a pass. Resubmission of controlled assessments is not allowed.

Learners must have completed all assessment components to gain the NCFE CACHE Level 4 Diploma: Healthcare Science Associate (603/7754/9).

All the evidence generated by the learner will be assessed against the standards expected of a level 4 learner for each learning outcome.

For the delivery of assessments please refer to the centre guidance and assessment materials found on our website.

External assessment

Each learner is required to undertake 4 external assessments.

External assessments are set by NCFE and marked by the centre. The assessment assesses learners' knowledge, skills and behaviours from across the qualification content.

Assessment	Themes	Knowledge and skills statements
Scenario based written assessment	1, 3, 7 and 8	K1.1, K1.2, K1.3, K1.4, K1.5, K1.6, K1.7, K1.8, K1.11, K1.12, K1.13, K1.15, K1.17, K3.1, K3.2, K3.3, K3.4, K3.5, K3.6, K3.7, K7.4, K7.5, K7.6, K7.7, K.7.10, K8.1, K8.2, K8.3, K8.4, K8.5, K8.6, K8.8, K8.9, K8.10, K8.11 S1.18, S1.19, S1.20, S1.21, S1.22, S3.8, S3.9, S3.10, S7.13, S7.14, S7.15, S7.16, S8.12, S8.13, S8.14
Case study	1, 2, 3, 4, 6, 7 and 8	K1.1, K1.2, K1.3, K1.10, K2.1, K2.2, K2.3, K2.4, K2.5, K2.6, K3.1, K3.2, K3.3, K4.1, K4.2, K6.1, K7.1, K7.2, K7.3, K7.4, K7.5, K7.6, K7.8, K7.9, K7.10, K8.1, K8.5, K8.7, K8.8, K8.9, K8.10, K8.11 S1.19, S1.20, S1.22, S1.23, S2.7, S3.9, S3.10, S7.13, S7.14, S7.15, S7.16, S7.17, S8.12, S8.13, S8.14, S8.15
Practical assessment	1, 3, 7 and 8	K1.9, K1.10, K1.11, K1.12, K1.14, K1.15, K3.1, K3.2, K7.1, K7.7, K8.5, K8.10, K8.11 S1.19, S1.20, S1.22, S3.9, S7.13, S7.15, S7.16, S8.12, S8.13, S8.14, S8.15
Innovation research presentation	1, 2, 4, 5, 6, 7 and 9	K1.16, K2.3, K2.4, K2.5, K2.6, K4.1, K4.2, K4.3, K4.4, K5.1, K5.2, K6.1, K6.2, K6.3, K6.4, K6.5, K7.7, K7.11, K7.12, K9.1, K9.2, K9.3 S1.24, S4.5, S5.3, S5.4, S6.6, S7.16, S7.17, S9.4

The external assessment consists solely of or of a combination of:

- set date and time (invigilated) – NCFE specifies the exact date and time that the external assessment must be administered in the centre
- assessment window (supervised) – the centre arranges supervised periods of external assessment within a set window
- independent self-study (ORSPAs) – these are completed independently by learners

The assessment is administered under specified assessment conditions.

Assessment	Hours/Timings
1. Scenario based written assessment	3 hours
2. ORSPA: case study	30 hours
3. Practical assessment	2 hours

| 4. ORSPA: innovation research presentation | 20 hours |

For further information, centres should refer to the regulations for the conduct of external assessments and qualification specific instructions for delivery documents, available on the policies & documents page on the NCFE website.

Where qualifications have external assessment, centres must have entered learners using the Portal to access the assessment.

Centres must enter learners at least 10 working days in advance of the assessment window to avoid late entry fees.

If applicable, pre-release material will be made available by NCFE in advance of the assessment. All centres with entries will be notified.

The external assessment material will be sent out in time for the start of the assessment. Assessment materials must be kept secure at all times.

Resits and resubmissions

Learners may resit an assessment that is graded as not yet achieved. There is no limit on the number of resit attempts, however the assessments are only offered once per year. For the ORSPA, one resubmission will be allowed for learners who fail at the first attempt. In these circumstances, learners can only achieve a pass grade for the assessment. Resubmission of controlled assessments is not allowed.

Enquiries about results

All enquiries relating to learners' results must be submitted in line with our enquiries and appeals about results and assessment decisions policy, which is available on the policies & documents page on the NCFE website.

Assessment windows

For assessments sat in windows, the centre must enter learners to the specified window. This will be either a set date and time assessment or a window in which the assessment will be completed.

For qualifications with 'entry on registration', the centre will choose the assessment window at the point of registering the learner.

The Level 4 Diploma: Healthcare Science Associate consists of 4 assessments with the following windows:

Assessment	Window	Themes covered
1. Scenario based written assessment	Fixed date and time-controlled assessment in March	Themes 1, 3, 7 and 8
2. ORSPA: case study	8 week window, starting 1 March	Themes 1, 2, 3, 4, 6, 7 and 8
3. Practical assessment	Fixed date and time-controlled assessment in May	Themes 1, 3, 7 and 8

4. ORSPA: innovation research presentation	3 week window, starting 1 June	Themes 1, 2, 4, 5, 6, 7 and 9

Assessment windows have been set to ensure centres have time to deliver relevant content before the assessment is sat. In each case, centres should review the coverage, including detailed coverage listed in the external assessment table above, to plan their delivery.

Types of external assessment

Each learner is required to undertake 2 controlled assessments and 2 ORSPAs.

External assessment conditions

For more information on external assessment conditions, please see the regulations for the conduct of external assessments and qualification specific instructions for delivery on the policies & documents page on the NCFE website.

To access the external assessment, centres need to ensure that learners are entered for the external assessment through the online assessment platform as appropriate.

Please refer to the external assessment timetable on the NCFE website for specific dates for assessment windows.

For instructions on conducting external assessments, please refer to our regulations for the conduct of external assessments and qualification specific instructions for delivery documents, available on the policies & documents page on the NCFE website.

Grading information

To achieve the qualification, learners must achieve at least a pass in all of the assessments.

The learner's final qualification grade is made up of an aggregation of their achievement in each of the assessments, based on the assessments' proportional importance to the final grade – this is represented as a percentage weighting.

Assessments are assigned an incremental weighting based on their percentage weighting. Each grade is assigned a points value: pass = 1, merit = 3 and distinction = 5. The value of each grade in each assessment is determined by multiplying the incremental value by the grade value.

Assessment	% weighting	Incremental weighting	Distinction		Merit		Pass	
			Grade value	Points	Grade value	Points	Grade value	Points
1. Scenario based written assessment	20%	4	5	20	3	12	1	4
2. ORSPA: case study	40%	8	5	40	3	24	1	8
3. Practical assessment	25%	5	5	25	3	15	1	5
4. ORSPA: innovation research presentation	15%	3	5	15	3	9	1	3

The points achieved in each assessment are summed and the total is used to determine the overall qualification grade based on the following values:

Points score	Grade
80–100	Distinction
40–79	Merit
20–39	Pass
0–19	NYA

Assessment grading

Assessment tasks for the controlled assessments and ORSPAs are set by NCFE and assessed by the centre.

With the exception of some practical tasks, where a mark-based approach is taken, NCFE's controlled assessments and ORSPAs are judged by the centre using level of response grade descriptors, ranging from zero evidence (and therefore no achievement) through near pass, pass, merit and distinction standards. In each case, these descriptors are written to reflect the mid-point, rather than the borderline, of that standard.

This approach, including the use of a near pass grade, allows for a degree of compensation across the tasks and assessments, to ensure that the final grade fairly reflects the learner's achievement against the standard.

Overall grade boundaries are set at a mid-point between bands. For example, the overall pass boundary lies at the mid-point between bands 1 and 2, which are aligned to the grading standard associated with the near pass and pass grades respectively. The near pass grade allows learner evidence that may be below the pass standard, but still represents some achievement, to be recognised in the final assessment grade.

The grade boundaries are aligned to the qualification level grade descriptors at pass and distinction. These descriptors have been written as a description of the typical or mid-point pass and distinction standard required in the context of the purpose of the qualification.

This means that a learner will have to demonstrate the grade standard in at least half of the tasks, with the remaining half being demonstrated at the band below, in order to achieve the minimum requirement for the grade. The grading model also allows a compensatory approach to be taken for all possible combinations of assessment decisions. For example, while a learner will achieve an overall distinction if they achieve 50% of tasks at distinction standard and 50% at merit, they can also achieve an overall distinction if they achieve a pass standard in some tasks but compensate for this by achieving more than 50% of tasks at distinction.

A grading calculator has been provided to produce assessment grades based on task-based assessment decisions. Centres should use this calculator to calculate their overall assessment grades before submission of grades to NCFE. Values have been provided in the tables below for information.

Assessment 1: scenario based written assessment

Task	Weighting	Band			
		N	**P**	**M**	**D**
1	40%	8	16	24	32
2	30%	6	12	18	24
3	30%	6	12	18	24
Total	100%	20	40	60	80

Assessment 2: ORSPA: case study

Task	Weighting	Band			
		N	**P**	**M**	**D**
1	20%	4	8	12	16
2	35%	7	14	21	28
3	35%	7	14	21	28
4	10%	2	4	6	8
Total	100%	20	40	60	80

Assessment 3: practical assessment

Task	Weighting	Band			
		N	**P**	**M**	**D**
1	25%	5	10	15	20
2	25%	5	10	15	20
3	25%	5	10	15	20
4	25%	5	10	15	20
Total	100%	20	40	60	80

Assessment 4: ORSPA: innovation research presentation

Task	Weighting	Band			
		N	**P**	**M**	**D**
1	85%	17	34	51	68
2	15%	3	6	9	12
Total	100%	20	40	60	80

Qualification grade descriptors

The following descriptors represent the standard expected of a learner at the relevant grade. They describe the mid-point or typical standard for that grade (they do not attempt to describe the borderline pass or borderline distinction standard – rather the mid-point or typical standard for that grade):

Grade	Demonstration of attainment
Pass	The evidence is logical and displays relevant knowledge of healthcare science in response to the demands of the briefs.
	The learner makes good use of relevant knowledge and understanding, including how it informs practices in the healthcare science sector, and demonstrates an understanding of healthcare science practice standards or approaches associated with the industry.
	The learner makes good use of facts/theories/approaches/concepts and is able to demonstrate a reasonable breadth and depth of knowledge and understanding.
	The learner is able to identify information from appropriate sources and makes use of appropriate information, including appraising the relevance of information, and can combine information to make decisions that are relevant to the context of the brief.
	The learner makes judgements and takes action, or seeks clarification with guidance, and is able to solve problems (which are routine in the context of the brief) in simulated scenarios.
	The learner is able to demonstrate skills and knowledge of concepts and techniques reflected in the healthcare science sector and applies these across different organisational and audience requirements.
	The learner shows good understanding of problems that have not been seen before, using their knowledge and understanding to find solutions to problems and make justifications for strategies for problem solving in the healthcare science sector.
	The learner demonstrates good understanding of how to carry out technical and scientific procedures within hospitals, primary care and other healthcare settings.
	The learner is able to carry out technical scientific services for a range of settings, while maintaining professional practice and adhering to all appropriate laws, regulations and guidelines.

	The learner can demonstrate an understanding of person-centred care, ensuring that the needs of patients are considered consistently, and apply it to a patient-centred setting.
Merit	The evidence is logical and displays relevant knowledge in healthcare science in response to the demands of the briefs**.**
	The learner demonstrates a range of knowledge and understanding of healthcare science, including how it informs practices of the healthcare science sector, and demonstrates an understanding of patient care standards or approaches associated with these job roles.
	The learner demonstrates a range of facts/theories/approaches/concepts and is able to evidence a good breadth and depth of knowledge and understanding.
	The learner is able to identify information from a wide range of sources and makes valid use of appropriate information, including appraising the relevance of information, and can combine information to make decisions that are relevant to the context of the brief.
	The learner makes valid judgements and takes appropriate action, or seeks clarification with guidance, and is able to solve problems (which are in the context of the brief) in simulated scenarios.
	The learner demonstrates a range of knowledge, relevant concepts and techniques reflected in a relevant healthcare science sector role and applies this across organisational and audience requirements to tackle problems that have not been seen before, using their knowledge to analyse and find suitable solutions to the problems.
	The learner can demonstrate a good understanding of problems that have not been seen before, using their knowledge and understanding to find relevant solutions to problems, and make justifications for strategies for problem solving, with an attempt to explain their reasoning.
	The learner can examine and present data and information and apply some analysis which attempts to confirm or refute conclusions, carrying out further work to justify strategies for solving problems.
	The learner demonstrates understanding of how to carry out technical and scientific procedures within hospitals, primary care and other healthcare settings and can carry out a range of procedures, ensuring safe and professional practice throughout.

		The learner is able to carry out technical scientific services for a range of settings with effective practice demonstrated, while maintaining professional practice and adhering to appropriate laws, regulations and guidelines throughout.
		The learner can demonstrate an understanding of person-centred care, ensuring that needs of patients are considered consistently, and interventions can be developed and applied in a patient-centred setting.
Distinction		The evidence is highly logical and detailed and provides an informative and relevant response to the demands of the brief.
		The learner makes very effective use of relevant knowledge and has very good understanding of the practices of the healthcare science sector and demonstrates a very well-developed and effective understanding of the different perspectives and approaches associated with the sector.
		The learner makes good use of facts/theories/approaches/concepts, demonstrating breadth and depth of knowledge and understanding and selects appropriate skills/techniques/methods.
		The learner is able to accurately identify information from a wide and relevant range of sources and makes very good use of appropriate information, including effectively evaluating the relevance of information and can combine information to make coherent and logical decisions that address the context of the brief well.
		The learner makes well-founded judgements and takes appropriate action based upon those judgements and is able to use that to problem solve in a way that is relevant and effective (in the context of the brief) and can reflect on scenarios to draw useful conclusions relevant to the healthcare science sector.
		The learner demonstrates very good knowledge of relevant concepts and techniques reflected within relevant healthcare science sectors and applies this across a variety of organisational requirements to tackle problems that arise and can use their knowledge to analyse and find solutions to complex issues.
		The learner can examine and present data and information in context and apply appropriate analysis in confirming or refuting conclusions and carrying out further work to justify strategies for solving problems, giving explanations for their reasoning that are thoroughly backed up and rationalised.
		The learner demonstrates excellent understanding of how to carry out technical and scientific procedures within hospitals, primary care and other healthcare settings and can

	carry out a range of procedures independently, ensuring safe and professional practice throughout.
	The learner is able to carry out technical scientific services for a range of settings with excellent practice demonstrated, while maintaining professional practice and adhering to all appropriate laws, regulations and guidelines throughout.
	The learner can demonstrate an excellent understanding of person-centred care, ensuring that complex needs of patients are considered consistently, and interventions can be developed and applied across a range of patient-centred settings.

NCFE does not anticipate any changes to our aggregation methods or any overall grade thresholds; however, there may be exceptional circumstances in which it is necessary to do so to secure the maintenance of standards over time. Therefore, overall grade thresholds published within this qualification specification may be subject to change.

Section 2: qualification content

This section provides details of the structure and content of this qualification.

Behavioural framework

Embedded within higher technical qualifications is the opportunity for learners to develop behaviours relevant to their chosen discipline, in line with the qualification's knowledge and skills.

The following table identifies opportunities to demonstrate the behaviours – embedded within the skills – that will be assessed as part of this higher technical qualification. Learners may also naturally demonstrate these behaviours elsewhere, beyond the listing below. All listed behaviours are subject to assessment.

B1: be compassionate
B2: be honest
B3: be conscientious
B4: adhere to the standards of good scientific practice (GSP) which sets out the standards of behaviour/practice/personal conduct that underpin the delivery of healthcare science appropriate to the role/work undertaken.

Themes	Behaviours			
	B1	**B2**	**B3**	**B4**
1: Professional practice and person-centred care	S1.18, S1.19, S1.21	S1.18, S1.19, S1.21, S1.22, S1.23, S1.24	S1.18, S.19, S1.20, S1.23, S1.24	S1.18, S1.19, S1.20, S1.21, S1.23, S1.24
2: Personal and professional development (PPD)		S2.3	S2.3	S2.3
3: Health, safety and security		S3.9	S3.7, S3.8, S3.9	S3.7, S3.8, S3.9
4: Quality		S4.5	S4.5	S4.5
5: Audit/service improvement		S5.3	S5.4	S5.3, S5.4
6: Research and innovation			S6.6	S6.6
7: Technical scientific services		S7.13, S7.14	S7.11, S7.12	S7.11, S7.13, S7.14, S7.15
8: Clinical care	S8.12, S8.13	S8.12, S8.13, S8.14, S8.15	S8.12, S8.13, S8.14, S8.15	S8.12, S8.13, S8.14, S8.15
9: Leadership		S9.3	S9.3	S9.3

Skills delivery

This matrix table below exemplifies the suggested delivery methods for all our skills statements.

Skills	Methods of delivery					
	Formative OSCE (objective structured clinical examination)	Practical scenario (simulation/ role play)	Desk based scenario	Case study	Presentation	Professional discussion 1:1 or group
S1.18	N/A	x	x	x	x	x
S1.19	x	x	N/A	N/A	N/A	N/A
S1.20	x	x	N/A	N/A	N/A	N/A
S1.21	x	x	x	x	x	x
S1.22	x	x	x	x	x	x
S1.23	N/A	x	x	N/A	N/A	x
S1.24	N/A	x	N/A	N/A	x	x
S2.7	N/A	x	x	x	x	x
S3.8	x	x	x	N/A	N/A	x
S3.9	x	x	x	N/A	N/A	N/A
S3.10	N/A	x	x	x	N/A	x
S4.5	N/A	x	x	x	x	x
S5.3	x	x	x	x	x	x
S5.4	N/A	x	N/A	N/A	x	x
S6.6	N/A	N/A	x	x	x	N/A

S7.13	x	x	N/A	N/A	N/A	N/A
S7.14	N/A	x	x	x	x	x
S7.15	x	x	x	N/A	x	x
S7.16	N/A	n/a	x	x	N/A	N/A
S7.17	x	x	x	N/A	x	x
S8.12	x	x	x	N/A	N/A	x
S8.13	x	x	N/A	x	N/A	N/A
S8.14	x	x	x	x	x	x
S8.15	x	x	N/A	N/A	N/A	N/A
S9.4	x	x	x	x	x	x

Theme 1: Professional practice and person-centred care
Knowledge – what you need to teach

The learner must understand:

K1.1 the importance of the National Health Service (NHS) principles and values applied by the healthcare science workforce:

- the 7 key NHS principles:
  - aims for the highest standards of quality and professionalism
  - works across organisational boundaries
  - care provided is entirely patient-centred
  - access to NHS services are free of charge and based on clinical need
  - answerable to the communities, public and the patients that it serves
  - committed to efficiency of service, providing excellent value for money
  - provides an inclusive service that is available to all
- the 6 NHS values:
  - working together for patients
  - respect and dignity
  - commitment to quality of care
  - compassion
  - improving lives
  - everyone counts

K1.2 the principles and values on which good practice undertaken by the healthcare science workforce is founded:

- the 5 good scientific practice (GSP) domains:
  - domain 1 – professional practice:
    - requirement for high standards of professional practice
    - requirement to follow professional code of ethics and conduct
  - domain 2 – scientific practice:
    - requirement to keep technical knowledge and skills up to date
    - requirement to carry out suitable scientific skills to a high level of quality, identify and contribute to maintenance and inspection plans and communicate results
  - domain 3 – clinical practice:
    - requirement to keep clinical knowledge and skills up to date and undertake clinical duties within scope of role
    - requirement for healthcare science associate to communicate effectively with patients/carers/families and to ensure decisions are patient-centred
    - requirement for adherence to confidentiality regarding patient information and records
  - domain 4 – research, development and innovation:
    - requirement to undertake research, development and innovation to support the NHS in meeting health challenges and improving patient outcomes
  - domain 5 – clinical leadership:
    - requirement to lead and work within a team to deliver healthcare science services efficiently to meet service needs

Theme 1: Professional practice and person-centred care
Knowledge – what you need to teach

K1.3 the primary functions of a healthcare science associate including their application across different settings:

- supporting technical practice of colleagues across a broad range of healthcare science divisions
- working within multi-disciplinary teams (MDTs)
- undertaking routine technical and scientific procedures (for example, basic interpretations and observations, analysing samples, drafting and following standard operating procedures (SOPs))

K1.4 the influence of equality and diversity legislation, policies and local ways of working on organisational policy and professional practice when promoting patient-centred care:

- inclusivity
- anti-discrimination
- guidelines for dealing with non-compliance
- organisational reputation

K1.5 the appropriate strategies and channels for reporting issues relating to culture, equality and diversity:

- strategies:
  - make informal complaint to employer/university/college/organisation
  - follow formal grievance/complaints procedure
  - seek counselling for the affected person/clinical supervision
  - mediation
  - tribunal
- channels for reporting:
  - personal incident/observation of an incident:
    - follow policies for reporting
    - speak to:
      - manager
      - human resources
      - employment union
  - concern raised by patient:
    - speak to manager:
      - if unable to resolve, refer patient to patient advice and liaison service (PALS)
    - organisation investigates complaints as per policy
- support services available:
  - freedom to speak up (FtSU) guardians (NHS trusts)
  - policies and documents (for example, whistleblowing, bullying and harassment)
  - Citizens Advice
  - professional bodies
  - trade/learner unions

Theme 1: Professional practice and person-centred care
Knowledge – what you need to teach

K1.6 the relationship between the different levels of healthcare and the healthcare science associate's role within them:

- primary care:
  - general practitioner (GP)
  - walk-in centres
  - community care services
  - community pharmacy
- secondary care (for example, district general hospital)
- tertiary care (for example, regional centres)
- regulators:
  - organisations:
    - Care Quality Commission (CQC)
  - patients:
    - Healthwatch England

K1.7 strategies that could be adopted within a healthcare setting when encountering behaviour that challenges:

- types of behaviour that challenges (for example, a patient with limited capabilities due to sedation or dementia)
  - aggression
  - self-harm
  - destructiveness
  - disruptiveness
- strategies:
  - check patient notes for history of behaviour that challenges
  - ask carer if behaviour is related to their condition
  - ensure the environment is safe
  - create better environment where possible (for example, patient's choice of music, bigger sized magnetic resonance imaging (MRI) scanner for claustrophobic patient)
  - discussion, active engagement and questioning
  - route of escalation:
    - familiarisation with policies within their workplace relating to routes of escalation
    - gather information
    - who to report to/how to report
    - use of local trust's incident reporting by exception

Theme 1: Professional practice and person-centred care
Knowledge – what you need to teach

K1.8 the relationship between probity and honesty and the application of these principles in healthcare science:

- relationship between probity and honesty:
  - build together for continuous professional practice
  - ensure staff are observing their duty of candour by having the honesty and integrity to admit when mistakes have been made
  - undertake a critical review of own practice and pursue areas of required improvement
  - domain 1 (professional practice) in GSP
- application of probity and honesty in healthcare:
  - communicating to patients if an issue or error has occurred (duty of candour)
  - apologising to patient (for example, when things have gone wrong) where appropriate
  - developing and discussing appropriate solutions to the issue or error which has occurred
  - being honest with colleagues, supervisor and relevant organisations about the issue and co-operating with applicable investigations
  - reflecting on what has gone wrong and preventative actions for future (for example, appraisal, continuing personal and professional development (CPPD))

K1.9 strategies for developing effective partnerships with patients/carers/families:

- surveys (for example, family and friends)
- support groups
- patient, carer and public involvement (PCPI) programme
- promotion of patient health and wellbeing (for example, healthy lifestyle advice)

K1.10 the definition and role of person-centred care in patient healthcare:

- definition:
  - a collaborative approach to healthcare which puts patients and their families at the centre of choices about their healthcare:
    - ensures an equal partnership is achieved and healthcare is tailored to fit individual needs
- the considerations required in applying a person-centred approach:
  - patient factors:
    - age
    - mental capacity
    - health condition
    - social factors
  - patient public representation:
    - design and innovation of service
    - patient education
    - staff training
    - departmental accreditation

Theme 1: Professional practice and person-centred care
Knowledge – what you need to teach

K1.11 the benefits of involving patients/the public in healthcare science and in making choices about their care:

- patient benefits:
  - improves patient experience and health outcomes
  - patient is more engaged with their care, improving compliance
  - enables people to make informed choices about their care
  - supports health promotion
  - enables patients to manage their own care independently
- sector benefits:
  - reduction in patient complaints
  - improvement in positive feedback
  - maintaining or increasing a positive CQC grading
  - reduction in future hospital appointments
- professional practice benefits:
  - improved understanding of patient's individual requirements/preferences
  - increased job satisfaction

K1.12 the strategies used to keep patients/the public informed about healthcare science:

- public health campaigns
- involvement of patient representatives (PCPI)
- direct communication with patient (for example, face to face discussion, sending medical test results)
- feedback (for example Healthwatch England)
- healthcare advice services:
  - NHS:
    - PALS
  - private sector (for example, patients association, independent sector complaints adjudication services (ISCAS))
- involving family/carer

K1.13 the principles which underpin the promotion of mental health and wellbeing of colleagues and patients:

- awareness of the main signs of mental illness or anguish
- maintaining patient confidentiality
- knowing when to escalate concerns
- setting a positive example (for example, taking a break when needed)
- creating an acceptable culture to ask for help and support

K1.14 best practice when dealing with concerns regarding the mental health and wellbeing of a colleague, oneself, or a patient:

- connecting with individual:
  - speaking to the person, using a calm tone
  - asking questions
- signposting to helplines (for example, occupational health)
- self-care if own mental health deteriorates:
  - taking a break
  - speaking to line manager if struggling with mental health
  - utilising technology to stay connected and access help and advice
  - increasing physical activity
  - learning new skills
  - practising mindfulness

K1.15 the importance and application of the following communication skills for professional practice and person-centred care:

- active engagement (for example, utilising body language, eye contact)
- observation
- appropriate language
- providing and receiving constructive feedback

K1.16 best practice when delivering an oral presentation including appropriate use of technology:

- requirement to speak clearly
- understanding the audience and tailoring language appropriately
- understanding of purpose and content of presentation to enable effective planning
- adherence to timeframe provided for presentation
- inclusion of appropriate referencing/citations to avoid plagiarism
- requirement to handle questions effectively
- self-reflection after the event:
  - what went well/what you would do differently as part of a development plan for future presentations?

K1.17 best practice when problem solving:

- 5 steps of a root cause analysis:
  - gather and manage data:
    - what happened?
    - why did it happen?
  - prepare problem statement
  - analyse cause of effect
  - report a solution:
    - what is required to prevent the problem from happening again?
  - issue final report
- teamwork (for example, action learning set)
- 6 sigma/mind mapping
- effective communication

Theme 1: Professional practice and person-centred care
Skills – what you need to teach

The learner must be able to

S1.18 raise awareness and act in situations relating to discrimination:

- recognise incidents of discrimination
- follow relevant policies and procedures
- provide support to the effected individual using active engagement (for example, utilising body language) where appropriate
- promote positive behaviour

S1.19 demonstrate best practice when providing person-centred care:

- treat every person with compassion, dignity and respect
- liaise where appropriate with other members of the MDT to provide co-ordinated care
- demonstrate person-centred communication skills (for example, active listening) to ensure technique/procedure meets patient's needs
- fulfil duty of candour
- self-reflect after the event

S1.20 develop professional partnerships with patients/carers/families:

- communicate accurately, using most appropriate method for audience
- be respectful of different beliefs (for example, religious/cultural)
- provide effective support (for example, patient with behaviour that challenges)
- demonstrate communication skills (for example, active listening) to ensure technique/procedure meets patients' needs
- promote shared decision making
- respect patient's choices when sharing information with family members

S1.21 promote patient mental health and wellbeing:

- use of communication skills to connect with the individual (for example, utilisation of open body language)
- raise concerns if mental ill-health is suspected (for example, self-harm)
- identify when to escalate concerns
- escalate concerns, where appropriate
- maintain patient confidentiality
- signpost to appropriate services

S1.22 convey information to the public, patient, carers and colleagues:

- provide information to agreed protocols
- provide effective and constructive feedback

Theme 1: Professional practice and person-centred care
Skills – what you need to teach

S1.23 utilise feedback effectively to improve own or wider practice:

- use feedback to:
  - inform changes to processes through understanding of public/patient/carer perspective
  - inform CPPD requirements
  - inform changes to own approach through understanding of others' opinions
- undertake period of self-reflection
- amend personal goals
- undertake additional training
- seek support and guidance from peers, line management or learning and development department

S1.24 demonstrate best practice, when presenting information orally including the appropriate use of technology:

- identify key information that needs to be communicated and using references where appropriate
- group information into logical themes for delivery
- use effective communication skills (for example, speak clearly, eye contact)
- identify audience level of understanding and adapt delivery to suit (for example, using less jargon when presenting to non-technical audiences)
- timekeeping and allow time for audience questions
- handle questions effectively
- undertake self-reflection after the event

Theme 2: Personal and professional development (PPD)
Knowledge – what you need to teach

The learner must understand:

K2.1 the role of critical reflection in improving professional practice:

- raises quality of patient care
- improves safety of patients
- enables ongoing improvements to professional practice
- identification of areas where improvement is required
- enables realisation of how own beliefs can impact judgement or outcomes
- ability to gain feedback from other people

K2.2 critical reflection models used in healthcare science and factors to consider when choosing an appropriate model:

- Gibbs' reflective cycle:
  - practised in scenarios where soft skills are required (for example, interpersonal communication with patients/ colleagues)
  - is reactive, rather than proactive
- Kolb's model of reflection:
  - utilised in scenarios where an analytical, methodical approach is required
  - based on 4 stages of how to improve and do better
  - best applied in a laboratory setting so can be limited in its scope

K2.3 best practice when working within the limits of their personal competence to support professional performance in accordance with GSP:

- awareness of the value of scope of practice
- requirement to ensure appropriate supervision on any task undertaken
- requirement to be aware of restrictions in place for carrying out certain tasks outside the scope of practice and to seek advice when necessary
- only carry out an unsupervised task if you have the knowledge, skills, and the appropriate permission to do so
- requirement to follow relevant guidance, policies, and procedures
- requirement to take responsibility for own learning

K2.4 the role of good mentoring practice and application of underpinning theories:

- the role of mentoring practice with reference to mentorship qualification standards:
  - awareness of mentorship qualifications and how this promotes good mentoring practice
  - supports with career planning and highlights progression opportunities
  - provides a good role model for colleagues by being:
    - available
    - supportive
    - knowledgeable
  - provides guidance, support and feedback for setting career targets and meeting goals
- the application of underpinning principles:
  - meets with the mentee regularly to check on progress
  - helps to set objectives and outcomes for mentoring sessions
  - provides respect to the mentee and listens

Theme 2: Personal and professional development (PPD)
Knowledge – what you need to teach

     o   coaches the individual to resolve their own problems as opposed to providing solutions

K2.5 the importance of good (effective) appraisal and performance review, including how to prepare an action plan to support professional performance in accordance with GSP:

- the importance of good appraisal and performance review:
  - to examine how an individual is performing within their roles and offer opportunity for feedback
  - to recognise high performance and maintain the individual's engagement
  - to identify areas for improvement and establish strategies for improvement with individuals and teams
  - to support the employer/organisational objectives
  - to improve the confidence of employees
- how to prepare an action plan:
  - talk to the individual to discuss and agree performance goals based on the outcomes of appraisal/performance review
  - set SMART objectives
  - break down how the goal will be achieved into smaller steps through stretch assignments or shadowing
  - agree deadlines with the individual for completing the steps agreed
  - identify who you will need to work with, and any sources of support required

K2.6 best practice when supporting CPPD of junior colleagues, including responding constructively to appraisal/feedback:

- best practice when supporting CPPD of junior colleagues:
  - arrange regular one to ones with the junior colleague
  - highlight training opportunities
  - monitor improvement using appropriate model (for example, plan-do-check-act method)
  - provide prompt feedback and amend action plan if applicable
  - motivate colleagues
- how to respond constructively to feedback:
  - reflective practice (for example, looking at the positives and opportunities for improvement)
  - understanding importance of constructive feedback to improve practice
  - amending action plan based on the feedback

Theme 2: Personal and professional development (PPD)
Skills – what you need to teach

The learner must be able to:
 	
S2.7 critically reflect on own technical/non-technical practice:
 	
• select the appropriate reflection model:
   o Kolb
   o Gibbs
• utilise the selected model to reflect on own practice
• identify personal strengths and areas for improvement
• seek further guidance to ensure full understanding
• develop an action plan to address areas of improvement

Theme 3: Health, safety and security
Knowledge – what you need to teach

The learner must understand:

K3.1 the impact of health and safety legislation on performance of healthcare science associate's role and how it forms the basis for professional practice:

- sets out standards for performance of work safely (for example, application of Control of Substances Hazardous to Health Regulations 2002, use of appropriate personal protective equipment (PPE), use of personal radiation dosimeter)
- highlights the healthcare science associate's personal responsibilities for the health and safety of their patients, colleagues and themselves
- includes policies on reporting accidents/near misses, in line with the Health and Safety at Work etc Act 1974
- sets out standards for safe operation and maintenance of medical equipment (for example, managing medical devices by MHRA)

K3.2 best practice in infection control:

- hand hygiene
- using correct personal protective equipment (PPE) (for example, barrier nursing)
- waste disposal including segregation of clinical waste
- decontamination of medical equipment
- hospital acquired infection antimicrobial stewardship
- respiratory and cough hygiene (for example, Covid-19)
- occupational safety including radiation management
- aseptic non-touch technique (ANTT)
- single-use device versus single-patient use

K3.3 reasons for carrying out risk assessments in a clinical environment:

- to keep individuals safe from harm by identifying and reducing risk
- legal requirement as included in the Management of Health and Safety at Work Regulations 1999
- to meet the requirements for risk assessments in relation to new tests, procedures or use of new technical equipment
- to meet the requirements of local and national policy
- future planning (for example, staff retiring, device replacement)
- identification of issue outside of normal auditory process/procedure
- as part of the process of root cause analysis

K3.4 the steps required when carrying out a risk assessment:

- the Health and Safety Executive's 5 steps to risk assessment

Theme 3: Health, safety and security
Knowledge – what you need to teach

K3.5 strategies for disseminating risk assessment findings to colleagues and the wider organisations, including impacts:

- strategic routes of dissemination:
  - interdepartmental:
    - health and safety group/quality management board
    - in smaller organisations, findings may just be reported to health and safety officer, department/laboratory manager
  - organisation wide:
    - oversight health and safety board/quality board
    - patient safety group
    - medical equipment group
  - regionally:
    - integrated care system (ICS)/ sustainability and transformation plan (STP)
  - nationally:
    - yellow card scheme - MHRA
    - central alerting system (CAS)
- impacts:
  - low impact - local dissemination:
    - local impact
    - low severity
    - good mitigations in place
  - high impact - national dissemination:
    - widespread impact
    - severity high
    - weak mitigating steps

K3.6 best practice when implementing risk assessment outcomes:

- detective
- preventative
- corrective

K3.7 best practice when training junior staff in relevant health, safety and security practices, including infection control and participating in risk assessments:

- health and safety relevant to the healthcare science sector
- infection control relevant to the healthcare science sector
- information technology relevant to the healthcare science sector
- ensure delivery of high-class healthcare through the awareness of own role in training junior colleagues
- awareness of assessment models of competence and how to apply them, relevant to the healthcare science sector:
  - Kolb's learning cycle
  - the 4 stages of competence
- requirement to plan, deliver and evaluate training sessions for junior staff in relevant health, safety and security practices with reference to infection control and risk assessments if applicable

Theme 3: Health, safety and security
Skills – what you need to teach
The learner must be able to: **S3.8 demonstrate best practice when carrying out a risk assessment:** • use the Health and Safety Executives 5 steps to risk assessment **S3.9 promote a safe and healthy working environment:** • carry out effective infection control procedures if applicable • follow the correct hand hygiene procedure • demonstrate correct use of PPE • decontaminate medical equipment • correct waste disposal, including segregation of clinical waste • promote wellness (for example, antimicrobial stewardship, radiation management, ANTT) **S3.10 demonstrate correct approaches to protect oneself and colleagues from illness or harm:** • report near miss in line with policy (for example, MHRA notifications) • react to any potential security threats

Theme 4: Quality
Knowledge – what you need to teach

The learner must understand:

K4.1 the impact of quality management standards on healthcare science workplace practices:

- awareness of standardisation through recognised professional standards and reference values ensures all healthcare staff work in a consistent manner to improve patient safety and outcomes
- ensures safety and effectiveness of clinical practice by awareness or participation in:
    - quality assurance/MDT meetings
    - incident reporting
    - clinical audits
    - feedback from staff members and patients

K4.2 the role of the healthcare science associate in relation to audit activities:

- sample and data retrieval of larger audits (for example, gathering batch numbers, looking up age of equipment from database)
- may be asked to carry out the practical aspects of a simple audit:
    - collate and share data with senior colleagues to inform and produce the report
    - use the data to produce the report
    - compare data from the report with current audits, previous outcomes and make recommendations
- types of audits applicable to the role of healthcare science associate:
    - stock control (for example, consumables, service parts, accessories, Control of Substances Hazardous to Health (COSHH) products)
    - equipment calibration
    - equipment procurement trials
    - patient feedback
    - incident investigation
- communication of audit findings:
    - written
    - verbal

K4.3 factors to consider when communicating quality and audit requirements:

- lines of communication:
    - department quality manager
    - department management
    - external auditor
    - public inquiry
- by what method:
    - logged on audit register
    - presented to the organisation (for example, MDTs, colleagues on another site)
    - externally (if risk to wider audience or request from external body/public request for data) (for example, serious hazards of transfusion (SHOT), MHRA reporting)
- what information is communicated:
    - aim of audit
    - reference to previous data if available to provide a baseline
    - outcomes
    - recommendations

Theme 4: Quality
Knowledge – what you need to teach
K4.4 the role of quality management/audit activities in driving organisational improvements: • maintaining quality standards to meet accreditation • ensuring operational waste and consumables are minimised • contributing towards better patient care • contributing to education and training of workforce

Theme 4: Quality
Skills – what you need to teach
The learner must be able to: **S4.5 support quality management technical audit processes:** • undertake appropriate data retrieval and analysis • produce report of findings • present reports/findings • effectively question colleagues on compliance with process • identify instances of non-compliance • identify and evaluate deficiencies or areas of improvement in a process, system or proposal

Theme 5: Audit/service improvement
Knowledge – what you need to teach

The learner must understand:

K5.1 the 7 pillars of clinical governance and the impact of these on patient care:

- clinical effectiveness
- risk management
- patient experience and involvement
- communication
- resource effectiveness
- strategic effectiveness
- learning effectiveness

K5.2 the governance and ethical framework applied to audit and its contribution to patient care:

- governance principals applied to audit:
  - accountability
  - responsibility
  - probity
  - representative
- ethical principles applied to audit in healthcare settings:
  - autonomy
  - beneficence
  - non-maleficence
  - justice
- contribution of audit to patient care
  - making continuous improvements to the quality of services
  - maintaining and protecting high standards

Theme 5: Audit/service improvement
Skills – what you need to teach

The learner must be able to:

S5.3 demonstrate best practice when participating in audit, research, innovation or service improvement programmes:

- identify aim and criteria for the purpose of research, innovation and improvement using literature
- outline the stages of the audit process/cycle
- carry out data retrieval
- accurate interpretation of data (for example, comparison of data between current audit and previous outcomes)
- link outcomes of the audit with service improvement plans

S5.4 communicate and implement outcome of audit/service improvement:

- use of appropriate communication method to senior colleagues in order to seek feedback
- provide outcome/recommendations to wider audience

Theme 5: Audit/service improvement
• implement service improvement and draft SOPs

Theme 6: Research and innovation
Knowledge – what you need to teach

The learner must understand:

K6.1 the qualitative and quantitative factors to consider when selecting data type methods:

- qualitative:
  - using senses to observe results:
    - experimental
    - observational
  - explore and seek understanding
- quantitative (numbers):
  - instruments to measure results
  - quantify, validate, make decisions

K6.2 the ethical considerations for research approval:

- gaining informed consent
- voluntary participation
- do no harm
- justify risks to participants
- adherence to confidentiality
- compliance with GDPR
- patient anonymity

K6.3 the benefits of research when critically evaluating practice:

- improves clinical knowledge and understanding
- enables new approaches and procedures to be considered, contributing to improved patient outcomes
- benchmarking:
  - reference to wide selection of sources enables a broader picture to be established and better solutions
- research results in streamlining of services, improving efficiency
- introduction and implementation of new technologies

K6.4 where to source useful insight to inform the development and introduction of innovation:

- employee ideas
- patient surveys
- competitor analysis
- literature review
- action learning sets:
  - mind mapping
  - Belbin's theory

Theme 6: Research and innovation
Knowledge – what you need to teach

- o   empathy mapping
- national initiatives
- new ways of working and the development of new technologies in response to public health threats

K6.5 the principal steps required when practicing and promoting innovation in the healthcare science sector:

- undertake a needs assessment to identify areas where innovation may be required
- use of sources (for example, patient feedback, results of a clinical audit)
- setting clear goals for what needs to be achieved giving consideration to:
  - o   high relative advantage
  - o   trialability
  - o   observability
  - o   compatibility
  - o   complexity
- creation of a collaborative culture that supports innovative ideas
- organisational buy-in
- engage with patients
- have a plan to ensure effective adoption of innovation
- flexibility when managing change
- share learning

Theme 6: Research and innovation
Skills – what you need to teach

The learner must be able to:

S6.6 undertake a literature review on recent developments and technology:

- consider quality improvements, based on evidence findings in some of the following areas:
  - o   life sciences
  - o   physiological sciences
  - o   physical science and clinical engineering
  - o   bioinformatics

Theme 7: Technical scientific services
Knowledge – what you need to teach

The learner must understand

K7.1 impact of disease on bodily structures and their functions relating to specific body systems:

- organisation of the body in terms of the structure and chemical reactions within cells making up various tissues
- the structure and function of all 11 body systems:
  - o cells
  - o tissues
  - o organs
- how body systems are effected by common diseases

K7.2 the fundamental principles of clinical genetics, genomics and personalised/precision medicine:

- use of genetic techniques to personalise medicine to a patient's genome (sequences of genes)
- patient referral pathway to healthcare science services

K7.3 the relationship between sociology and epidemiology in healthcare science:

- the basis of epidemiology referencing the distribution of causes and risk factors of health and disease within a population
- the link between epidemiology and the basis of public health, health prevention and health protection
- the role of the public health function and healthcare science services
- the principal concepts of social life, social change and social causes in reference to health and illness
- the impact on patient referrals to healthcare science services

K7.4 the links between clinical pharmacology and therapeutics that underpin healthcare science:

- the core principles of clinical pharmacology, referencing the safe, effective and economic use of medicines
- the core principles of therapeutics in the treatment of disease
- the impact on patient referrals to healthcare science services

K7.5 the links between physics and clinical engineering that underpin healthcare science:

- the core principles of physics and electrical safety rules that underpin the medical technology used in healthcare delivery
- the core principles of medical physics and clinical engineering and how they link to successful application of medical equipment and implementation of risk management to optimise healthcare delivery
- the impact to patient referrals where healthcare science services are linked to clinical engineering and medical physics

Theme 7: Technical scientific services
Knowledge – what you need to teach

K7.6 the use of mathematical and statistical techniques in clinical bioinformatics and health informatics:

- development and improvement of acquisition, organisation and analysis of biological data which supports patient care delivery
- presentation of a range of data (for example, textual, graphical and tabular)
- the role of computational biology applications and bioinformatics in diagnosis through tele-based healthcare
- synthesising data from multiple sources
- the role of predictive algorithms and artificial intelligence in diagnosis and treatment of disease
- the role of data mining to turn raw patient data into useful information

K7.7 the application of fundamental principles of effective equipment management:

- planning:
  - assessment of requirements (for example, how many items are required? how regularly would they be used? how long for?)
- purchase/budget:
  - divided into revenue (below £5000) and capital (above £5000) including vat
  - financial viability of equipment
  - total cost of ownership (for example, operating costs)
- skills development and training:
  - staff training prior to use of equipment
  - requirement for SOPs to be drafted and reviewed (for example, following correct decontamination procedure)
  - requirement for risk assessments to be completed
- equipment roll out:
  - requirement for first line users to maintain and troubleshoot equipment and arrange repair
  - requirement for technical staff to understand how to maintain and repair equipment
- end of life decommissioning:
  - requirement to adhere to waste disposal regulations
  - requirement to consider environmental impacts
  - requirement to remove all patient data

K7.8 the methodology for drafting standard operating procedures (SOPs):

- SOPs are part of the quality management system (QMS) which will be version-controlled
- SOPs should be based on:
  - evidence-based practice
  - International Organization for Standardization (ISO) or equivalent standards
  - existing quality systems
  - national standards (for example, National Institute for Health and Care Excellence (NICE) guidance)
  - user manuals/service manuals
  - local requirements

K7.9 the purpose and rationale of SOP review:

- purpose:
  - to ensure SOP remains current and fit for purpose
- rationale:
  - the scheduled time for SOP review has been reached to review content
  - the existing SOP is required to change at non-scheduled time due to:
    - audit
    - incident
    - change of reference range
    - change of kit/supplier
    - change of method
    - change of equipment
    - software change (for example, operating systems, medical device software)
    - change of operators (for example, workforce skill mix change)

K7.10 best practice when undertaking a critical evaluation:

- collection of literature from a range of sources (for example, national guidance, local policies)
- evaluation of selected sources:
  - validity of literature (for example, credibility/currency)
  - relevance of sources to research
  - hierarchy of evidence (for example, peer review versus randomised control trial)
- comparisons drawn
- recommendations made

K7.11 application of best practice approaches when assessing practical skills in accordance with a practical skills teaching framework:

- confirm the learner has reached the level of competency required to be assessed
- select type of assessment that would be most appropriate to assessing the particular skill (for example, direct observation)
- select the environment that would be most appropriate to assessing the particular skill (for example, simulation, live clinical environment)
- choose the most appropriate time to schedule the assessment (for example, taking shift pattern into consideration)
- consider if the assessor has the level of competency required to assess the skill
- select the most appropriate method of recording the assessment (for example, gathering feedback from the patient directly)
- be learner focussed (for example, provide timely and specific feedback, providing the learner with an opportunity to reflect on the assessment)

K7.12 the principles underpinning the practical training of others in techniques and procedures:

- planning and delivery of practical training sessions relevant to the healthcare science sector
- assessment of colleagues' practical skills gained from practical training sessions to meet the needs relevant to the healthcare science sector
- ensuring appropriate approaches are considered when supporting junior colleagues, including:
  - their level of competence
  - their previous experience
  - how senior they are

Theme 7: Technical scientific services
Knowledge – what you need to teach

- understanding of the differences between, and the correct application of, practical skills frameworks to ensure effective teaching, supervision, and assessment
- reflection on practical training session to ensure it meets the needs relevant to the healthcare science sector, using a suitable model such as Kolb or Gibbs

Theme 7: Technical scientific services
Skills – what you need to teach

The learner must be able to:

S7.13 perform a range of equipment management techniques for appropriate technical investigation:

- select equipment that meets testing procedure (for example, blood pressure monitor and cuffs, spirometry, electrocardiograph (ECG), portable appliance testing (PAT), analysers for blood testing, urine analysis)
- undertake an assessment of equipment requirements to ensure fitness for purpose:
  - including accurate identification of:
    - faults
    - preventative maintenance required
    - calibration
- monitor and document performance of equipment (for example, quality checks, calibration testing)

S7.14 participate in the drafting of a range of SOPs as a writer, tester or reviewer as required:

- draft a SOP
- review a SOP document
- test a SOP document
- feedback on a SOP document
- revise a SOP document in line with feedback

S7.15 recognise problems and seek technical solutions to resolve them:

- undertake root cause analysis and report findings

S7.16 analyse and interpret technical data to provide insight:

- selection of appropriate data collection method
- analysis of data using appropriate statistical tool/resources including mean, median and mode
- interpretation of data against known standards
- interpretation of results as per specialist area:
  - ECG rhythm, axis and heart rate
  - blood pressure
  - spirometry
  - blood analysis
  - urine analysis

Theme 7: Technical scientific services
Skills – what you need to teach
S7.17 record and present technical data in an appropriate format depending on required use: • selection of appropriate presentation method (for example, textual, tabular, graphical)

Theme 8: Clinical care
Knowledge – what you need to teach

The learner must understand:
 	
K8.1 responsibilities in relation to duty of care:
 	
• complying with law
• acting in best interests of all parties
• doing no harm
• staying up to date with training
• acting within competence and scope of practice
 	
K8.2 the application of safeguarding legislation to the role of a healthcare science associate:
 	
• compliance with legislation
• unusual behaviours to look out for
• specific signs and symptoms of abuse or neglect
• signpost to available support
 	
K8.3 the impact of the Mental Capacity Act on the provision of clinical care:
 	
• with reference to the 6 principles of safeguarding
 	
K8.4 approaches and support available when dealing with difficult situations or in the event a complaint is made:
 	
• approaches if a patient makes a complaint:
   o requirement to inform the ward or departmental manager
   o requirement to signpost patient to PALS
   o signpost to formal complaints procedure
• approaches if member of public is aggressive or violent:
   o contact made with security or where appropriate contact police
   o reporting of incidents of physical assault or verbal abuse so that patterns can be monitored
• approaches if there is a data breach:
   o assessment of data breach
   o assessment of impact and effect on the individual
   o requirement to report to information governance team and Caldicott guardian (they would notify patient if breach involved their information)
   o requirement to report incident (for example, Datix)
• channels of support in the above situations:
   o conflict resolution training

Theme 8: Clinical care
Knowledge – what you need to teach

- o designing out violence (part of incident reporting)
- o staff counselling

K8.5 best practice when seeking informed consent from a patient:

- where appropriate, inviting family/guardian to ensure transparency
- ensuring full information is provided to patient
- ensuring patient is competent to make a decision
- ensuring appropriate documentation is completed

K8.6 alternative approaches to consent if patient does not have capacity:

- best interests decision
- consultation with independent mental capacity advocate (IMCA)
- consultation with appointed lasting power of attorney (LPA)
- next of kin becomes guardian and has power of authorised consent
- can discuss individual's medical care and make decisions on individual's behalf if incapacitated

K8.7 the purpose and impact of information governance requirements on the role of the healthcare science associate, including their requirement to adhere to the Caldicott principles:

- purpose of information governance:
  - o sets out the way in which healthcare information about patients should be processed and handled
  - o helps ensure everyone follows the same guidelines
  - o gives patients the assurance that their information will not be shared inappropriately

K8.8 the impact of confidentiality requirements for the processing and storing of patient information on the role of healthcare science associate:

- must adhere to Data Protection Act 2018
- 8 Caldicott principles
- tiered, authorised access to patient data
- awareness of data retention periods

K8.9 factors that can limit/impact confidentiality and how to address and overcome the challenges:

- limiting factors:
  - o safeguarding issues- duty of care
  - o patient consent (under 16 years of age):
    - Gillick competence
- approaches to addressing these situations:
  - o referring to the Caldicott guardian

K8.10 influencing factors applicable to dignity, rights, privacy and confidentiality of patients and colleagues:

- patient-centred care:
  - o respect

Theme 8: Clinical care
Knowledge – what you need to teach

- o chaperoning
- o privacy
- o shared decision making
- professional conduct:
  - o modelling best practice
  - o adherence to infection control procedures
  - o compliance with dress code
  - o personal conduct (for example, social media)
  - o not discussing patient details to members of staff
  - o not undermining professional colleagues
  - o anonymising patient data

K8.11 appropriate technical investigations for relevant clinical conditions and pathway for each healthcare science theme:

- atrial fibrillation pathway (reference to NICE guidelines and quality management systems, including SOPs):
  - o physiological tests:
    - ECG
    - blood pressure monitoring
    - Holter monitoring
    - exercise physiology
    - transthoracic echocardiogram (TTE)
    - transesophageal echo (TEE)
  - o life science tests:
    - blood test for an international normalised ratio (INR)
    - liver blood test
    - measurement of tumour markers (for example, CA 15-3)
  - o physical sciences and clinical engineering tests:
    - cardiac monitoring equipment set up
    - calibration testing
    - repair
    - annual maintenance
    - investigating incidence involving medical equipment
    - replacement of medical equipment
- chronic obstructive pulmonary disease pathway (COPD) (reference to quality management systems, including SOPs and NICE guidelines, over 16's diagnosis and management)
  - o physiological tests:
    - peak flow meter testing
    - height, weight and temperature measurements
    - spirometry testing:
      - chest X-ray
      - computerised tomography (CT) thorax referral (if applicable)
    - ECG (if applicable)
    - lung function testing
    - lifestyle advice and patient education (for example, proper use of inhaler)
    - pulse oximetry
  - o life science tests:
    - haematology:

Theme 8: Clinical care
Knowledge – what you need to teach

- full blood count for anaemia
  - biochemistry:
    - serum antitrypsin
    - arterial blood gas
    - urea and electrolyte
  - microbiology:
    - sputum sample for culture and sensitivity
    - blood culture
  o medical physics tests:
    - CT:
      - equipment maintenance
      - quality assurance/checks/calibration
      - management of repairs and annual service (performed by external engineer)
      - replacement planning
    - X-ray:
      - equipment maintenance
      - X-ray maintenance
      - quality assurance/checks/calibration
      - management of repairs and annual service (performed by external engineer)
      - replacement planning
  o clinical engineering tests:
    - pulse oximetry:
      - issuing pulse oximetry device and accessories
      - calibration tests and annual maintenance
      - repairs
      - replacement
    - spirometry:
      - issuing spirometer device and accessories
      - calibration tests and annual maintenance
      - repairs
      - replacement
    - nebulizer:
      - issuing nebulizer device and accessories
      - calibration tests and annual maintenance
      - repairs
      - replacement
  o MDT support for COPD pathway:
    - physiotherapists
    - occupational therapists
    - pulmonary rehabilitation
    - psychological referral (for example, cognitive behavioural therapy (CBT))
    - pulmonary specialist nurses
    - radiographer
- breast cancer (reference to NICE guidelines: early and locally advanced breast cancer and management and quality management systems, including SOPs)
  o physiological tests if applicable (for example, pre-surgery):
    - ECG
    - blood pressure monitoring

Theme 8: Clinical care
Knowledge – what you need to teach

- spirometry
- TTE (if applicable during treatment)
  - life sciences tests:
    - histopathology:
      - fine-needle aspiration (FNA)
      - tissue biopsy
    - haematology:
      - full blood count
    - transfusion:
      - group and save
    - microbiology:
      - pre-operation screening for methicillin-resistant Staphylococcus aureus (MRSA)
    - genetics and bioinformatics:
      - braca1 and braca2
      - further genetic testing subject to family history
  - medical physics and/or clinical engineering tests:
    - performing test (medical physics):
      - mammogram
      - ultrasound (if recalled)
      - MRI scan (invasive breast cancer)
      - radiotherapy (if applicable)
      - nuclear medicine techniques (if applicable)
      - chemotherapy (if applicable)
    - equipment maintenance (medical and/or clinical engineering):
      - maintenance
      - calibration
      - management of servicing
      - repair
      - replacement

Theme 8: Clinical care
Skills – what you need to teach

The learner must be able to:

S8.12 demonstrate their responsibilities under duty of care:

- act appropriately to adhere to person-centred care, respect and dignity
- act appropriately to adhere to safeguarding
- communicate effectively to appropriate persons
- manage patient data effectively and lawfully

S8.13 obtain and document appropriate consent in line with protocols:

- provide accurate explanation of procedure to patient

Theme 8: Clinical care
Skills – what you need to teach

- assess patient capacity and understanding using appropriate manner, communication skills and considering the following factors:
  - age
  - mental capacity
  - language
  - complexity of information
- complete appropriate documentation
- correct storage of recorded consent for audit purposes

S8.14 protect patient/carers confidentiality and privacy:

- compliance to Data Protection Act 2018
- compliance to Caldicott principles
- compliance to ISO standards

S8.15 demonstrate delivery of high quality technical clinical procedures in the investigation/management of patients:

- adhere to best practice when following quality management standards/SOPs
- referral to other member of the MDT
- competent use of equipment
- appropriate escalation (for example, equipment is malfunctioning, results are abnormal)

Theme 9: Leadership
Knowledge – what you need to teach
The learner must understand: **K9.1 the principles of leading teams/individuals in a healthcare setting based on the healthcare NHS leadership model:** • leadership dimensions **K9.2 models of leadership:** • transactional leadership • transformational leadership • servant leadership • democratic leadership • autocratic leadership • bureaucratic leadership • laissez-faire leadership • charismatic leadership **K9.3 best practice when leading where appropriate within the multidisciplinary team with reference to the leadership academy:** • monitoring the output of the multidisciplinary team and leading to ensure work is completed to the required standard that supports a high quality of patient care • supporting colleagues in relevant healthcare science sector within the multidisciplinary team • working alongside colleagues within the multidisciplinary team to improve patient safety, care and outcomes • ensuring a balance of different skill sets within the multidisciplinary team to maximise efficiency and working processes

Theme 9: Leadership
Skills – what you need to teach
The learner must be able to: **S9.4 plan/assess the work of a team and individuals within it (not solely associated to healthcare):** • use models of leadership • calculate capacity of team (for example, how many tasks could realistically be completed?) • identify strengths and weaknesses of the team • identify interdependent tasks within the team • identify opportunities to delegate • providing constructive feedback

Section 3: explanation of terms

This table explains how the terms used at level 4 in the content are applied to this qualification (not all verbs are used/represented in this table/qualification).

Analyse	Break the subject or complex situations into separate parts and examine each part in detail. Identify the main issues and show how the main ideas are related to practice and why they are important. Reference to current research or theory may support the analysis.
Critically analyse	This is a development of 'analyse' which explores limitations as well as positive aspects of the main ideas in order to form a reasoned opinion.
Clarify	Explain the information in a clear, concise way showing depth of understanding.
Classify	Organise accurately according to specific criteria.
Collate	Collect and present information arranged in sequence or logical order which is suitable for purpose.
Compare	Examine the subjects in detail, consider and contrast similarities and differences.
Critically compare	This is a development of 'compare' where the learner considers and contrasts the positive aspects and limitations of the subject.
Consider	Think carefully and write about a problem, action or decision showing how views and opinions have been developed.
Demonstrate	Show an in-depth understanding by describing, explaining, or illustrating using examples.
Describe	Provide a broad range of detailed information about the subject or item in a logical way.
Discuss	Write a detailed account which includes contrasting perspectives.
Draw conclusions (which…)	Make a final decision or judgement based on reasons.
Evaluate	Examine strengths and weaknesses, arguments for and against and/or similarities and differences. Judge the evidence from the different perspectives and make a valid conclusion or reasoned judgement. Apply current research or theories to support the evaluation.
Critically evaluate	This is a development of 'evaluate' where the learner debates the validity of claims from the opposing views and produces a convincing argument to support the conclusion or judgement.
Explain	Apply reasoning to account for how something is or to show understanding of underpinning concepts. Responses could include examples to support these reasons.

Identify	Apply an in-depth knowledge to give the main points accurately (a description may also be necessary to gain higher marks when using compensatory marking).
Justify	Give a detailed explanation of the reasons for actions or decisions.
Reflect	Learners should consider their actions, experiences or learning and the implications of these in order to suggest significant developments for practice and professional development.
Review and revise	Look back over the subject and make corrections or changes based on additional knowledge or experience.
Summarise	Give the main ideas or facts in a concise way to develop key issues.

Section 4: support

Support materials

The following support materials are available to assist with the delivery of this qualification and are available on the NCFE website:

- evidence and grading tracker
- learning resources
- qualification fact sheet

Useful websites

Centres may find the following websites helpful for information, materials and resources to assist with the delivery of this qualification:

- ISO www.iso.org/standards.html
- Improving Quality in Physiological Services Accreditation (IQIP) www.ukas.com/accreditation/standards/iqips/
- UKAS www.ukas.com/
- World Health Organsation (WHO) www.who.int/
- Gov.UK: UK standards for microbiology investigations www.gov.uk/government/collections/standards-for-microbiology-investigations-smi
- National Institute for Heath and Care Excellence (NICE) www.nice.org.uk/
- NICE guidance www.nice.org.uk/guidance
- Gov.UK: UK Health Security Agency www.gov.uk/government/organisations/uk-health-security-agency
- NHS: Leadership academy website www.leadershipacademy.nhs.uk/
- NHS: Healthcare leadership model www.leadershipacademy.nhs.uk/resources/healthcare-leadership-model/
- NHS England www.england.nhs.uk/
- NHSX www.nhsx.nhs.uk/
- NHS Employers health and wellbeing network www.nhsemployers.org/retention-and-staff-experience/health-and-wellbeing/health-and-wellbeing-network
- NHS England: Infection prevention and control (IPC) www.england.nhs.uk/coronavirus/secondary-care/infection-control/
- NHS health careers www.healthcareers.nhs.uk/
- NHS Horizons horizonsnhs.com/
- Greener NHS www.england.nhs.uk/greenernhs/
- Health Education England: The NHS constitutional values hub www.hee.nhs.uk/about/our-values/nhs-constitutional-values-hub-0
- NHS Health Research Authority (HRA) www.hra.nhs.uk/
- National Institute for Health Research (NIHR) www.nihr.ac.uk/
- Academy for Healthcare Science: Professional Bodies Council www.ahcs
- .ac.uk/professional-bodies-council/
- National Infection Prevention and Control Manual (NIPCM): Chapter 1 - standard infection control precautions (SICPs) www.nipcm.hps.scot.nhs.uk/chapter-1-standard-infection-control-precautions-sicps/#a1069
- Health Protection Agency: Health care associated infection operational guidance and standards for health protection units assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/332051/HCAI_Operationalguidancefinalamended_05July2012.pdf

- Gov.UK: the Caldicott principles www.gov.uk/government/publications/the-caldicott-principles
- Healthcare Quality Improvement Partnership: Developing a patient and public involvement panel for quality improvement www.hqip.org.uk/wp-content/uploads/2018/02/developing-a-patient-and-public-involvement-panel-for-quality-improvement.pdf
- Academy for Healthcare Science: Good scientific practice www.ahcs.ac.uk/wordpress/wp-content/uploads/2013/09/AHCS-Good-Scientific-Practice.pdf
- Health & Care Professions Council (HCPC): Reflective practice www.hcpc-uk.org/standards/meeting-our-standards/reflective-practice/
- Gov.UK: Medicines and Healthcare products Regulatory Agency (MHRA) www.gov.uk/government/organisations/medicines-and-healthcare-products-regulatory-agency
- Academic Health Science Networks (AHSN) www.ahsnnetwork.com/
- Health & Care Professions Council: Regulating health and care professionals www.hcpc-uk.org
- Health and Safety Executive (HSE) Risk Assessment: A brief guide to controlling risks in the workplace https://www.hse.gov.uk/pubns/indg163.pdf

These links are provided as sources of potentially useful information for delivery/learning of this subject area. NCFE do not explicitly endorse any learning resources available on these websites. For official NCFE endorsed learning resources please see the additional and teaching materials sections on the qualification page on the NCFE website.

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Contact us

NCFE
Q6
Quorum Park
Benton Lane
Newcastle upon Tyne
NE12 8BT

Tel: 0191 239 8000*
Fax: 0191 239 8001
Email: customersupport@ncfe.org.uk
Websites: www.qualhub.co.uk
www.cache.org.uk

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