



The Royal College of Pathologists
Pathology: the science behind the cure

CURRICULUM FOR SPECIALTY TRAINING IN CHEMICAL PATHOLOGY

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1. Introduction

Chemical pathology (also known as clinical biochemistry and medical biochemistry) is the specialty that uses chemical tests to diagnose disease and monitor treatment. These investigations have become essential in providing safe and effective patient care on a daily basis, in every medical specialty and in every part of the National Health Service (NHS). Chemical pathologists offer clinical and scientific leadership to laboratory services providing these investigations, as well as clinical advice for the daily management of patients. In addition, chemical pathology consultants provide specialised direct clinical care in secondary care for patients with a variety of common and rare metabolic disorders, particularly those conditions covered by the former subspecialty of metabolic medicine (the training for which is now incorporated into this curriculum).

2. Purpose

2.1 Purpose statement

Chemical pathologists take responsibility for managing the laboratories that undertake biochemical investigations and for providing them with clinical and scientific direction. They are heavily involved in developing guidelines and protocols for disease management. A major part of their role is to advise clinicians, both in general practice and in all specialties of secondary care, about the appropriate use and interpretation of tests in managing individual patients. Where such tests are not provided locally, they act as a link between local clinicians and specialist laboratories, for example for rare endocrine, toxicological or genomic testing. Chemical pathologists are involved in dealing with large amounts of data and with the information technology systems required to manage these, and in using the data to support research and audit across the whole field of medicine. Chemical pathologists are also involved in the screening and risk management of disease; in addition to their role in cardiovascular risk management, they have an important role in managing antenatal, neonatal and cancer screening programmes.

The purpose of the curriculum is to set the standards for attainment of the award of the Certificate of Completion of Training (CCT) or Certificate of Eligibility for Specialist Registration (CESR) through the Combined Programme (CP) in chemical pathology and to ensure that trainees are fully prepared to lead a full clinical and laboratory biochemistry service at consultant level in the NHS.

This purpose statement has been endorsed by the General Medical Council's (GMC) Curriculum Oversight Group and confirmed as meeting the needs of the health services of the countries of the UK.

2.2 High-level curriculum outcomes: capabilities in practice

The 11 capabilities in practice (CiPs) describe the professional tasks or work within the scope of chemical pathology. Each CiP has a set of descriptors associated with that activity or task. Descriptors are intended to help trainees and trainers recognise the minimum level of knowledge, skills and attitudes that should be demonstrated for an entrustment decision to be made. By the completion of training and award of the CCT, the doctor must demonstrate that they are capable of unsupervised practice in all generic and specialty CiPs.

The six generic CiPs cover the universal requirements of all specialties as described in the generic professional capabilities (GPC) framework. Assessment of the generic CiPs will be underpinned by the GPC descriptors. Satisfactory sign-off will indicate that there are no concerns before the trainee can progress to the next part of the assessment of clinical capabilities.

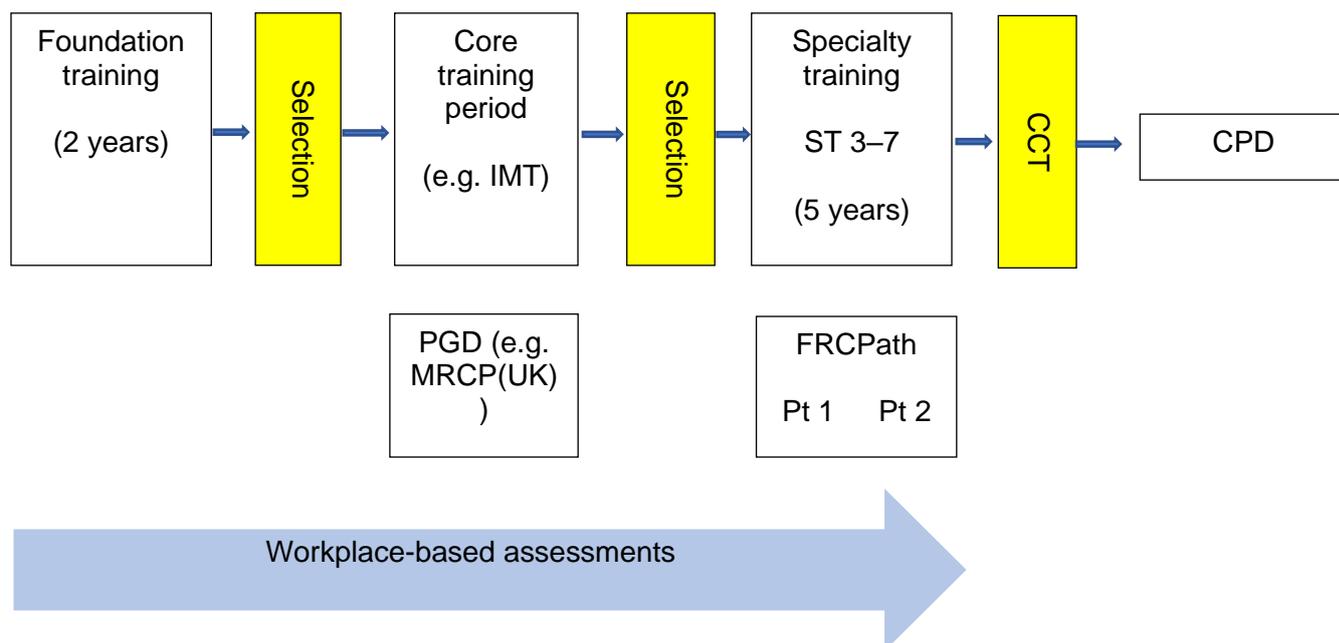
The five specialty CiPs describe the laboratory and clinical tasks or activities which are essential to the practice of chemical pathology. The specialty CiPs have also been mapped to the GPC domains and subsections to reflect the professional generic capabilities required to undertake the clinical tasks. Satisfactory sign-off requires demonstration that, for each of the CiPs, the trainee's performance meets or exceeds the minimum expected level of performance for completion of this stage of chemical pathology training, as defined in the curriculum.

Learning outcomes – capabilities in practice (CiPs)	
Generic CiPs	
1.	Able to function successfully within NHS organisational and management systems.
2.	Able to deal with ethical and legal issues related to clinical practice.
3.	Communicates effectively and is able to share decision making, while maintaining appropriate situational awareness, professional behaviour and professional judgement.
4.	Is focused on patient safety and delivers effective quality improvement in patient care.
5.	Able to carry out research and manage data appropriately.
6.	Able to act as a teacher and clinical supervisor.
Specialty CiPs	
1.	Able to lead and manage a laboratory.
2.	Able to use the laboratory service effectively in the investigation, diagnosis, and management of disease processes.
3.	Able to manage a multi-disciplinary team effectively.
4.	Able to contribute effectively to the management of problems in patients in other specialties.
5.	Able to lead and manage a clinical service, including the management of patients in an outpatient clinic or inpatient, ambulatory or community setting, and the management of long-term conditions.

2.3 Training pathway

Trainees in the specialty will initially develop knowledge of laboratory work, together with supervised clinical liaison and validation of results, and direct clinical care. Following completion of the Fellowship Examination of the Royal College of Pathologists (FRCPath) Part 1 examination (typically after 18–24 months of training), they will continue to develop their skills in the laboratory (including assessment of new tests and guideline development) and in direct patient care, with greater responsibility and less direct supervision; they will also develop involvement in laboratory. After passing the FRCPath Part 2 examination, trainees will continue to develop their skills with support; they may also develop a specialist interest.

Figure 1. Structure of training in chemical pathology.



This curriculum will enable the development of a generalist medical chemical pathologist who can integrate into the local structure and be flexible enough to complement the work of other staff and cooperate to deliver the required service. Therefore, the proportion of clinical and laboratory work will vary widely according to local needs, but trainees should have the capability and readiness to perform either role.

This curriculum supports a flexible approach to training with broad entry routes from post-foundation core training programmes, with clinical experience to closely mirror the range of clinical specialties supported by chemical pathologists and chemical pathology services (see section 3.2).

The curriculum requires training to be undertaken both in the laboratory and in clinical settings. As all disease processes, whether occurring in premature neonates or in the very elderly, involve changes in body chemistry, the scope of chemical pathology covers the whole of medicine. There are some areas in which knowledge of the underlying biochemistry is particularly relevant, and trainees will be expected to attain capabilities to provide direct clinical care to patients in the following five areas, which comprised the former subspecialty of metabolic medicine:

- nutrition
- inborn errors of metabolism in adults
- cardiovascular risk management and disorders of lipid metabolism
- disorders of calcium and bone metabolism
- diabetes mellitus.

Most chemical pathologists provide direct clinical care to patients in at least one of these areas (for example, leading clinical services for lipid clinics or nutrition), or contribute to clinical services in other areas such as endocrinology or toxicology.

2.4 Duration of training

The indicative length of training for chemical pathology is five years, following foundation and core training.

The CCT or CESR (CP) in chemical pathology will be awarded on the recommendation of the Royal College of Pathologists following evidence of:

- satisfactory completion of the chemical pathology curriculum and the minimum training period
- satisfactory outcomes in the requisite number of workplace-based assessments (including multi-source feedback)
- FRCPath by examination
- acquisition of Annual Review of Competence Progression (ARCP) outcome 6.

The Royal College of Pathologists anticipates that training of five years' duration would normally be required to satisfactorily complete the chemical pathology curriculum to the required depth and breadth. However, as this is an outcomes-based curriculum and in order to ensure flexibility, the College advises that the minimum duration of training as identified in Schedule 3 of the General and Specialist Medical Practice (Education, Training and Qualification) Order 2003 is four years, but that all provisional CCT dates should be set at five years in the first instance. The College also recognises that some trainees may require longer to progress, and this flexibility is also available, in line with the guidance in the 'Gold Guide'.

2.5 Flexibility

Chemical pathology training offers excellent opportunities to contribute to research and service development across the whole field of medicine, as well as providing opportunities for training in other related specialties and in a range of settings, as outlined above. GPCs will promote flexibility in postgraduate training, as these common capabilities can be transferred from specialty to specialty.

2.6 Less than full-time training

Less than full-time training is the term used to describe doctors undertaking training on a basis that is not full-time – normally between five and eight sessions per week. In exceptional circumstances, trainees may be allowed to undertake training at less than 50% of full time. These circumstances should be considered by the trainee's deanery and should have the support of the postgraduate dean or their deputy. A placement at less than 50% of full time should be for a maximum of 12 months and should be subject to regular review.

The aim of less than full-time training is to provide opportunities for doctors in the NHS who are unable to work full time. Doctors can apply for less than full-time training if they can provide evidence that training on a full-time basis would not be practicable for well-founded individual reasons.

Less than full-time trainees must accept two important principles:

- less than full-time training shall meet the same requirements (in depth and breadth) as full-time training
- the total duration and quality of less than full-time training must be not less than those of a full-time trainee.

In other words, a less than full-time trainee will have to complete the minimum training time for their specialty pro rata.

Prior to beginning their less than full-time training, trainees must inform the Training Department at the Royal College of Pathologists so that the Chemical Pathology College Specialty Training Committee (CSTC) can ensure that their less than full-time training programme will comply with the requirements of the CCT. The documentation towards a less than full-time training application will be collected and checked to ensure compliance and a

revised provisional CCT date will be issued. It must also be ensured that the less than full-time training post is approved as part of a GMC-approved training programme. Separate guidance and an application form are available on the College website for this purpose.

2.7 Generic professional capabilities and good medical practice

The GMC has developed the generic professional capabilities (GPC) framework with the Academy of Medical Royal Colleges (AoMRC) to describe the fundamental, career-long, generic capabilities required of every doctor. The framework describes the requirement to develop and maintain key professional values and behaviours, knowledge, and skills, using a common language. GPCs also represent a system-wide, regulatory response to the most common contemporary concerns about patient safety and fitness to practise within the medical profession. The framework will be relevant at all stages of medical education, training and practice.

The nine domains of generic professional capabilities



Good medical practice (GMP) is embedded at the heart of the GPC framework. In describing the principles, duties and responsibilities of doctors, the GPC framework articulates GMP as a series of achievable educational outcomes, which will inform curriculum design and assessment.

The GPC framework describes nine domains with associated descriptors outlining the 'minimum common regulatory requirement' of performance and professional behaviour. These attributes are common, minimum and generic standards expected of all medical practitioners achieving a CCT or its equivalent.

The 20 domains and subsections of the GPC framework are directly identifiable in the chemical pathology curriculum. They are mapped to each of the generic and specialty CiPs, which are in turn mapped to the syllabus, and to the assessment blueprints. This is to emphasise those core professional capabilities that are essential to safe clinical practice and that must be demonstrated at every stage of training as part of the holistic development of responsible professionals.

This approach will allow early detection of issues most likely to be associated with fitness to practise and aims to minimise the possibility that any deficit is identified during the final phases of training.

3. Learning and teaching

3.1 The training programme

This section of the curriculum outlines the training regulations for chemical pathology. In line with GMC guidance, this reflects the regulation that only training that has been prospectively approved by the GMC can lead towards the award of the CCT. Training that has not been prospectively approved by the GMC can still be considered, but the trainee's route of entry to the Specialist Register changes to CESR (CP) route.

The organisation and delivery of postgraduate training is the responsibility of Health Education England (HEE) and its Local Education and Training Boards (LETBs), NHS Education for Scotland (NES), Health Education and Improvement Wales (HEIW) and the Northern Ireland Medical & Dental Training Agency (NIMDTA). A training programme director will be responsible for coordinating the chemical pathology training programme. In England, the local organisation and delivery of training is typically overseen by a school of pathology within a LETB.

Progression through the programme will be determined by the Annual Review of Competence Progression (ARCP) process, and the training requirements for each indicative year of training are summarised in the chemical pathology ARCP decision aid (available on the College website). The successful completion of the programme will be dependent on achieving the expected level in all CiPs and GPCs. The programme of assessment will be used to monitor and determine progress through the programme. Training will normally take place in a range of district general hospitals and teaching hospitals.

The sequence of training should ensure appropriate progression in experience and responsibility. The training to be provided at each training site is defined to ensure that, during the programme, the entire syllabus is covered and also that unnecessary duplication and educationally unrewarding experiences are avoided. However, the sequence of training should ideally be flexible enough to allow the trainee to develop a special interest.

3.2 Entry requirements

Trainees are eligible for entry to a chemical pathology training programme following satisfactory completion of any one of the following post-foundation core training programmes and appropriate postgraduate diploma, whose clinical experience will closely mirror the range of clinical specialties supported by chemical pathologists and chemical pathology services:

- two years of Stage 1 Internal Medicine plus MRCP(UK)
- core paediatric training plus MRCPCH
- core GP training plus MRCPGP
- broad-based training plus completion of core training in one of the above specialties and the relevant postgraduate diploma
- Acute Care Common Stem (ACCS) plus FRCA part 1 or MRCP(UK)
- core anaesthetic training plus FRCA part 1.

3.3 Teaching and learning methods

Models of learning

There are three broad categories of learning which trainees employ throughout run-through training: the instructional model, the constructionist model and the social learning model. The models of learning can be applied to any stage of training in varying degrees. Most of the curriculum will be delivered through work-based experiential learning, but the environment within the department should encourage independent self-directed learning and make opportunities for relevant off-the-job education by making provision for attendance at local, national and, where appropriate, international meetings and courses. Independent self-

directed learning should be encouraged by, for example, making use of the e-learning tool or providing reference textbooks. It is the trainee's responsibility to seek opportunities for experiential learning.

The rotations are also arranged in such a way that trainees have time available for participation in research projects as part of their training. The more academically inclined trainees will be encouraged to take time out from their training time to include a more sustained period of grant-funded research, working towards an MSc, MRes/MD or PhD.

Learning for knowledge, competence, performance and independent action will be achieved by assessment and graded responsibility for reporting, allowing trainees at various stages of training to acquire responsibility for independent reporting. Assessment will be set by the Royal College of Pathologists in the form of workplace-based assessment including multi-source feedback and the FRCPath examination.

The principles of Bloom's taxonomy have been applied to the knowledge, skills and behaviours outlined in the curriculum to indicate the trainees' learning journey from the initial acquisition of knowledge and comprehension through to application and analysis and resulting in the synthesis and evaluation required to achieve mastery in the specialty of chemical pathology. In using this model, it is acknowledged that there are many different versions of the taxonomy. The achievement of mastery in this curriculum requires the trainee to demonstrate a combination of detailed knowledge in the associated political context, with the ability to do independent clinical work, and to lead and organise services.

Learning experiences

The following teaching/learning methods will be used to identify how individual objectives will be achieved:

- **Routine work:** the most important learning experience will be day-to-day work.
- **Textbooks and online resources:** chemical pathology is a subject requiring a great deal of background learning and reading, as well as the practical experience gained within day-to-day working, and trainees should take every opportunity to 'read around' their subject.
- **Private study:** more systematic reading of textbooks and journals will be required in preparation for examinations.
- **Regional training courses:** these are valuable learning opportunities. Trainees should be released from service duties to attend.
- **National training courses:** these are particularly helpful during preparation for the FRCPath Part 2 examination. In addition to providing specific teaching, they also allow trainees to identify their position in relation to the curriculum and their peers.
- **Scientific meetings:** research and the understanding of research are essential to the practice of chemical pathology. Trainees should be encouraged to attend and present their work at relevant meetings.
- **Discussion with Biomedical Scientist (BMS):** BMS staff can provide excellent training, particularly in relation to laboratory methods, health and safety, service delivery, procurement and human resources.
- **Multidisciplinary team meetings (MDTs):** attendance at and contribution to MDTs and clinicopathological conferences offer the opportunity for trainees to develop an understanding of clinical management and appreciate the impact of laboratory diagnosis on patient care. The MDT is also an important arena for the development of interprofessional communication skills.
- **Attachment to specialist departments:** attachments of this kind will be required if a training programme cannot offer the full range of specialist experience needed to complete the curriculum. They will also be beneficial for those trainees in their final

year of training who wish to develop a special interest before taking up a consultant post.

- **E-learning**
- **Learning with peers**
- **Work-based experiential learning**
- **Medical clinics including specialty clinics**
- **Practical laboratory experience**
- **Formal postgraduate teaching**
- **Independent self-directed learning**
- **Formal study**

It must be ensured that the appropriate teaching and learning methods are employed for each area of the curriculum.

4. Taking time out of programme (OOP)

There are a number of circumstances when a trainee may seek to spend some time out of the specialty training programme to which they have been appointed, which are outlined below. Further information can also be found in [the Reference Guide for Postgraduate Specialty Training in the UK](#).

4.1 Time out of training

The GMC has provided [guidance](#) on the management of absences from training and their effect on a trainee's CCT date. The GMC guidance states that within each 12-month period where a trainee has been absent for a total of 14 days or more (when they would normally be at work), a review to determine if the trainee's CCT date should be extended is triggered. The absence includes all forms of absence such as sickness, maternity, paternity, compassionate paid/unpaid leave, etc. but does not include study or annual leave or prospectively approved out-of-programme training/research. The administration of the absence and any extension to training will be undertaken by the relevant deanery in consultation with the Royal College of Pathologists where necessary. The GMC supports the deaneries implementing this guidance flexibly to reflect the nature and timing of the absence, and its effect on the individual's competence. Each trainee's circumstances will be considered on an individual basis and any changes to CCT date will reflect the trainee's demonstration of competence.

4.2 Acting up as a consultant (AUC)

A doctor in training can apply to the postgraduate dean to take time out of programme and credit the time towards CCT/CESR (CP) as an AUC. This will normally be for a period of three months (pro rata for less than full-time trainees). Where the AUC is in the same training programme, then prospective approval is not needed from the GMC. If it is a different training programme, the usual out-of-programme (OOP) process applies. When trainees are acting up as a consultant, appropriate supervision must be in place and approval will only be considered if the acting up placement is relevant to gaining the competences, knowledge, skills and behaviours required by the curriculum. AUC posts can only be taken in the final year of specialty training.

4.3 Out-of-programme research (OOPR)

Some trainees may wish to spend a period of time in research as out-of-programme research (OOPR) after entering chemical pathology training.

Research undertaken prior to entry into a chemical pathology training programme

Trainees who have undertaken a period of research prior to entering a chemical pathology training programme can apply to have this period recognised towards a CCT or CESR (CP), if it includes clinical or laboratory work directly relevant to the chemical pathology curriculum and there is prospective approval from the GMC.

Research undertaken during a chemical pathology training programme

Trainees who undertake a period of OOPR after entering a chemical pathology training programme and obtaining their National Training Number (NTN) may have a period of research recognised towards the award of the CCT or CESR (CP). Trainees must ensure that their OOPR is approved prospectively before beginning their research and that it includes clinical or laboratory work directly relevant to the chemical pathology curriculum, and must demonstrate that they have achieved, or will be able to achieve, all requirements of the curriculum.

Prior to beginning the period of research, trainees must agree the OOPR with their deanery and apply to the Training Department at the Royal College of Pathologists in order that the Chemical Pathology CSTC can ensure that the trainee will comply with the requirements of the CCT programme and issue a revised provisional CCT date if necessary. It must be ensured that, following deanery agreement and acceptance from the Chemical Pathology CSTC, the GMC prospectively approves the OOPR in order that the period can count towards a CCT or CESR (CP).

[Separate guidance and an application form](#) are available on the College website for this purpose.

4.4 Academic training

Trainees who intend to pursue a career in academic or research medicine may undertake specialist training in chemical pathology. Such trainees will normally be clinical lecturers and hold an NTN(A). It is expected that such trainees should complete the requirements of the chemical pathology curriculum in addition to their academic work. However, the content of their training, while meeting the requirements of the curriculum, will have to take into account their need to develop their research and the provisional CCT date should be amended accordingly. NTN(A) holders in chemical pathology should consult the Training Department at the College on an individual basis with regard to the agreement of their provisional CCT date.

4.5 Out-of-programme training (OOPT)

The GMC must prospectively approve clinical training out of programme if it is to be used towards a CCT or CESR (CP) award. This could include posts inside or outside the UK that are not already part of a GMC-approved programme in the same specialty. Further approval from the GMC is not required if the OOPT is already part of a GMC-approved programme in the same specialty.

Trainees can have up to one year of OOPT recognised towards the award of the CCT. Prior to beginning the period of OOPT, trainees must agree the OOPT with their deanery and inform the Training Department at the Royal College of Pathologists that they will be undertaking OOPT so that the Chemical Pathology CSTC can ensure that the trainee will comply with the requirements of the CCT programme.

The postgraduate dean is required to submit an application for prospective GMC approval for any OOPT that is to count towards a CCT or CESR (CP) on behalf of the trainee and this application is required to include support from the Royal College of Pathologists. If

prospective approval for OOPT is not sought from the GMC, then it cannot count towards a CCT or CESR (CP).

Trainees must have their OOPT agreed by the relevant deanery, accepted by the Chemical Pathology CSTC and approved by the GMC before beginning their OOPT.

[Separate guidance and an application form](#) are available on the College website for this purpose.

4.6 Out-of-programme clinical experience (OOPE)

Trainees may seek agreement for OOP to undertake clinical experience that has not been approved by the GMC and that will not contribute to the award of a CCT or CESR (CP). In these circumstances, it is likely that the CCT date will need to be extended. During their chemical pathology training, some trainees may wish to spend a period of training in a related clinical specialty such as paediatrics or oncology. This is acceptable and should be undertaken as out-of-programme clinical experience (OOPE). However, such a period of training – although useful to the individual trainee in broadening their understanding of the relationship between chemical pathology and the clinical specialties – will not be accepted by the Chemical Pathology CSTC towards the requirements of the CCT.

5. Quality management

The curriculum outlines the minimum chemical pathology training requirements for delivery in a training programme. It guides educational supervisors (ES) as to what is required to deliver the curriculum and trainees in the learning and assessment methods required for satisfactory completion of training.

It is the responsibility of the training programme director (TPD) and their deanery, with the assistance of the regional STC to ensure that the programme delivers the depth and breadth of chemical pathology training outlined in the curriculum. The TPD must ensure that each post within the programme is approved by the GMC. Heads of Pathology School (HOPS) have a strategic overview of training in the pathology specialties. They are responsible for ensuring that the delivery of education and training meets the College's and the GMC's agreed curriculum and is provided to the standards set by the College and the GMC.

It is the responsibility of the GMC to provide quality assurance for training programmes, and the responsibility of the Royal College of Pathologists through the Chemical Pathology CSTC to ensure training programmes across the UK are able to deliver a balanced programme of training.

It is the responsibility of the College to monitor the quality of our curricula and assessments, and there are several means by which we achieve this, including but not limited to: including curricula and assessment systems as a standing item on the agenda of respective CSTC meetings, thereby allowing Heads of Schools, TPDs and trainee representatives to raise issues and make suggestions for change; seeking feedback from trainees as part of the Trainees' Advisory Committee meetings; issuing an annual report to the GMC detailing exam results; and analysing any findings which may arise.

It is the responsibility of the educational supervisor of a particular post or attachment within a programme to ensure that the training delivered in their post meets the requirements of the relevant section(s) of the curriculum. The educational supervisor must undertake regular educational appraisal with their trainee, at the beginning, middle and end of a section of training, to ensure structured and goal-oriented delivery of training.

Trainees must [register with the College](#) on appointment to a chemical pathology training programme. It is the trainee's responsibility to become familiar with the curriculum, inclusive of the generic and specialty-specific CiPs, and assessment requirements both for the satisfactory completion of each stage of training and the award of the CCT or CESR (CP). They must be familiar with all aspects of the assessment system; workplace-based assessment including multi-source feedback and the [FRCPATH examination](#). It is the trainee's responsibility to ensure that they undertake workplace-based assessments on a regular basis and that they apply in good time for the FRCPATH examinations. Trainees must also make appropriate use of the [electronic portfolio](#) – the Learning Environment for Pathology Trainees (LEPT) system.

6. Intended use of curriculum by trainers and trainees

This curriculum and the ARCP decision aid are available from the Royal College of Pathologists via the [website](#).

Clinical and educational supervisors should use the curriculum and decision aid as the basis of their discussion with trainees, particularly during the appraisal process. Both trainers and trainees are expected to have a good knowledge of the curriculum and should use it as a guide for their training programme.

Each trainee will engage with the curriculum by maintaining an ePortfolio. This is the [Learning Environment for Pathology Trainees](#) (LEPT) system, which captures trainees' progress during training. It records workplace-based assessments including multi-source feedback (MSF) and there is a functionality to support the ARCP process. The trainee will use the curriculum to develop learning objectives and reflect on learning experiences.

It is the trainees' responsibility to ensure their LEPT ePortfolio is kept up to date, to arrange assessments and ensure they are recorded, prepare drafts of appraisal forms, maintain their personal development plan, record their reflections on learning and record their progress through the curriculum.

Clinical supervisors and others contributing to assessment will provide formative feedback to the trainees on their performance throughout the training year. This feedback will include a global rating in order to indicate to the trainee and their educational supervisor how they are progressing at that stage of training.

The educational supervisor's main responsibilities are to use LEPT evidence, such as outcomes of assessments, reflections and personal development plans. They use this evidence to inform appraisal meetings, to update the trainee's record of progress through the curriculum, to write end-of-attachment appraisals, and to report on the trainee's progress to the training programme director. This report will include an assessment of the trainee's progress against generic and specialty-specific CiPs.

Deaneries, training programme directors and ARCP panels may use the LEPT system to monitor the progress of trainees for whom they are responsible.

All appraisal meetings, personal development plans and workplace-based assessments (including MSF assessments) should be recorded in the LEPT system. Trainees are encouraged to reflect on their learning experiences and to record these in the LEPT system. Reflections can be kept private or shared with supervisors.

Reflections, assessments and other LEPT content should be used to provide evidence towards acquisition of curriculum capabilities. Trainees should add their own self-

assessment ratings to record their view of their progress. The aims of the self-assessment are to:

- provide the means for reflection and evaluation of current practice
- inform discussions with supervisors to help both gain insight and create personal development plans
- identify shortcomings between experience, competency and areas defined in the curriculum so as to guide future clinical exposure and learning.

7. Equality and diversity

The following is an extract from the Royal College of Pathologists' *Diversity and equality policy and approach*. A full copy of the policy is available on the [College website](#).

The Royal College of Pathologists is committed to the principle of diversity and equality in employment, membership, academic activities, examinations and training. As part of this commitment, we are concerned to inspire and support all those who work with us directly and indirectly.

Integral to our approach is the emphasis we place on our belief that everyone should be treated in a fair, open and honest manner. Our approach is a comprehensive one and reflects all areas of diversity, recognising the value of each individual. We aim to ensure that no one is treated less favourably than another on the grounds of sex, race, age, sexual orientation, gender reassignment, disability, pregnancy and maternity, religion and belief and marriage and civil partnership. Our intention is to reflect not only the letter but also the spirit of equality legislation.

Our policy will take account of current equality legislation and good practice as outlined in the Equality Act 2010 which supersedes/includes all previous legislation.

The Training Department collects information about the gender and ethnicity of trainees as part of their registration with the College. Further information about the monitoring activities of the College trainees, candidates and Fellows are available in the College policy.

8. Content of learning

8.1 Capabilities in practice

Capabilities in practice (CiPs) describe the professional tasks or work within the scope of chemical pathology. CiPs are based on the format of entrustable professional activities, which are a method of using the professional judgement of appropriately trained, expert assessors as a key aspect of the validity of assessment and a defensible way of forming global judgements of professional performance.

Each CiP has a set of descriptors associated with that activity or task. Descriptors are intended to help trainees and trainers recognise the minimum level of knowledge, skills and attitudes which should be demonstrated by chemical pathologists. Trainees may use these capabilities to provide evidence of how their performance meets or exceeds the minimum expected level of performance for their year of training. The descriptors are not a comprehensive list and there are many more examples that would provide equally valid evidence of performance.

Many of the CiP descriptors refer to patient-centred care and shared decision-making. This is to emphasise the importance of patients being at the centre of decisions about their own treatment and care, by exploring care or treatment options and their risks and benefits and discussing choices available.

Additionally, the specialty CiPs repeatedly refer to the need to demonstrate professional behaviour with regard to patients, carers, colleagues and others. Good doctors work in partnership with patients and respect their rights to privacy and dignity. They treat each patient as an individual. They do their best to make sure all patients receive good care and treatment that will support them to live as well as possible, whatever their illness or disability. Appropriate professional behaviour should reflect the principles of good medical practice and GPC.

In order to complete training and be recommended to the GMC for the award of CCT and entry to the Specialist Register, the doctor must demonstrate that they are capable of unsupervised practice in all generic and specialty CiPs.

Satisfactory sign-off at the end of chemical pathology training requires demonstration that, for each of the CiPs, the trainee's performance meets or exceeds the minimum level of performance expected for completion of this stage of training.

This section of the curriculum details the 11 generic and specialty CiPs for chemical pathology with expected levels of performance, mapping to relevant GPCs and the evidence that may be used to make an entrustment decision for specialty-specific CiPs.

8.1.1 Generic capabilities in practice

The six generic CiPs cover the universal requirements of all specialties as described in good medical practice and the GPC framework. Assessment of the generic CiPs will be underpinned by the descriptors for the nine GPC domains and evidenced against the performance and behaviour expected at that stage of training. Satisfactory sign-off will indicate that there are no concerns before the trainee can progress to the next part of the assessment of clinical capabilities. It will not be necessary to assign a level of supervision for these non-clinical CiPs.

In order to ensure consistency and transferability, the generic CiPs have been grouped under the GMP-aligned categories used in the foundation programme curriculum, plus an additional category for wider professional practice:

- professional behaviour and trust
- communication, team-working and leadership
- safety and quality
- wider professional practice.

For each generic CiP, there is a set of descriptors of the observable skills and behaviours that would demonstrate that a trainee has met the minimum level expected. The descriptors are not a comprehensive list and there may be more examples that would provide equally valid evidence of performance.

Chemical Pathology Generic capabilities in practice (CiPs)	
Category 1: Professional behaviour and trust	
1. Able to function successfully within NHS organisational and management systems.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates awareness of and adherence to the GMC professional requirements. • Demonstrates recognition of public health issues including population

	<p>health, social detriments of health and global health perspectives</p> <ul style="list-style-type: none"> • Demonstrates effective clinical leadership. • Practises promotion of an open and transparent culture. • Demonstrates up-to-date practice through learning and teaching. • Demonstrates engagement in career planning. • Demonstrates capabilities in dealing with complexity and uncertainty. • Demonstrates awareness of the role and processes for commissioning.
GPCs	<p>Domain 1: Professional values and behaviours Domain 3: Professional knowledge</p> <ul style="list-style-type: none"> • Professional requirements • National legislative requirements • The health service and healthcare systems in the four countries <p>Domain 9: Capabilities in research and scholarship</p>
Evidence to inform decision (examples)	<p>CS/ES report ECE MSF Management & Leadership course</p>

2. Able to deal with ethical and legal issues related to clinical practice.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates awareness of national legislation and legal responsibilities, including safeguarding vulnerable groups. • Demonstrates behaviour in accordance with ethical and legal requirements. • Demonstrates ability to offer apology or explanation when appropriate. • Demonstrates leadership of the clinical and laboratory team in ensuring that medical legal factors are considered openly and consistently. • Demonstrates ability to advise clinicians and other health professionals on medico-legal issues related to pathology.
GPCs	<p>Domain 1: Professional values and behaviours Domain 3: Professional knowledge</p> <ul style="list-style-type: none"> • Professional requirements • National legislative requirements • The health service and healthcare systems in the four countries <p>Domain 4: Capabilities in health promotion and illness prevention Domain 7: Capabilities in safeguarding vulnerable groups Domain 8: Capabilities in education and training Domain 9: Capabilities in research and scholarship</p>
Evidence to inform decision (examples)	<p>CS/ES report MSF CbD ECE FRCPPath</p>

Category 2: Communication, team-working and leadership	
3. Communicates effectively and is able to share decision making, while maintaining appropriate situational awareness, professional behaviour and professional judgement.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates effective communication with clinical and other professional colleagues. • Demonstrates clear communication with patients and carers in a variety of settings. • Identifies and manages barriers to communication (e.g. cognitive impairment, speech and hearing problems, capacity issues, cultural issues). • Demonstrates effective consultation skills including effective verbal and non-verbal interpersonal skills. • Practises effective decision making by informing the patient, prioritising the patient's wishes, and respecting the patient's beliefs, concerns and expectations. • Practises effective decision making with children and young people. • Demonstrates effective management and team working skills appropriately, including influencing, negotiating, re-assessing priorities and effectively managing complex, dynamic situations.
GPCs	<p>Domain 2: Professional skills</p> <ul style="list-style-type: none"> • Practical skills • Communication and interpersonal skills • Dealing with complexity and uncertainty • Clinical skills (history taking, diagnosis and medical management; consent; humane interventions; prescribing medicines safely; using medical devices safely; infection control and communicable disease) • The health service and healthcare systems in the four countries <p>Domain 5: Capabilities in leadership and team working</p>
Evidence to inform decision (examples)	<p>CS/ES report MSF CbD Mini-CEX ECE Management course</p>

Category 3: Safety and quality	
4. Is focused on patient safety and delivers effective quality improvement in patient care.	
Descriptors	<ul style="list-style-type: none"> • Identifies patient safety as a priority in clinical practice. • Raises and escalates concerns where there is an issue with patient safety or quality of care. • Demonstrates commitment to learning from patient safety investigations and complaints. • Applies good practice appropriately. • Contributes to and delivers quality improvement. • Identifies basic Human Factors principles and practice at individual, team, organisational and system levels. • Recognises the importance of non-technical skills and crisis resource management. • Recognises and works within limit of personal competence.
GPCs	<p>Domain 1: Professional values and behaviours</p> <p>Domain 2: Professional skills</p> <ul style="list-style-type: none"> • Practical skills • Communication and interpersonal skills • Dealing with complexity and uncertainty • Clinical skills (history taking, diagnosis and medical management; consent; humane interventions; prescribing medicines safely; using medical devices safely; infection control and communicable disease) <p>Domain 3: Professional knowledge</p> <ul style="list-style-type: none"> • Professional requirements • National legislative requirements • The health service and healthcare systems in the four countries <p>Domain 4: Capabilities in health promotion and illness prevention</p> <p>Domain 5: Capabilities in leadership and team working</p> <p>Domain 6: Capabilities in patient safety and quality improvement</p> <ul style="list-style-type: none"> • Patient safety • Quality improvement
Evidence to inform decision (examples)	<p>CS/ES report</p> <p>MSF</p> <p>CbD</p> <p>ECE</p> <p>FRCPPath</p>

Category 4: Wider professional practice	
5. Carrying out research and managing data appropriately.	
Descriptors	<ul style="list-style-type: none"> • Describes and explains principles of research and academic writing. • Describes and explains legal and ethical frameworks underlying research in the UK. • Describes and explains structures supporting health service research. • Demonstrates awareness of sources of finance to support research. • Demonstrates ability to manage clinical information/data appropriately. • Demonstrates ability to carry out critical appraisal of the literature. • Demonstrates ability to design and perform a research project. • Demonstrates ability to follow guidelines on ethical conduct in research and consent for research. • Identifies public health epidemiology and global health patterns.
GPCs	Domain 1: Professional values and behaviours Domain 3: Professional knowledge <ul style="list-style-type: none"> • Professional requirements • National legislative requirements • The health service and healthcare systems in the four countries Domain 7: Capabilities in safeguarding vulnerable groups Domain 9: Capabilities in research and scholarship
Evidence to inform decision (examples)	CS/ES report Good Clinical Practice certificate FRCPPath DOPS Evidence of research activity

6. Acting as a teacher and clinical supervisor.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates effective teaching and training to medical students, junior doctors, laboratory staff and other healthcare professionals. • Demonstrates ability to deliver effective feedback to trainees, with appropriate action plan. • Demonstrates ability to effectively supervise healthcare professionals, including medical staff, in earlier stages of training. • Demonstrates ability to act as a clinical supervisor to healthcare professionals, including medical staff, in earlier stages of training
GPCs	Domain 1: Professional values and behaviours Domain 8: Capabilities in education and training
Evidence to inform decision (examples)	CS/ES report MSF ECE Postgraduate education qualification (certificate or higher)

8.1.2 Specialty capabilities in practice

The five specialty CiPs describe the tasks or activities that are essential to the practice of chemical pathology and metabolic medicine. These CiPs have been mapped to the nine GPC domains to reflect the generic professional capabilities required to undertake these tasks.

Satisfactory sign-off will require educational supervisors to make entrustment decisions on the level of supervision required for each CiP, and if this is satisfactory for the stage of training, the trainee can progress. More detail is provided in the syllabus section of the curriculum.

Specialty capabilities in practice – chemical pathology and metabolic medicine	
7. Able to lead and manage a laboratory.	
Descriptors	<ul style="list-style-type: none"> • Describes and explains the structure of healthcare laboratories. • Describes and explains relevant legislation, including that related to Health and Safety • Demonstrates awareness of developments, both scientific and managerial, that may affect the organisation and delivery of pathology services. • Demonstrates awareness of the costing and financing of pathology services • Describes and explains principles of methods for biochemical analysis, and of potential interferences. • Demonstrates ability to select appropriate tests and methods for clinical investigation. • Demonstrates understanding of method validation. • Demonstrates ability to effectively use internal quality control and external quality assurance information to diagnose and resolve analytical problems. • Describes and explains laboratory information management systems and other healthcare IT systems, including understanding the legislation surrounding information governance. • Demonstrates ability to work effectively within a multidisciplinary framework within the laboratory. • Demonstrates effective clinical leadership. • Demonstrates ability to work effectively as a member of a multidisciplinary team within pathology, the hospital and the local healthcare economy. • Demonstrates motivation for continual improvement and development of laboratory services.
GPCs	Domain 1: Professional values and behaviours Domain 2: Professional skills <ul style="list-style-type: none"> • Practical skills • Communication and interpersonal skills • Dealing with complexity and uncertainty Domain 3: Professional knowledge <ul style="list-style-type: none"> • Professional requirements

	<ul style="list-style-type: none"> • National legislative requirements • The health service and healthcare systems in the four countries <p>Domain 4: Capabilities in health promotion and illness prevention Domain 5: Capabilities in leadership and team working Domain 6: Capabilities in patient safety and quality improvement Domain 7: Capabilities in safeguarding vulnerable groups</p>
Evidence to inform decision (examples)	<p>CS/ES report DOPS ECE FRCPPath Management course</p>

8. Able to use the laboratory service effectively in the investigation, diagnosis and management of disease.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates professional behaviour with regard to patients, laboratory users and laboratory staff. • Describes and explains normal human biochemistry and physiology and recognises pathological deviations from this. • Recognises and gives appropriate advice on pre-analytical factors which affect biochemical tests. • Describes and explains national and other systems to provide advice on the use of tests and technologies. • Selects appropriate repertoire of tests for the laboratory, according to clinical requirements. • Indicates appropriate turnaround time for investigations, as required for management of individual patients. • Demonstrates ability to effectively advise laboratory users appropriately on the choice of investigations for individual patients. • Uses biochemical and other data effectively to form a differential diagnosis. • Demonstrates ability to effectively advise laboratory users appropriately on the interpretation of laboratory results. • Demonstrates understanding of criticality of some investigations to patient management and has ability to add clarifying tests to assist interpretation and clinical management. • Describes and explains reasoning behind investigational and diagnostic advice clearly to clinicians and to laboratory staff. • Recognises the need to liaise effectively with specialty services and refers where appropriate.
GPCs	<p>Domain 1: Professional values and behaviours Domain 2: Professional skills</p> <ul style="list-style-type: none"> • Practical skills • Communication and interpersonal skills • Dealing with complexity and uncertainty <p>Domain 3: Professional knowledge</p> <ul style="list-style-type: none"> • Professional requirements • National legislative requirements • The health service and healthcare systems in the four countries <p>Domain 4: Capabilities in health promotion and illness prevention</p>

	Domain 5: Capabilities in leadership and team-working Domain 6: Capabilities in patient safety and quality improvement Domain 7: Capabilities in safeguarding vulnerable groups
Evidence to inform decision (examples)	CS/ES report MSF ECE FRCPATH

9. Able to manage a multidisciplinary team effectively.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates effective management and team working skills, including influencing, negotiating, continually re-assessing priorities and effectively managing complex, dynamic situations. • Identifies and supports effective continuity and coordination of patient care through the appropriate transfer of information. • Practises patient centred care including shared decision making • Recognises the importance of prompt and accurate information sharing with the team primarily responsible for the care of the patient.
GPCs	Domain 1: Professional values and behaviours Domain 2: Professional skills <ul style="list-style-type: none"> • Practical skills • Communication and interpersonal skills • Dealing with complexity and uncertainty • Clinical skills (history taking, diagnosis and medical management; consent; humane interventions; prescribing medicines safely; using medical devices safely; infection control and communicable disease) Domain 5: Capabilities in leadership and team-working
Evidence to inform decision (examples)	CS/ES report MSF Mini-CEX CbD ECE

10. Contributes effectively to the management of medical problems in patients in other specialties.	
Descriptors	<ul style="list-style-type: none"> • Demonstrates effective consultation skills (including when in challenging circumstances) • Demonstrates provision of appropriate advice about patients under the care of other specialties • Demonstrates appropriate and timely liaison with other medical specialty services when required • Demonstrates the ability to collaborate across specialties in developing and implementing guidelines
GPCs	Domain 1: Professional values and behaviours Domain 2: Professional skills <ul style="list-style-type: none"> • Practical skills

	<ul style="list-style-type: none"> • Communication and interpersonal skills • Dealing with complexity and uncertainty • Clinical skills (history taking, diagnosis and medical management; consent; humane interventions; prescribing medicines safely; using medical devices safely; infection control and communicable disease) <p>Domain 7: Capabilities in safeguarding vulnerable groups</p>
Evidence to inform decision (examples)	<p>CS/ES report MSF CbD ECE</p>

<p>11. Able to lead and manage a clinical service, including the management of patients in an outpatient clinic, inpatient, ambulatory or community setting, and the management of long-term conditions.</p>	
Descriptors	<ul style="list-style-type: none"> • Demonstrates professional behaviour with regard to patients, carers, colleagues and others. • Practises patient-centred care including shared decision making. • Demonstrates effective consultation skills. • Formulates an appropriate diagnostic and management plan, taking into account patient preferences. • Demonstrates the ability to use evidence-based medicine and remain up to date on national and international guidance in order to provide the most appropriate clinical care. • Demonstrates awareness of the cost and financing of clinical services. • Demonstrates effective management and team working skills in a multidisciplinary environment. • Demonstrates effective leadership of a clinical service. • Demonstrates motivation for continual improvement and development of clinical services. • Describes and explains clinical reasoning behind diagnostic and clinical management decisions to patients/carers/guardians and other colleagues. • Demonstrates ability to manage comorbidities in outpatient clinic, ambulatory or community setting. • Identifies patients with limited reversibility of their medical condition and determines palliative and end of life care needs. • Demonstrates effective consultation skills in challenging circumstances. • Demonstrates compassionate professional behaviour and clinical judgement. • Demonstrates awareness of the quality of patient experience. • Recognises and works within limit of personal competence and refers to other specialties when required.
GPCs	<p>Domain 1: Professional values and behaviours Domain 2: Professional skills</p> <ul style="list-style-type: none"> • Practical skills • Communication and interpersonal skills • Dealing with complexity and uncertainty

	<ul style="list-style-type: none"> • Clinical skills (history taking, diagnosis and medical management; consent; humane interventions; prescribing medicines safely; using medical devices safely; infection control and communicable disease) Domain 3: Professional knowledge <ul style="list-style-type: none"> • Professional requirements • National legislation • The health service and healthcare systems in the four countries Domain 5: Capabilities in leadership and team-working Domain 7: Capabilities in safeguarding vulnerable groups
Evidence to inform decision (examples)	CS/ES report MSF CbD Mini-CEX FRCPPath ECE

8.2 Syllabus

The scope of chemical pathology is broad, covering the biochemical processes which underlie the whole of human physiology and medicine. It includes metabolic medicine, which covers five defined areas of medicine (calcium and bone, cardiovascular risk, diabetes, inherited metabolic disease in adults, and nutrition) where a knowledge of metabolic processes is particularly relevant to providing direct clinical care, although it is a developing area (especially with regard to inborn errors of metabolism). Any attempt to list all relevant methods, presentations, conditions and issues would be extensive, but would inevitably be incomplete and would rapidly become out of date.

The table below details the key areas of chemical pathology. These are described in more detail in appendices 1 and 2. Each of these areas should be regarded as a context in which trainees should be able to demonstrate CiPs and GPCs. Trainees will need to become familiar with the relevant knowledge, skills and values/attitudes related to these areas. The patient should always be at the centre of knowledge, learning and care.

Laboratory	CiPs: 1, 2, 3, 4, 5, 6, 7, 9
<ul style="list-style-type: none"> • Laboratory organisation • Principles and practicalities of biochemical analysis • Method development and validation • Biological, pre-analytical and analytical variation • Laboratory management • Duty biochemist role 	
Genetics and genomics	CiPs: 1, 2, 3, 5, 7, 8, 10
Proteins and proteomics	CiPs: 3, 5, 7, 8, 10
Enzymes and metabolomics	CiPs: 3, 8, 10
Endocrinology	CiPs: 3, 8, 10
Diabetes mellitus	CiPs: 1, 2, 3, 8, 10, (11)
Nutrition	CiPs: 1, 2, 3, 4, 8, 9, 10, (11)
Inborn errors of metabolism	CiPs: 1, 2, 3, 4, 5, 8, 9, 10, (11)

Haemoglobin and disorders of red cell enzymes	CiPs: 2, 4, 8, 10
Assessment and management of cardiovascular risk	CiPs: 1, 2, 3, 4, 8, 9, 10, (11)
Cardiac disease	CiPs: 3, 4, 8, 10
Disorders of calcium metabolism	CiPs: 3, 4, 8, 10, (11)
Water and electrolytes	CiPs: 3, 4, 8, 10
Blood gases and acid-base balance	CiPs: 3, 4, 8, 10
Respiratory system	CiPs: 3, 4, 8, 10
Liver	CiPs: 3, 4, 8, 10
Kidney and urogenital tract	CiPs: 3, 4, 8, 10
Gastrointestinal system	CiPs: 3, 4, 8, 10
Screening	CiPs: 1, 2, 3, 4, 5, 7, 8, 10
Pregnancy	CiPs: 2, 3, 4, 8, 10
Neonates and childhood	CiPs: 2, 3, 4, 8, 10
Cancer	CiPs: 2, 3, 4, 8, 10
CNS/neuromuscular	CiPs: 3, 4, 8, 10
Toxicology	CiPs: 2, 3, 4, 7, 8, 10
Therapeutic drug monitoring	CiPs: 2, 3, 4, 7, 8, 10

9. Programme of assessment

9.1 Purpose of assessment

The Royal College of Pathologists' mission is to promote excellence in the practice of pathology and to be responsible for maintaining standards through training, assessments, examinations and professional development. The RCPATH assessment strategy contains further information, but the programme of assessment will reassure the public, professions, and other relevant bodies that the trainee is fit for purpose and ready to be a consultant by:

- providing relevant feedback and support to the trainee about their progress and learning needs
- ensuring fairness for all candidates regardless of their background
- driving learning demonstrated through the acquisition of knowledge and skill
- supporting trainees to progress at their own pace by measuring a trainee's capacity to achieve competencies for their chosen career path
- indicating the capability and potential of a trainee through tests of applied knowledge and skill relevant to the speciality
- demonstrating readiness to progress to the next year or stage of training having met the required standard of the previous stage
- enabling the trainee to collect all necessary evidence for the ARCP
- gaining the FRCPath
- providing evidence for the award of the CCT.

A blueprint of the chemical pathology assessment system which is mapped to good medical practice can be viewed under 9.8.

9.2 Programme of assessment

Our programme of assessment refers to the integrated framework of exams, assessments in the workplace and judgements made about a trainee during their approved programme of training. The purpose of the programme of assessment is to robustly evidence, ensure and clearly communicate the expected levels of performance at critical progression points, and to demonstrate satisfactory completion of training as required by the curriculum.

The programme of assessment comprises several different individual types of assessment. These include the FRCPATH examination, and summative and formative assessments. A range of assessments is needed to generate the necessary evidence required for global judgements to be made about satisfactory performance, progression in, and completion of, training. All assessments, including those conducted in the workplace, are linked to the relevant curricular learning outcomes (e.g. through the blueprinting of the assessment system to the stated curricular outcomes).

The programme of assessment emphasises the importance and centrality of professional judgement in making sure learners have met the learning outcomes and expected levels of performance set out in the approved curricula. Assessors will make accountable, professional judgements. The programme of assessment includes how professional judgements are used and collated to support decisions on progression and satisfactory completion of training.

The assessments will be supported by structured feedback for trainees. Assessment tools will be both formative and summative and have been selected on the basis of their fitness for purpose.

Assessment will take place throughout the training programme to allow trainees to continually gather evidence of learning and to provide formative feedback. Those assessment tools which are not identified individually as summative will contribute to summative judgements about a trainee's progress as part of the programme of assessment. The number and range of these will ensure a reliable assessment of the training relevant to their stage of training and achieve coverage of the curriculum.

Reflection and feedback should be an integral component to all workplace-based assessments. In order for trainees to maximise benefit, reflection and feedback should take place as soon as possible after an event. Every clinical encounter can provide a unique opportunity for reflection and feedback and this process should occur frequently. Feedback should be of high quality and should include an action plan for future development for the trainee. Both trainees and trainers should recognise and respect cultural differences when giving and receiving feedback.

9.3 Assessment of CiPs

Assessment of CiPs involves looking across a range of different skills and behaviours to make global decisions about a trainee's suitability to take on particular responsibilities or tasks.

Clinical supervisors and others contributing to assessment will provide formative feedback to the trainee on their performance throughout the training year. This feedback will include a global rating in order to indicate to the trainee and their educational supervisor how they are progressing at that stage of training. To support this, workplace-based assessments will include global assessment anchor statements.

Global assessment anchor statements

- Below expectations for this year of training; may not meet the requirements for critical progression point.
- Meeting expectations for this year of training; expected to progress to next stage of training.
- Above expectations for this year of training; expected to progress to next stage of training.

Towards the end of the training year, trainees will make a self-assessment of their progression for each CiP and record this in the LEPT system with signposting to the evidence to support their rating.

The educational supervisor will review the evidence in the LEPT system, including workplace-based assessments, feedback received from clinical supervisors and the trainee's self-assessment, and record their judgement on the trainee's performance in the Educational Supervised Structured Report (ESSR), with commentary.

For **generic CiPs**, the ES will indicate whether the trainee is meeting expectations or not using the global anchor statements above. Trainees will need to be meeting expectations for the stage of training as a minimum to be judged satisfactory to progress to the next training year.

For **specialty CiPs**, the ES will make an entrustment decision for each CiP and record the indicative level of supervision required with detailed comments to justify their entrustment decision. The ES will also indicate the most appropriate global anchor statement (see above) for overall performance.

Entrustability scales are behaviourally-anchored ordinal scales based on progression to competence and reflect a judgement that has clinical meaning for assessors.

Level descriptors for specialty CiPs

Level	Descriptor
Level 1	Entrusted to observe only – no provision of clinical care.
Level 2	Entrusted to act with direct supervision: The trainee may provide clinical care, but the supervising physician is physically within the hospital or other site of patient care and is immediately available if required to provide direct bedside supervision.
Level 3	Entrusted to act with indirect supervision: The trainee may provide clinical care when the supervising physician is not physically present within the hospital or other site of patient care, but is available by means of telephone and/or electronic media to provide advice, and can attend at the bedside if required to provide direct supervision.
Level 4	Entrusted to act unsupervised.

9.4 Critical progression points

There will be three key progression points during chemical pathology training. The first is at entry to the specialty, the second on attainment of the FRCPATH Part 1 by the end of ST5, and the third at award of the CCT. The outline grid below sets out the expected level of

supervision and entrustment for the specialty CiPs and the critical progression points for the whole of chemical pathology training.

It is anticipated that the majority of trainees entering chemical pathology will do so from internal medicine (IM), applying to enter normally after two years of IM stage 1 training. Trainees will be expected to have completed all parts of the MRCP(UK) examination by the time of entry into the specialty. Similarly, those entering from other training programmes will be expected to have completed the appropriate postgraduate diploma for that programme (e.g. MRCPGP) by the time of entry to chemical pathology training.

9.5 Outline grid of levels expected for chemical pathology specialty capabilities in practice (CiPs)

Levels to be achieved by critical progression points

NB: It is anticipated that the majority of entrants to the specialty will come from IM stage 2, but recognised that some will come from other routes. The levels at IM stage 2 are therefore included only as an indicator of the levels to be anticipated at entry to the specialty.

Level descriptors

- Level 1: entrusted to observe only
- Level 2: entrusted to act with direct supervision
- Level 3: entrusted to act with indirect supervision
- Level 4: entrusted to act unsupervised

	Stage 1 training	Selection	Chemical pathology training						CCT
Specialty CiP			ST3	ST4	ST5		ST6	ST7	
Able to lead and manage a laboratory	1	Critical progression point	1	2	3	Critical progression point – completion of FRCPATH Part 1	3	4	Critical progression point
Able to use the laboratory service effectively in the investigation, diagnosis and management of disease	2		2	2	3		3	4	
Able to manage a multidisciplinary team effectively	2		2	2	3		3	4	
Contributes effectively to the management of medical problems in patients in other specialties	2		2	2	3		3	4	
Able to lead and manage a clinical service, including the management of patients in an outpatient clinic, inpatient, ambulatory or community setting, and the management of long-term conditions	2		2	2	3		3	4	

9.6 Evidence of progress

Methods of assessment

Trainees will be assessed in a number of different ways during their training. Workplace-based assessment allows the trainee to be assessed at regular intervals in the workplace by an appropriately trained, qualified and experienced assessor. The MSF assessment, amongst other things, generates candid feedback on behaviour, attitude, communication and team-working issues. The FRCPATH examination provides an external, quality-assured assessment of the trainee's knowledge of their specialty and their ability to apply that knowledge in the practice of the specialty. Satisfactory completion of all assessments and examinations will be monitored as part of the ARCP process and will be one of the criteria upon which eligibility to progress will be judged. A pass in the FRCPATH examination is required as part of the eligibility criteria for the award of the CCT or CESR (CP).

Workplace-based assessment

Trainees will be expected to undertake workplace-based assessment in the form of supervised learning events (SLE) throughout their training in chemical pathology. In general, SLEs are designed to be formative in nature; as such they are best suited to determine educational progress in different contexts. To this end, it is strongly recommended that workplace-based assessment be carried out regularly throughout training to assess and document a trainee's progress. The numbers below are indicative however, it is recommended that a minimum number of SLEs should be completed during each stage of training.

These will include:

- case-based discussion (CbD): minimum of six per year in years ST3 – ST7
- direct observation of practical skills (DOPS); minimum of 12 per year in ST3 and a minimum of 11 in ST4
- evaluation of clinical events (ECE): minimum of seven in ST5 and a minimum of six per year in years ST6 and ST7
- clinical evaluation exercise (mini-CEX): minimum of six per year in years ST3–ST7
- multi-source feedback (MSF): minimum of three during training, typically in years ST3, ST5 and ST7.

Further separate guidance is provided about the method and required frequencies of these assessments.

FRCPATH examination

The FRCPATH examination is the major summative assessment of competence in chemical pathology. The Part 1 examination is the major assessment of knowledge. It is expected that medical candidates will be able to sit this examination during ST4, and they will be required to have passed it by the end of ST5. Failure to do so will be grounds for the issue of an outcome 3 at ARCP.

The expectation for medical candidates in UK GMC-approved training programmes is that they should normally pass the FRCPATH Part 2 examination within seven years of passing the FRCPATH Part 1. However, there will be circumstances where the guidelines will need to be applied flexibly and candidates who feel that they will not be able to comply with this timescale should contact the RCPATH Examinations Department for further advice.

Examination results are evaluated after each session and an annual review of validity and reliability is undertaken and reported to the Examinations Committee.

Evidence of competence

Annual Review of Competence Progression

The ARCP is an annual opportunity for evidence gathered by a trainee, relating to the trainee's progress in the training programme, to document the competencies that are being gained. Evidence of competence will be judged based on a portfolio of documentation, culminating in an ESSR.

Separate ARCP guidance is available on the College website. A copy of all ARCP forms issued to the trainee must be provided to the Royal College of Pathologists prior to recommendation for the award of the CCT. Lack of progress, identified by the issue of an ARCP outcome 3 or 5 and necessitating repeat training to rectify deficiencies will lead to the extension of training. Training leading to the issue of an ARCP outcome 3 or 5 and necessitating repeat training will not be recognised towards the award of the CCT.

The ARCP that takes place 12–18 months before the anticipated CCT date will be used as an opportunity to review the trainee's global progress through the curriculum to identify any gaps or deficiencies in their training that can be rectified during the final year. Highlighted issues can be documented as either mandatory or desirable targets for the final year of training. Progress will be reviewed at the subsequent ARCP, and mandatory targets must be achieved before an ARCP outcome 6 can be issued.

Evidence of ARCP outcome 6 is required as part of the evidence for the award of the CCT.

9.7 Decisions on progress

The decisions made at critical progression points and upon completion of training should be clear and defensible. They must be fair and robust and make use of evidence from a range of assessments, potentially including exams and observations in practice or reflection on behaviour by those who have appropriate expertise or experience. They can also incorporate commentary or reports from longitudinal observations, such as from supervisors or formative assessments demonstrating progress over time.

Periodic (at least annual) review should be used to collate and systematically review evidence about a doctor's performance and progress in a holistic way and make decisions about their progression in training. The ARCP process supports the collation and integration of evidence to make decisions about the achievement of expected outcomes.

Assessment of CiPs involves looking across a range of different skills and behaviours to make global decisions about a learner's suitability to take on particular responsibilities or tasks, as do decisions about the satisfactory completion of presentations/conditions and procedural skills set out in this curriculum. The outline grid in section 9.5 sets out the level of supervision expected for each of the specialty CiPs. The requirements for each year of training are set out in the ARCP decision aid.

The ARCP process is described in the Gold Guide. LETBs/deaneries are responsible for organising and conducting ARCPs. The evidence to be reviewed by ARCP panels should be collected in the LEPT system.

In order to guide trainees, supervisors and the ARCP panel, the College has produced an ARCP decision aid, which sets out the requirements for a satisfactory ARCP outcome at the end of each training year and critical progression point. The ARCP decision aid is available on the College website.

9.8 Assessment blueprint

The table below shows the possible methods of assessment for each key area of chemical pathology, cross-referenced to CiPs and to GPC domains. This blueprint is not an exhaustive means of evidencing attainment; it is not expected that every method will be used for each capability. Additional evidence not included in the blueprint may be used to help make a judgement on a trainee's capability.

Syllabus area	CiPs	GPCs	ECE	CbD	Mini-CEX	DOPS	FRCPath
Laboratory	1, 2, 3, 4, 5, 6, 7, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓	✓	✓
Genetics and genomics	1, 2, 3, 5, 7, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Proteins and proteomics	3, 5, 7, 8, 10	1, 2, 3, 4, 5, 6, 7, 9	✓	✓	✓	✓	✓
Enzymes and metabolomics	3, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓	✓	✓
Endocrinology	3, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Diabetes mellitus	1, 2, 3, 8, 10, 11	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Nutrition	1, 2, 3, 4, 8, 9, 10, 11	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Inborn errors of metabolism	1, 2, 3, 4, 5, 8, 9, 10, 11	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Haemoglobin and disorders of red cell enzymes	2, 4, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓			✓
Assessment and management of cardiovascular risk	1, 2, 3, 4, 8, 9, 10, 11	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Cardiac disease	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Disorders of calcium metabolism	3, 4, 8, 10, 11	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Water and electrolytes	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Blood gases and acid-base balance	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Respiratory system	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Liver	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Kidney and urogenital tract	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Gastrointestinal system	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Screening	1, 2, 3, 4, 5,	1, 2, 3, 4, 5,	✓	✓	✓	✓	✓

	7, 8, 10	6, 7, 8, 9					
Pregnancy	2, 3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Neonates and childhood	2, 3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
Cancer	2, 3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓		✓
CNS/neuromuscular	3, 4, 8, 10	1, 2, 3, 4, 5, 6, 7	✓	✓	✓		✓
Toxicology	2, 3, 4, 7, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓	✓	✓
Therapeutic drug monitoring	2, 3, 4, 7, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9	✓	✓	✓	✓	✓

KEY

ECE	Evaluation of clinical/management events
CbD	Case-based discussion
FRCPPath	Fellowship examination of the Royal College of Pathologists
Mini-CEX	Mini clinical evaluation exercise
DOPs	Direct observation of practical skills

9.9 Supervision and feedback

Specialty training must be appropriately delivered by the senior medical and scientific staff on a day-to-day basis under the direction of a designated educational supervisor and a Specialty Training Committee that links to the appropriate Postgraduate Deanery.

Educational supervision is a fundamental method for delivering teaching and training in the NHS. It takes advantage of the experience, knowledge and skills of educational supervisors/trainers and their familiarity with clinical situations. It ensures interaction between an experienced clinician and a doctor in training. This is the desired link between the past and the future of medical practice, to guide and steer the learning process of the trainee. Clinical supervision is also vital to ensure patient safety and the high-quality service of doctors in training.

The College expects all doctors reaching the end of their training to demonstrate competence in clinical supervision before the award of the CCT. The College also acknowledges that the process of gaining competence in supervision starts at an early stage in training with foundation doctors supervising medical students and specialty registrars supervising more junior trainees. The example provided by the educational supervisor is the most powerful influence on the standards of conduct and practice of a trainee.

The role of the educational supervisor is to:

- have overall educational and supervisory responsibility for the trainee in a given post
- ensure that the trainee is familiar with the curriculum relevant to the year/stage of training of the post
- ensure that the trainee has day-to-day supervision appropriate to their stage of training

- ensure that the trainee is making the necessary clinical and educational progress during the post
- ensure that the trainee is aware of the assessment system and undertakes it according to requirements
- act as a mentor to the trainee and help with both professional and personal development
- agree a training plan (formal educational contract) with the trainee and ensure that an induction (where appropriate) has been carried out soon after the trainee's appointment
- discuss the trainee's progress with each trainer with whom a trainee spends a period of training
- undertake regular formative/supportive appraisals with the trainee (two per year, approximately every six months) and ensure that both parties agree to the outcome of these sessions and keep a written record
- regularly inspect the trainee's training record, inform trainees of their progress and encourage trainees to discuss any deficiencies in the training programme, ensuring that records of such discussions are kept
- keep the STC chair informed of any significant problems that may affect the individual's training.

In order to become an educational supervisor, a consultant must have a demonstrated interest in teaching and training and appropriate access to teaching resources, be involved in and liaise with the appropriate regional training committees and be involved in annual reviews and liaise closely with the TPD. The deaneries organise extensive training programmes for educational supervisors' development. Educational supervisors must keep up to date with developments in postgraduate medical training (e.g. by attending deanery and national training the trainer courses), have access to the support and advice of their senior colleagues regarding any issues related to teaching and training, and keep up to date with their own professional development.

10. Curriculum review and updating

The curriculum will be evaluated and monitored by the Royal College of Pathologists as part of continuous feedback from STCs, heads of schools, training programme directors, trainers and trainees. Additionally, the Curriculum Working Group responsible for designing the curriculum will continue to meet on a twice-yearly basis in order to monitor the implementation of the curriculum and the new suite of workplace-based assessments and to discuss any issues that may arise.

The curriculum will be reviewed in the first instance by the Chemical Pathology CSTC within two years of implementation. In reviewing the curriculum, opinions will be sought from the College's Clinical Biochemistry Specialty Advisory Committee (SAC), the Trainees Advisory Committee, the College Lay input, and College Fellows and Registered Trainees. Any significant changes to the curriculum will need the approval of the Royal College of Pathologists' Council and the GMC.

11. Transitional arrangements

With the exception of trainees in the final year of training prior to the award of the CCT, all chemical pathology (metabolic medicine) trainees who meet the entry requirements for this curriculum will transfer to this curriculum unless they do not meet the entry requirements. In this instance, such trainees must transfer to the transitional chemical pathology curriculum.

Trainees in the final year of training will remain on their current curriculum. Such trainees would normally be expected to have already achieved FRCPATH Part 2 by examination.