

Chemical pathology

Chemical pathologists are qualified doctors who combine practical laboratory and clinical skills. They use biochemical laboratory tests to diagnose disease and to manage patients. Chemical pathologists have a detailed understanding of biochemical processes and changes that occur in disease.

This page provides useful information on the nature of the work, the common procedures/interventions, sub-specialties and other roles that may interest you.



Nature of the work

Chemical pathologists have two main roles. The first is to run and manage the biochemistry laboratory. Hundreds of samples are analysed each day for testing. The tests can be very wide-ranging but might include measurement of:

- electrolytes (minerals) in the blood, to indicate heart and other diseases
- liver function
- tumour markers

Sample analysis is often performed by automated analysers, which are usually operated by biomedical

scientists. Chemical pathologists manage the processes and the laboratory staff. They provide guidance on the selection of appropriate tests, and assess the significance of the results. This is particularly the case with more unusual tests. They also provide quality assurance [1] as part of their strategic leadership role.

The second role is clinical - chemical pathologists don't spend all their time in the laboratory. They have an important role working alongside patients who have metabolic [2] disturbances, relating to the body's internal chemistry. Chemical pathologists have direct responsibility for these patients, who may be seen on the wards or in outpatient clinics.

Chemical pathologists also work closely with GPs who often request tests. They also liaise with a wide range of hospital colleagues, providing expert guidance where necessary.

They also work very closely with endocrinologists, to oversee specialist tests and help with the development and interpretation of hormone tests.

Chemical pathologists generally work with adult patients, although some with a paediatric background see children.

Metabolic [2] Medicine

Inherited metabolic [2] disease (IMD) is a genetic inherited disorder of the metabolism. It can lead to a dangerous imbalance of chemicals in the body and ultimately organ damage and disabilities.

In the UK 600 children are born each year with IMD and 20,000 adults and children live with this.

One of the most common IMD condition is phenylketonuria or PKU. Sufferers are unable to break down the amino acid phenylalanine which then builds up in the blood and brain and causes brain damage resulting in severe learning disabilities.

Newborn babies are routinely screened for this disease via a heel-prick test given after birth. If PKU is indicated further tests will be carried out by the chemical pathologist. They are then given a special low-protein diet and amino acid supplements to prevent brain damage. Providing advice to pregnant women with PKU is an important part of the work.

We also have role pages for metabolic medicine [3].

"I particularly enjoy applying clinical biochemistry directly to patient care" Dr Andrew Day is a consultant chemical pathologist at Bristol Royal Infirmary. He is also director of examinations at the Royal College of Pathologists.

Read Andrew's story [4]

Common procedures/interventions

As well as running tests and seeing patients chemical pathologists may develop particular skills in one area of biochemistry, offering tests and advice over a wide geographical area.

They also develop relationships with GPs, helping them understand and utilise tests in better ways.

New diagnostic tests allow for more specific diagnosis, and opportunities abound to assess the efficacy of new tests. Chemical pathologists also have an important role to play in the development of new tests which allow for more specific diagnosis and improve the lives of patients.

Sub-specialties

Metabolic medicine [3] is the only sub-specialty within chemical pathology. It includes the following clinical areas:

- nutrition, including total parenteral nutrition [5] (TPN) for intravenous feeding and nutrition following gastric surgery
- cardiovascular [6] risk
- diabetes mellitus
- metabolic [2] bone disease , eg osteoporosis
- inherited metabolic [2] disease (IMD)

What to learn more?

Find out about:

- the working life [7] of a chemical pathologist
- the entry requirements [8] [9]needed
- a first-hand account of life as a consultant in chemical pathology [4]

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| Pay and conditions | Expand / collapse |
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This section provides useful information about the pay for junior doctors (doctors in training), SAS doctors (specialty doctors and associate specialists) and consultants.

Find out more about the current pay scales for doctors [10], and there's more information on the BMA website [11].

NHS employers [12] provides useful advice and guidance on all NHS pay, contracts terms and conditions.

Medical staff working in private sector hospitals, the armed services or abroad will be paid on different scales.

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| Where the role can lead | Expand / collapse |
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Read about consultant and non-consultant roles in chemical pathology, flexible working and about wider opportunities.

Consultant roles

You can apply for consultant roles six months prior to achieving your Certificate of Completion of Training [13] (CCT [14]). You will receive your CCT [14] at the end of your chemical pathology

training.

Managerial opportunities for consultants include:

- clinical lead - lead NHS consultant for the team
- clinical director - lead NHS consultant for the department
- medical director - lead NHS consultant for the Trust

Most NHS consultants will be involved with clinical and educational supervision of junior doctors.

Here are some examples of education and training opportunities:

- director of medical education - the NHS consultant appointed to the hospital board who is responsible for the postgraduate medical training in a hospital. They work with the postgraduate dean to make sure training meets GMC standards.
- training programme director - the NHS consultant overseeing the education of the local cohort of trainee doctors eg foundation training [15] programme director. This role will be working within the Local Education Training and Board (LETB)/deanery
- associate dean - the NHS consultant responsible for management of the entirety of a training programme. This role will be also be working within the LETB/deanery

SAS doctor roles

There are also opportunities to work at non-consultant level, for example as a SAS (Specialist and Associate Specialist) doctor. SAS doctors are non-training roles where the doctor has at least four years of postgraduate training, two of those being in a relevant specialty. Find out more about SAS doctors roles. [16]

Other non-training grade roles

These roles include:

- Trust grade
- Clinical fellows

Flexible working

There are opportunities for flexible training and working arrangements.

Academic pathway

If you have trained on an academic chemical pathology pathway or are interested in research there are opportunities in academic medicine.

For those with a particular interest in research, you may wish to consider an academic career in chemical pathology. Whilst not essential, some doctors start their career with an Academic Foundation post. This enables them to develop skills in research and teaching alongside the basic competences in the foundation curriculum.

Entry into an academic career would usually start with an Academic Clinical Fellowship (ACF) and may progress to a Clinical Lectureship (CL). Alternatively some trainees that begin with an ACF post then continue as an ST trainee on the clinical programme post-ST4.

Applications for entry into Academic Clinical Fellow posts are coordinated by the National Institute for Health Research Trainees Coordinating Centre (NIHRTCC). [17]

There are also numerous opportunities for trainees to undertake research outside of the ACF/CL route, as part of planned time out of their training programme. Find out more about academic medicine [18]. [19]

The Clinical Research Network [20](CRN) actively encourages all doctors to take part in clinical research.

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Job market and vacancies

This section provides useful information about the availability of jobs, how to find vacancies and sources of further information.

Job market information

At present there are 116 chemical pathology consultants and 32 medical registrars in England (NHS Digital 2016 [21]). There are no available competition ratios for chemical pathology itself. (Also see metabolic medicine [3], a sub-specialty of chemical pathology).

This is a very small specialty and recruitment might not take place every year – at present no statistics are available on competition ratios.

On this section we have information for England only. For information regarding Scotland, Wales and Northern Ireland please click on the links below.

[NHS Scotland workforce information \[22\]](#)

[NHS Wales workforce information \[23\]](#)

[Northern Ireland workforce information \[24\]](#)

Where to look for vacancies

Chemical pathology training is open to those who may want to train flexibly on a less than full-time [25]basis (LTFT). You can request and apply for this after you have been offered the job. Restrictions apply.

Specialist recruitment for chemical pathology is organised by Health Education East Midlands.

Registration and applications for chemical pathology training is online via Oriel [26].

Northern Ireland has its own recruitment process. For further details please visit the Northern Ireland Medical and Dental Training Agency [27] website.

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Further Information

Organisations

The Association for Clinical Biochemistry [28]

British Inherited Metabolic Disease Group [29]

British Medical Association [30]

BMJ Careers [31]

General Medical Council [32]

Heart UK [33]

Royal College of Pathologists [34]

Royal College of Physicians [35]

Society for the Study of Inborn Errors of Metabolism [36]

The Pathological Society of Great Britain and Ireland [37]

Video case-studies

Interview with a consultant chemical pathologist (HEWM) [38]

Other roles that may interest you

- Endocrinology and diabetes [39]
- Microbiology (healthcare scientist) [40]
- Haematology (doctor) [41]
- Histopathology (doctor) [42]

Source URL: <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/pathology/chemical-pathology>

Links

[1] https://www.healthcareers.nhs.uk/glossary#Quality_assurance

[2] <https://www.healthcareers.nhs.uk/glossary#Metabolic>

[3] <https://www.healthcareers.nhs.uk/explore-roles/medicine/metabolic-medicine>

[4] <https://www.healthcareers.nhs.uk/explore-roles/pathology/chemical-pathology/real-life-story-andrew-day>

[5] https://www.healthcareers.nhs.uk/glossary#Parenteral_nutrition

[6] <https://www.healthcareers.nhs.uk/glossary#Cardiovascular>

[7] <https://www.healthcareers.nhs.uk/explore-roles/pathology/chemical-pathology/working-life>

[8] <https://www.healthcareers.nhs.uk/explore-roles/pathology/chemical-pathology/entry-requirements-skills-and-interests>

[9] <https://www.healthcareers.nhs.uk/explore-roles/pathology/chemical-pathology/training-and-development>

[10] <https://www.healthcareers.nhs.uk/about-us/careers-medicine/pay-doctors>

[11] <http://bma.org.uk/practical-support-at-work/pay-fees-allowances/pay-scales>

[12] <http://www.nhsemployers.org/>

[13] https://www.healthcareers.nhs.uk/glossary#Certificate_of_completion_of_training

[14] <https://www.healthcareers.nhs.uk/glossary#CCT>

[15] https://www.healthcareers.nhs.uk/glossary#Foundation_training

- [16] <https://www.healthcareers.nhs.uk/i-am/currently-working-health/information-doctors/sas-doctors>
- [17] <https://www.nihr.ac.uk/about-us/how-we-are-managed/managing-centres/about-the-trainees-coordinating-centre.htm>
- [18] http://www.medicalcareers.nhs.uk/career_options/academic_medicine.aspx
- [19] <https://www.healthcareers.nhs.uk/i-am/currently-working-health/clinical-academic-careers/clinical-academic-medicine>
- [20] <http://www.crn.nihr.ac.uk/>
- [21] <http://content.digital.nhs.uk/searchcatalogue?productid=23451&topics=2fWorkforce%2fStaff+numbers%2f>
- [22] <http://www.isdscotland.org/Health-Topics/Workforce/Medical-and-Dental/>
- [23] <https://statswales.wales.gov.uk/Catalogue/Health-and-Social-Care/NHS-Staff/Medical-and-Dental-Staff>
- [24] <https://www.health-ni.gov.uk/articles/staff-numbers>
- [25] <https://www.healthcareers.nhs.uk/i-am/currently-working-health/information-doctors/less-full-time-training-doctors>
- [26] <https://www.oriel.nhs.uk/Web/>
- [27] <http://www.nimda.gov.uk/>
- [28] <http://www.acb.org.uk/>
- [29] <http://www.bimdg.org.uk/site/index.asp>
- [30] <http://www.bma.org.uk>
- [31] <http://careers.bmj.com/>
- [32] <http://www.gmc-uk.org/>
- [33] <http://heartuk.org.uk/>
- [34] <http://www.rcpath.org>
- [35] <http://www.rcplondon.ac.uk>
- [36] <http://www.ssiem.org/home/welcome.asp>
- [37] <https://www.pathsoc.org/>
- [38] <http://www.westmidlandsdeanery.nhs.uk/SpecialtySchools/PostgraduateSchoolofPathology/ChemicalPathologyMeta>
- [39] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/endocrinology-and-diabetes>
- [40] <https://www.healthcareers.nhs.uk/explore-roles/healthcare-science/roles-healthcare-science/life-sciences/microbiology>
- [41] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/pathology/haematology-doctor>
- [42] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/pathology/histopathology-doctor>