



Careers in
pathology
for medical
students



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

What is pathology?

Pathology is the branch of medicine concerned with the cause of disease and the study of disease processes. It bridges science and medicine and underpins every aspect of medicine, from diagnostic testing to cutting-edge genetic technologies.

Whenever someone has a blood test, a cervical smear or a lump removed, it will be a pathologist who looks at the specimen to work out if there's any disease present. Millions of pathology tests are carried out every year — over 14 tests each year for every man, woman and child in the country. This vital investigative work in teasing out an accurate diagnosis is needed by physicians and surgeons to guide them in treatment decisions, making pathology the science behind the cure and a key player in patient care.

The Misconceptions

- Pathologists work with the dead.
- Pathologists do repetitive and isolated work, confined to the lab in the bowels of the hospital.
- Pathologists are non-communicative, social misfits.

The Reality

- Forensic pathology is just one branch of pathology; the vast majority of pathologists investigate samples taken from living patients.
- Pathology offers a wide variety of disciplines — there are 18 in total and each has its own training programme and exams. Information about the four largest specialties is given on the following pages.
- Pathology services are provided by teams in a variety of practice settings. Some specialties are largely lab-based, others also involve working on hospital wards and in outpatient clinics.
- Pathology is intellectually challenging. Excellent communication skills are essential for effective communication between colleagues and in clinical multidisciplinary team meetings.
- Unlike in some medical specialty training, in pathology you follow the specialty of your choice from completion of foundation training.
- Most pathologists work family friendly hours; weekend duties, 'on-call' and night shifts are the exception rather than the rule.



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As a boy I was fascinated by how things work and why they go wrong. Toys, bicycles, radios, engines, I took them all apart. Sometimes I even got them back together and working again. At university, I realised this is what pathology does for medicine; laboratory investigation of what's gone wrong. Dissecting disease. Quite often you're responsible for curing the patient. After that my choice of career was obvious, and I've never regretted it for an instant.”

Professor Peter Furness
President
The Royal College of Pathologists

Histopathology

Histopathology is the study of the changes caused by disease in human tissue. Using sophisticated microscopes and a trained eye, histopathologists examine stained tissues and cells taken from patients in the clinic or at operation. From this, the histopathologist decides whether disease is present and, if so, he/she can advise on prognosis and best management.



What's it like?

As a histopathology trainee, I'm closely involved with patient care. My daily work can be split into diagnosis, research and autopsies. The diagnostic side involves teamwork with other doctors who care for patients with cancer and other diseases. My role is to diagnose whether someone has

a particular disease, and I do this by looking at tissue or cell samples from patients under the microscope. Pathology has a lot in common with art. Diagnosing cancer in a biopsy is a bit like recognising which artist painted a picture—it's a combination of good pattern recognition and experience. The research work pathologists undertake is crucial for the advancement of patient care. Pathologists have won Nobel prizes for the contribution of their research to society. Autopsies are similar to detective work—working out what killed someone, which in turn improves the way patients are cared for in hospitals and the community. Some pathologists specialise in one of these areas, others do a mixture of all the different types of work.

Histopathology is a rewarding and challenging career that is well respected. Good communication skills are essential, as pathologists work in teams, teach other doctors and students, and have patient contact in clinics or on the ward. The typical working day is from 8 am until 5 pm, Monday to Friday, leaving us free to pursue other interests and see friends and family in the evenings and at weekends. As trainees, pathologists learn how to recognise different diseases under the microscope and how to perform autopsies. Some trainees get the opportunity to undertake a research degree, or train in education. Training is fun, with several trainees working together in a hospital.

Dr Maesha Deheragoda, SpR



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Histopathology attracted me as a medical specialty because it gets to the core of the patient's illness. It gives a diagnosis and provides prognostic information for appropriate clinical management. A career that is intellectually satisfying, involves working as part of laboratory and clinical multidisciplinary teams, and is of great benefit to patients. Would I choose it if I were starting over again — a very definite YES!
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Dr Derek Allen
Consultant Pathologist

Clinical Biochemistry (Chemical Pathology)

Clinical biochemistry is concerned with the biochemical investigation of bodily fluids, e.g. blood, cerebrospinal fluid and urine, to diagnose diseases in which the body's chemistry is altered. The clinical biochemist will be involved in lab management, hands-on lab work, advising clinicians on appropriate tests and result interpretation, and treatment of patients with, for example, cancer, diabetes, renal failure and heart problems.



What's it like?

Poisoning with anti-freeze, diagnosis of hypopituitarism, investigating possible porphyria – these are just some of the problems you may be dealing with. This is scientific medicine at its best, with the attraction of seeing a patient in the clinic, arranging the biochemical investigations, interpreting the results

yourself and then seeing the patient again and organising their treatment. The satisfaction of playing a part in every step of the process is immense and one of the best parts of the job.

But what does a chemical pathologist actually do with their day? The core job involves clinical validation – interpreting and commenting on test results, and providing advice to clinicians on subsequent investigation. Clinical work is usually outpatient based, and there is the option of subspecialty training in metabolic medicine. Chemical pathologists usually end up running the whole Biochemistry department as a consultant, and so management skills are also key to success. Opportunities abound for developing special interests, and the speciality is by its nature academically inclined. All trainees will undertake a research project for the FRCPath, and there are ample openings to pursue a PhD. Out-of-hours commitments are generally light, with most being done from home, although weekends may require you to be in the lab.

So you'll need a good eye for detail, be able to deal with a wide range of laboratory and clinical problems, and have excellent communication skills to succeed. Almost every specialty uses the Biochemistry lab, and they'll all come to you when they don't know what the biochemistry means. Just don't expect too many bottles of wine at Christmas!

Dr Duncan Cole, SpR



I love detective stories and certainly clinical biochemistry requires you to have good detective skills! That is probably why I chose it as a career. Almost every clinical condition has an underlying clinical biochemical abnormality. A career in clinical biochemistry offers huge opportunities in many different areas that will improve patient care: work in the lab, direct patient contact in the clinic and on the wards, and teaching, often 'on the job'.



Dr Danielle Freedman
Consultant Chemical
Pathologist

Haematology

Haematologists are experts in diseases of the blood — anaemias, leukaemias, haemophilias and bone marrow diseases. They have both clinical and laboratory responsibilities. The doctor who manages the patient with a blood disorder and the doctor who examines that patient's bone marrow under the microscope are one and the same. Haematologists also supervise blood transfusions.



What's it like?

I love being able to combine my training in patient care with my academic and laboratory skills. When a patient with suspected leukaemia is referred, I assess them at the bedside, sample blood and bone marrow, examine and interpret these samples myself, and discover the likely

diagnosis. Working with a team of consultants, pharmacists and specialist nurses, I can devise and deliver a package of care, including counselling as to diagnosis and treatment options, and selection and delivery of the best available chemotherapy. This can all be achieved in an exhausting but rewarding few hours!

The clinical practice of haematology can provide great personal fulfilment. Patients are faced with life-threatening, complex illnesses. Managing such emotionally intense scenarios, while striving to provide clear and objective guidance, is a phenomenal challenge.

Haematologists are trained to employ a cognitive approach, appraising evidence from laboratory and clinical trials, to solve patient problems. Haematology has a successful pedigree in this respect, resulting in more effective and safer treatments. The pace of change is so rapid that I regularly see patients directly benefitting from treatments developed in the past 5 years. This has inspired me to spend 3 years as a clinical research fellow.

Training lasts many years, but with inspirational patients and teachers, and a rapidly advancing field, I have never felt this was a disadvantage. The huge variety of work adds to the enjoyment. If you want to work in an exciting scientific field, with the emotional and practical challenges of delivering care to seriously ill patients, then I would recommend a career in haematology.

Dr Simon Hallam, Clinical Research Fellow



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A career in haematology is great for doctors who want to combine lots of direct patient contact with scientific and laboratory work. Unlike almost any other discipline, the haematologist can use his/her laboratory skills, such as looking at blood and bone marrow slides, on a daily basis to diagnose and monitor the treatment of the patients they look after in the ward or clinic.
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Dr Derek Norfolk
Consultant Haematologist

Medical Microbiology

The microbiologist diagnoses, advises on the treatment of and controls the spread of infection, e.g. bacteria, viruses and fungi, both in the hospital and the community setting. It is a microbiologist who will be at the heart of the investigation of any infection outbreak, immunisation campaign or advice on judicious use of antibiotics.



What's it like?

Forget the picture of the reclusive microbiologist, holed up in his lab all day peering down a microscope. Microbiology is both a clinical and scientific specialty, combining the medical skills of history, examination and clinical reasoning with the scientific processes involved in

laboratory investigation and diagnosis.

How do we go about doing this? A typical day might start by joining a multidisciplinary team ward round, e.g. on ITU. As microbiologists we are valued members of many teams where infections are common and may be life threatening. It's then off to the lab to find out this morning's positive culture results, and then spend time reviewing patients we are concerned about on the wards and discussing their management plans with their teams. Every ward in the hospital requires input from us at some point, making for very interesting case mixes from different specialties. It's also as important to us to prevent infection as to treat it, and we work closely with the Infection Prevention and Control teams and visit any areas with problems to give advice. Microbiology is a great specialty if you enjoy teaching. It's often a subject people lack confidence in and because infection affects all disciplines, people are always eager to learn more. It's also a great area in which to conduct research and audit, as the bugs are quick to outsmart us and there are always rapid developments, especially in drug development, to keep track of.

Contrary to popular belief, infection doesn't only occur between 9 and 5 and we do provide a 24-hour service for both microbiology and infection prevention and control advice. We are largely able to provide this from home however, so the out of hours commitment is not onerous. Training is varied, interesting and fun. I've never looked back!

Dr Ali Hames, SpR



“Of the many things that attracted me to the specialty, the fact that you can really cure people of infections was an impressive one. Most other specialties manage, palliate and control disease, but cure? Not that often. The other thing that makes microbiology great is that sometimes you get to be a detective on a treasure hunt – finding the source of infection and stopping it. Don't get me wrong, the detective thing doesn't happen that often, but when it does... Also they keep finding new infections – avian and swine flu, SARS. And the old infections keep coming back – TB, puerperal fever, measles. All this means you have to keep on your toes and be very up to date.”

Professor John Croall
Consultant Microbiologist

Research

Pathology is not just about testing and diagnosis; it is also at the forefront of medical research with many of the major advances in clinical and surgical practice made as a result of work carried out by pathologists. Major advances have been made in understanding disease and developing treatments: ensuring safe blood transfusion, developing vaccines against major infections, managing the immune system for successful organ transplants, and pinpointing the genetic causes of disease.

Examples of recent advances

- By showing that involved margins in bowel cancer correlated with poor survival, a change in surgical technique across the world has improved survival at 5 years from 40% to 65–70%.
- The development of point-of-care testing has given patients the convenience of rapid monitoring of their condition without the need to attend hospital.
- Haemolytic disease of the fetus and newborn was once a devastating disease affecting fetuses of Rhesus-negative women. Thanks to the development of blood typing tests and effective maternal treatments, the past 30 years has seen its virtual eradication.
- The firm belief until the 1980s was that bacteria could not survive in the acid environment of the stomach. The persistence of one pathologist to confirm the presence of bacteria in gastric biopsies, led to the identification of *Helicobacter pylori* and a cure and prevention for peptic ulcers with the simple introduction of antibiotics.

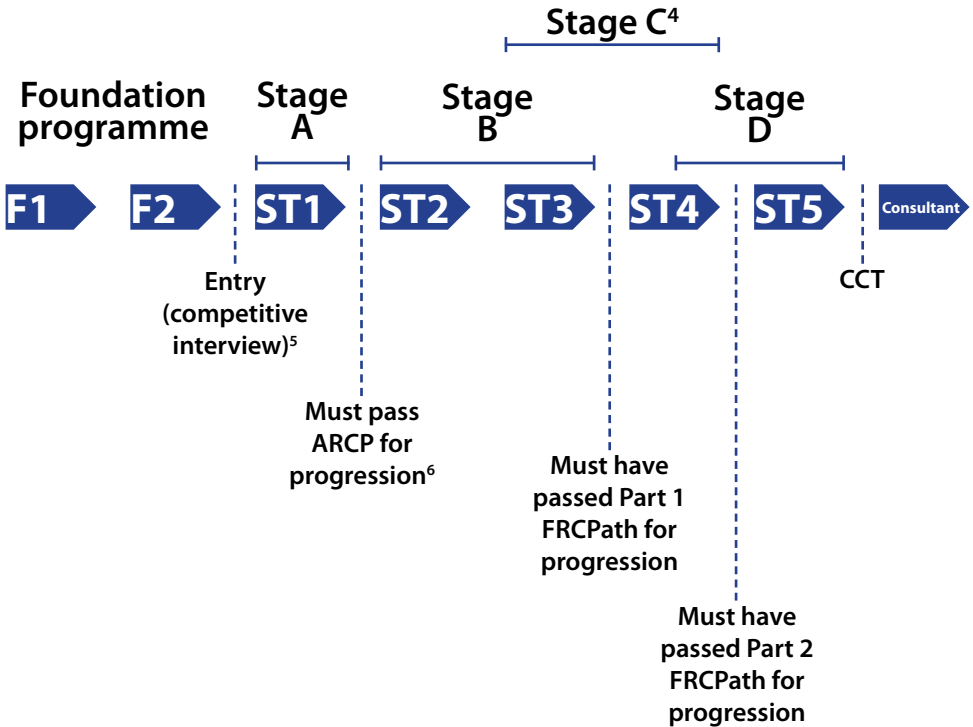


Run-through training

Histopathology¹

Clinical Biochemistry²

Medical Microbiology/Virology³



¹Plans awaiting (November 2009) PMETB approval to extend training to 5½ years if opting for one of three modules: autopsy, cervical cytology or research methodology.

²At entry to clinical biochemistry, providing you have the MRCP, you can elect for dual training in metabolic medicine as well; the training years are then called ST3–ST7.

³For first 2 years, training pathway between medical microbiology and virology is shared.

⁴Specialist training: either general histopathology, or subspecialty training in cytopathology, forensic pathology, neuropathology or paediatric pathology.

⁵Entry is also possible from clinical training.

⁶ARCP also at end of each subsequent year of training.

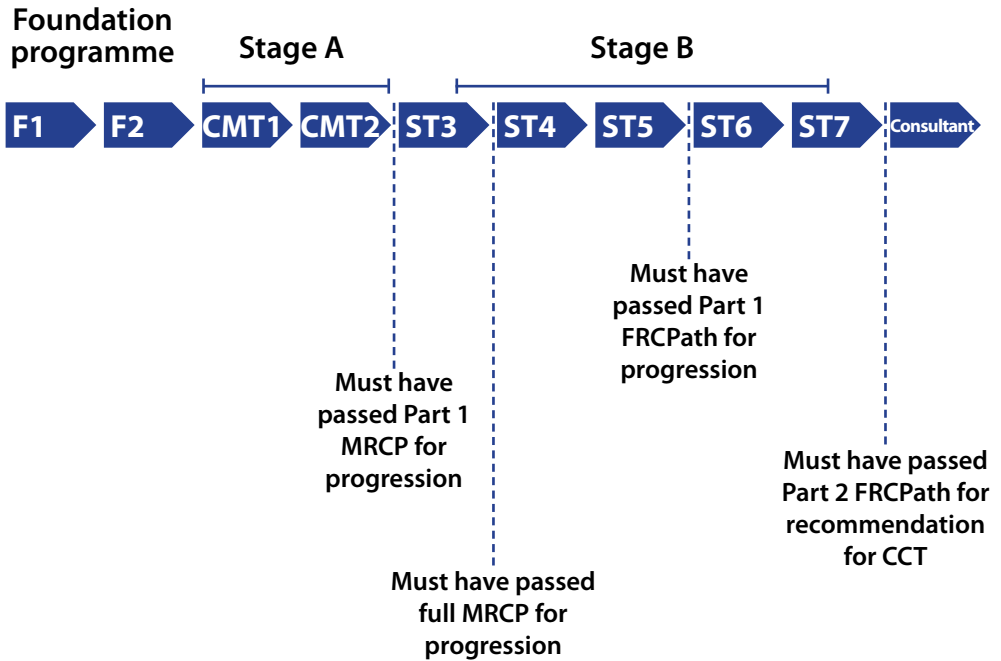
ARCP = Annual Review of Competence Progression

ST = Specialist Training

CCT = Certificate of Completion of Training

Run-through training

Haematology¹



¹From August 2011, full MRCP required at end CMT2 for progression into specialty training.

CMT = Core Medical Training

ST = Specialist Training

Career opportunities

Trainees are assessed after the first year, and providing they demonstrate the necessary aptitude for the job, there is an almost guaranteed training placement for years 2–5. Thereafter, promotion is often quick and there are plenty of opportunities for flexible working. Good quality trainees are likely to be successful in gaining senior posts, particularly if they are flexible in adapting their offered specialisms to those needed by prospective employers.

Consultant and trainee numbers

| | Trainees* | Consultants** |
|-----------------------|-----------|---------------|
| Histopathology | 490 | 1448 |
| Clinical biochemistry | 85 | 212 |
| Haematology | 313 | 864 |
| Microbiology | 155 | 585 |

*June 2009

**Medically qualified 2006/2007 (last census)



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I was drawn to immunology because it involved an entire system, rather than a single organ. It also had the advantage that there are both clinical and laboratory aspects to a career in immunology, and now my typical week involves both laboratory work as well as seeing patients in the clinic. A further advantage is that many new interventions in medicine are immunologically-based, from monoclonal antibodies to gene therapy, so it always feels that practice in immunology is very futuristic.

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Professor Carrock Sewell
Consultant Immunologist

Interested?

- Most importantly, focus on completing the Foundation Training Years satisfactorily, as this is a compulsory condition for entering the training programme.
- If you are certain that Pathology is your career option, try and obtain a 4-month rotation to Pathology during your F2 year.
- If you are just considering Pathology as a possible option, try and organize an 'embedded taster' with the Pathology department in your hospital. This can last up to 10 days and will give you a very good idea of the daily work involved and of the training opportunities.
- The interview to get into the programme is competitive, so you do need to be prepared. You do not need to have any previous experience of Pathology, but you do need to show passion and commitment to the specialty. The embedded taster provides you with a great opportunity to understand the system, get involved in presenting an interesting case, write a short article or even do an audit project.



Further information

The Royal College of Pathologists

2 Carlton House Terrace is the home of the Royal College of Pathologists, a professional membership organisation with charitable status, concerned with all matters relating to the science and practice of pathology.

The College was founded in 1962 and received its Royal Charter in 1970. College Fellows work mostly in hospitals, universities and industry. The College Fellowship includes several Nobel Laureates. Information about the work of the College can be found at www.rcpath.org.

For further information

To find out more about a career in pathology, please visit The Royal College of Pathologists' website at www.rcpath.org.

For more details about pathology training, please contact the College Training and Educational Standards Manager on training@rcpath.org or 020 7451 6741.

