CAREERS IN RADIOTHERAPY

RADIOTHERAPY PHYSICS

Clinical Scientists
Clinical Technologists
Clinical Engineers

EAST OF ENGLAND RADIOTHERAPY NETWORK

WHAT ARE CLINICAL SCIENTISTS, CLINICAL TECHNOLOGISTS AND CLINICAL ENGINEERS?

Clinical Scientists
Clinical Scientists work closely with other healthcare professionals in research, development, testing and maintenance of specialist medical equipment. They play a central role in developing, planning and implementing patient treatment programmes.

Clinical Technologists (dosimetrists)
Clinical Technologists (also known as healthcare science practitioners) are responsible for planning an individual patient's treatment, using complex computer algorithms.

Clinical Technologists (engineers)
Clinical Engineers are responsible for the maintenance, fault-finding and repair of radiotherapy machines and systems.

GLOSSARY

AfC - Agenda for Change. The pay scale and conditions for most professionals in the NHS.
CPD - Continuing Professional Development.
HCPC - Health and Care Professions Council.
IPEM - Institute of Physics and Engineering in Medicine.
PTP - Practitioner Training Programme.
STP - Scientists Training Programme.

QUALIFICATIONS NEEDED

Clinical Scientists

- 5 GCSEs at grades 9 to 4 (A* to C), or equivalent, including English, maths and science
- 2 or 3 A levels, or equivalent, including maths and physics
- A degree that includes a high level of physics, for example, applied physics, physics and mathematics or astrophysics
- An MSc in medical or radiation physics may also be required by some departments

You would then complete one of the following to get registration with the HCPC:

- 3-year STP run by the National School of Healthcare Science
- "Route 2" through in-work training, operated by the Association of clinical scientists, supported by IPEM's clinical scientist guided training scheme
- STP equivalence, operated by the Academy of Healthcare Science

Clinical Technologist (dosimetrist)

- 5 GCSEs at grades 9 to 4 (A* to C) or equivalent, including English, maths and science
- 2 or 3 A levels, or equivalent, including maths and physics
- BSc in Therapeutic Radiography
- Optional: A BSc that includes a high level of physics, for example, applied physics, physics and mathematics or astrophysics

You will be expected to register with the Register of Clinical Technologists by completing one of the following:

- The Clinical Technologist Training Scheme, operated by IPEM.
- Healthcare Science Practitioner degree (Level 6) apprenticeship
- PTP operated by the National School of Healthcare Science.

For universities that offer the PTP please see

Clinical Technologist (Engineering)

- 5 GCSEs at grades 9 to 4 (A* to C), or equivalent, including English, maths, and science
- 2 or 3 A levels, or equivalent, including maths and physics
- Optional: BSc in physics or engineering.

For accredited engineering courses please see

You are also expected to register with the Register of Clinical Technologists using any of the routes above for dosimetrists.

Apprenticeships

Apprenticeships give you the chance to earn a living while gaining your qualification. Your employer and the government will pay the tuition fees, so apprenticeships aren't eligible for student grants.

For more information on appropriate apprenticeships, please scan.

RESPONSIBILITIES

Clinical Scientist

- Commissioning, assessing, and ensuring the safe operation of specialist equipment used by therapeutic radiographers
- Planning and supervising radiotherapy treatment in discussion with other staff
- Processing complex patient image data
- Supporting clinical trials
- Researching new equipment developments and techniques, review existing local practice, advise on procurement of new equipment and compile reports to initiate changes
- Overseeing the quality control of equipment to ensure that correct and consistent results or outputs are achieved and ensure that ongoing maintenance routines are followed
- Lecturing and training other health professionals, including radiographers, nurses and doctors

Clinical Technologists

- Produce routine and complex treatment plans, in accordance with relevant clinical protocols.
- Check that all patient images required to produce treatment plans are available.
- Co-register images from different sources; evaluating the validity of the co-registration.
- Accurately outline anatomical volumes from CT scans for Gross Tumour Volumes and Organs at Risk, where trained.
- Advise clinical staff on the effects of various treatment plan options on patient dose distributions.
- Check treatment plans generated by other staff for accuracy and appropriateness prior to treatment commencing

- Assist with the development of new techniques in conjunction with other staff groups and take an active role in introducing new equipment and clinical techniques

Clinical Engineers

- Monitoring and testing radiotherapy equipment
- Calibrating devices, taking measurements and readings ensuring that equipment and devices are safe to use
- Maintenance, fault finding, and repair of complex radiotherapy machines
- Maintaining accurate records of the condition of specialist medical devices and any safety checks, repairing and tests that have taken place
- Working closely with other professionals (e.g., therapeutic radiographers, nurses and clinical scientists)
- Using software to diagnose, calibrate and repair computer systems used in radiotherapy

SALARY

Clinical Scientists

Trainee Clinical Scientists are usually employed at AfC band 6, once qualified, you're likely to be employed on band 7

Clinical Technologists

Salaries for trainee Clinical Technologists start at band 4 or band 5, depending on qualifications

Experienced Clinical Technologists are typically employed on band 7

Clinical Engineers

Depending on starting qualifications, you can expect to start between band 3 and band 5.

More details about the NHS pay scale and current rates can be found here

CAREER PROSPECTS

With further training and experience you can become involved in:

- further specialisation
- operational management
- work in higher education
- research
- medical equipment manufacturing
- Project Management
- Quality Improvement
- commissioning
- leadership

It's possible to progress through the bands and eventually take up a clinical management post. As the head of a radiotherapy physics department, you'll have responsibility for staff and managing a budget.

WORK EXPERIENCE FOR UNIVERSITY APPLICATION

At your interview, you should have a good understanding of what is involved in radiotherapy physics and are advised to shadow Clinical Scientists in practice before applying for a place at university. This will show your interest in and commitment to, the profession. Experience working in a caring or healthcare environment, either in a paid or voluntary capacity, is also useful.

APPRENTICESHIP DEGREE IN HEALTHCARE SCIENCES

Hear from Freya and Tallulah about their experience

How did you find out about the apprenticeship scheme?

Tallulah: ***I started at university just as Covid hit and all learning moved online. I have dyslexia and being taught through pre-recorded videos is not my learning style, so I left university. I knew I wanted to work in a hospital so I looked at alternative routes to find a job I wanted. I found out about degree apprenticeships and realised their advantage as a debt-free way to get the degree alongside practical experience.***

Freya: ***I have always been interested in doing an apprenticeship due to its hands-on, practical nature. I attended a specialist STEM college where this route was encouraged just as much as going to university was which meant I was very well supported throughout the process. I found my apprenticeship through an online website designed for students looking to start an apprenticeship or placement in a STEM related subject.***

Why were you interested in an apprenticeship Healthcare Sciences?

Tallulah: ***I have always loved science subjects and maths but also have wanted to be in a job where I can help people. Also, it's quite a broad qualification so it gives me the opportunity to really find the area that I want to go into after completing the degree and the experience to back it up.***

Freya: I studied biology, maths and physics at A-Level. Working in Healthcare science, in particular Clinical Engineering, allowed me to use elements from each and apply them to a job. Although my role is more 'behind the scenes', I see patients when moving around the hospital and knowing that the role I take ensures safe and efficient treatment for them is very rewarding.

Why did you choose radiotherapy?

Tallulah: ***While doing A level physics we had an optional module to choose from, and I chose medical physics. I looked at medical physics in more depth and I heard about radiotherapy. I read a bit more and realised it would be a rewarding job helping to plan radiotherapy treatment.***

Freya: ***Choosing a role within the radiotherapy department means that I get the chance to work on some amazing machines and call upon my existing physics knowledge, while providing important treatment to all patients. The radiotherapy department team all work very closely with each other, from radiographers to engineers and technicians, planners and doctors responsible for referrals***

What support is provided by the university and hospital?
Tallulah: ***The university assigned me a tutor. The students had Q+A sessions with her during the first few weeks at university. The hospital has been supportive accommodating my studies and I am allowed to do my study day from home so I can fully focus. I have regular 1-to-1 progress checks with my line manager and also with the university, so I know that if I ever did have a problem there's a support system there.***
Freya: ***Both staff at my hospital and at the university have been excellent in trying to maintain the balance of work-based learning alongside the lectures and university assignments we are given. We are allocated 20% of our contracted working hours to dedicate to our studies.***

What advice would you give to others considering an apprenticeship in healthcare sciences?
Tallulah: ***It's such an amazing opportunity, but it requires hard-work and good time management. Research the different areas of healthcare science you'd be interested in before applying as it's such a broad subject to go into!***
Freya: ***I would say to someone considering an apprenticeship in a Healthcare science field to just go for it. If you have a passion and basic knowledge of the field, it's such a great opportunity to be in a real working environment and develop your practical skills as well as your theory. The earn-as-you-learn alongside the experience you gain provides such a great head start. You can get so much out of an apprenticeship as long as you ask the right questions and are willing to get stuck in!***

FOR MORE INFORMATION.....

RADIOTHERAPY

CLINICAL SCIENTISTS AND TECHNOLOGISTS

CLINICAL ENGINEERS

WORKING IN THE NHS