Imaging (ionising)

Imaging with ionising radiation is an area of healthcare science that includes diagnostic radiology, interventional radiology and nuclear medicine.

As a clinical scientist or technologist working in this area, you'll support clinical staff and advise them on how to produce optimum quality images whilst restricting radiation dose. Your role also includes periodic quality assurance [1] and safety testing of the imaging systems, providing safety advice for a technique or individual patient, teaching and training, the development of image analysis software and more general research and development activities.

All clinical scientists and technologists working with ionising radiation have a role to play in ensuring all uses of x-rays and radioactive materials comply with the applicable legislation.

> "One of the best bits about my job is working with and helping patients. The day I got signed off to administer my first therapy without supervision is still one of the proudest moments of my career."
>
> Read Jessica's story [2]

Overview

You will typically be based within either a radiology, nuclear medicine or medical physics department of a hospital.

> In this area, you'll support clinical staff and advise them on how to produce optimum quality images whilst restricting radiation dose.

Ionising radiation can be used to obtain anatomical and functional information at a lower risk than alternative methods. This information allows doctors to better manage patient care.

Clinical scientists working with ionising radiation may also act as medical physics experts, radiation protection advisers and radioactive waste advisers which are all official roles defined within the legislation surrounding the use of ionising radiation in healthcare.

Imaging using ionising radiation can increase the lifetime risk of cancer for patients and operators. However, the radiation used in healthcare is closely controlled thanks in part to the contribution of clinical scientists and technologists and so whilst working with ionising radiation, exposures to all staff are regulated, continuously measured and kept at a safe level.

Working life

If you work in imaging using ionising radiation, you'll use a range of imaging techniques, including:

- Conventional x-ray imaging – uses x-rays to create a 2D image of part of the patient. Conventional x-ray imaging is widely used in healthcare in hospitals, health centres, some GP surgeries and dentists
- Fluoroscopic x-ray imaging – uses a continuous beam of x-rays to produce a real time image of part of the patient. Fluoroscopy can be used to track barium through a patient or guide a radiologist or cardiologist during an interventional procedure
- Computed tomography (CT) imaging – uses x-rays produced whilst rotating around the patient and sophisticated reconstruction techniques to create cross sectional images of the patient
- Nuclear medicine imaging – radiopharmaceuticals are administered to a patient. After a short period of time, the radiopharmaceutical will have concentrated in the organ of interest. The patient is placed in a gamma camera or Positron Emission Tomography (PET) scanner where the radiation emitting from within the patient is detected externally. Images show where the radiopharmaceutical is within the body, providing important physiological information.

Nuclear medicine staff are also involved in non-imaging applications, such as measuring the Glomerular Filtration Rate (GFR) and red cell mass. They have an important role to play in patient therapies, such as the administration of radioiodine as a treatment of hyperthyroidism or thyrotoxicosis.

Who will I work with?

You will be part of a team that includes radiologists [3], cardiologists [4], diagnostic radiographers [5], clinical technologists [6], nurses [7], assistant practitioners [8] and support staff [9].

Want to learn more?

- Find out more about the entry requirements, skills and interests required to enter a career in ionising imaging [10]
- Find out more about the training you'll receive for a career in ionising imaging [11]

- **Pay and conditions**

Most jobs in the NHS are covered by the Agenda for Change (AfC) [12] pay scales. This pay system covers all staff except doctors, dentists and the most senior managers. As a clinical scientist working in ionising imaging, your salary will be between AfC [13] bands 6 and 9, depending on your role and level of responsibility. Trainee clinical scientists train at band 6 level, and qualified clinical scientists are generally appointed at band 7. With experience and further qualifications, you could apply for posts up to band 9.

Staff will usually work a standard 37.5 hours per week. They may work a shift pattern. Terms and conditions of service can vary for employers outside the NHS.

Where the role can lead

With further training or experience or both, you may be able to develop your career further and apply for vacancies in areas such as further specialisation, management, research, or teaching.

Job market and vacancies

Job market

In November 2018, there were 6,123 clinical scientists registered with the Health and Care Professions Council [14].

The NHS Scientist Training Programme (STP) [15] attracts many more applicants than there are places and so there is considerable competition for places.

Finding and applying for jobs

When you're looking for job vacancies, there are a number of sources you can use, depending on the type of work you're seeking.

Check vacancies carefully to be sure you can meet the requirements of the person specification before applying and to find out what the application process is. You may need to apply online or send a CV for example.

For the STP [16] there is an annual recruitment cycle. Applications usually open in early January for the intake in the following autumn and should be made through the National School of Healthcare Science's website [17], where you can also find information about the programmes and the recruitment process.

Key sources relevant to vacancies in the health sector:

- vacancies in organisations delivering NHS healthcare can be found on the NHS Jobs website [18]

- opportunities in the Civil Service can be found on the Civil Service Jobs website [19]

As well as these sources, you may find suitable vacancies in the health sector by contacting local employers directly, searching in local newspapers and by using the Universal Jobmatch tool [20].

Find out more about applications and interviews [21].

Volunteering is an excellent way of gaining experience (especially if you don't have enough for a specific paid job you're interested in) and also of seeing whether you're suited to a particular type of work. It's also a great way to boost your confidence and you can give something back to the community.

Find out more about volunteering and gaining experience [22].

- ## Further information

For further information aboit working and training in non-ionising imaging, please contact:

- Academy for Healthcare Science [23]
- Health and Care Professions Council [24]
- Institution of Physics and Engineering in Medicine [25]
- National School of Healthcare Science [17]

Other roles that may interest you

- Imaging (non-ionising) [26]
- Diagnostic radiographer [27]
- Clinical radiology [28]
- Radiotherapy physics [29]

Links
[1] https://www.healthcareers.nhs.uk/glossary#Quality_assurance [2] https://www.healthcareers.nhs.uk/explore-roles/physical-sciences-and-biomedical-engineering/imaging-ionising/real-life-story-jessica-johnson [3] https://www.healthcareers.nhs.uk/explore-roles/clinical-radiology [4] https://www.healthcareers.nhs.uk/explore-roles/medicine/cardiology%20 [5] https://www.healthcareers.nhs.uk/explore-roles/allied-health-professionals/radiographer-diagnostic [6] https://www.healthcareers.nhs.uk/explore-roles/physical-sciences-and-biomechanical-engineering/clinical-technologist [7] https://www.healthcareers.nhs.uk/explore-roles/nursing [8] https://www.healthcareers.nhs.uk/explore-roles/clinical-support-staff/assistant-practitioner [9] https://www.healthcareers.nhs.uk/explore-roles/administration [10] https://www.healthcareers.nhs.uk/explore-roles/physical-sciences-and-biomedical-engineering/imaging-ionising/entry-requirements-skills-and-interests-ionising [11] https://www.healthcareers.nhs.uk/explore-roles/physical-sciences-and-biomedical-engineering/imaging-ionising/training-development-and-

registration-ionising [12] https://www.healthcareers.nhs.uk/about/careers-nhs/nhs-pay-and-benefits/agenda-change-pay-rates [13] https://www.healthcareers.nhs.uk/glossary#AfC [14] http://www.hcpc-uk.org [15] https://www.healthcareers.nhs.uk/i-am/considering-university/not-studying-health-related-degree/nhs-scientist-training-programme [16] https://www.healthcareers.nhs.uk/i-am/considering-or-university/not-studying-health-related-degree/nhs-scientist-training-programme [17] http://www.nshcs.hee.nhs.uk/ [18] http://www.jobs.nhs.uk [19] https://www.civilservicejobs.service.gov.uk/csr/index.cgi [20] https://www.gov.uk/jobsearch [21] https://www.healthcareers.nhs.uk/career-planning/offering-career-support/training-and-teaching-resources-young-people/application [22] https://www.healthcareers.nhs.uk/i-am/secondary-school-or-fe-college/gaining-experience [23] http://www.ahcs.ac.uk [24] http://www.hcpc-uk.org/ [25] http://www.ipem.ac.uk/ [26] https://www.healthcareers.nhs.uk/explore-roles/healthcare-science/roles-healthcare-science/physical-sciences-and-biomedical-engineering/imaging-non-ionising [27] https://www.healthcareers.nhs.uk/explore-roles/allied-health-professionals/roles-allied-health-professions/roles-allied-health-professions/diagnostic-radiographer [28] https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/clinical-radiology [29] https://www.healthcareers.nhs.uk/explore-roles/healthcare-science/roles-healthcare-science/physical-sciences-and-biomedical-engineering/radiotherapy-physics/radiotherapy-physics