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Radiotherapy physics

Radiotherapy [1] is the treatment of cancer with high energy radiation, such as x-rays.

In this area of healthcare science, you'll be responsible for the precision and accuracy of radiotherapy [1] treatment.

[A career in radiotherapy YouTube video](#)>

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Working life

Patients with various forms of cancer will receive radiotherapy [1] treatment. They'll often undergo this treatment every day for a number of weeks, so it's vital to ensure that the treatment is delivered safely and accurately.

You'd be planning the treatment beams to be used to treat the tumour, making sure that the radiation dose to surrounding tissue is minimised.

Working in radiotherapy [1] physics, you'll be responsible for the precision and accuracy of treatments by using advanced computer calculations to develop individual patient treatment plans.

Planning starts with images of the cancer to be treated usually taken on a CT or MRI [4] scanner, outlining the target volume. You'd then be planning the treatment beams to be used to treat the tumour, making sure that the radiation dose to surrounding tissue is minimised.

You'll also be responsible for ensuring that equipment used in radiotherapy [1] is calibrated precisely and used safely, and that the imaging equipment used during treatment allows the radiotherapy [1] team to update the treatment plan during a course of treatment.

'Radiotherapy [1] is a careful balancing act; on the one hand cancer cells must be bombarded with enough radiation to kill them, but on the other, we must avoid damaging any of the normal cells either that surround the cancer or through which the radiation beams must travel to reach the tumour' - Dr Chris Golby, radiotherapy [1] physicist

Read Chris' story [5]

Who will I work with?

You'll work as part of a team that includes therapeutic radiographers [6], clinical oncologists [7], clinical radiologists [8], nurses [9] and other healthcare science staff working in physical sciences and biomedical engineering [10].

Want to learn more?

- Find out more about the entry requirements, skills and interests required to enter a career in radiotherapy physics [11]
- Find out more about the training you'll receive for a career in radiotherapy physics [12]

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Pay and conditions

Most jobs in the NHS are covered by the Agenda for Change (AfC) [13] pay scales. This pay system covers all staff except doctors, dentists and the most senior managers. As a healthcare science practitioner, you'd usually start on band 5, with opportunities to progress to more senior positions. Trainee clinical scientists train at band 6 level, and qualified clinical scientists are generally appointed at band 7. With experience and further qualifications, including Higher Specialist Scientist Training [14], 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.

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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.

Healthcare science staff often work at the forefront of research and innovation, so that patients are continually receiving the very best healthcare. For example, in radiotherapy [1] physics, you could be developing new techniques such as image guided radiotherapy [1] and proton beam therapy [15] to improve the effectiveness of treatments.

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Job market and vacancies

Job market

In November 2018, there were 6,123 clinical scientists registered with the Health and Care Professions Council [16].

The NHS Scientist Training Programme (STP) [17] and Higher Specialist Scientist Training (HSST) [14] attract 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 [17] and HSST [14] 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 [18], 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 [19]
- opportunities in the Civil Service can be found on the Civil Service Jobs website [20]
- vacancies in local government can be found on the Local Government Jobs website [21] and the Jobs Go Public website [22]

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 [23].

Find out more about applications and interviews [24].

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 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 [25].

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**Further
information**

For further information about a career in radiotherapy [1] physics, please contact:

- Academy for Healthcare Science [26]
- Health and Care Professions Council [27]
- Institute of Physics and Engineering in Medicine [28]
- National School of Healthcare Science [18]
- UCAS [29]

Other roles that may interest you

- Therapeutic radiographer [30]
- Clinical oncology [31]
- Radiotherapy physics [32]
- Clinical bioinformatics health informatics [33]

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Links

[1] <https://www.healthcareers.nhs.uk/glossary#Radiotherapy>
[2] <https://www.healthcareers.nhs.uk/privacy-and-cookies/#CookieDeclarationChangeConsentChange>
[3] <https://www.youtube.com/NHSCareers> [4] <https://www.healthcareers.nhs.uk/glossary#MRI>
[5] <https://www.healthcareers.nhs.uk/explore-roles/physical-sciences-and-biomechanical-engineering/radiotherapy-physics/real-life-story> [6] <https://www.healthcareers.nhs.uk/explore-roles/allied-health-professionals/radiographer-therapeutic> [7] <https://www.healthcareers.nhs.uk/explore-roles/clinical-oncology> [8] <https://www.healthcareers.nhs.uk/explore-roles/clinical-radiology>
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[13] <https://www.healthcareers.nhs.uk/about/careers-nhs/nhs-pay-and-benefits/agenda-change-pay-rates>
[14] <https://www.healthcareers.nhs.uk/i-am/working-health/nhs-higher-specialist-scientific-training>
[15] <https://www.healthcareers.nhs.uk/about/news/range-staff-needed-administer-new-cancer-treatment>
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[33] <https://www.healthcareers.nhs.uk/explore-roles/healthcare-science/roles-healthcare-science/clinical-bioinformatics/clinical-bioinformatics-health-informatics>