

## Nuclear medicine

Nuclear medicine doctors use radioactive substances to examine the physiological processes in diseases. This can help with the diagnosis and treatment of life-threatening or chronic conditions.

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

Nuclear medicine doctors use radioactive substances to examine the physiological processes in diseases. This can help with the diagnosis and treatment of life-threatening or chronic conditions.

Nuclear medicine specialists deals with a range of pathology across all age ranges, but specific clinical practice involves major input in:

- [oncology](#) <sup>[1]</sup> (diagnosis and treatment of cancer)
- [cardiology](#) <sup>[2]</sup>
- nephro-urology (kidney treatments)
- orthopaedics (conditions relating to bones and joints)
- [rheumatology](#) <sup>[3]</sup>
- neuropsychiatry (mental disorders linked to diseases of the nervous system)

Services are hospital based and are either integrated with radiology departments or as their own stand-alone facility.

## Common procedures/interventions

Common procedures and interventions include:

Diagnostic tests, commonly including:

- positron emission tomography (PET) imaging in [oncology](#) <sup>[1]</sup> - widely used for the staging, response assessment and evaluation of recurrence in a variety of cancer
- bone scan – assesses bone metabolism and is routinely used in the staging of a variety of cancer, and also has a role in other bone pathologies
- ventilation and perfusion lung imaging, using two imaging agents in succession, to make the diagnosis of pulmonary embolus (lung clot)
- myocardial perfusion imaging (an imaging test that shows how blood is flowing through the heart). Differences in blood flow between a rest state and a stressed state provide information about the hearts blood supply
- kidney imaging, to evaluate kidney scarring and drainage
- sentinel node imaging (to assess lymphatic drainage of a tumour), where a tracer is injected into a tumour to identify the draining lymph nodes. This technique is used in a variety of cancer types to guide surgery
- accurate measurement of glomerular filtration rate (kidney filtration), which is used to calculate dosage of potentially harmful [chemotherapy](#) <sup>[4]</sup> agents

Therapeutic procedures, including:

- administering radio-iodine, which is taken up very efficiently by thyroid tissue. The aim is to deliver a large dose of radiation locally and damage surrounding abnormal cells. This is used for the treatment of overactive thyroid glands and thyroid cancer
- treatment of metastatic neuroendocrine tumours (tumours relating to the nervous system and hormone glands that have spread from the original cancer site). By attaching a radioactive emitter to specially tailored molecules a large dose of radiation can be delivered very precisely to the cancer and damage local malignant cells.
- treatment of bone metastases (where cancer spreads to the bones) for a variety of cancer types, using bone seeking highly radioactive substances, which can control metastatic (or secondary) cancer.

Nuclear medicine is a varied speciality with the average week including clinical reporting sessions, multidisciplinary team meetings (MDTs), preparing and reviewing patients for nuclear medicine tests and therapies and may also include a general medicine commitment.

# Sub-specialties

Nuclear medicine can be combined with other sub specialties such as acute internal medicine and endocrinology. Sub-specialist areas also include:

- nuclear cardiology
- [oncology](#) <sup>[1]</sup>
- endocrinology
- [metabolic](#) <sup>[5]</sup> bone disease
- paediatrics

## Want to learn more?

Find out more about:

- the working life <sup>[6]</sup> of someone in nuclear medicine
- the entry requirements <sup>[7]</sup> and training and development <sup>[8]</sup>

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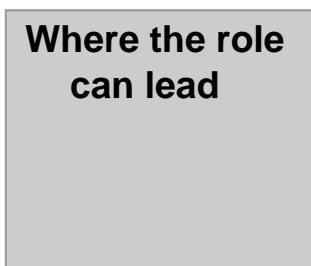
This section provides useful information about the pay for junior doctors (doctors in training), specialty doctors, consultants and general practitioners.

Find out more about the current pay scales for doctors <sup>[9]</sup> and there's more information on the BMA website <sup>[10]</sup>.

NHS Employers <sup>[11]</sup> 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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## Expand / collapse

Read about consultant and non-consultant roles in nuclear medicine, 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](#) <sup>[12]</sup> ([CCT](#) <sup>[13]</sup>). You will receive your [CCT](#) <sup>[13]</sup> at the end of nuclear medicine.

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](#) <sup>[14]</sup> programme director. This role will be working within the HEE local office/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 HEE local office/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 doctor roles <sup>[15]</sup>.

### Other non-training grade roles

These roles include:

- trust grade
- clinical fellows

### Academic pathways

If you have trained on an academic nuclear medicine 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 immunology. 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 <sup>[16]</sup>(NIHRTCC).

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 <sup>[17]</sup>.

The Clinical Research Network <sup>[18]</sup>(CRN) actively encourages all doctors to take part in clinical research.

### **Other opportunities**

Research has always been an important aspect of nuclear medicine. Not only are new diagnostic and therapeutic tools developed and evaluated, but nuclear medicine techniques offer an effective means to non-invasively investigate a wide range of biological processes in-vivo. In view of the small size of the specialty, a high proportion of nuclear medicine consultants are involved in teaching, mostly at postgraduate level. Undergraduate teaching opportunities are available.

Appointments at staff and associate specialist grade or similar do occur, but these are limited in view of the small size of the specialty.

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**Job market and  
vacancies**

**Expand /  
collapse**

This page provides useful information about the availability of jobs, finding vacancies and where to find out more.

## Job market information

NHS Digital regularly publish workforce statistics which show the number of full time equivalent consultants and doctors in training for each specialty: NHS Digital workforce statistics <sup>[19]</sup>.

Competition ratios for medical specialty training places are published on Health Education England's specialty training webpage <sup>[20]</sup>.

**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 medical and dental workforce data <sup>[21]</sup>

NHS Wales medical and dental workforce data <sup>[22]</sup>

Department of Health, Social Services and Public Safety workforce information for Northern Ireland <sup>[23]</sup>

## Where to look for vacancies

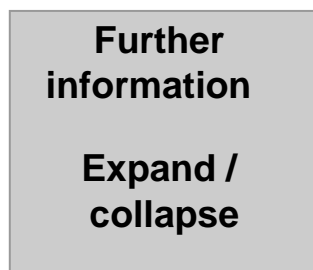
All candidates apply through the online application system Oriel <sup>[24]</sup>. You will be able to register for training, view all vacancies, apply, book interviews and assessment centres, and manage offers made to you.

HEE offices and deaneries will have details of training vacancies. Not all areas of the UK will offer new training posts in all specialties in all years.

All jobs will be advertised on the NHS Jobs website <sup>[25]</sup>.

The BMJ Careers website <sup>[26]</sup> also advertises vacancies.

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## Organisations

Royal College of Physicians <sup>[27]</sup>

Royal College of Physicians of Edinburgh <sup>[28]</sup>

Royal College of Physicians and Surgeons of Glasgow [29]

British Nuclear Medicine Society [30]

British Nuclear Cardiology Society [31]

European Association of Nuclear Medicine [32]

Society of Nuclear Medicine and Molecular Imaging [33]

American Society of Nuclear Cardiology [34]

### **Real-life stories**

Dr Dave Colville – ST7, nuclear medicine (RCPE) [35]

## **Help us improve your experience of our website**

Register your interest in research to improve our website.

Let's go [36]

## **Other roles that may interest you**

- General internal medicine [37]
- Endocrinology and diabetes [38]
- Experienced paramedic [39]
- Emergency care assistant [40]

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**Source URL:** <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/nuclear-medicine>

### **Links**

- [1] <https://www.healthcareers.nhs.uk/glossary#Oncology>
- [2] <https://www.healthcareers.nhs.uk/explore-roles/medicine/cardiology>
- [3] <https://www.healthcareers.nhs.uk/explore-roles/medicine/rheumatology>
- [4] <https://www.healthcareers.nhs.uk/glossary#Chemotherapy>
- [5] <https://www.healthcareers.nhs.uk/glossary#Metabolic>
- [6] <https://www.healthcareers.nhs.uk/explore-roles/medicine/nuclear-medicine/working-life>
- [7] <https://www.healthcareers.nhs.uk/explore-roles/medicine/nuclear-medicine/entry-requirements-skills-and-interests>
- [8] <https://www.healthcareers.nhs.uk/explore-roles/medicine/nuclear-medicine/training-and-development>
- [9] <https://www.healthcareers.nhs.uk/about-us/careers-medicine/pay-doctors>
- [10] <http://bma.org.uk/practical-support-at-work/pay-fees-allowances/pay-scales>
- [11] <http://www.nhsemployers.org/your-workforce/pay-and-reward>
- [12] [https://www.healthcareers.nhs.uk/glossary#Certificate\\_of\\_completion\\_of\\_training](https://www.healthcareers.nhs.uk/glossary#Certificate_of_completion_of_training)
- [13] <https://www.healthcareers.nhs.uk/glossary#CCT>
- [14] [https://www.healthcareers.nhs.uk/glossary#Foundation\\_training](https://www.healthcareers.nhs.uk/glossary#Foundation_training)
- [15] <https://www.healthcareers.nhs.uk/i-am/currently-working-health/information-doctors/sas-doctors>

- [16] <https://www.nihr.ac.uk/about-us/how-we-are-managed/managing-centres/about-the-trainees-coordinating-centre.htm>
- [17] <https://www.healthcareers.nhs.uk/i-am/currently-working-health/clinical-academic-careers/clinical-academic-medicine>
- [18] <http://www.crn.nihr.ac.uk/>
- [19] <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics>
- [20] <https://specialtytraining.hee.nhs.uk/Competition-Ratios>
- [21] <http://www.isdscotland.org/Health-Topics/Workforce/Medical-and-Dental/>
- [22] <https://statswales.wales.gov.uk/Catalogue/Health-and-Social-Care/NHS-Staff/Medical-and-Dental-Staff>
- [23] <https://www.health-ni.gov.uk/articles/staff-numbers>
- [24] <https://www.oriel.nhs.uk/>
- [25] <https://www.jobs.nhs.uk/>
- [26] <http://careers.bmj.com>
- [27] <http://www.rcplondon.ac.uk/>
- [28] <http://www.rcpe.ac.uk/>
- [29] <http://www.rcpsg.ac.uk>
- [30] <http://www.bnms.org.uk/>
- [31] <http://www.bncs.org.uk/>
- [32] <http://www.eanm.org/>
- [33] <https://www.snmml.org/>
- [34] <http://www.asnc.org/>
- [35] <https://www.rcpe.ac.uk/careers-resource/nuclear-medicine>
- [36] <https://bit.ly/36kefZD>
- [37] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/general-internal-medicine>
- [38] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/endocrinology-and-diabetes>
- [39] <https://www.healthcareers.nhs.uk/explore-roles/ambulance-service-team/roles-ambulance-service/experienced-paramedic>
- [40] <https://www.healthcareers.nhs.uk/explore-roles/ambulance-service-team/roles-ambulance-service/emergency-care-assistant>