

A CAREER AS A SPECIALIST RADIOPHARMACIST

Radiopharmacists provide a clinical and technical pharmacy service within nuclear medicine. Zoë Gross outlines the work involved and the career path followed by some of the pharmacists working in this field

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Radiopharmacy is the branch of the profession that involves the manufacture and supply of safe and effective radiopharmaceuticals (radioactive products) for the diagnosis and therapeutic treatment of patients with cancer. It also involves providing advice and support on the use of radiopharmaceuticals. A radiopharmacy service in a hospital is provided either as a stand-alone service by a radiopharmacy department or by a radiopharmacy section of a nuclear medicine department.

Radiopharmacies generally produce from 2,000 to over 10,000 doses every year. However, the range and complexity of the radiopharmacy (or nuclear medicine) service provided does not necessarily depend on the size of the hospital in which it is based.¹

For everyday practice, radiopharmacists are required to have a working knowledge in nuclear physics, radiation protection, chemistry, biochemistry, radiochemistry, immunology, anatomy, haematology and law.² They also need computer skills and need to know and understand a considerable amount of mandatory legislation and guidance, since radiopharmaceuticals are controlled as both medicines and radioactive substances.²

Role of the radiopharmacist

The radiopharmacist's main responsibility is the procurement, preparation, quality control and supply of radiopharmaceuticals, ensuring the safety and efficacy of such products.

Daily activities may include managing the production of radiopharmaceuticals. Radiopharmacists also have a clinical role to play, eg, providing advice on the use of radiopharmaceuticals and having input to patient care in the nuclear medicine department. In addition, they may provide education and training to their own staff as well as other health care professionals. There is scope to get involved in the research and development of new radiopharmaceuticals, including clinical trials and in the development of new dispensing techniques. Other examples of activities carried out by radiopharmacists and areas of expertise are summarised in the first panel.

Day-to-day practice

So what do radiopharmacists and their teams do in practice? Beverley Ellis, is head of radiopharmacy services at Central Manchester and Manchester Children's University Hospitals NHS Trust. The radiopharmacy unit at this trust is based in the trust's clinical nuclear medicine department and prepares approximately 12,000 doses a year. It provides a clinical radiopharmacy service to the trust as well as to other hospitals requesting a radiopharmacy service. Dr Ellis works as part of a multidisciplinary team, comprising nuclear medicine physicians, medical physicists, nuclear medicine technologists and nuclear medicine nurses. Dr Ellis said: "I provide advice on potential and actual drug interactions with radiopharmaceuticals,

possible causes of abnormal biodistributions seen on nuclear medicine scans, the choice and suitability of using drugs to enhance nuclear medicine studies, and the stability and formulation of radiopharmaceuticals, as well as monitoring and reporting adverse reactions." However, the routine preparation and quality control testing of both radiopharmaceuticals and radiolabelling of blood components (for reintroduction into a patient for diagnostic purposes, eg, for infection and inflammation imaging) is mainly undertaken by nuclear medicine technologists who rotate through the radiopharmacy unit.

Consultant radiopharmacist Jilly Croasdale is based at City Hospital, Birmingham, and fulfils both a managerial role at the hospital and a regional role with West Midlands Regional Health Authority. She manages the hospital's centralised radiopharmacy department, working alongside three radiopharmacy technicians — two pharmacy trained and one trained in nuclear medicine — to provide both an advice and supply service to City Hospital and five other hospitals. The team manufactures technetium radiopharmaceuticals for diagnostic nuclear medicine and radio-labels blood cells for clinical studies for all purchasers of the service. Her managerial role involves considering ways of developing the radiopharmacy service and possibilities for expanding the business, writing business cases and service level agreements, managing the

Examples of activities or areas in which radiopharmacists can provide expertise

Advising on:

Possibility of drug interactions

Possible causes of abnormal biodistributions

Use of medicines that will interfere with scan quality or results

Stability and formulation of radiopharmaceuticals

Legal status of particular products

Use of drugs to enhance nuclear medicine studies

Whether a previously administered radiopharmaceutical will interfere with an isotope scan

Special dosage formulations

Health and safety for individuals while using radiopharmaceuticals

Use of radiopharmaceuticals in animals.

Other:

Investigating, monitoring and reporting adverse reactions

Assisting with reporting scans

Improving cost effectiveness of diagnostic tests

Providing clinical information on new products

Organisational and quality audits of radiopharmacy services, including maintenance and monitoring of facilities and equipment

Useful resources and information

UK Radiopharmacy Group (UKRG) (www.ukrg.org.uk) — website includes UKRG newsletters and radiopharmacy handbook

British Nuclear Medicine Society (www.bnms.org.uk)

VirRAD — a virtual online learning environment for the radiopharmacy community (www.virrad.org)

European Association of Nuclear Medicine website (www.eanm.org)

Society of Nuclear Medicine (<http://interactive.snm.org>)

This list is not exhaustive

department's budget and ensuring customers' needs are met.

Mrs Croasdale also conducts in-house research projects with a view to publishing or presenting the results, plays an active role in training new staff and participates in the dispensing and manufacturing process to help keep staff radiation dose exposure down and to "keep her hand in". In addition, she is involved in a clinic for hyperthyroid patients, which is currently run by the radiopharmacy team at City Hospital two afternoons a week. Outside the City Hospital, she acts as regional expert, which requires her to support other radiopharmacies in the region. "I visit them every quarter, sending a report to

their chief pharmacist afterwards, and I audit them once a year," she said.

Conclusions

Radiopharmacy provides pharmacists with the opportunity to be a key part of a multidisciplinary nuclear medicine team. According to Mrs Croasdale: "It is a job where you can use the science background that is part of your pharmacy degree, as well as giving you contact with patients, managerial experience and practical work."

For those pharmacists thinking about a career in radiopharmacy, think carefully about the type of career you wish to pursue. As a pharmacist within a small

specialty, you might find limits to promotional progression. On the other hand, if you wish to follow a career that is intellectually and scientifically challenging, with opportunity to interact with a wide range of scientists, clinicians and technologists, then radiopharmacy may be the one. ■

References

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