Nuclear medicine and the physician

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Under the auspices of the Intercollegiate Standing Committee for Nuclear Medicine (ICSCNM), two reports have been published to highlight pressing problems in the provision and development of services.

Nuclear medicine and radionuclide imaging: a strategy for provision in the UK

The ICSCNM has produced this report to guide national authorities on the access to, and quality of, nuclear medicine and radionuclide radiology services in the UK over the next 10 years.[1] Two circumstances prompted the report; namely the expected crisis caused by an ageing medical workforce in staffing the service, and the requirement for cancer care reconfiguration to provide larger and better staffed cancer centres.

There seems little doubt that 30–40% of consultants in nuclear medicine and radionuclide radiology (120 individual consultants) will be lost in the next 10 years,[1,2] and that recruitment from the UK is never going to fill the gaps in the service. The report acknowledges this and proposes that, to maintain quality, the most experienced individuals are placed in the regional cancer care centres or the associated acute trust (the 'hub') where the more complicated or less used procedures would be performed. Smaller more peripheral departments (the 'spokes') would be run by those trained in a smaller area and would provide a limited imaging service only. The report also acknowledges that many current practitioners of radionuclide radiology have an inadequate notional half-day (NHD) allocation for this work and that this undesirable state of affairs must change.

Although it is not explicitly stated, the report appears to anticipate a contraction in the nuclear medicine and radionuclide radiology workforce in the short term and, therefore, a contraction in the service to patients.

How could all this have happened? Nuclear medicine is a unique specialty. It requires competence and core-knowledge in non-imaging tests (eg glomerular filtration rate measurement), imaging investigations of a wide range of organ systems (eg ventilation perfusion imaging, cardiac perfusion imaging) and treatment for both benign and malignant conditions with unsealed radionuclides (eg radioiodine-131 therapy for hyperthyroidism and thyroid cancer). In continental Europe, the USA and Australia, nuclear medicine became a specialty in its own right in the 1960s and early 1970s, and with adequate resourcing and a sympathetic central organisation the training pathways and career structure became transparent. In the UK, the new specialty was recognised but funding was scarce and limited to certain major academic centres; development was therefore haphazard in the early stages. In truth, the UK bumbled its way into a hotchpotch of arrangements for the provision of nuclear medicine services across the three Royal Colleges of Physicians, the Royal College of Radiologists and the Royal College of Pathologists. To those experienced in NHS ways, it had been a typical fudge. In the early days of rapid expansion in nuclear medicine, gamma cameras were given to radiology departments across the country without manpower funding. Unsuspecting and untrained radiologists were often delegated duties in the specialty, without the NHDs to do the job. It is to their credit that the majority of these individuals learned their craft under less than ideal training conditions and increasingly performed a sterling service in providing radionuclide radiology for large swathes of the country. It is the impending retirement of these 'baby-boomers' that will contribute most to a manpower crisis. To compound the problem, young radiologists are increasingly specialising in cross-sectional imaging or interventional radiology. It appears likely that there will be a dearth of trained individuals to replace the retirees.

The monospecialty of nuclear medicine is also short of trainees. Currently, there are no UK graduates training in nuclear medicine in the UK. Enthusiastic overseas graduates fill all the specialist registrar posts. Why then this change of fortune for a specialty where twenty to thirty years ago, able young physicians saw the potential and were falling over themselves to get training in the technology, either in the UK or abroad? The answer may be deceptively simple; for today, none of the young trainee physicians in hospital have any knowledge of nuclear medicine. In the past, senior house officers or registrars would often rotate through nuclear medicine as part of their general professional training, or be involved in research involving radionuclides. Today, general professional and specialty training is dominated by a shortened, more intense training period, preparation for the European Working Time Directive limiting

hours of work, and the rapidly increasing load of acute medicine. It is a long time since such junior staff rotated through nuclear medicine. To compound the problem, SpRs in nuclear medicine have no on-call duties allocated, not even to A&E, so that their salary is 25–30% lower than medical and radiological trainees.

I think that this report from the ICSCNM will help its readers to focus on the changes that will soon be necessary. But there is a risk that even this sober report could encourage complacency. If anything, it has understated the depth of the crisis by not incorporating demographic trends in the calculations. The number people over 80 will increase dramatically over the next 20 years. With this population change will come a constantly rising workload secondary to infection, cancer, heart disease and degenerative conditions. These trends alone may require a doubling of the radiological and nuclear medicine and radionuclide radiology workforce over the next 20 years. Medical school output alone cannot possibly fill the shortfall. A further difficulty is that with women now comprising more than 50% of UK medical school output, trends indicate that at least one third of them want to work part-time. Added to that, the staffing of a PET programme will require additional individuals in the short to medium term.

I am in little doubt that the ICSCNM hope that this report will allow services to continue until the recruitment problems are addressed. But though practitioners from Europe or elsewhere can be enticed to fill nuclear medicine shortages in the UK, radionuclide radiology is largely a British creation with very little potential for recruitment from abroad.

The clock is ticking for radionuclide radiology. Because of the unpredictable age of consultant retirement, none of us can know or even guess whether high noon has still to come or has been and gone. It is therefore perhaps time to step out of the 'comfort zone' and think radically. This staffing crisis is imminent and even a hub and spoke approach may become inadequate within 10 years. The most attractive move might be the development of training schemes for part-time women doctors, enticing them into the specialty in the knowledge that later on they might want to increase their hours. Less attractive and a last resort, should demedicalising basic investigations even be considered? Should, for example, nurse practitioners, radiographers or medical physics technologists be trained to interpret basic investigations under the Administration of Radioactive Substances Advisory Committee (ARSAC) certificate holder? Clearly, this type of extended role already exists in endoscopy and ultrasound and the possibility needs to be considered for nuclear medicine.

The report concludes that 'there is an urgent need to recruit junior doctors into nuclear medicine'. Can this be done? Perhaps, but it is probable that this call to action will be a triumph of optimism over experience unless major structural changes are made and more flexibility given to training of junior medical staff.

What is the likelihood of having nuclear medicine practitioners by the end of the decade?

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Positron emission tomography: a strategy for provision in the UK

This is a timely and welcome position paper from the ICSCNM, albeit one which would have been even better had it emerged two years ago. It describes in unequivocal terms what should be done in order to ensure that patients have reasonable access to what has become an indispensable technology, and sets out in clear terms their vision and expectations for the minimum provision of positron emission tomography (PET) in the UK. The authors are to be congratulated on bringing this text to public attention.[3]

Almost certainly, the clinical need for PET was significantly underestimated at the time this document was drawn up; new indications for its use are rapidly emerging. The document also bases estimates on just a single PET investigation per patient, whereas a patient will usually be referred more than once for PET studies. As response monitoring gains a clear place in the assessment of therapies in cancer, and new uses for the technology are discovered, significant new demands will clearly be placed on PET.

The report makes a number of important points, among them that between 85% and 90% of PET work is cancer related (implying that there is a significant amount of non-cancer activity), that a PET instrument should perform between 1,000 and 1,600 patient studies per annum, and that a population of 1–1.5 million people will contain 700–750 patients with lung cancer, colorectal cancer (metatstatic or recurrent) or lymphoma who will need to undergo PET scanning each year. It recommends that a national policy should be developed for PET facilities, that dedicated PET instruments should be established in at least 15 sites in the UK within 3–5 years and in 35–60 within ten years, and that funding should be provided by government or a mixture of private and government sources.

The development of these 15 sites within the next five years will require many millions of pounds. Costs will include scanning instrumentation, perhaps five cyclotrons producing the tracers as required, at least 75 newly trained staff to support the service, a significant complement of trained medical staff and considerable maintenance costs. Are the primary care trusts, networks and trusts ready to provide the necessary funding?

The NHS may be singularly at risk in terms of its readiness to embrace the powerful clinical tool of positron emission tomography. There are only a handful of medical experts, a handful of trained physics staff and a handful or two of trained technical staff and, probably uniquely in our time, those with responsibility for setting such protocols may have no first-hand, personal experience of the benefits to be derived from the new technology. Patients need access to medical experts capable of modern staging, recurrent staging and treatment monitoring of his or her specific cancer or other relevant pathology in the setting of an agreed and up-to-date treatment plan.

PET is just another example of how nuclear medicine continues to make inroads into new areas of clinical practice. There

is little time left for reflection on how the service will be provided, and yet another round of committee meetings – there is an urgent need for concerted action. It is to be hoped that all primary care trusts and cancer networks will read this document very carefully and provide the necessary resources to meet the challenges outlined within it. If they do not do so, patients will be put at risk.

PJ ELL

References

1 Intercollegiate Standing Committee on Nuclear Medicine. *Nuclear medicine and radionuclide imaging: a strategy for provision in the UK*. London: Royal College of Physicians, 2003.
2 Nuclear medicine and radionuclide imaging: survey of recruitment issues. *Nuc Med Commun* (in press).
3 Intercollegiate Standing Committee on Nuclear Medicine. *Positron emission tomography: a strategy for provision in the UK*. London: Royal College of Physicians, 2003.