A.N.Z.A.P.N.M
Australian and New Zealand Association of Physicians in Nuclear Medicine (Inc)

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Health Workforce Study
Productivity Commission
P O Box 80
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Nuclear Medicine

Background

Nuclear medicine is a medical specialty that uses unsealed sources of radioactivity to both image the body and treat disease. Nuclear medicine imaging is unique in that it provides information about both the anatomy of the body and its physiology (function).

In Australia, the nuclear medicine workforce is comprised principally of nuclear medicine specialists and nuclear medicine technologists. The organisations representing the nuclear medicine workforce in Australia are the Australian and New Zealand Association of Physicians in Nuclear Medicine Inc. (ANZAPNM), representing the specialists, and the Australian and New Zealand Society for Nuclear Medicine (ANZSNM), which represents the technologists, medical physicists, radiochemists, nurses and medical practitioners (both specialists and trainees).

The Australian and New Zealand Association of Physicians in Nuclear Medicine (ANZAPNM) is the peak body representing nuclear medicine specialists in Australia. The ANZAPNM takes a major role in the promotion and advancement of the clinical practice of nuclear medicine, and is responsible for accreditation of both practices and training sites, administration of specialist credentialling and for a range of other professional issues, including a number of components of the advanced training program.

Issues on which the ANZAPNM wishes to comment are:

1. The supply and effectiveness of nuclear medicine specialist workforce preparation and its impact on the supply of this workforce

Current training requirements are an effective preparation for the nuclear medicine specialist workforce. The ANZAPNM is monitoring both Australian and overseas trends in nuclear medicine in order to ensure that the Advanced Training Program in nuclear medicine keeps pace with current and projected workforce requirements, and will continue to liaise with the Royal Australian and New Zealand College of Radiologists (RANZCR) and the Royal Australasian College of Physicians (RACP), and overseas bodies such as the Society for Nuclear Medicine (USA), regarding options to improve nuclear medicine specialist training and continuing education.

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2. The structure and distribution of the nuclear medicine workforce, including: responsibilities and distribution of the workforce

There are limited data regarding the nuclear medicine specialist workforce in Australia, but the ANZAPNM/RANZCR Nuclear Medicine Workforce Survey underway at present is expected to provide useful data in the near future. In the interim, numerically-speaking, Australia produces sufficient nuclear medicine specialists to maintain the requisite workforce, but there may be a maldistribution of specialists, resulting in workforce shortages in some areas, including metropolitan areas.

With regard to workforce responsibilities the particular safety issues relating to nuclear medicine impose certain responsibility delineations that are currently considered to be appropriate. In particular, the ANZAPNM would stress the importance of an appropriately-trained workforce, operating to appropriate standards, to ensure the safety of patients and personnel.

3. Factors affecting demand for services; specifically the impact of technology on diagnostic and health services

The demand for positron emission tomography (PET) services is predicted to increase considerably in future, as has occurred internationally. To meet this demand, core training in nuclear medicine now incorporates training in PET, and practising, credentialled nuclear medicine specialists are also able to undertake training in PET. However, access to PET training may prove problematic for some trainees if the availability of PET facilities at Australian training sites is not increased in the near future.

Other technological advances, such as telereporting, are unsuitable for nuclear medicine, due to the specialty's use of ionising radiation and the potential for radiation related hazards.

Issues 1 – 3 above are expanded on below:

1. The supply and effectiveness of nuclear medicine workforce preparation and its impact on the supply of this workforce.

In Australia, nuclear medicine specialist services are provided by recognised specialists who are credentialled in the specialty by the Joint Nuclear Medicine Credentialling and Accreditation Committee of the Royal Australasian College of Physicians (RACP) and the Royal Australian and New Zealand College of Radiologists (RANZCR). Nuclear medicine technologist services are provided by technologists accredited by the Accreditation Board of the Australian and New Zealand Society of Nuclear Medicine (ANZSNM).

Nuclear Medicine is an advanced specialty, with a three-year Advanced Training Program undertaken by medical graduates post-Fellowship of either the RACP or the RANZCR. Nuclear medicine specialists thus complete a further 7-8 years of training after they have qualified as medical practitioners (a total of approximately 15 years' university and post graduate training). Specialist training may be undertaken only at sites accredited (or, if overseas, approved) for advanced training in nuclear medicine by the ANZAPNM; there are currently some 30 sites accredited for general nuclear medicine training (including nine sites accredited for training in both general nuclear medicine and positron emission tomography [PET]) in Australia; several sites are accredited for training of two or three trainees per annum.

Australian-trained nuclear medicine specialists are highly regarded internationally, and many work overseas during their early careers, particularly in the USA and the United Kingdom.

Since 1992, there have been, at a conservative estimate, between 10 – 15 new nuclear medicine specialists completing training each year, with approximately 50 new specialists completing training between 2000 -2004. Compared with the numbers of nuclear medicine specialists known to have fully retired since the requirement for credentialling was introduced in 2000 (approximately 17 specialists as of July 2005), numerically-speaking, Australia produces sufficient nuclear medicine specialists to maintain the requisite workforce.

Nevertheless, as has been the case in other areas of medicine, problems of maldistribution (and, to a degree, loss of specialists overseas) and increasing demand for procedures, combine to create relative shortages of nuclear medicine specialists in both outer urban and rural areas.

The ANZAPNM, with the cooperation and support of the RANZCR, is currently undertaking a Nuclear Medicine Workforce Survey and it is hoped that the information provided by this Survey will assist in future planning, particularly with respect to training numbers, the area over which the ANZAPNM has most influence in terms of workforce.

Nuclear Medicine Specialist Training Program

The nuclear medicine specialist training program is overseen by the Joint Specialist Advisory Committee (JSAC) in Nuclear Medicine of the RACP and the RANZCR and, with agreement, the program is administered by the RACP. The JSAC has recently expanded membership to include members who are recently-qualified nuclear medicine specialists, to assist in ensuring that the training program keeps pace with contemporary expectations for nuclear medicine trainees. Regular reviews of the training program and syllabus have also ensured that training keeps pace with technological advances and population demands. In particular, positron emission tomography (PET) and bone mineral densitometry [BMD] have been incorporated into core training to meet the demands of an ageing population for these types of services). Access to training in BMD has been facilitated by trainees' ability to undertake an intensive clinical densitometry training course offered by the Australian and New Zealand Bone and Mineral Society (ANZBMS). Access to PET training, however, may prove problematic for some trainees unless the number of PET facilities at Australian nuclear medicine training sites is increased in the near future. At present, NSW appears to have the most acute shortage relative to the number of trainees.

The ANZAPNM's view is that current training requirements are an effective preparation for the nuclear medicine specialist workforce. The ANZAPNM is monitoring both Australian and overseas trends in nuclear medicine in order to ensure that the Advanced Training Program in nuclear medicine keeps pace with current and projected workforce requirements, and will continue to liaise with the RANZCR and the RACP, and overseas bodies such as the Society for Nuclear Medicine (USA) regarding options to improve nuclear medicine specialist training and continuing education.

At the same time, it is essential that training resources are adequate for future workforce needs. As such, it is important that there be wider availability of PET resources in Australian nuclear medicine training sites to ensure that all trainees can complete this aspect of their training program.

2. The structure and distribution of the nuclear medicine workforce, including responsibilities of the workforce

There are currently 305 credentialled nuclear medicine specialists who deliver nuclear medicine services in approximately 180 sites across Australia.

There are limited data on the current structure and distribution of the nuclear medicine specialist workforce, although claims have been made regarding difficulty in recruiting specialists, and also forecasting problems arising from an ageing workforce. There is anecdotal evidence to suggest that nuclear medicine practices are encountering difficulties in recruiting nuclear medicine specialists to work in provincial or remote areas, and even in some metropolitan areas (e.g. Canberra, Perth), which in turn suggests that the problem may lie with a maldistribution of specialists rather than an actual workforce shortage, as noted earlier.

Responsibilities of the Nuclear Medicine Workforce

With regard to the responsibilities of the workforce, including "evolving health workforce roles and redesign" as stated in the Commission's Terms of Reference, it should be noted that there are special concerns for nuclear medicine. Because nuclear medicine procedures are generally complex and involve the administration of unsealed radioactive sources, this limits the extent to which nuclear medicine services could, or should, be provided by personnel without recognised training in the specialty. Thus, there is a good reason why workforce responsibilities in nuclear medicine are clearly delineated.

Broadly speaking, nuclear medicine specialists are responsible for consultation with patients, determining the procedure to be used (including prescribing the radiopharmaceutical), monitoring the procedure and assessing its outcome, advice on radiation protection, and providing a final consultation report. Nuclear medicine technologists are responsible for the application of nuclear medicine instrumentation to obtain diagnostic information, laboratory procedures (including preparation of radiopharmaceuticals), care of the patient during the nuclear medicine procedure, and quality control of both instruments and procedures.

The International Commission on Radiological Protection's *Summary of the Current ICRP Principles for Protection of the Patient in Nuclear Medicine* – 1993, pp. xii-xiii stresses the responsibilities of the nuclear medicine specialist, and in particular states:

> *"The nuclear medicine physician has the ultimate responsibility for the control of all aspects of the conduct and extent of nuclear medicine examinations, including the protection of the patient from unnecessary radiation. The nuclear medicine physician should advise on the appropriateness of examinations, and determine the techniques to be used. Ideally, all nuclear medicine examinations should be individually planned so that the necessary information is obtained with minimum irradiation."*

The ANZAPNM has developed standards for accreditation of nuclear medicine practices in consultation with the RANZCR and the ANZSNM, to ensure the provision of safe, high quality nuclear medicine services, bearing in mind that radiation safety considerations are paramount for both patients and workers in this specialty. The professional standards that apply to nuclear medicine specialists (and which must be met in order for the specialist to be credentialled in the specialty) include a requirement for personal supervision of all nuclear medicine procedures,

including direct consultation with the patient. This standard is regarded as a core professional standard for the delivery of safe, quality nuclear medicine services.

Nuclear medicine services differ from other imaging procedures in that the length of the procedure (defined as the time from the first patient contact to the completion of the report) can vary from less than half an hour to almost a week, although the average length is at least several hours. Personal supervision is not intended to mean the physical presence of the nuclear medicine specialist throughout the entirety of a procedure, but rather requires that the specialist undertakes each of the following components of a nuclear medicine service:

1. direct consultation with the patient, to evaluate the patient's history, to determine the presence of medical conditions or medications which may modify or contraindicate a procedure, and to advise the patient of the nature and potential risks and benefits of the proposed procedure;
2. determining the appropriateness of, and monitoring the quality of, the procedure;
3. assessing and influencing the outcome of the procedure, i.e. evaluating the clinical significance of unforeseen findings (including arranging additional investigations if necessary), and ensuring the procedure is fully complete and that the quality of the results is satisfactory before the patient leaves the practice;
4. providing a final consultation report.

There are exemptions from personal supervision by a nuclear medicine specialist for the first three components of the service, under special circumstances, and wider exemptions for practices located in provincial and remote areas (see below).

This view of the importance of personal supervision for nuclear medicine services, is concordant with international guidelines on nuclear medicine (see International Commission on Radiological Protection (ICRP): ICRP Publication 52, *Protection of the Patient in Nuclear Medicine*, March 1987, Pergamon Press; WHO/IAEA [Volume 4, *Manual on Radiation Protection in Hospitals and General Practice*]. It is also a requirement of most state radiation authorities that the nuclear medicine specialist and/or radiation licence holder must be on site during any examination involving the use of unsealed radioactive sources.

The standards for accreditation of nuclear medicine practices and credentialling of nuclear medicine specialists allow for some exemptions from the requirement for personal supervision, in order that certain metropolitan or provincial or remote nuclear medicine practices may continue to offer nuclear medicine services at the present time.

For metropolitan practices that operated without the services of a full-time specialist in nuclear medicine prior to 1 April 2000, a "sunset clause" allows the first three components of the nuclear medicine service to be provided by a specialist in diagnostic imaging, with a nuclear medicine specialist providing all reports on site.

To ensure access to nuclear medicine services by Australia's rural and remote population, the standards include exemptions from the personal supervision requirement for nuclear medicine practices operating in provincial or remote areas. The exemptions permitted for provincial and remote practices under these standards have been designed to maintain what the profession considers to be an appropriate level of care for patients in rural and remote Australia, i.e. a level of medical supervision consistent with that offered at a metropolitan centre.

Full details of these exemptions are set out in the attached extracts from the *Standards for Accreditation of Nuclear Medicine Practices*. It should be emphasised that regulatory requirements will always take precedence over the standards.

The ANZAPNM's view of workforce responsibilities is that, given the particular safety issues relating to nuclear medicine, existing responsibility delineations are appropriate, and that it is not appropriate for personnel untrained in nuclear medicine procedures to be given responsibility for these procedures. As stated previously, it is recognised that there continue to be recruitment difficulties in some areas, although it is believed that there are mechanisms for addressing such difficulties. However, at the same time it should be recognised that claims made about shortages are frequently not supported by adequate attempts to recruit, and in other cases, by creating appropriately funded positions that would attract suitably trained and experienced specialists and technical staff.

3. Factors affecting demand for services; specifically the impact of technology on diagnostic and health services

Positron Emission Tomography (PET)

Positron emission tomography (PET) is one component of nuclear medicine imaging, for which demand is predicted to increase substantially in the near future, as has occurred internationally. At present, Medicare rebates for PET services are restricted to those services provided at an "Approved Location" as designated by the Commonwealth, while a national project looking at some aspects of PET's effectiveness is completed.

PET utilises short-lived radioactive isotopes (principally radioactive glucose) to provide images of blood flow or other biochemical functions. PET is used increasingly in the detection of cancers, particularly in metastatic spread, where increased glucose metabolism enables metastases to be readily identified. Through the use of PET scanning, the use of nuclear medicine for diagnosis of cancer and for identifying metastatic spread is increasing rapidly and, with an ageing and more cancer-prone population, is likely to continue to do so for the foreseeable future.

To cope with the likely increase in workforce needs, training in PET has, from 2005, been incorporated into the Advanced Training Program for nuclear medicine. In addition, PET training has been available to credentialled nuclear medicine specialists since 2002; training for PET is approved only if the training site is accredited (or, for overseas sites, approved) for PET training by the ANZAPNM. There are currently nine sites accredited for PET training plus general nuclear medicine training, plus one site accredited for PET training only, in Australia. As mentioned earlier, increased availability of PET facilities in Australian training sites is considered important in ensuring that all nuclear medicine specialist trainees are able to complete their PET training.

With regard to technologies to allow remote medical services to operate, the ANZAPNM has serious concerns about the safety of telereporting as a means of providing remote nuclear medicine services due to a variety of issues. Of paramount importance is the consideration of radiation safety and the need to perform the correct procedure according to the A.L.A.R.A ("As Low As Reasonably Achievable") principle; procedures can only be undertaken optimally after consultation with the patient and examination of the affected area. Finally, many nuclear medicine procedures are dynamic and interactive in nature and require intervention such as exercise or pharmacologic stress tests, administration of various medications such as frusemide and captopril,

and urethral catheterisation. As such, it is difficult to envisage any circumstance where nuclear medicine procedures could be safely undertaken via telereporting.

In summary, demand for PET services is predicted to increase substantially in the near future. Australia appears well-positioned to provide an adequately trained specialist workforce to meet this demand, provided there is a corresponding increase in the availability of PET facilities at Australian training sites.

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