

Health Technologist and Technician Training in New Zealand

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Executive Summary

The impact of technology on the provision of health services in New Zealand has been wide-ranging and fundamental. Significant numbers of technicians, technologists and scientists now specialise in the provision of health services which used to be the domain of the traditional professions. Planning for the education, training and deployment of the new personnel has been limited, with a variety of education and registration mechanisms in place for the different professions.

The technician and technologist professions are characterised by the need to constantly retrain in order to keep up with the technology advances, high levels of specialisation and relatively small professional groups, many with strong links to their Australian counterparts. Many of the groups require an initial undergraduate degree to enter the profession, and additional training is usually on-the-job, requiring a high level of supervision.

A number of issues have been identified within each of the groups analysed, and common themes are:

- Shortages of staff and a shortage of training posts.
- A reliance on overseas-trained professionals to meet service needs.
- A call for recognition of technician and technologist professions, with a number of groups making submissions to the Health Practitioners' Competence Assurance Bill to facilitate registration being made compulsory (anaesthetic technicians, cardiac/cardiopulmonary technologists).
- A call for standardisation of entry requirements.

Specific issues for the Clinical Training Agency to consider are:

- Anaesthetic technicians – significantly more technicians are required than exist currently, and current training levels are significantly above the current level of funding available. However, a change from the current apprenticeship style training to an academic undergraduate qualification may see the responsibility for funding move to the Ministry of Education.
- Cardiac/cardiopulmonary technicians/technologists – there is a strong demand for a nationally recognised, post-entry clinical training programme leading to registration.
- Cardiovascular perfusionists – a significant shortage, although a national training programme is in place. This training programme does not attract any funding from either the Ministry of Education or the Ministry of Health. Initial analysis suggests the programme meets the criteria for post-entry clinical training.
- Nuclear medicine technologists – a global shortage. The only training programme available is provided by the University of Newcastle in Australia, although fees are seen as a significant barrier.

Introduction

Background

In 2001 the Clinical Training Agency published *The Health Workforce: A Training Programme Analysis*. This publication outlined current programmes purchased by CTA and described the associated workforce where information was available. A recommendation made in the document was that:

CTA initiate a review of technician training, to provide workforce analysis and an estimate of training numbers required. This review should include all identified technician training, including clinical perfusionist and nuclear medicine technologist.

Current programmes funded by CTA for technicians/technologists include:

- Anaesthetic technician
- Sonography
- Cardiopulmonary/physiology

Initial analysis of other technician/technologist training indicates a number of programmes that meet the post-entry clinical training criteria. Many of these programmes are hospital-based, and require supervision of practical elements combined with theoretical learning. Increased calls for funding of these or similar programmes are linked to the fact that the use of technologists and technicians in delivering health care has increased in the last five years and is expected to increase further. This is due to the increased use of technology in the delivery of care, and the need for appropriately qualified people to carry out the tasks involved.

This analysis was undertaken over the first six months of 2002, and initial findings used to inform development of the Clinical Training Agency Strategic Intentions.

Method

The method of information collection and analysis included interviews, a literature review and information gathering from sources such as District Health Boards, Medical Colleges, training establishments, Statistics New Zealand and the New Zealand Health Information Service. Analysis of the workforce included analysis of international trends, available data on the labour force, and interviews with relevant people within the workforce.

Analysis

Introduction

Levels of information available for the various types of technologist/technician varied according to whether the profession had any registration procedures. Some professions (such as medical laboratory scientists, medical radiation technologists and clinical perfusionists) have Registration Boards, mandatory registration, and good workforce and training data. Others (such as cardiac technologists) have voluntary registration, so information tends to focus on the registered part of the workforce. Other areas (such as neurophysiology technicians) have no registration, so information is limited.

This report covers both health technologists and technicians. There are some inconsistencies in terminology in this sector. In general, the term “technologist” relates to a more senior position, usually requiring at least degree level qualification. Technologists tend to work independently, undertaking more complex procedures, and analysing information. Technicians are usually qualified to certificate level, and are more likely to work under supervision. There are, however, technicians in some areas who would be classified as technologists in others, and vice versa.

Technologist/Technician Types

Information was analysed for the following technologist/technician types:

- Anaesthetic technicians.
- Cardiac/cardiopulmonary technologists & technicians (cardiac technologists are also known as physiology technologists at Greenlane Hospital).
- Cardiovascular perfusionists.
- Medical laboratory scientists & technicians.
- Medical radiation technologists.
- Nuclear medicine technologists (medical radiation technologists specialising in radionuclide imaging).
- Neurophysiology technicians.

The following technician types were also identified, but analysis is not included for these practitioners.

- Audiology technicians
- Biomedical technicians (mechanical and electronic)
- Intensive care technicians
- Pharmacy technicians
- Sleep lab technicians

Anaesthetics

Anaesthetic technicians

Current issues

- A shortage of anaesthetic technicians in New Zealand.
- Implementation of the Health Professionals' Competency Assurance Bill is expected to lead the way to anaesthetic technicians becoming registered professionals. Actual enactment of the Bill is not expected for at least 12 months.
- The current training programme is viewed by some as inadequate preparation for the role, and provides limited scope for career progression. A proposal currently under consideration by the sector recommends a change in the training programme from 3-year clinically based (i.e. technicians employed in hospitals while in training) to a 3-year degree programme with a potential pre-registration year. This new training programme would have a clinical component of at least 50%.
- There are few dedicated trainer roles in training hospitals, and resulting pressure on senior technicians could lead to incomplete practical experience for trainees (Poppe, 2000).
- The New Zealand Society of Anaesthetic Technicians and the Anaesthetic Technicians Board have joined recently to form one governing body – the New Zealand Association of Anaesthetic Technicians and Nurses.

The role of the anaesthetic technician

The main role of the anaesthetic technician is to assist the anaesthetist, and registered nurses or other health personnel sometimes carry out this task. The policy document PS8 *The Assistant for the Anaesthetist* developed by the Australian and New Zealand College of Anaesthetists (ANZCA) identifies that an assistant is required:

- during preparation for and induction of anaesthesia until the anaesthetist instructs that this level of assistance is no longer required.
- at short notice if required during maintenance of anaesthesia.
- at the conclusion of anaesthesia.

Workforce information

The total number of anaesthetic technicians in the workforce is difficult to estimate, as it is an unregulated profession. In 1999 the Anaesthetic Technicians Board identified 260 qualified and registered anaesthetic technicians. In 2000 there were 217 qualified technicians holding practising certificates and 104 trainees. In 2002 there are 358 qualified technicians and 128 trainees.

Training programme

A full description of the training programme is in *The Health Workforce: A training programme analysis* (MoH, 2001a) and also in the CTA specification for non-medical anaesthetic technician training. The ANZCA PS8 document outlines the minimum training standards for the assistant to the anaesthetist and the Auckland University of Technology training programme is the only programme in New Zealand to fit this policy.

Essentially, training is comprised of three years clinical training, including a final year of supervised practice. The formal teaching component is provided by the Auckland University of Technology, and takes two years to complete.

Recognition of prior learning is available, and some trainees are exempted from modules depending on their relevant experience and qualifications.

In 2001 CTA contracts reflect funding for 44 FTEs. There were 59 trainees in years one and two in 2001 as Table 1 shows.

Table 1: Anaesthetic technician trainees (2001)

Year of training	Number in training
Year 1	33
Year 2	26
Total	59

Nineteen of the twenty-one District Health Boards and four private hospitals provide training positions for anaesthetic technicians.

Cardiac/Cardiopulmonary Technology

Cardiac technologists and technicians

Current issues

- There is a shortage of cardiac technologists, and a need to recruit from overseas. An increase in work for cardiologists has generated more work for cardiac technologists.
- Cardiac technologists introduced voluntary registration in 1996. Although it is not a legal requirement, it is accepted as the professional standard by departments around the country. The Society for Cardiopulmonary Technologists Registration Board (SCTRB) has submitted for registration to become compulsory under the Health Practitioners' Competence Assurance Act.
- Approaches to training vary quite significantly throughout the country. Each hospital determines its own professional framework and requirements. This is seen as a barrier to professionalising cardiac technology. (Poppe, 2000).
- There is a strong demand for a national qualification for cardiac technologists (Poppe, 2000 and Searancke, 2000). At present, a structured programme leading to a specialised qualification can only be undertaken in the Auckland area.

The role of the cardiac technician and technologist

Cardiac technicians and technologists monitor, record and measure the way patients' hearts are working in order to help doctors diagnose and treat patients with heart disease. There is a distinction between technologist and technician. Cardiac technologists perform more complex procedures than technicians, work independently and have an independent diagnostic role. Technicians' work is supervised. Cardiopulmonary technologists are trained in respiratory function procedures as well as cardiac procedures. For the purpose of this document, "cardiac" will also include "cardiopulmonary".

There is no standardisation with regard to roles, titles and backgrounds within the profession. The lack of a national qualification, the size of the hospital, and level of experience that is required or can be gained there, have all contributed to these differences. (Poppe, 2000)

Workforce information

Voluntary registration was introduced by the Society for Cardiopulmonary Technologists (SCT) in 1996. The SCT has submitted for registration to become compulsory under the Health Practitioners' Competence Assurance Act. There is no published data available on unregistered, practising technologists and technicians.

Table 2: Location of cardiopulmonary technicians/technologists (May 2002) by level of registration

Hospital	Trainee	Level 1	Level 2	Level 3	Total @ each Hospital
North Shore	0	1	0	0	1
Auckland	1	0	1	3	5
Starship	0	0	1	1	2
Greenlane	6	2	6	11	25
Middlemore	2	2	0	4	8
Waikato	3	1	2	1	7
Whakatane	0	1	0	0	1
Tauranga	0	0	0	0	0
Rotorua	0	0	0	0	0
New Plymouth	0	0	0	0	0
Masterton	0	0	0	0	0
Hutt	0	0	0	0	0
Porirua	0	1	0	0	1
Wellington Public	4	3	3	2	12
Wakefield	0	0	0	2	2
Nelson	0	0	0	0	0
Greymouth	0	0	0	0	0
Christchurch	11	0	1	1	13
Timaru	1	0	0	0	1
Dunedin	1	0	3	3	7
Invercargill	0	0	2	0	2
Non Practising	0	0	1	1	2
Total @ each Level	29	11	20	29	89

Source: Society of Cardiopulmonary Technology

Table 3: Registered Cardiopulmonary Technicians/Technologists (1997 & 1999)

Year	Trainee	Level 1	Level 2	Level 3	Total
1999	Did not exist	9	27	37	73
1997	Did not exist	17	17	27	61

Source: Society of Cardiopulmonary Technology

Training programme

Cardiac technicians can gain Associateship of the Society of Cardiopulmonary Technology (ASCT). This is obtained through a correspondence course that includes theoretical and practical elements, and requires two years' practical experience. Table 4 below shows the number and location of qualified technicians as well as those in training.

Table 4: Location of cardiac technicians sitting or holding the ASCT

Hospital	To sit 2003	To sit 2002	Qualified in 2001	Qualified in 2000	Qualified in 1999	Qualified in 1998
North Shore						
Auckland		1			1	
Greenlane	5	6	4	6	3	5
Middlemore	3		2		1	
Waikato		2	2	1	2	
Whakatane						
Tauranga		1				
Rotorua		1			1	1
New Plymouth	1					
Masterton	1					
Hutt		1				1
Wellington Public	2	1	1		4	1
Wakefield			2		1	
Nelson						
Greymouth						
Christchurch	7	3	8		1	
Timaru		1				
Dunedin	1		3	1	1	
Invercargill					2	
Australia					1	
TOTAL	20	17	22	8	18	8

Source: Society of Cardiopulmonary Technology

In many centres in New Zealand, cardiac technologists can start work as trainees with any relevant science degree. Auckland University of Technology offers a specialised degree – the Bachelor of Applied Science in Human Anatomy and Physiology. The BAppSci(HAP) has a cardiopulmonary sub-pathway. All second year trainees must also complete a course and sit an exam for Associateship of the Society of Cardiopulmonary Technology. This is a requirement for level one registration with the SCT Registration Board.

Greenlane Hospital has a formal training programme for cardiac technologists to the recognised national standard. Trainee technologists undertake 3 years of practical training whilst employed in the Physiology department at Greenlane Hospital. At the same time they undertake a course at Auckland University of Technology leading to a BAppSci(HAP).

Middlemore Hospital has a new training programme, also through Auckland University of Technology, and has sent a draft specification to the Clinical Training Agency for consideration. In essence it follows the Greenlane model. The training programme has started, and has four trainees in post (See Table 5 below).

Table 5: Cardiopulmonary technologists on formal training programmes (2002)

Hospital	Yr 1	Yr 2	Yr 3
Greenlane	4	3	4
Middlemore	2	2	0

Source: Society of Cardiopulmonary Technologists

At Waikato hospital, trainees must have an appropriate tertiary qualification (Bachelor of Science) before starting in the position. The clinical element follows the Greenlane training model, with adaptations for local conditions. There was one trainee in place as at February 2002.

In a recent survey, two hospitals reported structured training programmes for cardiac technologists in place, three reported structured programmes that needed improvement, and two reported that a training programme was being developed. Three hospitals reported a regular intake of 8 trainees (in total). Eight hospitals recruited trainees as vacancies arose. (Searancke, 2000).

The Clinical Training Agency is currently working with the SCT to better define and organise the training programme, prior to the Board undertaking governance of the profession.

Cardiovascular Perfusion

Cardiovascular perfusionists

Current issues

- There is a shortage of cardiovascular perfusionists and vacancies are difficult to fill. Greenlane Hospital currently has two full-time vacancies and is using a six-month overseas locum scheme to try to address the issue. Retention appears to be an issue, with overseas salaries (UK and Europe) much higher than New Zealand salaries.
- Greenlane hospital may be splitting the current service into an adult and a paediatric service, in which case two further posts will be required.

(Source: Personal communication, Australasian Board of Cardiovascular Perfusionists' Course Coordinator)

The role of a cardiovascular perfusionist

According to the Australasian Board of Cardiovascular Perfusionists (ABCP), a clinical perfusionist

- operates and controls extracorporeal circulation equipment during cardiopulmonary by-pass,
- may operate and control such equipment during any medical situation where it is necessary to support, or temporarily replace, the patients' circulatory function,
- ensures the safe management of physiological functions by monitoring all necessary physiological and pharmacological variables.

All these duties are performed upon prescription by a cardiac surgeon or medical practitioner

Workforce statistics

According to the ABCP, there are eighteen certified perfusionists based in New Zealand (eight in Auckland, two in Dunedin, three in Wellington, two in Christchurch and two in Waikato). Certification is now a requirement for employment as a perfusionist, and annual recertification commenced in 2002.

Greenlane Hospital currently has six full-time perfusionists, one part-time perfusionist, one trainee, and two full-time vacancies. Other centres are likely to have a much smaller perfusionist workforce. (Personal communication, ABCP Course coordinator)

Training programme

The ABCP introduced certification in 1990. Practising perfusionists at that time were certified either through a grandfather clause or by sitting an examination. From 1993 onwards, trainee Clinical Perfusionists have had to undertake a structured training programme and examinations, in order to obtain certification. Of the eighteen currently certified perfusionists in New Zealand, seven were certified through the grandfather clause

(including recognition of greater than five years experience and 500 caseload), three were certified by exam only and five were certified after graduating from the ABCP course.

Entry requirements for the programme are as follows:

- A candidate must be employed as a trainee clinical perfusionist
- A candidate must have a Bachelor of Science degree or equivalent.
- Candidates must have assurances from their units to have time to study and attend tutorials with adequate resources and a supervisor to manage their course.

The Board provides the broad framework and the objectives of the programme, while the candidate's own hospital provides the practical and theoretical training. Only teaching hospitals or Board accredited hospitals are recognised by the Board as suitable training centres.

According to the ABCP Course Coordinator, Greenlane Hospital has trained around 6 perfusionists since the introduction of the training programme. Training is likely to continue at the level of one trainee per year, although the maximum number of trainees is two per year as there is a significant commitment in terms of supervision. Wellington has trained one perfusionist in the past, and Waikato has trained two perfusionists.

Medical Laboratory

Medical laboratory technical assistants (MLTA)

Synonyms used to describe this group include laboratory assistant, qualified technical assistant and cytotechnician.

Current issues

- The requirement for highly experienced medical laboratory technical assistants to undertake a degree if they want to progress to become a registered medical laboratory scientist has been an ongoing source of dissatisfaction amongst this group. (Personal communication, New Zealand Institute of Medical Laboratory Scientists (NZIMLS)). This is particularly relevant in the area of medical cytology in which many cytotechnicians are highly experienced, and form a separate employment group between technical assistants and medical laboratory scientists. Within this group there is dissatisfaction about the lack of recognition. (Personal communication, NZIMLS and various submissions to Cancer Screening Programme Draft Workforce Strategy).
- Alternative pathways to registration as a medical laboratory scientist for cytotechnicians other than a degree are currently not recognised by the Medical Laboratory Technologists Board (MLTB).
- A greater clarity is required on the current and future roles of the cytotechnicians and medical laboratory technical assistant groups in the laboratory.

The role of the MLTA

The medical laboratory technical assistant works under the supervision of a medical laboratory scientist and/or a Pathologist. They assist with tests and perform other duties. They may specialise in one area (as for the medical laboratory scientists). In some laboratories they work across several disciplines. (Kiwicareers website)

Workforce statistics

The National Screening Unit stocktake survey identified 40 cytotechnicians (29 FTEs). All are qualified technical assistants (NZIMLS – QTA) and more than half have further cytology qualifications from the International Academy of Cytology (IAC) or the Australian Society of Cytology (ASC). Forty per cent are over 45. Most are of New Zealand/European origin. Three labs reported a total of four vacancies (9%). (NSU, 2001)

Training programme

The entry requirement is usually 6th Form Certificate. Technicians receive on-the-job training from medical laboratory scientists and/or pathologists. After two years' laboratory experience, they can undertake the Qualified Technical Assistant exam that is offered by the New Zealand Institute of Medical Laboratory Science. Success in this examination entitles the candidate to be known as a Qualified Technical Assistant (QTA). QTA's do not hold registration with the NZMLTB. (Kiwicareers website)

Medical Laboratory Scientists (MLS)

Terminology

Prior to the introduction of degree based training in New Zealand ten years ago, medical laboratory scientists (MLS) were known as medical laboratory technologists (MLT). The New Zealand Medical Laboratory Technologists Board (MLTB) who holds the register and issue annual licenses for medical laboratory scientists has not yet been able to change its name to reflect the change in terminology. The upcoming Health Practitioners' Competence Assurance Bill scheduled to be drafted into law in 2002 will provide the opportunity for this to occur. Hence the New Zealand Health Information Service (NZHIS) workforce survey refers to MLT rather than MLS.

Current issues

- Retention is a problem.
- Some graduates do not progress to registration as medical laboratory scientists in New Zealand due in part to the requirement for six months postgraduate work experience. (Personal communication , NZIMLS)
- There is a shortage of trained medical laboratory scientists available for employment (MLTB).
- There is a shortage of medical laboratory scientists with qualifications and experience in gynaecological cytology (National Screening Unit, 2001). Eight cytotechnologist vacancies (16%) were reported by labs participating in the National Cervical Screening Project (NSU, 2001).
- There is a proposal in the Cancer Screening Programme Draft Workforce Development Strategy to consider clinical postgraduate certificate in cytology for registered cytotechnologists. (MoH, 2001b).
- Medical laboratory scientist training does not meet the requirements of post-entry clinical training. Any shortages in this area have an impact on the potential numbers available to undertake further specialised post-entry clinical training.

The role of a medical laboratory scientist (MLS)

Work is varied and ranges from analysis of patient specimens through to section and laboratory management. Medical laboratory scientists provide information that helps doctors to diagnose, prevent and/or treat disease. In addition they supervise and train technical assistants and provide the clinical laboratory training to students enrolled in the medical laboratory scientist degree programmes. Examples of the specialty discipline areas in which they work are:

- Clinical biochemistry
- Molecular pathology
- Microbiology
- Haematology
- Transfusion science
- Immunology/serology
- Cytology
- Virology

- Cytogenetics
- Histology
- General medical laboratory science

Workforce statistics

According to the 2000 NZHIS workforce survey of medical laboratory technologists (MLTs), there were 1292 annual licences issued to MLTs between March and September 2000. The majority of active MLTs are female (72.6%), and identify themselves as belonging to the NZ European/Pakeha ethnic group (87.1%). Around two-thirds (65.4%) are aged between 35 and 54. Many MLTs work in more than one field in their main employment setting. (Based on the 634 active MLTs responded to the survey, that is 49.1% of licence holders). According to the NZHIS Survey, 27 of the respondents worked in the area of cytology.

The National Screening Unit stocktake survey (conducted for the Cancer Screening Programme Workforce Development Strategy) identified 42 cytotechnologists (32 FTEs) working an average of 30.5 hours (based on 11 of the 13 laboratories participating in the National Cervical Screening Programme). Three laboratories reported a total of eight vacancies (16%). (NSU, 2001)

Training programme

The entry requirement to the profession is a Bachelor's degree in Medical Laboratory Science. Courses are run at the University of Otago, Massey University and Auckland University of Technology. The first two years are based on the biological sciences with a stronger focus on the clinical laboratory sciences in the final two years. Year four is spent in selected medical laboratories. During this year, students undertake a distance taught academic course in two chosen specialisations. The Bachelor of Medical Laboratory Science (BMLSc) is awarded on successful completion of the programme of study in year four. Opportunities exist for postgraduate studies at both MSc and PhD levels. Following completion of study to the Bachelor level graduates are eligible to register with the New Zealand Medical Laboratory Technologists' Board after satisfactory completion of a minimum of six months fulltime employment in a medical laboratory. Following registration, medical laboratory scientists must hold an annual licence in order to continue working as a medical laboratory scientist or medical laboratory technologist.

Medical Radiation

Medical Radiation Technologists (MRT)

Current issues

- There is a serious shortage of medical radiation technologists, which in turn has an impact on availability of medical radiation technologists to undertake further training in areas of specialisation (eg sonography, nuclear medicine). This shortage also includes radiation therapists.
- There are 80 medical radiation technologists vacancies (Oct 2001) in hospital radiology departments, which are taking 6 months plus to fill (15.5%).
- Numbers of medical radiation technologists in training are limited by the fact that students need to have clinical placements, and hospitals have difficulties in providing supervision due to staff shortages.
- Postgraduate training has become necessary in some areas, as the technology has become so advanced (sonography, nuclear medicine, CT scanning, MRI).
- Medical radiation technologists' training is not post-entry clinical training, but some subsequent specialist training is (for example, nuclear medicine and sonography).

(Source: NZIMRT, 2001)

The role of a medical radiation technologist

The medical radiation technologist works with ionising radiation and other imaging modalities to gain a differential diagnosis, and for radiation treatment planning and delivery for cancer patients. They work in:

- Diagnostic radiography
- Radiotherapy
- Diagnostic ultrasound
- Computerised tomography
- Radionuclide imaging
- Magnetic Resonance imaging

Medical radiation technologists were formerly known as radiographers. Their role has expanded as more advanced technology has been integrated into the clinical setting.

Nuclear Medicine Technologists are medical radiation technologists with specialised training in radionuclide imaging. Sonographers are usually medical radiation technologists with specialised training in diagnostic ultrasound. Magnetic resonance imagers are usually medical radiation technologists with specialised training in magnetic resonance imaging, and mammographers are medical radiation technologists with specialised training in mammography.

Workforce statistics

According to the 2000 NZHIS workforce survey, 1459 medical radiation technologists (MRTs) were issued Annual Licences between March and September 2000. Most active MRTs are female (87.9%), and identify themselves as belonging to the NZ European/Pakeha ethnic group (83.7%). Just under two-thirds (61.8%) are aged between 30 and 49. Many MRTs work in more than one field in their main employment setting. (Based on the 903 active MRTs who responded to the survey, that is 61.9% of licence holders).

Training programme

Registration with the Medical Radiation Technologists Board (MRTB) is compulsory for medical radiation technologists. They must have a degree in medical radiation technology (UNITEC, Universal College of Learning or Christchurch Polytechnic Institute of Technology) before they can register with the MRTB. Similarly, registration with the MRTB is compulsory for Medical Radiation Therapists. The University of Otago provides a degree in medical radiation therapy. As part of the degrees in medical radiation technology and medical radiation therapy, students spend some time in hospitals under the supervision of medical professionals.

Nuclear Medicine Technologists (NMT)

Current issues

- Employment numbers are expected to remain stable over the next two to three years.
- Nuclear medicine is constantly changing as a result of new techniques and procedures being developed constantly.
- Turnover is low, and usually caused by nuclear medicine technologists leaving NZ to work overseas.
- There is a shortage of nuclear medicine technologists in NZ and internationally (Kiwicareers website).
- The Nuclear Medicine Technologists' Board predicts that the demand for trained nuclear medicine technologists is likely to increase over the next ten years due to advances in technology (particularly if Positron Emission Tomography is introduced, but a significant investment in equipment would be required first). (Personal Communication).

The role of a nuclear medicine technologist

A nuclear medicine technologist uses radioactive materials (tracers) to diagnose and occasionally treat diseases. Nuclear medicine is a specialised area of medical radiation technology. Tasks include preparation and injection of radiopharmaceuticals (tracers) and analysis of the tracers with a gamma camera and a computer. They may also use radiopharmaceuticals to treat diseases. (Kiwicareers website)

Workforce statistics

There are about twelve nuclear medicine departments in New Zealand public hospitals as well as about three private practices (these cannot take trainees). There are 27 registered nuclear medicine technologists, but not all of these are in the workforce, and not all work full-time. There are an estimated 15 – 18 FTEs in the workforce plus approximately five in private practice. Vacancies are estimated at about five to six. (Personal communication with Nuclear Medicine Technologist (NMT) Board)

The 2000 NZHIS medical radiation technologists' workforce survey showed 18 respondents working in radionuclide imaging (ie nuclear medicine). Twelve of these reported working in the public medicine sector, and 6 in private practice. The active medical radiation technologist workforce in general is predominantly female (87.9%). The majority identify themselves as NZ European/Pakeha ethnic group (83.7%). Nearly two-thirds (61.7%) are aged between 30 and 49. (Based on 903 active MRTs who responded to the health workforce survey. This represents 61.9% of the 1459 MRTs who were issued Annual Licences between March and September 2000)

Training programme

Trainees must be working in a nuclear medicine department, and must have a Bachelor of Applied Science majoring in medical diagnostic imaging in order to train as a nuclear medicine technologist. To become fully qualified they must complete a two-year

postgraduate diploma in nuclear medicine technology. This is undertaken extramurally through the University of Newcastle in Australia. (2 years part time or one year full time, 80 units). Nuclear medicine technologists need to be registered with the Medical Radiation Technologists Board before undertaking nuclear medicine technology training.

The Nuclear Medicine Technologists' Board estimates that 2 to 3 people are participating in this training programme per year. The cost of postgraduate training was cited as a barrier. Currently the fees are Aus\$6,400.00. (Personal communication).

University of Newcastle offers Graduate Diploma and Master of Nuclear Medicine courses for nuclear medicine technologists. The programmes are fully accredited by the Australian and New Zealand Society of Nuclear Medicine. There is no requirement for on campus attendance. Material is clinically focussed.

The number of people training in this occupation is low, and this is unlikely to change because trainees need to have completed an undergraduate degree in medical radiation technology and have work placement before commencing nuclear medicine technology training. (Kiwicareers website)

Neurophysiology

Neurophysiology technicians

Current issues

- Training numbers are limited in NZ by the need to find work placement before starting training. As a result there is a trend towards employing trained staff from overseas.
- Numbers are not expected to change over the next two to three years. Turnover is low and this is unlikely to change in the near future
- Numbers are expected to increase over the long term. There is demand for skills of neurophysiology technicians. (Source: Kiwicareers website).

- Auckland is the main training centre. Smaller centres are less likely to take on trainees due to large commitment in terms of expense and supervisory time.
- The New Zealand Society of Neurophysiology Technologists (NZSNPT) is looking at setting up a registration system, but the small workforce in NZ makes this difficult.
- All centres are busy, but there is no funding available for more posts.
- Epilepsy is a growth area, as the importance of early diagnosis is being recognised (impacts on child development). (Source: Personal communication with NZ Society of Neurophysiology Technicians).

The role of a neurophysiology technician

Neurophysiology technicians record electrical activity produced by the brain and brain cells or muscles, using electroencephalograph (EEG) machines. This assists with the diagnosis of illness. As well as operating EEG machines, neurophysiology technicians observe and monitor brain activity and responses, and analyse and interpret patients' test results. Senior neurophysiology technicians may help in research on the brain or nervous system. (Kiwicareers website).

Neurophysiology technicians work in their own departments as well as on the ward and in intensive care units. As well as EEG recordings they carry out “evoked potentials” – stimulating auditory/visual/sensory pathways. Neurophysiology technicians work with patients with conditions such as multiple sclerosis, Parkinson’s disease, benign tremor, back injury and epilepsy.

Workforce statistics

There are approximately 30 neurophysiology technicians in NZ. Numbers have remained fairly static for the last decade. (Kiwicareers website)

There are approximately eight centres in NZ. Wellington has three staff but has enough work for four. The department may split into adult/paediatric services in the new hospital; in which case, one further neurophysiology technician will be needed (five in total). Dunedin operates with one neurophysiology technician, and Christchurch staff all work part-time. (Personal communication with NZSNPT)

Training programme

Neurophysiology technicians undertake four years of practical and theoretical training. The first part of the training is fully supervised by a qualified technician. In New Zealand neurophysiology technicians study by correspondence to obtain a Diploma in Health Sciences, majoring in clinical neurophysiology. Current fees for the Advanced Diploma are \$2354 (Aus) for 1770 hours. In 1999 an advanced diploma replaced the certificate as the qualification for neurophysiology technicians in New Zealand. The NZSNPT estimated that there were about 4 trainees as at February 2002. (two in Christchurch and two in Auckland)

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