

## NUCLEAR MEDICINE SERVICES

### CHAPTER 54

SWSAHS provides nuclear medicine services through two Nuclear Medicine Departments in SWSAHS, located at the Bankstown and Liverpool Hospitals. Nuclear medicine uses radioactive substances to image the body and treat disease. Nuclear medicine looks at both the physiology (functioning) and the anatomy of the body in establishing diagnosis and treatment.

In 2001, SWSAHS successfully tendered the Commonwealth for a public Positron Emission Tomography (PET) machine to be located in Liverpool Health Service. The capital cost totalled \$3.7 million. This service is one of only two Medicare-funded machines available in the State (the other is located at Royal Prince Alfred Hospital) and provides the residents and service providers in SWSAHS improved access to state of the art medical technology. There are currently eight Medicare-funded PET scanners in Australia. A State-wide Positron Emission Tomography (PET) Service commenced operation in Liverpool Nuclear Medicine department in August 2002. Positron Emission Tomography is a minimally invasive method of nuclear medicine imaging that uses short-lived radiopharmaceuticals to detect and assess perfusion and metabolic activity in various organ systems. When compared to information that is provided by radiological techniques such as CT scanning, Magnetic Resonance Imaging (MRI) and radiology PET can provide information about function and metabolism that is complementary to the structural information provide by these other medical imaging technologies.

Demand for PET services is projected to grow rapidly over the next 2 years, until the number of PET cameras in NSW is re-assessed. Nuclear medicine services at Liverpool Hospital are expected to grow at about 5% per year in keeping with recent trends, whilst the demand for nuclear medicine services at the Bankstown Hospital is expected to stabilise after increasing 10% in 2003.

### Current Services

Staff Specialists, capital equipment, and other running costs at both the Bankstown and Liverpool Hospitals have been substantially funded through Trust Fund monies.

### Bankstown Hospital

Bankstown Hospital provide comprehensive diagnostic and therapeutic nuclear medicine, bone mineral density, diagnostic and interventional ultrasound with special interests in endoscopic, paediatric and vascular ultrasound. In 2002/03 there were a total of 15,000 occasions of service (including ultrasound which accounts for approximately 50% of the total). Approximately 70% of the patients are outpatients.

Current equipment: 3 multihead SPECT gamma cameras (commissioned in 1994,1996, and 1997), 3 ultrasound machines (2002,2003,2004) and an x-ray bone densitometry machine (1997). An additional ultrasound is shared with maternity and endoscopic ultrasound with gastroenterology.

### **Liverpool Hospital**

Comprehensive diagnostic and therapeutic nuclear medicine services and PET are provided at Liverpool Hospital. The Hospital also provides a consultative thyroid clinic, a range of diagnostic and interventional and intra-luminal ultrasound services, bone mineral densitometry and tracer kinetics. In 2002/03 there were a total of 8,500 occasions of service (including ultrasound which accounts for approximately 10% of the total).

Liverpool Hospital also provides nuclear medicine services to Campbelltown and Fairfield Hospital inpatients. Inpatients at Liverpool Hospital have access to after hours on call nuclear medicine services. The Department participates in 5 weekly combined clinics.

The State-wide PET Service is based at Liverpool Hospital. Up to 65% of referrals to the PET Service come from outside of SWSAHS. Currently a bimonthly Quality assurance meeting for PET is held between Bankstown and Liverpool nuclear medicine departments. From August 2002-May 2003 there were a total of 650 scans performed on 590 patients. From September 2003 – January 2004 a total of 550 scans were performed which is a 70% workload increase compared to the first 10 months of operation. The PET scanner operation hours is 8am-6pm. The Department is accredited for training of technologists and FRACP advanced trainee in both general nuclear medicine and PET.

Current equipment: 3 multihead SPECT gamma cameras (commissioned in 1995, 1996, and 1997, one single head gamma camera (1989); a PET camera (2002) 2 ultrasound machines (1994 and 1997) and an x-ray bone densitometry.

### **Campbelltown Hospital**

A nuclear medicine facility has been incorporated into the new clinical buildings at Campbelltown as part of the Campbelltown Hospital development.

The nuclear medicine department will enable patients to be scanned within Campbelltown Hospital and be utilised for patients with suspected pulmonary emboli (lung scans), ischaemic chest pain (non-invasive myocardial perfusion stress studies, biliary scans, red cell scans for gastro-enterologic bleeding, bone scan for fractures and infection (osteomyelitis), paediatrics and brain scans.

## Teaching and Research

The Nuclear Medicine Departments at Liverpool and Bankstown Hospital are actively involved in teaching and research.

The Liverpool Hospital Nuclear Medicine Department is accredited for training technologists, and FRACP advanced trainees in both general nuclear medicine and PET. Education sessions on clinical applications of PET and the referral process are provided to Liverpool, Bankstown, Westmead, Royal North Shore, Nepean, St George and St Vincent Hospitals. In addition, the Department is currently involved in approximately 14 research projects including 5 multi-centre trials.

A collaborative multi centre trial on lung cancer using PET involving Westmead (chief investigator), Liverpool, Royal Prince Alfred, Royal North Shore and Prince Of Wales Hospitals commenced in early 2004. Three interstate multicenter trials on lymphoma, head and neck and gastroesophageal cancer also commenced in early 2004. There is also a biweekly education and quality assurance program conducted.

The Bankstown Nuclear Medicine Department provides education and training of undergraduate and postgraduate students and FRACP advanced trainees. In addition, research is an important component of the Service provided.

## RECOMMENDATIONS

- All imaging (including nuclear medicine) be incorporated into one Area-wide medical imaging service.
- Nuclear medicine services provided at Bankstown, Liverpool and Campbelltown be networked to ensure quality and have:-
  - An Area Nuclear Medicine Advisory Committee;
  - PET advisory and research committees;
  - Radiation Safety Committee;
  - Shared clinical governance program; and
  - Shared expertise in physicists and radiopharmacists.
- All nuclear medicine staff be funded from General funds.
- The Nuclear Medicine Department at Campbelltown Hospital progressively be developed as the third main site in SWSAHS from 2005.
- Locally raised trust funds will remain locally held for use at the site where raised.