

GRAFTON NUCLEAR MEDICINE & BONE DENSITOMETRY



New Services at Grafton Nuclear Medicine

Grafton Nuclear Medicine and Bone Densitometry offers a number of services that are not widely available elsewhere in regional NSW, and are typically only performed in major metropolitan teaching hospitals. These include:

- **White Cell Scans:** considered the gold standard in the imaging of acute infection, preferred in most instances to Gallium scans and Leukoscans
- **High Resolution Pinhole imaging:** with 3 times the resolution of standard nuclear medicine scanners, especially useful in thyroid, parathyroid and renal imaging
- **Radioactive Iodine Treatment for Thyroid Cancer:** available as adjunctive treatment for patients after surgery for thyroid cancer. These patients can now be managed in the outpatient setting and no longer have to travel to Sydney, Newcastle or Brisbane for inpatient treatment
- **Iodine SPECT/CT Scans:** for thyroid cancer surveillance following surgery and radioactive iodine ablation

Stress Testing of Patients with Limited Mobility

Although exercise stress testing has high sensitivity and specificity when combined with functional imaging such as a sestamibi scan or echocardiography, the accuracy of the test is dependent on patients being able to exercise **to a target heart rate of 85%** of their predicted maximum.

For patients who are unable to exercise adequately, pharmacological stress testing using a **vasodilator** (persantin or preferably adenosine) is available. Coronary arteries which are stenosed and unable to dilate adequately

can be identified and evaluated for further management. The high diagnostic accuracy when combined with a non-invasive sestamibi scan makes this an ideal first line examination.

Common indications include the assessment of chest pain, the pre-operative workup of patients with cardiac risk factors, and early evaluation of patients following infarction (in whom exercise testing is contra-indicated).

Modality	Sensitivity	Specificity
Exercise Stress Test Only	58%	67%
Echo + Exercise Stress	84% (71-97%)	77% (64-90%)
+ Pharmacological	55-61%	96-100%
MIBI + Exercise Stress	88% (76-100%)	86% (81-92%)
+ Pharmacological	90-97%	81-100%

The sestamibi scan has the highest overall sensitivity and specificity in both ambulant and non-ambulant patients



Infection Imaging — White Cell Scans

Autologous labelled white cell scans are considered the gold standard for the imaging of infection in soft tissues and bone. However, until now this service has not been readily available, and patients in the area have been limited to Leukoscans or Gallium scans, which have a lower sensitivity and specificity (except in the skull and spine).

To increase diagnostic accuracy, the white cell scan is combined with a marrow scan in cases of suspected osteomyelitis. A bone scan within the preceding two weeks is also recommended for correlation. These scans are ideally performed at the same centre and on the same SPECT/CT scanner for comparison purposes.

Modality	Sensitivity	Specificity
White Cell + Marrow Scan	95%	90%
White Cell Scan	90%	86%
Leukoscan	85%	77%
Gallium Scan	80%	85%



Fig 1.

Fig 1. Gallium scan negative for infection in the left knee – the increased uptake was interpreted as probable inflammation

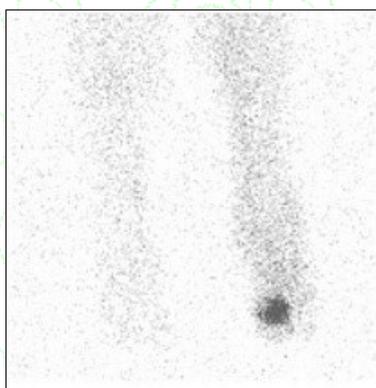


Fig 3.

Fig 2. Leukoscan negative for infection in the left hip – the mild uptake was interpreted as probably non-significant

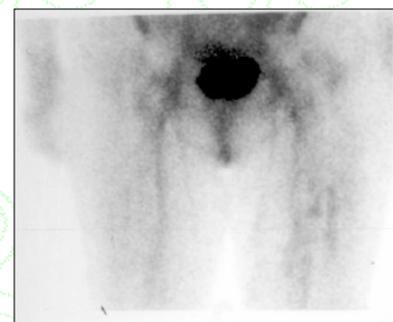


Fig 2.

Fig 3. White cell scan positive for infection in the left great toe. The uptake is clearly visualised, and is usually less equivocal compared to Gallium and Leukoscan.

