



# New Bone Imaging Protocol Using **79% Less Radiation** than CT Studies

*minimising radiation exposure in molecular imaging*

Dr. Alan Ting *MB BS (Hons I) FRACP (Nuclear Medicine & Endocrinology)*

Nuclear Medicine studies usually employ much lower radiation doses compared to Computed Tomography (CT). At Chatswood Nuclear Medicine and Endocrinology, we have been refining our protocols to further reduce the radiation exposure from our scans. We are pleased to announce that our bone scans now deliver a radiation dose that is only slightly higher than x-ray examinations. We call this our Mini-Dose Protocol. The radiation dose required is **79% lower** than CT examinations (see Table 1). All this is achieved without affecting image quality or diagnostic accuracy.

No preparation or precautions are required. The isotope remains safe even in patients with renal failure, previous contrast reactions or metallic implants. Patients do not need to cease metformin or nephrotoxic medications prior to the scan.



Procedure	Radiation Dose (mSv)
<b>Bone Scan</b> (Using our Mini-Dose Protocol)	3.7
<b>Bone Scan</b> (Typical exposure at other Practices)	6.3 <b>(+70%)</b>
<b>CT Chest</b>	7.0 <b>(+89%)</b>
<b>CT Abdomen</b>	8.0 <b>(+116%)</b>
<b>CT Pelvis</b>	6.0 <b>(+62%)</b>
<b>CT Chest/Abdo/Pelvis</b>	18.0 <b>(+386%)</b>
<b>X-ray Thoracolumbar Spine</b>	2.5



## SPECT/CT, Medicare Audits and the Professional Services Review

Images from Nuclear Medicine examinations (SPECT) can be merged with Computed Tomography to produce a SPECT/CT study. This allows us to combine the high sensitivity of the Nuclear Medicine camera with the high resolution of a CT scanner.

We use a hybrid camera that allows both scans to be performed seamlessly in the one setting. The CT is used only for anatomical localisation and therefore requires very low levels of radiation. The advantages of this approach are:

- 1) radiation exposure is **90% lower than a standard CT scan**
- 2) the referrer has the option of requesting a formal diagnostic CT scan if clinically indicated, and
- 3) the procedure is not categorised as a CT examination for Medicare Audit purposes

However care should always be taken that requests for medical imaging reflect an appropriate clinical indication and are directed at the patient's needs.



## chatswood nuclear medicine and endocrinology

Suite 105, 443 Victoria Ave  
Chatswood 2067

- 3 hours free parking at Westfield
- 50m from Chatswood Train Station and Bus Interchange

Phone: 02 9419 6556

Fax: 02 9419 6557

reception@chatswoodnuclearendo.com.au

[www.ChatswoodNuclearEndo.com.au](http://www.ChatswoodNuclearEndo.com.au)

- **Nuclear Medicine**
- **Bone Densitometry (DXA) Scans**  
Bulk-billing available on request for diagnostic imaging services (\$50 for non-Medicare rebatable bone density scans)
- **Clinical Endocrinology** (special interest in Thyroid Disease)  
Electronic reports available via Healthlink, Argus, and Email

## Nuclear Medicine Case Corner: Back Pain and Facet Joint Inflammation

Degenerative disease in the facet joints is a common finding on x-ray and CT imaging of the spine, and may be symptomatic in some cases. Facet joint pain may mimic other causes of back pain, but is more likely to be a contributing factor where the pain is reproduced on twisting and arching of the spine, predominantly ipsilateral with associated tenderness, and with features of radiculopathy such as radiation to the legs, shoulders or head.

A bone scan is useful in these cases to detect the presence of inflammation or active arthritis within the facet joints. Patients with significant uptake on the bone scan have an 87% likelihood of response to intra-articular steroid injections at 1 month, compared to 31% in patients with a negative scan (Radiology 2006; 238: 693-8). It is common for patients with known multilevel facet joint disease to undergo a bone scan prior to therapeutic injections, so the most inflamed facet joints may be detected and selectively targeted.

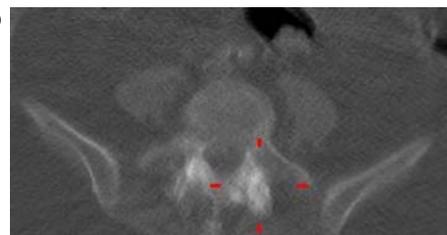
At Chatswood Nuclear Medicine and Endocrinology, we perform low-

radiation SPECT/CT imaging to ensure accurate localisation of facet joint levels. This provides an ideal map for CT-guided intra-articular steroid injections.

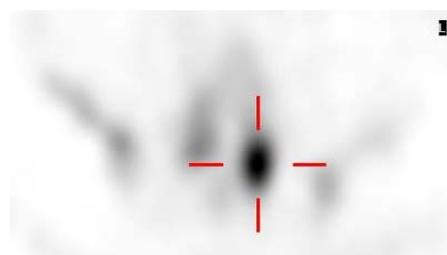
Other causes of back pain commonly detected on a bone scan include fractures, skeletal malignancy, Paget's disease, and infection.

**A positive bone scan predicts an 87% success rate with intra-articular steroid injections**

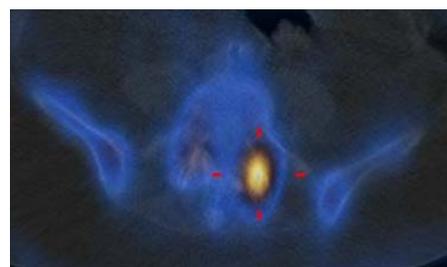
**This compares with only 31% in patients with a negative scan**



*Degenerative change in **bilateral facet joints***



*The bone scan shows intense facet joint inflammation **only on the left***



*The same view on SPECT/CT. The site of active arthritis is precisely localized prior to steroid injections*