

Nuclear Medicine Christchurch Hospital

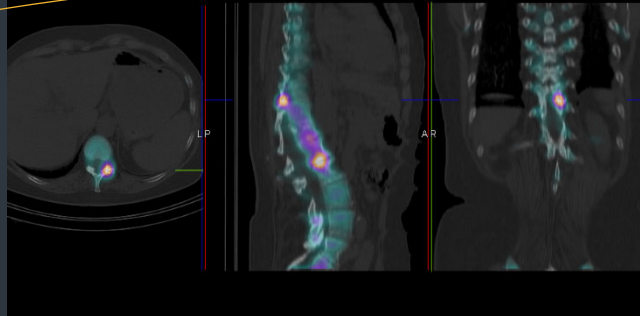
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News in brief

- We welcome Dr. William Avery, Radiologist, to Christchurch Hospital.
- Know the difference between bone scans and 'bone scans'. Read on for further information.
- Parathyroid imaging - just one of the many scans thriving in the age of SPECT/CT imaging. See this newsletter for more details.
- The new CDHB website is fully operational. Check out the Nuclear Medicine webpages at www.cdhb.health.nz/nuclear-medicine
- Our bone scan and thyroid scan health pathways documents are now online: cdhb.healthpathways.org.nz

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www.cdhb.health.nz/nuclear-medicine



SPECT/CT imaging—coming of age ...

Referrer survey

This newsletter comes to you with a survey form. We use the results of this survey to decide where to focus our service improvement efforts. It's hard to judge from the inside how well we are doing, so we appreciate your feedback - positive, negative, or both. Please take a couple of minutes to help us out.

Bone scan referrals

Because there are different types of 'Bone scan', this has led to some confusion over the term. To clarify:

Bone (Isotope) Scan referrals go to Nuclear Medicine. Follow the Bone Pain HealthPathway. Please include ACC details if applicable.

Bone Density Scan (DXA) referrals go to Community Referred Radiology. Follow the Osteoporosis HealthPathway.

NaF Scans - Sodium Fluoride (NaF) PET/CT Bone Scan referrals go to CRG (Christchurch Radiology Group).

Patient weight

Many of the pharmaceuticals we label with radioactivity are prepared in advance of the patient arriving in the Department and these radiopharmaceuticals are adjusted for patient

weight. This is why we need a patient weight when you submit a request for a scan.

Welcome to Dr. William Avery

Dr. William Avery joined the Radiology and Nuclear Medicine Departments at Christchurch Hospital in April 2012. Dr. Sue O'Malley and he now anchor the Nuclear Medicine Department. He and his family are permanent immigrants from the United States, and are excited to relocate to Christchurch. Dr. Avery received



his radiology and nuclear medicine training at Doctors Hospital in Columbus, Ohio and completed a fellowship in neuroradiology in San Diego at the University of California, San Diego. He has practiced medicine for approximately 30 years and has extensive experience in academic teaching centres, public hospitals, and private medical facilities. Areas of special interest include musculoskeletal and neuroimaging.

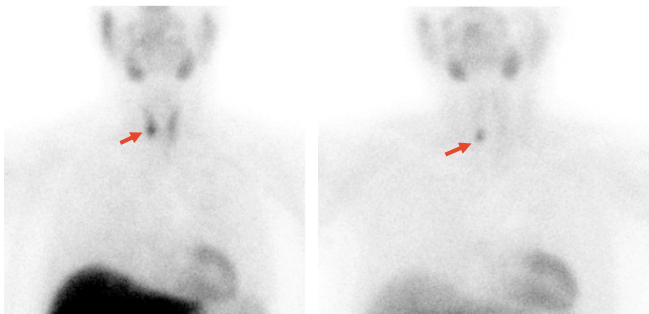
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Parathyroid imaging

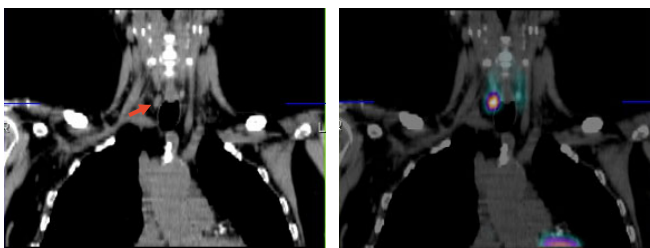
Hypercalcaemia is not an unusual clinical scenario in general practice. Some of these patients will have an underlying parathyroid abnormality. The clinical presentation of hypercalcaemia is varied, there may be none and be picked up on a routine biochemical screen, or may present with anorexia, vomiting, constipation, thirst, polyuria, confusion and coma.

If parathyroid adenoma is suspected with elevated calcium and parathyroid hormone, a Nuclear Medicine (NM) scan can localise the parathyroid adenoma prior to surgery if required. Nuclear medicine scanning has proven to be very reliable in identifying a parathyroid adenoma. It is more helpful than ultrasound, CT and MRI.

The scan relies on the differential washout of isotope from the parathyroid tissue compared to the thyroid tissue.



Early sestamibi image showing the prominent right gland. Delayed sestamibi image showing a hyperactive parathyroid nodule.



Sestamibi SPECT/CT image showing the hyperactive parathyroid nodule corresponding to the region marked on the CT scan.

Parathyroid glands are notoriously variable in their location, especially the lower parathyroid glands which migrate along with the thymus during intrauterine development at 6-8 weeks. As a consequence, it is not unusual for a parathyroid adenoma to migrate into the mediastinum.

Nuclear medicine parathyroid imaging requires a thyroid scan to form a background for the subsequent parathyroid scan. In

many individuals the thyroid gland is non-uniform and this can make interpretation difficult without the baseline thyroid scan. The thyroid scan requires a very small radioactive injection of Technetium-99m and takes 15 minutes to scan, with no preparation required.

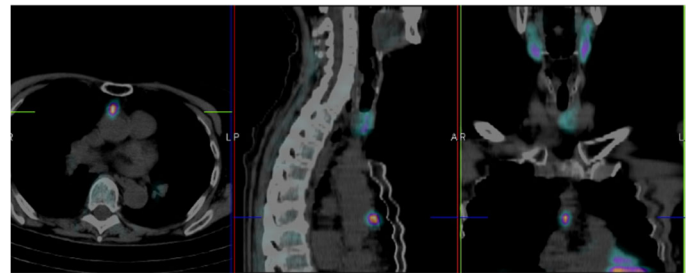


Delayed sestamibi image showing an ectopic parathyroid adenomata.

The parathyroid scan requires a different radiopharmaceutical called sestamibi. It takes 2 hours.

The initial sestamibi scan is taken at 10 minutes with a low-dose CT scan for SPECT/CT imaging. This helps to precisely

localise the parathyroid adenoma. The scan is then repeated at 2 hours (delayed) to determine if there has been expected washout of the isotope from the thyroid gland with



Delayed sestamibi SPECT/CT image showing an ectopic parathyroid adenomata adjacent to the aorta (displayed in pseudo colour on the grayscale CT image).

retention of the radiotracer by the parathyroid adenoma.

This information then enables the clinician to plan best treatment, whether that is to observe or to plan surgical intervention.

The Nuclear Medicine Department at Christchurch Hospital does these scans routinely with a waiting time of about 4 weeks (earlier if urgently requested). Results are made available on the day of the second scan (the sestamibi parathyroid scan). The scans are not uncomfortable and do not require patient preparation.