National Health Committee

An Overview of Imaging in New Zealand
**National Health Committee (NHC)**

The National Health Committee (NHC) is an independent statutory body charged with prioritising new and existing health technologies and making recommendations to the Minister of Health.

It was reformed in 2011 to establish evaluation systems that would provide the New Zealand people and the health sector with greater value for money invested in health.

The NHC Executive is the secretariat that supports the Committee. The NHC Executive’s primary objective is to provide the Committee with sufficient information for it to make decisions regarding prioritisation and reprioritisation of interventions and services. They do this through a range of evidence-based products chosen according to the nature of the decision required and timeframe within which decisions need to be made.

The New Zealand Government has asked that all new diagnostic and treatment (non-pharmaceutical) services, and significant expansions of existing services, are to be referred to the NHC.

In August 2011 the NHC was appointed with new Terms of Reference and a mandate to establish the capacity to assess new and existing health technologies. Its objectives (under Section 4.2 of its Terms of Reference – www.nhc.health.govt.nz) include contributing to improved value for money and fiscal sustainability in the health and disability sector by:

- providing timely advice and recommendations about relative cost-effectiveness based on the best available evidence;
- providing advice and recommendations which influence the behaviour of decision makers including clinicians and other health professionals;
- providing advice and recommendations which are reflected in resource allocation at national, regional and local levels; and
- contributing to tangible reductions in the use of ineffective interventions and improved targeting to those most likely to benefit.

In order to achieve its objectives under Section 4.2 and to achieve ‘Value for Money’, the NHC has adopted a framework of four assessment domains – Clinical Safety & Effectiveness; Economic; Societal & Ethical; and Feasibility of Adoption – in order that assessments cover the range of potential considerations and that the recommendations made are reasonable.

It is intended that the research questions asked will fall across these domains to ensure that when the Committee comes to apply its decision-making criteria, it has a balanced range of information available to it. When the NHC is setting those questions they will have the decision-making criteria in mind.

The 11 decision-making criteria will assist in the determination of the NHC work programme and in the appraisal and prioritisation of assessments.
# Contents

1. Introduction ................................................. 4

2. Organisation of imaging in New Zealand .......... 5
   2.1 Volumes and costs ........................................... 6
   2.2 Workforce .................................................. 7
   2.3 Information systems ...................................... 7

3. Emerging technologies ...................................... 8

4. New Zealand service developments and issues .... 9

References ..................................................... 11

   National Health Committee (NHC) and Executive .... 13
   Disclaimer .................................................. 13
1 Introduction

This document is intended to provide the National Health Committee (NHC) with an overview of the current situation for diagnostic imaging in order to inform decisions about whether to undertake further work in the area.

Diagnostic imaging services comprise a variety of modalities performed by a range of professionals. The following are considered:

- **Radiological diagnostic imaging** services provided include plain X-rays, computerised tomography (CT), magnetic resonance imaging (MRI), ultrasound and nuclear medicine imaging techniques. These modalities provide images that are interpreted to assist in the diagnosis of disease.\(^1\)

- **Echocardiography** technology uses sound waves to give structural and functional information regarding the heart and is performed by specialist technicians and interpreted by cardiologists.

- **Coronary angiography** is performed by cardiologists and provides structural information relating to the coronary arteries in the assessment of ischaemic heart disease (IHD). Angioplasty can be performed at the same time. An equivalent approach investigating the peripheral vasculature is performed by radiologists.

- **Endoscopy** – colonoscopy, sigmoidoscopy and upper gastrointestinal endoscopy are examinations of the gastrointestinal tract that utilise a flexibly mounted video camera providing images to a monitor screen for the diagnosis and management of a variety of gastrointestinal conditions.
2 Organisation of imaging in New Zealand

Radiological imaging services are provided by both private and public health care providers. Sources of funding of services are through DHBs, patient expenditure and the Accident Compensation Corporation (ACC).

DHBs’ hospital services provide imaging services, the extent of which is covered by the Service Coverage Schedule. The description of service provision is general with the addition of some specific requirements. Services funded by the DHB include but are not limited to diagnostic imaging services including X-rays, ultrasound scans and mammography for diagnosis.

There is provision of imaging services to patients seen in the primary care setting as set out in the Community Radiology (Hospitals) Service specification. However the access to imaging services has not been equitable across DHBs. In response, the Ministry of Health has developed a minimum set of imaging modalities that must be provided to community practitioners with their evidence-based indications defined in tandem. This is due to be finalised and will be implemented via DHB annual plans in 2014. ACC is a bulk funder of radiological imaging to DHBs for the period of six weeks after the date of an injury. Investigations are funded via the individual claimant in primary care.

The balance of provision of services between the public and private sectors varies across DHBs and depends on local circumstances. The drivers for the public system using the private sector are:

- capacity issues at the hospital (these may be general or more specific such as lack of sonographers)
- cost of physical assets – some equipment (e.g. MRI) is expensive to purchase.

The partnership approach between the public and private sector can operate in varied ways:

- buying of specific services
- private ownership and operation of equipment but placed at the DHB
- joint ownership.

Instead of outright purchase of new equipment, DHBs may have access to leasing agreements in the future.

All DHBs in New Zealand provide transthoracic echocardiography, with 17 performing adult and paediatric scans. Thirteen perform stress echo procedures and 15 trans-oesophageal services.

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1 Personal communication: Dr Liz McAnulty, National Clinical Leader Radiology
Coronary angiography is performed in the diagnosis of IHD, used in the management of acute presentations and is recommended in stable patients assessed clinically as having a higher likelihood of having IHD, particularly if angioplasty is being considered. Angiography is performed at 11 sites across New Zealand.² Patients assessed as low or intermediate risk initially are investigated with a CT calcium score, or non-invasive functional modalities.³ The assessment of patients presenting with acute coronary syndromes with coronary angiography and of left ventricular function are used as quality improvement indicators.⁴ Provision of cardiac MRI diagnosis has been proposed by clinicians at Nelson Marlborough DHB. An economic analysis of modalities used in the diagnosis of IHD did not find MRI a cost-effective option.⁵

2.1 Volumes and costs

The imaging modalities of CT and MRI, colonoscopy and coronary angiography are relevant to health targets.

For the calendar year 2012 the number of CT scans performed was 115,100 and MRI scans was 17,800.³

CT and MRI data are collected for primary care and outpatients and is currently available only for one year. For the year 2012/13 the number of CT scans performed was 70,851 and MRI scans was 36,463.⁴ These radiological modalities are also a significant source of increasing costs.

The utilisation of coronary angiography and colonoscopy is also mapped by reference to domicile population for DHBs. There were 15,503 coronary angiograms performed in 2012/13. The standardised intervention rate by DHB had a range between 26.3/10,000 and 45.2/10,000.⁵ This number of procedures equates to a cost of $30.09 million.⁶

There were 41,369 diagnostic colonoscopies performed in 2012/13. The standardised intervention rate by DHB ranges between 71 and 137/10,000 population.⁷

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² Source: DHB Performance, National Health Board
³ Source: Analytical Services, Ministry of Health
⁴ Source: DHB Performance, National Health Board
⁵ Source: DHB Performance, National Health Board
⁶ Source: 2013 NHC analysis of New Zealand casemix price 2011/12 NMDS data
⁷ Source: DHB Performance, National Health Board
2.2 Workforce

Practising radiologists are medically qualified and fellows of the Royal Australian and New Zealand College of Radiologists. As of June 2012 the active New Zealand workforce was 319 radiologists, equivalent to 72 radiologists per million. The growth in radiologists is 3.9% since 2010 and 44% since 2000.\(^8\)

Medical radiation technologist professionals provide the skills required to perform radiological investigations and come under the Health Professionals Competence Assurance Act 2003.\(^9\) Health Workforce New Zealand have a focus on increasing the availability of sonographers\(^10\) as their lack of availability is recognised as a hindrance to service provision.

There were 60.3 total full-time equivalent (FTE) cardiac sonographers at the end of 2010, with 9% of DHB positions unfilled. The size of the workforce equates to 14 per million population, which is higher overall than the UK rate. Of the cardiac sonographers in New Zealand, 70% are registered with professional representative bodies in New Zealand and Australia.\(^4\)

Gastrointestinal endoscopies are performed by physicians and surgeons and the requirements and recognition of training are determined by the New Zealand Society of Gastroenterology.\(^11\) A survey in 2005 showed inadequate provision of colonoscopy in New Zealand public hospitals.\(^12\)

2.3 Information systems

The improvement in IT services is recognised as a component of service delivery improvement for diagnostic imaging.\(^13,14\) Digital storage and off-site access to images improves patient flow, investigation reporting and reduces duplicate imaging.\(^13-15\)
3 Emerging technologies

The miniaturisation of ultrasonography equipment is leading to broader clinical use. Point-of-care applications have become broad but include procedural guidance, and ‘focused’ diagnostic assessments by clinicians such as in the emergency setting and cardiology. Point-of-care use may support quicker diagnosis and supplement or replace current modalities.\(^{16}\) Training and quality control are important to provide benefits.\(^{16, 17}\) Point-of-care echocardiography may enable improved diagnostic accuracy and reduced use of formal echocardiography.\(^{18, 19}\)

The role of radiologists is developing, with interventional radiology taking an increased part of their function. Radiologists are performing procedures, aided by imaging technologies that were previously done by other specialists. However, procedures may be delivered in conjunction with other specialists.
4 New Zealand service developments and issues

Radiological service capacity is limited and demands are increasing; requests for CT scans increased by 7% year-on-year for the three DHBs in the greater Wellington region.\(^{13}\) National data for the outpatients show an increase of accepted referrals for CT scans of 9% and an increase of 8% for MRI scans over a 12-month period up to the end of 2013.\(^8\)

The limits to capacity revolve around the availability of staff and the cost of technology. The impact of constraints may mean a modality is not locally available at all (e.g. MRI) or an alternative modality is used. This substitution has the potential of higher radiation exposure or repeat testing with the preferred option. Development of standardisation of prioritisation and access criteria to radiology services is in process.\(^{13, 15}\) A three-year staged programme to reduce waiting times for diagnostic services commenced in 2011/12. From 2012/13 DHBs are required to report waiting time information on a number of key diagnostic modalities – colonoscopy, coronary angiography, CT and MRI.\(^2\)

The health care service development linkages for diagnostic imaging services include diagnostic wait indicators, faster cancer treatments and elective services.\(^{15}\) The Faster Cancer Treatment programme\(^{20}\) has improved timeliness of diagnosis as a component of improved care.

Another driver to diagnostic imaging services is described as the ‘Pipeline effect’: as radiology is a service provider to other clinicians, the appointment of new clinicians generates more requests for imaging and new interventions can generate demand for pre- and post-procedure imaging assessment.

Radiological imaging services can be considered as providing support to other clinical services that endeavour to add value in terms of improved patient outcomes or overall service delivery. Radiology services are currently pursuing a quality improvement programme.\(^{13, 15}\) Also an updated community radiology scheme is in development through Sector Capability and Implementation at the Ministry.

Audit of the positive diagnosis rate, either from the perspective of a radiological examination or by clinical service area has been used to drive discussion of the appropriate use of modalities. If the positive diagnostic rate is considered ‘too low’ this can lead to clinical discussion regarding best use of modalities. However it is not straightforward to define the appropriate level. This method is at an early stage and is not ‘business-as-usual’.\(^9\) Examples of condition/investigation overuse, though difficult to quantify or demonstrate, are:

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\(^8\) Ministry of Health

\(^9\) Personal communication, Dr Kim McAnulty, National Clinical Leader Radiology
• the follow-up of abnormal liver function tests with ultrasound
• use of CT in the context of suspected pulmonary embolism
• use of CT urogram in the context of suspected renal colic
• use of ultrasound in the investigation of abdominal pain
• use of pelvic ultrasound in the investigation of pelvic pain.

Anecdotally the drivers for increased use of investigations and a low positive diagnostic rate are the medico-legal environment and clinicians’ willingness to operate in a situation of perceived risk and to accept ‘clinical uncertainty’.

In December 2012 the NHC received a referral from the Ministry of Health’s Cancer Programme Steering Group to undertake a review of the national clinical indications for PET scanning. Regional PET Variance Committees had been working together in this area on indications to be included in such a review. The NHC considered at their May 2013 meeting that the use of PET was a well-managed part of the sector and that governance arrangements and mechanisms were already in place to consider PET scanning indications.

A national bowel screening programme will have important impacts on colonoscopy services. Individuals with an initial positive test will have a colonoscopy performed for definitive diagnosis. The need for additional workforce capacity and facilities to perform colonoscopy is recognised.\(^{(21)}\)

The need to improve access to community echocardiography for the diagnosis of asymptomatic heart murmurs has been identified by Waikato DHB. One in six referred patients is found to have clinically significant disease but waiting times are long and an alternative and better means has been sought rather than all having a first specialist appointment.\(^{(22)}\)
References


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