

# Lung cancer in New Zealand: overcoming barriers

Lung cancer is the leading cause of cancer death in New Zealand. In 2004, Dr Wendy Stevens, from the University of Auckland, conducted an audit of lung cancer care, from presentation in secondary care to treatment. At this time, five year survival from lung cancer was 10.2% in New Zealand, compared to 13% in Australia and 15% in the United States.

The audit revealed a number of disturbing findings:

- More patients presented to secondary care via an acute admission (36%) rather than as an outpatient referral to respiratory medicine via their General Practitioner (29%)
- Patients presenting via the emergency department more often had advanced, incurable disease
- Diagnosis and treatment was often subject to lengthy delays, particularly noticeable in outpatients (often with potentially curable disease)
- Only 28% of patients were presented at a thoracic multidisciplinary meeting (considered to be the gold standard approach to management)
- Rates of delivery of anti-cancer treatments (surgery, radiotherapy, chemotherapy) were low, and below those in comparable countries
- Māori were 2.5 times more likely to have locally advanced disease, and four times less likely to receive curative treatment than Europeans (multi-variate analysis)

When the four Cancer Networks were formed in New Zealand, these sobering findings helped to ensure that lung cancer was chosen as the first tumour with a dedicated “project stream”. This brought together relevant clinicians to try to improve the lung cancer pathway for people in New Zealand.

In 2007, a multidisciplinary study, funded by the Health Research Council, was set up and lead again by Dr Wendy Stevens. The study, entitled “Barriers to the timely diagnosis and management of lung cancer and description of best practice solutions”, involved a number of healthcare providers, including Auckland, Counties Manukau and Lakes DHBs;

Procure and Tamaki PHOs; and the University of Auckland. The research included an audit of patients diagnosed with lung cancer in 2008, from initial presentation to treatment, patient interviews, General Practitioner focus groups and primary and secondary care provider surveys. The 2008 audit findings were very similar to 2004 – patients were more commonly presenting acutely to secondary care (rather than via a primary care referral) and presenting with advanced disease. Slower work-up times were encountered for outpatients/early stage patients.

As a result of these findings, it was recommended that systems be developed to expedite the diagnosis of patients with early stage disease, such as day-stay or “rapid access” clinics. Of the patients who presented directly to secondary care, 60% had seen their General Practitioner within the preceding six months, which suggests there may be an opportunity for earlier diagnosis. Patients interviewed or in focus groups (who had presented to hospital with advanced disease) tended to feel that most of the delays in the lung cancer pathway occurred in primary care, although in fact the median time from presentation to referral for the whole study population was quite short overall.

The 2008 audit found that the percentage of patients that were presented at a thoracic multidisciplinary meeting had improved to 56%. It has subsequently been recommended that all cases of lung cancer should be discussed at a multidisciplinary meeting.

Other key findings from the 2008 study are given in Table 1 (over page), along with solutions and recommendations.

One of the key issues highlighted from the 2008 study is use of radiology services in primary care. It was found that, on presentation to secondary care, only 64% of patients had undergone chest x-ray examination. Chest x-ray was, however, often a strong pointer either to a diagnosis of lung cancer or to a referral to secondary care, where lung cancer was

subsequently diagnosed. The New Zealand Guidelines Group guidelines for cancer diagnosis outline referral criteria for lung cancer. However, in the surveys and focus groups, General Practitioners felt that these referral criteria were not helpful.

### So where to from here?

Implementation of the recommendations from this study is likely to make some difference in lung cancer survival rates, but not a large difference. This is due to the intrinsic nature of lung cancer (often asymptomatic until a late stage) and the poor

responses to treatments such as conventional chemotherapy. Such changes would help to streamline the patient journey, and improve patient and family/whānau satisfaction with care received along that journey. However, it is important to also actually measure patient and family/whānau satisfaction directly, as a “one size fits all” approach may not be appropriate in all settings or cultures.

There are also other developments and strategies which may reduce deaths from lung cancer in the future.

**Table 1:** Key findings and solutions from “Barriers to the timely diagnosis and management of lung cancer and description of best practice solutions”

Finding	Solution and/or recommendation
<p>Pacific peoples more commonly presented with metastatic disease and were more commonly referred for acute admission.</p> <p>Māori and Pacific peoples were more likely than Europeans to not attend appointments or initially decline investigation or referral.</p>	<p>Social marketing campaigns – ongoing rather than one off, national, targeted to and developed in conjunction with Māori and Pacific peoples.</p> <p>Development of information resources – particularly targeted to Māori and Pacific peoples.</p>
<p>Delays documented in the clinical records occurred due to system factors (10%) such as lost referrals or lack of follow up of abnormal results, or to patient factors (10%) such as not attending appointments or declining investigation/referrals.</p> <p>Patients felt that the worst part of the pathway was waiting for investigations and appointments, coupled with lack of information, particularly leading up to diagnosis.</p>	<p>“Aunties” (primary care coordinators).</p> <p>Secondary care coordinators/lung cancer nurses.</p> <p>Systems/safety nets to follow-up incidental findings and abnormal results.</p> <p>Obtain formal feedback from patients and their whānau/family.</p>
<p>The most common presenting symptom of lung cancer was cough (49%); only 15% had haemoptysis.</p> <p>At initial presentation, General Practitioners took specific action, e.g. chest x-ray or referral, for 50% of patients with lung cancer. For the other 50%, the General Practitioner’s index of suspicion was not raised, usually because of co-morbidities.</p>	<p>Upskilling of General Practitioners and primary care workers, by respiratory team.</p> <p>Improve utilisation of chest x-rays (lower threshold for ordering); have defined guidelines in a user-friendly format.</p>
<p>Spirometry was rarely recorded in primary care notes.</p> <p>Smoking status was not well recorded, particularly for ex-smokers.</p>	<p>Risk assessment – recording smoking status accurately (including dose in pack-years).</p> <p>Better access to spirometry for General Practitioners.</p>
<p>General Practitioners referred patients to secondary care by a wide variety of ways (mainly paper-based such as fax) and were not informed of their patient’s progress along the pathway. Referrals sometimes got lost leading to delays as well as frustration. Although General Practitioners complained about the difficulty obtaining a timely specialist appointment, the median time from referral to first specialist appointment was 11 days, suggesting that information about secondary care services was lacking.</p>	<p>E-referral systems (rather than fax) with regionally consistent investigation and referral pathways.</p> <p>Expedite investigations and specialist assessment; systematic approach to action referrals to secondary care in a timely and appropriate manner.</p> <p>Improve communication between primary and secondary care, and with the patient/family/whānau.</p>

## Targeted chemotherapy

The molecular nature of lung cancer is being explored, and oral treatments have been developed to target any specific mutations present. In New Zealand, the tyrosine kinase inhibitors gefitinib and erlotinib, which target epidermal growth factor receptor, have been made available for suitable patients. As yet, only a minority of patients have been identified with such mutations and therefore have a good response to these medicines. These patients do better with the targeted medicines than with conventional chemotherapy, and usually have fewer adverse effects. However, these medicines are also expensive, and resistance develops, eventually leading to disease relapse or progression.

## Minimally invasive surgery

Lobectomy may now be performed thoracoscopically, which has a longer procedure time but is associated with reduced post-operative pain, shorter hospital stay and faster recovery. This may enable older patients or patients previously considered “marginal” to undergo resection. The shorter recovery times may also enable adjuvant chemotherapy to be more consistently delivered to those who may benefit (large Stage 1B, and Stage 2 and 3A tumours).

## Screening

The fundamental problem with screening for lung cancer is the very high false positive rate – small nodules are very commonly found on chest CT scans, and most turn out to be benign. A 2010 meta-analysis suggested that if 1000 asymptomatic smokers were screened with CT, nine curable Stage 1 lung cancers would be found but also 235 “false positive” nodules would be found, many of which would require follow up to ensure they were benign; four thoracotomies would also be performed for what turned out to be a benign process.<sup>1</sup>

The United States NLST trial found that CT screening at zero, one and two years led to a relative reduction in death from lung cancer of 20% compared to chest x-ray screening.<sup>2</sup> Although there was no control group with “no screening” in this study, these findings suggest that chest x-ray screening of asymptomatic smokers in primary care is not useful.

Questions remain about the cost effectiveness of lung cancer screening, especially compared to smoking cessation strategies. The NLST targeted current or ex-smokers with >15 pack-years; however, recent evidence suggests a common genetic susceptibility shared between COPD/emphysema and lung cancer. Future research needs to find a better definition of the highest risk group of smokers, with algorithms which may include spirometry, presence of emphysema on CT, family history and possibly evaluation of genetic susceptibility. Many

screening studies have also failed to evaluate whether smokers would be willing to participate in screening outside of the context of research trials – unlike successful “whole population” screening programmes such as cervical smears, smokers are a subgroup who are already engaging in risky behaviour.

## Tobacco control

Ultimately, prevention of lung cancer would be the best strategy. Effective treatments for smoking cessation in primary care include brief advice or more intensive counselling, nicotine replacement therapy (NRT), bupropion and varenicline. The Aspire 2025 project aims to support the government objective of making New Zealand tobacco free by 2025, via research into a number of potential smoking cessation and tobacco control strategies.

 Further information about Aspire 2025 is available from: [www.aspire2025.org.nz](http://www.aspire2025.org.nz)

Overall, this is a rapidly evolving time in lung cancer care. Dr Stevens’ studies have helped to enable significant progress to be made in offering quality lung cancer services, earlier and more rapid diagnosis and staging, and more effective and less toxic treatment. It is to be hoped that such advances in local care and international practice will translate into reduced morbidity and mortality from lung cancer in New Zealand in the coming years.

 Detailed reports on “Barriers to the timely diagnosis and management of lung cancer and description of best practice solutions” are available from: [www.northerncancernetwork.org.nz](http://www.northerncancernetwork.org.nz)

“Recommendations to expedite the diagnosis of lung cancer”, the final report of the HRC\_DHBNZ funded project was released in July, 2012 and is also available at the above web address. It contains a number of recommendations that are specific to primary care. An article on these recommendations will appear in a future edition of Best Practice Journal.

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1. Gopal M, Abdullah S, Grady J, Goodwin J. Screening for lung cancer with low-dose computed tomography: a systematic review and meta-analysis of the baseline findings of randomized controlled trials. *J Thorac Oncol* 2010;5(8):1233-9.
2. Neugut A, Accorino M. Review: CT screening for lung cancer reduced mortality in 1 large trial but not in 2 smaller trials. *Ann Intern Med* 2012;157(6):JC3-6.