Expert Forum
5th New Zealand Lung Cancer Conference 2016
Making Education Easy 2016

In this review:

Abbreviations used in this review

ALK = anaplastic lymphoma kinase
CTLA-4 = cytotoxic T-lymphocyte antigen-4
CXR = chest x-ray
CT = computerised tomography
EGFR = epidermal growth factor receptor
EGFR-TKI = epidermal growth factor receptor-tyrosine kinase inhibitor
MDT = multidisciplinary team
NSCLC = non-small cell lung cancer
OS = overall survival
PD-1 = programmed cell death 1
PD-L1 = programmed cell death ligand 1
PET = positron emission tomography
RCT = randomised controlled trial
RT = radiotherapy
TKI = tyrosine kinase inhibitor

Welcome

to this review of the 5th New Zealand Lung Cancer Conference, which was held in Auckland on 26–27 May 2016. Delegates included respiratory physicians, oncologists, radiologists, and pathologists, with strong attendance from nurse specialists and co-ordinators. This review presents selected highlights from the meeting including aspects of lung cancer pathology, prevention, medical and radiation oncology, local research, and end-of-life care. The conference was organised by the Thoracic Society of Australia and New Zealand (TSANZ) and endorsed as a continuing professional development (CPD) activity by the Royal New Zealand College of General Practitioners (RNZCGP).

INTRODUCTION

Patient perspective

John Ashton, Lung Foundation of New Zealand

I was fit, healthy, and a non-smoker when diagnosed with lung cancer 3 years ago. A test for EGFR mutation was negative thus excluding the option of EGFR-targeted therapy. Multiple rounds of standard chemotherapy failed to reduce tumour size. Faced with a bleak prognosis, I began applying for participation in clinical trials of novel drug treatments and was found to be positive for ALK mutation. This led to being able to access a compassionate supply of an ALK-inhibitor anti-cancer agent. Seven days after starting this treatment, my chronic cough had resolved and a CXR subsequently showed the disappearance of pulmonary nodules. I have now gained 27 additional months of life and I am able to exercise without chest pain or breathlessness.

The value of life extension for a terminal cancer patient cannot be overstated. For me, it extends beyond personal and family benefit. It also means not being a burden on the health system, being a productive member of society, and being able to give something back as a lung cancer patient advocate. I am still alive because I sought treatment early and the cancer was detected before it had spread from my chest, I am in the care of a team of dedicated doctors and specialists, and I had the good fortune to be able to receive a novel targeted cancer therapy.

DAY 1 SESSION 1: PREVENTION AND EARLY DETECTION OF LUNG CANCER

Tobacco control and Aspire 2025 – Where are we in 2016?

Prof. Richard Edwards, University of Otago

NZ is a leader in tobacco control, having launched many policies and initiatives to discourage smoking over the past 20 years. A new development in tobacco control in NZ is Smokefree 2025. The main driver of this initiative was the Māori Affairs Select Committee's inquiry into the tobacco industry in 2010, which recommended that the government aspire to make NZ a smokefree nation by 2025. In March 2011, the Government adopted the Smokefree 2025 goal for NZ. This represented a philosophical shift from aiming to reduce smoking to aiming to end smoking altogether, and the NZ Government was the first in the world to adopt such an 'endgame' goal.

Four years after its formal adoption, NZ has a higher tax on tobacco products, smoke-free prisons, no point-of-sale displays of tobacco products in retail outlets, and lower duty-free allowances for tobacco. There have also been some successful mass media campaigns, including the Stop Before You Start initiative and many local councils have adopted Smokefree 2025, e.g. introducing strategies to implement smokefree outdoor places. An online survey in 2013 indicated strong public support for more tobacco control measures, and specifically for the Smokefree 2025 goal of reducing smoking prevalence from 20% to <5% by 2025.[1]

However, little progress has been made on curtailing the supply of tobacco, NZ still does not have tobacco plain packaging, no progress has been made on smokefree cars, duty free sales of tobacco products

have not been banned, and more fundamentally the government still has no formal strategy on how NZ will achieve the goal of being smokefree by 2025. Moreover, there has not yet been a mass media campaign to promote Smokefree 2025 and many New Zealanders are not aware of this world-leading initiative.

Not surprisingly, census data still show smoking prevalence among young adults is still too high and projections based on current prevalence trends suggest that Māori in particular will not achieve the goal of reducing smoking prevalence to <5% by 2025. The main factors holding back the advance to a smokefree NZ are failure to implement a sufficiently robust suite of interventions to create an environment that encourages and supports smokers to quit and discourages young people from starting. This in turn reflects a lack of political will. Game-changer policies and initiatives are needed. These should include higher taxes, plain packaging, enhanced mass media campaigns, continued promotion of smoking cessation, smokefree cars, and reduced retail supply near schools. More radical measures such as de-nicotinised cigarettes and increasing the age of purchase to 21 years should also be considered. Health professionals involved in lung cancer care have an important role to play by clearly demonstrating their support for Smokefree 2025 and supporting key interventions to ensure that it is achieved.

Lung cancer screening: can we select the right patients?

Assoc. Prof. Rob Young, University of Auckland

The 2011 US National Lung Cancer Screening Trial (NLST) demonstrated that screening with low-dose CT produced a 20% reduction in lung cancer mortality.[2] This lead to the US Preventive Services Task Force (USPSTF) in 2014 endorsing screening by CT for those meeting the NLST criteria. However, European RCTs suggest that CT screening does not reduce lung-cancer mortality. Limitations of CT scanning for lung cancer include poor targeting of high-risk smokers, high rates of false positives, low lung cancer detection rates, high rates of over-diagnosis, and high cost. As such, doubts exist regarding several paradigms of CT screening for lung cancer, including the following:

1. NLST eligibility criteria identify the best group for screening.

There is evidence that expanding the criteria to include younger smokers and smokers with fewer pack-years might identify more cancers and increase the number of lung cancer deaths averted with screening. However, doing so will increase the cost of screening. Analyses of the NLST data suggest that the NLST criteria result in too many low-risk smokers being screened and, for low risk-groups, the harms of screening outweigh the benefits. This can be minimised by screening higher risk groups, e.g. COPD/emphysema, which will lead to more cancers being identified per person screened.

2. Over-diagnosis is not an issue.

An evaluation of the NLST data for over-diagnosis determined a benefit-to-harm ratio of only 1-to-1, and that an estimated 1 in 5 cancers identified via CT screening were in fact indolent lesions. Further analysis of the NLST data suggests that there is something about CT scanning that identifies less aggressive or indolent cancers that are missed by CXR and represent in part a histology shift (more BAC) rather than a true stage shift. This means any benefit from early diagnosis may be offset by the harms of investigating or treating an indolent cancer. Other analyses, including that of non-NLST data, suggest that over-diagnosis may be substantially underappreciated in the NLST and all of the excess cancers in the NLST were found were of indolent type representing a histology shift not a stage shift. To summarise, for every lung cancer death averted by CT screening there are 1–2 lung cancers that are over-treated.

3. Those at the highest risk of lung cancer get the greatest benefit from screening.

Analyses of NLST data involving comparison of patients with and without COPD showed that those with COPD had a 2-fold higher incidence of lung cancer and were twice as likely to die, regardless of screening. In terms of lung-cancer specific mortality rates, they are lower in patients with better lung function regardless of screening arm and this is not due to stage shift.

Differences in lung cancer-specific mortality reduction are related to two factors. There is higher mortality in COPD patients because they are more likely to die of their lung cancer than those without COPD and they also die more often of non-cancer causes. A failure to achieve a significant reduction in lung cancer-specific mortality in high-risk smokers with COPD appears unrelated to stage shift, i.e. overtly aggressive cancers, but may be related to a biology that is not understood and not reflected in staging or screening approaches. In summary, patients with COPD have a higher risk of lung cancer but it is unclear whether they get benefit from screening.

4. Based on the NLST criteria, CT screening will reduce the overall burden of lung cancer deaths.

A simulation of CT screening in a German population using NLST criteria showed that CT screening would prevent only 2.6% of all lung cancer deaths over a 6-year period. What this essentially means is that a higher return on investment will be gained from reducing smoking prevalence via tobacco control and smoking cessation measures than from CT scanning.

Modern management and the solitary pulmonary nodule

Dr Graeme Anderson, Counties Manukau DHB

Incidental pulmonary nodes are being increasingly detected since the introduction of multidetector CT in the late 1990s in NZ. However, very few (<1%) are diagnosed as lung cancer. The advent of other volumetric CT techniques for screening of other conditions also means that many more nodules are being discovered.

In the context of over-diagnosis, it is important to correctly define an incidental pulmonary nodule. The Fleischner Society definition, which has become the standard, defines the diameter of an incidental pulmonary nodule as up to 3cm in diameter. However, this value reflects the limits of detection in the pre-multidetector CT era. Nodules much smaller than 3cm are now being detected on CT scans. A proposed updated and more accurate definition of an incidental pulmonary nodules is: 'any rounded area of altered attenuation of <8mm in size (or 300mm^3 in volume) be it solid, sub-solid, or ground-glass discovered in the lung on CT not performed primarily to evaluate the lungs for carcinoma'.

The original Fleischner Society guidelines for management of small lung nodules detected incidentally on CT (nodule size >4mm requiring follow-up) were published 11 years ago.[3] Their delayed adoption by general radiologists in NZ is only now leading to an increase in regular follow-up CT scans. Problems with the Fleischner Society 2005 guidelines include the follow-up regimens for some nodules being overly conservative, only axial diameter measurements are used, and no consideration is given to sub-solid ground-glass nodules.

Nodules can be measured by diameter or by volume. The problem with measurement of nodule diameter with electronic callipers is that it is subject to considerable intra- and inter-reader variability. Volumetry has been shown to be more accurate than unidimensional measurement but volumetry is not available on all CT systems and there is general radiological resistance to using it. Volume doubling time can be used as a radiological biomarker. Although volume doubling times of tumours are variable, <400 days is a generally accepted value for malignant tumours.

It has been recognised that some nodules in the lungs are not cancer and are in fact benign nodules. These peri-fissural nodules, which tend to be triangular, oval or polygonal, and lie adjacent to fissures, are almost always intra-pulmonary lymph nodes. In contrast, more round or spherical nodules with spiculation are more likely to be cancers. Many nodules followed-up are in fact these benign peri-fissural nodules.

In 2015, the British Thoracic Society (BTS) published its new guidelines for determination of the significance of a pulmonary nodule.[4] However, they are lengthy and complicated, which makes them somewhat inconvenient for in-practice use. At Middlemore Hospital, the solid nodule, sub-solid nodule, and surveillance flow charts from the 2015 BTS guidelines have been consolidated into a single easy-to-use flow chart (**Figure 1**). Early indications are that it will be a useful tool that will reduce the number of follow-up nodules. The development of a national guidelines mobile app is planned as the inherent complexity of characterising nodules makes the guidelines ideally suited for integration into an electronic decision tool.

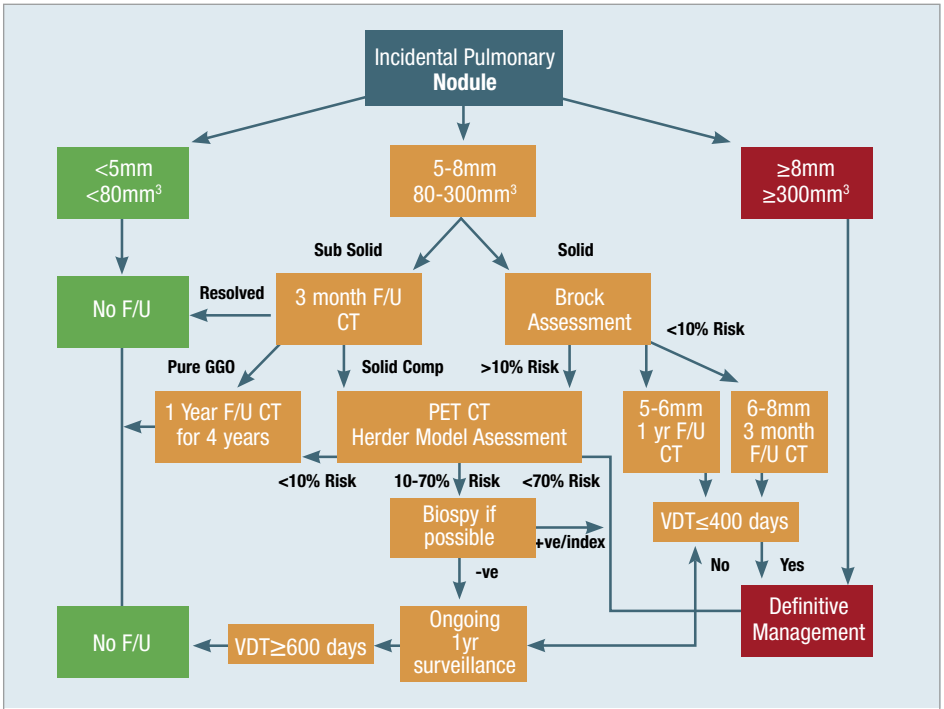

Figure 1. Summary flow chart (the 'Middlemore Compilation') for the management of a pulmonary nodule, which combines the solid, sub-solid, and surveillance algorithms from the 2015 BTS guidelines.

Earlier diagnosis of symptomatic lung cancer: role of the NZ lung cancer working group

Dr Charles De Groot, Waikato DHB

Variations in lung cancer patient outcomes exist in NZ, depending on factors including DHB of domicile, socioeconomic status, or ethnicity. Variations in standards of care through variable access to diagnostics (e.g. PET scan, EBUS), supportive care, and treatment are likely to account for differences in patient outcomes.

To try to help 'level the playing field', the first Standards of Care for Service Provision were published in 2011. They provided DHBs with a framework of standards to work towards to improve secondary and tertiary care for lung cancer. The standards addressed factors such as timeliness of therapy, appropriate diagnostics, multidisciplinary management, supportive care, and data capture.

Encouraging improvements in hospital level care have been seen since publication of the standards; however, meaningful improvements will only be achieved through prevention and earlier presentation of lung cancer. Indeed, the majority of patients present with stage III/IV disease.

Therefore, the aim of the 2016 revision of the Standards of Care aimed is earlier detection of lung cancer associated with symptoms. The revision involved Standards 1.1 (to encourage a lower threshold for doing CXRs), 1.2 (improved management and follow-up of abnormal results), and 1.3 (targets for offering advice and support to quit smoking).

The intent of the programme for earlier detection of lung cancer is to encourage investigation and surveillance of individuals at high risk of developing lung cancer. The key ingredients in such a programme are:

1. Public awareness campaign (e.g. the 'Cough, Cough, Cough' social marketing initiative) targeting high-risk groups (e.g. Māori).
2. Ongoing education strategies for primary care and community health providers.
3. Enabling access to radiology and secondary/tertiary care.
4. Evaluation to confirm benefit.

Support to initiate an early detection of lung cancer programme includes the MOH, cancer programme steering group, cancer treatment advisory group, cancer networks, national lung cancer work group, and regional lung cancer groups. A pilot study in the Midland Region is planned to take this initiative forward.

DAY 1 SESSION 2: MEDICAL ONCOLOGY

KEYNOTE ADDRESS: Immuno-oncology – state of the art

Assoc. Prof. Paul Mitchell, University of Melbourne; Austin Health

Investigational immunotherapeutic approaches in cancer can be categorized as either active, i.e. targeting the immune system, or passive, i.e. targeting the tumour (**Figure 2.**). The focus of research into immunotherapies for lung cancer has been on active approaches.

To date, the area of antigen-directed immuno-therapy has not proved particularly fruitful. Two recent large phase III vaccine studies have investigated the efficacy of the Cancer-Testis antigen, MAGE-A3 (MAGRIT trial), and a liposomal preparation of the Mucin1 glycoprotein (START trial) in NSCLC. Unfortunately, neither technology produced a survival advantage versus placebo.

In terms of modulating T cell function (i.e. immune-oncology), PD-1/PD-L1 or CTLA-4 inhibition has gained particular prominence. CTLA-4 and PD-1/PD-L1 are inhibitory receptors on the surfaces of T cells that act as a 'brake' for T cell activity; hence, inhibition of these receptors enhances activation of T cells promoting an immune response. Agents that inhibit CTLA-4 and PD-1/PD-L1 are known as checkpoint inhibitors.

In phase III trials, PD-1 inhibitors produced statistically significantly greater OS versus

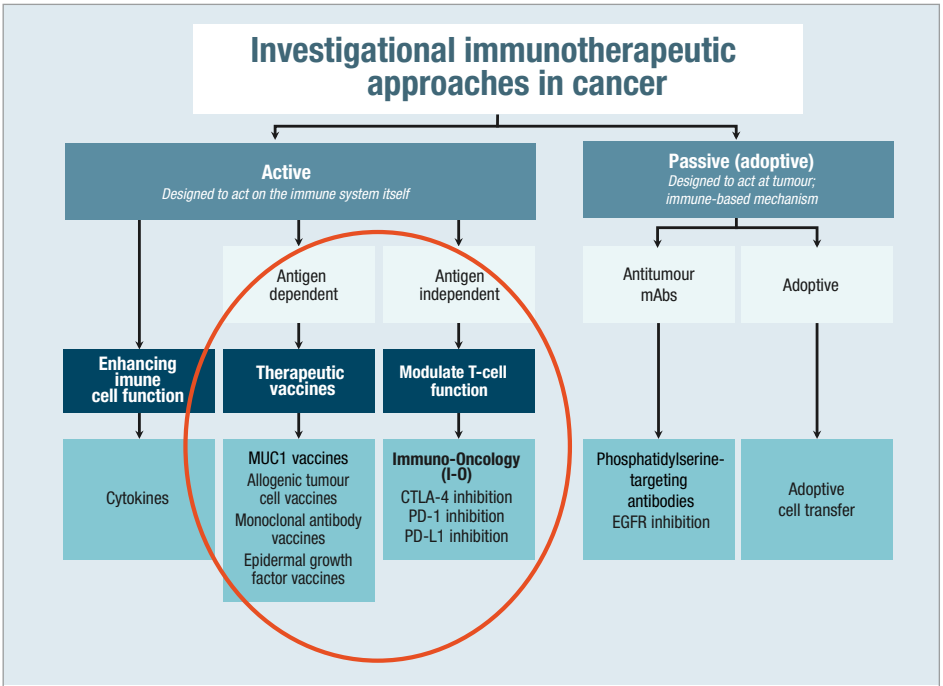

Figure 2. The current focus of immunotherapeutic approaches for lung cancer is on antigen-directed therapies.

docetaxel in patients with squamous (CheckMate 017 trial) and non-squamous NSCLC (CheckMate 057 trial), and in PDL-1 expressing NSCLC (CheckMate 010 trial). The phase II POPLAR trial showed a PD-L1 inhibitor to produce a greater survival benefit than docetaxel in patients with metastatic or locally advanced NSCLC. The checkpoint inhibitors are generally well tolerated; however, grade III/IV auto-immune inflammatory reactions, albeit uncommon, require vigilance and a prompt response.

High levels of PD-L1 ligand have been associated with greater patient benefit in some trials of PD-1/PD-L1 pathway inhibitors in NSCLC. However, controversy remains around the prognostic and predictive value of PDL-1 expression levels and there is often heterogeneity of PD-L1 expression in a tumour. In terms of testing, different companies have developed their own assays using different antibodies. It is also unclear what are the cut-off values for a positive result. Researchers are working to harmonize the multiple diagnostic tests used to predict which NSCLC patients are likely to do well on a PD-1 pathway inhibitor. The Blueprint Project's research indicates that not all of the PDL-1 assays are interchangeable and the implications of this for clinical practice are not yet clear.

Two trials have investigated checkpoint inhibition in patients with SCLC who had progressed on prior platinum-based therapy. In the CheckMate 032 trial, the combination of a PD-1 inhibitor with a CTLA-4 inhibitor produced tumour shrinkage and overall response rates superior to that with the PD-1 inhibitor alone. Preliminary results from the Keynote-028 trial showed PD-1 inhibition to have promising anti-tumour activity in patients with PD-L1-postive advanced SCLC.

Research is needed into how to maximise the benefit of PD-1 pathway inhibitors with chemotherapy and radiotherapy, and how to combine immunotherapies, including combination with antigen-specific approaches.

Treatment of patients progressing after first-generation EGFR-TKIs

Assoc. Prof. Paul Mitchell, University of Melbourne; Austin Health

EGFR-sensitising activating mutation is one of several oncogenic drivers identified that are associated with the development of NSCLC. Mutation analysis at Austin Health suggests an EGFR mutation rate of 5% overall and rates of 8% in non-squamous cases and 10% in adenocarcinoma cases.

Mutation in the T790M gene in exon 20 of the TKI domain of EGFR is the most important mutation leading to acquired resistance to first-generation TKIs (60–65% of cases). It is believed that the T790M EGFR-TKI mutation leads to either steric hindrance, which impedes the binding of first-generation TKIs, or an increase in the binding affinity of EGFR for ATP, resulting in reduced cellular potency of first-generation TKIs. For patients with resistance to first-generation TKIs (via the T790M mutation), there are effective third-generation agents in development.

Phase II/III trials of three different third-generation EGFR-TKIs in patients with T790M-positive NSCLC whose disease had progressed following prior therapy with an approved EGFR-TKI have demonstrated high rates of objective response and disease control but not necessarily substantially different durations of response compared with first- and second-generation TKIs (approx. 12 months). They were generally well tolerated showing a typical profile of treatment-related adverse effects expected with TKI therapy, including nausea, diarrhoea, and skin reactions and, importantly, few grade 3/4 adverse reactions.

A phase I trial of combination therapy with a third-generation TKI and an PD-L1 inhibitor in a small group of patients with and without the T790M mutation demonstrated good overall tumour response. However, due to unexpectedly high rates of interstitial lung disease, the study was discontinued. Treatment for patients who develop non-T790M mutations (e.g. c-MET and

HER2 amplification) resulting in resistance to first generation TKIs is limited to experimental therapy and chemotherapy, although in the future there maybe effective therapies at least for sub-populations.

Early reports of resistance to the third-generation TKIs implicate the EGFR C797S gene mutation, which codes for the binding site of these drugs, to be a major mechanism. Patients with the C797S mutation should in theory be sensitive to first-generation TKIs so it might be worth switching them back to their first-line treatment or trying combination therapy. Identification of different resistance mutations in individual patients can be useful for guiding therapy and gaining a deeper understanding of the resistance mechanisms to TKIs is crucial in developing more effective effective therapies.

DAY 1 SESSION 3: PATHOLOGY IN LUNG CANCER

Pathological testing in lung cancer: from molecular targets to immune-oncology

Prof. Stephen Fox, Peter MacCullum Centre Melbourne

Genome and exome sequencing research over the last decade has confirmed that cancer is a genetic disease. From the approximately 20,000 genes identified to date, 140 are important driver mutations. Cancer as a genetic disease has led to a fundamental change in tumour classification, from the examination of tissues and tumour types to pathway analysis and, increasingly, the integration of molecular data into tumour classification.

In terms of lung carcinoma classification, genomics complements morphology. Lung cancer pathology is directed at differentiating squamous cell carcinoma from adenocarcinoma and then molecular testing lung adenocarcinomas for susceptibility to available targeted drug therapies (e.g. EGFR-TKI and ALK inhibitors).

Although an adenocarcinoma may have a driver mutation, e.g. KRAS (32.2%), EGFR (11.3%), BRAF (7.0%), or ALK fusion (1.3%), there is a mixed mutational background, which explains the different behaviours of different tumours. In terms of technology, the molecular methods available for identification of EGFR mutation include allele-specific PCR, Sanger, MassArray, and next generation sequencing. Those for detection of ALK mutation are and IHC and FISH.

Turning to immunotherapy, the example of antibodies for measuring PD-1 or PD-L1 expression in tumour tissue exemplifies the challenges around testing for immunotherapy. There are different diagnostic assays as well as different cut-offs for different antibodies. In addition, expression of PD-1 in NSCLC is heterogeneous (being positive in one part of the tumour and negative in another part) and varies depending on the antibody used. The assay is time consuming as it is a percentage score and involves any expression, which can be heterogeneous 1+, 2+, and 3+. Because PD-1 is a sub-optimal predictor of response to immunotherapy, considerable research is being directed at identifying more objective biomarkers to better stratify patients in terms of response.

In terms of other tests, numerous studies have shown that tumour-infiltrating lymphocytes (TILs) or T cell subsets have diagnostic and predictive value. The problem is there are many different definitions of a TIL. Checkpoint inhibitor efficacy has been demonstrated to be correlated with both mutational and neoantigen load; hence both have been proposed as predictors of response to immunotherapy. Another potential molecular predictor of response to immunotherapy is the T effector/interferon-γ gene signature.

Some of the barriers to and important considerations for pathological testing include block retrieval (if tissue is held in other laboratories), tissue preservation, lack of in-house molecular testing (will all assays be run in a single laboratory or several different laboratories), and multiple commercial antibodies being available (on what basis will a laboratory select an antibody). There is also the question of laboratory-developed tests and how they are approved and validated.

DAY 2 SESSION 1: RADIATION ONCOLOGY

SABR for early stage lung cancer: uses, outcomes, and Dunedin experience

Dr John North, Dunedin Hospital

SABR is a technique for delivering external beam RT to an extra-cranial target with a high degree of accuracy, using high doses of irradiation, and in few (1–8) treatment fractions. It is typically used in primary disease of the lung, liver, prostate, kidney, and pancreas, but also for metastases.

In terms of primary lung cancer, most NSCLC patients have early-stage disease, are elderly, have significant co-morbidity, and are usually inoperable. Retrospective studies indicate that SBAR produces 3-year OS rates of 75–85%, which is at least comparable with surgery. These results require confirmation by RCTs comparing SABR with surgery, which are currently underway.

Conventional RT is limited by the total dose that can be delivered (60–66Gy/30–33 fractions) and consequently the results are relatively poor (local control 30–90% and 5-year OS rate 0–42%). Higher doses of radiation can be used with SABR (biological equivalent dose [BED]: >100Gy) and fewer treatments are required. Phase II studies show local control rates of 80–100% for T1 and 40–100% for T2 stages with SABR, which are higher than with conventional RT, and 2- to 3-year OS rates of 50–55%. SABR is not without adverse effects, however, especially chest wall toxicities. RCTs, including the TROG CHISEL study, are underway to confirm the findings of the phase II studies.

The decision to give SABR should be via an MDT meeting. Histological diagnosis is ideal but is not essential providing that the MDT has decided that the imaging is conclusive. Where no histology is available, FDG-PET staging is recommended. The dose of SABR (54–60Gy in 3–5 fractions aiming for a BED >100Gy; prescription isodose ≤150%) depends on tumour size and location. In terms of treatment delivery:

- Immobilisation is not needed.
- Image guidance is essential (Cone Beam CT intra- and inter-fraction).
- Breathing coaching, for quiet tidal breathing, is needed
- Use of gating/tracking may be necessary if excessive movement.

Dunedin hospital has treated 50 patients using SABR since 2010. The experience (median follow-up 13 months) suggests that SABR at Dunedin hospital is producing results comparable to those in clinical trials of SABR versus no treatment. Minimal complications have been encountered to date.

Modern radiotherapy techniques for locally advanced disease

Dr Louis Lao, Auckland DHB

A major challenge with RT for locally advanced lung cancers is that it involves treating a moving target since the tumour moves as the patient breathes. Historically, population margins on the target are used to deal with this problem but the margins must be generous to avoid missing the tumour, which often means normal lung is included in the target. Technological advances in radiation oncology have resulted in more precise targeting and delivery of RT.

With 4DCT RT motion management, which is similar to a diagnostic CT, target-site motion specific to an individual patient can be assessed. Data from a breathing trace gives an accurate picture of how the tumour

moves thus allowing radiation oncologists to design a patient-specific RT motion strategy to account for that motion. There are multiple methods to manage motion when a patient is having treatment, examples include gating and breath hold.

PET-CT is also useful in RT planning, allowing creation of a target much smaller than would normally be possible and thus avoiding inclusion of normal tissue in the target. Additionally, PET-CT can help to accurately identify nodal disease in the mediastinum, which is difficult to delineate on a normal CT.

Intensity modulated RT (IM-RT) uses a powerful computer algorithm that runs multiple iterations to achieve an optimal radiation plan based on a number of pre-defined objectives. This allows more precise dose distribution, i.e. shapes the radiation beams to closely fit the area of the cancer thus avoiding high doses being directed at normal tissue.

Volumetric modulated arc therapy (VMAT) is a novel radiation technique that can achieve highly conformal dose distributions with improved target volume coverage and sparing of normal tissues compared with conventional RT techniques. It allows treatment of very large tumours while being able to keep the dose to normal structures within 'safe' limits.

An exciting emerging technology is adaptive RT, which monitors changes while the patient is on treatment and makes adjustments to adapt treatment to those changes. For example, in response to the tumour shrinking during the course of treatment, the field margin and treatment dose is re-optimised to achieve a safe dose escalation.

DAY 2 SESSION 2: ORAL PRESENTATIONS – LOCAL PROJECTS

The 'SPoAC' project and use of upfront CT PET in potentially curative cases

Dr Paul Dawkins, Counties Manukau DHB

The single point of access clinic (SPOAC) project is a new lung cancer pathway to help the four DHBs of the Auckland region (Northland, Waitemata, Auckland, and Counties-Manukau) to expedite the diagnosis of lung cancer patients, with the objectives of reaching new health targets and supporting implementation of Standards of Service Provision.

The project was initiated after audits identified problems with the existing lung cancer pathway, including late patient presentation, high numbers being diagnosed via the acute secondary care route, and too few patients receiving potentially curative treatments. Attainment of MOH targets also provided impetus to rethink the Auckland region's lung cancer pathway.

In reviewing the existing pathways at each DHB, the methodology for the SPOAC project included:

- Data review at each DHB.
- Key stakeholder interviews.
- Literature review of existing models.
- Patient experience survey.

Based on the findings, a 12-week pilot clinic study was run. It involved each DHB having a rapid access clinic, all four DHBs following the same pathway (**Figure 3**), and incorporation of upfront PET-CT scan for potentially curative disease. A total of 165 patients completed the pathway of which 105 were diagnosed with primary lung cancer. The median reduction in time from referral to first treatment (i.e. reduction in time on the pathway) was significant for both curative (17.2 days) and palliative (12.7 days) pathway patients. Also, 85.7% of patients (vs 56.6% historically) in the pilot study met the MOH 62-day target.

The pilot study confirmed that there needs to be regional (and possibly national) conformity to models and that upfront PET-CT scan in potentially curative patients may decrease journey time through the pathway.

Enhanced recovery programmes and recovery from surgery

Dr Rachael Parke, Auckland DHB; CVICU

Patients with lung cancer often present for surgery in poor physical condition. This is especially relevant in the context of thoracic surgery, which is relatively high risk.

A single-centre study based on the concept of enhanced recovery after surgery (ERAS), was conducted at Auckland Hospital with the view to implementing ERAS for thoracic surgery patients to improve patient recovery and reduce the duration of hospital stay. ERAS involves multimodal and multidisciplinary approach to care in partnership with the patient and their family and standardisation of care across all phases of surgery.

The study was informed by a previous report of patient and family experiences when presenting for lung cancer treatment. The report, commissioned by the Northern Cancer Network, identified deficiencies in communication and co-ordination through-out the treatment pathway.

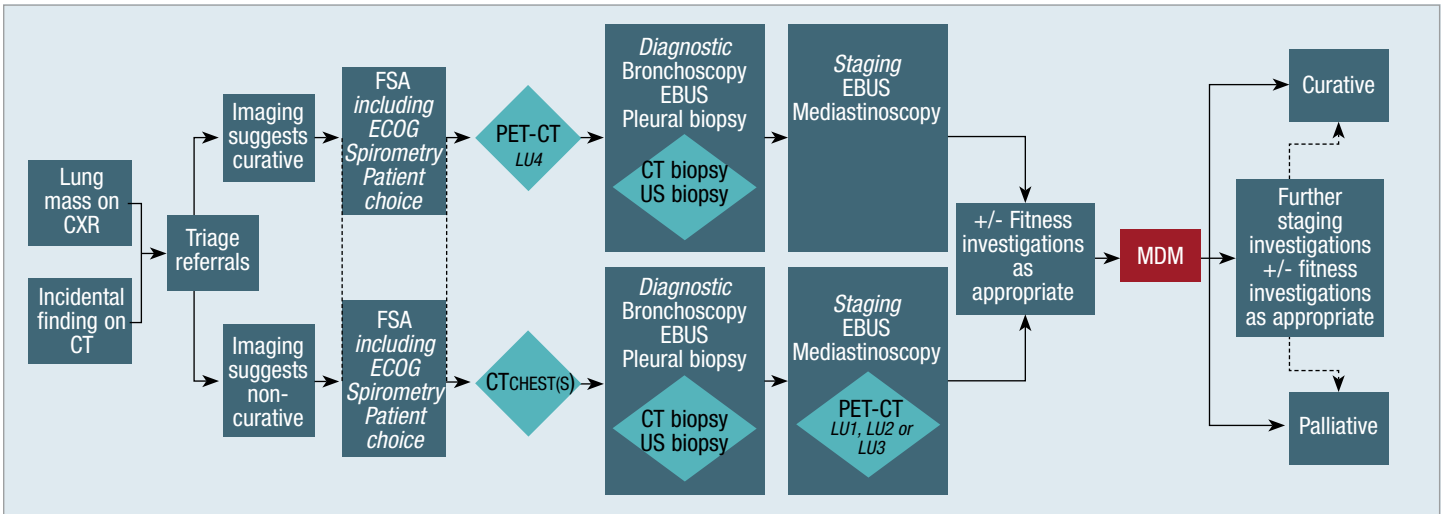

Figure 3. SPOAC imaging pathway.

The single-centre prospective observational study involved collection of patient audit data over a 6-month period, with follow-up calls to patients, and analysis of process of care measures. Only results documenting the current processes of care and patient outcomes are currently available.

Data available from 112 patients presenting for lung cancer surgery showed that:

- Patients were amenable to the study design and that the methods were feasible.
- Mortality was low but there were high rates of complications.
- Target areas for outcome improvement for an enhanced recovery programme were: reducing fasting times; preventing atrial fibrillation, nausea, and vomiting; and early mobilisation of patients.

Based on the findings, a grant application has been submitted to the Health Research Council to fund a large study of this ERAS intervention.

Early awareness of abnormal radiology reports: the CMDHB ALERTS system

Dr Elisa Perry, Counties Manukau DHB

Failure to follow up radiological imaging reports can lead to serious patient safety incidents. At Counties Manukau DHB, the practice for communicating critical or urgent results is well defined: the radiologist phones the clinician. However, prior to initiating the CMDHB ALERTS system, the practice for communicating important but not urgent results was less secure. The radiologist issued the report, with or without attempts to contact the clinician, and the clinician would 'accept' the report electronically.

There are several problems with this approach. Telephone contact may not be convenient for the radiologist or the clinician. Clinicians are overwhelmed with results from many different sources, much of which is non-urgent or normal. Therefore, there is no way of highlighting those that need to be prioritised. There may also be problems with sign off, e.g. the report being sent to the wrong clinician.

Furthermore, there are multiple points of error with the electronic acceptance of results. They may not be accepted or read, accepted but not read, read but not understood, or read and understood but not actioned. Additionally, the report may be read, understood, and actioned but not in a timely fashion. A survey conducted at a large US hospital determined that *lack of a reminder system (40%)*, difficulty accessing results (24%), competing demands on time (27%), and uncertainty about who should follow up (16%) were the main barriers to timely follow up of test results.[5]

The CMDHB ALERTS system is a mechanism by which radiologists can let clinicians know about potentially significant or unexpected findings. These are broadly defined as uncharacterised lesions that require further investigation, findings that may prompt early clinical assessment/follow-up, and findings that require prompt referral to another specialty.

The system is based on an alerts folder on the PACS system, faxes, and emails. Once the radiologist has decided that a test result meets the above criteria it is placed in the alerts folder. The clerical staff check the alerts folder daily and then either send a standard-format email to the referring clinician or fax the report to the GP. If a read-receipt e-mail message is not received, then the report is faxed. Faxed reports are followed up with phone call.

The CMDHB ALERTS system has received a generally positive reception and, importantly, has been of benefit to patients. The pros and cons of the system are summarised in **Table 1**.

Advantages	Disadvantages
• Gives clinicians a 'heads up' • Helps in dealing with uncertainty • Reduces contacting time between radiologists and clinicians • Formalises radiologist-clinician contact process • Helps to prevent delayed diagnosis, treatment, and follow up	• Time consuming to set up • Competent administration staff are essential for data collection

Table 1. Summary of the advantages and disadvantages of the CMDHB ALERTS system for the reporting of abnormal radiological imaging reports.

DAY 2 SESSION 3: END OF LIFE CARE IN LUNG CANCER – PATIENTS AND CARERS

Should every patient with lung cancer have an advanced care plan?

Ian D'Young, Auckland DHB

Many people with lung cancer are entering a palliative care phase without having made plans for their future care. Management of end-of-life care is made especially challenging for clinicians if their patient has not articulated want how they want to be cared for.

Advanced care planning (ACP) is a process of shared planning for future health. It belongs to the patient but also involves the care team and the family. The concept should be introduced early, i.e. before the palliative care phase. An ACP gives the patient the opportunity to develop and express their preferences for care, with a clear understanding of the treatments and care options available to them. Preferences for care could include emphasis on wanting quality rather than quantity of life and the specific preferences that define quality of life for that person.

ACP is important because people no longer die in the community; they are more likely to die in medical wards and often separated from loved ones by distance and visiting hours. People also tend to be passive recipients of their own care. ACPs are an example of person-centric care in action. They facilitate communication across care sectors bringing residential and hospice care primary care providers together to communicate meaningfully with secondary care.

Most people want their healthcare professional to initiate the discussion about end-of-life care. E-learning courses and other resources developed for healthcare workers on the process of initiating the discussion and their role and responsibilities in assisting patients in planning for future healthcare and end-of-life are available on the ACP website*.

Standardisation and consolidation of documentation into an accessible electronic record, e.g. My Advance Care Plan, that is visible to the next clinician in the chain is important, as is including a reference to the form in clinic letters and discharge letters to primary care.

*ACP website address: http://www.advancecareplanning.org.nz/

The role of allied health in lung cancer management

Kahren White, Private Practice

Lung cancer patients experience multiple concurring symptoms, e.g. dyspnoea, fatigue, pain, anorexia, anxiety, and depression. This emphasises the need for the involvement of allied health professionals in a lung cancer management MDT given their role as facilitators of improved patient function and quality of life alongside medical interventions.

The objective of occupational therapy is to recover or manage lost function and improve a patient's participation in their chosen everyday activities. For people who have undergone curative treatment, the focus is on rehabilitation. For people living with metastatic disease, the focus is on enabling continued participation in everyday life despite functional decline and growing symptom burden.

Physiotherapists are concerned with maximising quality of life and movement potential. Physiotherapy involves the prescription and delivery of exercise interventions to prevent deterioration and restore physical status. Exercise physiologists prescribe and supervise exercise programmes to improve exercise capacity, which can lead to improved function. Exercise physiology has a particularly important role to play in pulmonary rehabilitation, and is helpful in managing refractory symptoms, such as fatigue and breathlessness.

Dietitians are key members of the lung cancer MDT as cachexia is a common symptom in lung cancer, with 35% of patients as being malnourished at diagnosis according to one study.[6] Cachexia affects functional status, treatment tolerance, and survival. Dieticians identify patients who are malnourished or at risk of malnutrition and provide personalised nutritional care plans.

Other members of the lung cancer MDT are speech therapists, who assess and treat swallowing and communication disorders, and social workers and psychologists whose psychosocial interventions are valuable given high rates of distress among lung cancer patients.

Caring for the lung cancer carer

Dr Antonio Fernando, University of Auckland

Cancer carers need to care for themselves because patients expect their carers to be healthy and functional in mind as well as body. Unfortunately, the human mind is not wired for happiness. Rather, it has evolved to facilitate survival. As a consequence, people have a natural tendency to ruminate and fixate on negatives, which can lead to unhappiness and burnout. Healthcare professionals, in particular, have a propensity to 'over-think' and focus on what is wrong rather than what is right.

People have many 'fixes' for unhappiness, e.g. eating, drinking, shopping. The problem with these types of fixes is that they are dopamine-based sources of happiness, which means they are only temporary. Training the mind offers a more enduring alternative to external sources of ephemeral happiness. The brain is the end-organ for happiness and rumination can be modulated. Mind training techniques include learning how to focus the mind internally, developing a sense of gratitude, and mastering mindfulness, compassion, and self-compassion.

There is substantial published evidence that mindfulness in healthcare is beneficial, including for carers.[7-9] Mindfulness is a mental state-of-being during which a person is focussed on the present in a non-judgemental way. It requires training and regular practice. Mindfulness can be applied or practised during every-day activities, e.g. focussing on the process of walking, driving, or eating, which distracts the mind from ruminating.

Mindfulness is also crucial to be truly compassionate. Whereas empathy is recognising that someone is suffering, compassion is the desire or action to relive a person of suffering. Remaining in an empathic mode can lead to burn-out. Acts of compassion, however, generate positive emotions and feelings of being connected.

As with mindfulness, compassion also requires training and practice. One way to enhance compassion is to take time at the end of each day to think about the people that you helped. Developing the capacity for self-compassion is also important. Self-compassion is learning how to be kind to oneself, which facilitates being kind to others.

Young Investigator Award: Winner

Selected from presentations given by four young researchers, the Young Investigator Award was awarded jointly to Dr Libby Curtis and Ms Raewyn Hopkins for their presentations, *Routine follow up of NSCLC post curative attempt surgery is not beneficial* and *A comparison of NZ demographic risk variables in NZ Europeans and Māori: are Māori more susceptible to the effects of smoking*, respectively.

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