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## The thoracic physician and lung cancer in 2003

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As the biggest cause of cancer death in the Western world, lung cancer is frequently encountered in the day-to-day practice of adult thoracic physicians. The vast explosion of knowledge, ranging from emerging molecular fundamentals to new imaging modalities to new drug therapies, means that the knowledge base required by a thoracic physician is both substantial and continually expanding.

Lung cancer guidelines, like the NHMRC/ACN *Clinical Practice Guidelines for the Management of Lung Cancer* (in final stages), are designed to help optimise clinical management, but are not “cookbook recipes”, and require judicious interpretation and application to each individual patient. For instance, how do we explain to a patient the relative benefit of a particular therapy? Should we use concepts of median survival, one-year or two-year survival, reduction in hazard ratio, disease-free survival, Kaplan-Meier curve (all will coalesce in time), time to relapse, complete or partial response rate, quality of life? How do we apply population statistics from a study to our individual patient? What if our patient is slightly different from the trial patients?

What then is the role of the thoracic physician in combating this common and devastating disease?

From the early days of smoking (or other carcinogen exposure) to the terminal stages of the disease, the patient with lung cancer is likely to need help and support from a variety of medical and allied health practitioners.

One of several models that can be envisaged defines the thoracic physician as an advocate for the patient, guiding and coordinating through the complexities of specialist and sub-specialist diagnosis and treatment. Undoubtedly, many other health care providers will also be involved in patient care, but the thoracic physician often carries out the initial steps of diagnostic evaluation and “breaking the bad news”. Many thoracic physicians also participate in further evaluation such as functional and anatomical staging and management decisions.

So specifically, how does the thoracic physician fit into the “continuum of care” for the individual going through the stress of suspected lung cancer, in which the continuum of care refers to the entire process from prevention to detection, diagnosis, treatment, follow-up, and palliative care?

### Prevention

Clearly, as smoking causes the vast majority of lung cancer, maximum effort must be applied in this area. Our role is not only to advise our own patients and their families, but also to help disseminate the relatively simple and effective smoking cessation strategies available to us currently<sup>1,2,3,4</sup>.

### Early detection

This is a very topical area with the realisation that the five-year mortality from lung cancer has not changed appreciably over time. The role of helical CT screening is addressed in this series and the CXR screening component of the long awaited prostate, lung, colon, ovary (PLCO) study will be very interesting when results are to hand ([www3.cancer.gov/prevention/plco](http://www3.cancer.gov/prevention/plco)), bearing in mind the lengthy time to completion for such studies. The workload from any such screening will be considerable if we assume rates of

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nodule detection as in the ELCAP, IELCAP and Mayo Clinic studies.

There is increasing recognition that tumours develop from a multi-step accumulation of acquired key genetic defects, and some of the malignant transformation can be recognised morphologically. Dysplasia and carcinoma-in-situ are well-recognised preneoplastic lesions for proximal SCCs, for instance<sup>5</sup>. However, we are learning more about atypical adenomatous hyperplasia for bronchioloalveolar cell carcinoma (which is no longer diagnosed if there is stromal invasion) to diffuse idiopathic pulmonary neuroendocrine cell hyperplasia (DIP-NECH), an exceptionally rare lesion associated with the development of multiple carcinoid tumours. The attraction for research in this area is that intervention at this stage may be more effective than once the tumour is invasive.

New diagnostic tools for preneoplasia are becoming increasingly available, ranging from fluorescence bronchoscopy<sup>6</sup> to novel biomarkers such as hnRNP<sup>7</sup>. Indeed, with the realisation that phase III chemo prevention studies require large patient cohorts, major resources, and many years to yield a definitive result, it is becoming clear that a more productive approach to development of clinically useful chemo preventive agents is to perform short-term studies examining the effect of interventional agents on "intermediate endpoints" ie molecular, imaging, and histologic endpoints in populations at high risk for developing invasive cancer. A major focus of current research is therefore the identification of appropriate biomarker endpoints<sup>8</sup>.

## Diagnosis

The traditional role of the thoracic physician in clinical and bronchoscopic diagnosis and staging is becoming more refined by modern techniques, such as endobronchial ultrasound to identify lymph node enlargement and guide Wang needle biopsies to improve the accuracy of clinical staging. Nonetheless, thorough inspection of the bronchial tree with fibreoptic bronchoscopy remains an indispensable mainstay of lung cancer management. For example, we recently bronchoscoped a patient suspected of having a right lower lobe malignancy and found two other unsuspected tumours in the contralateral lung (a total of three), each of which was histologically proven to be a distinct synchronous tumour.

"Breaking the news" is as important an issue for the thoracic physician as for any other practitioner who has to do this. Recent joint initiatives between the Medical Oncology Group (MOG) and the Thoracic Society of Australia and New Zealand (TSANZ) to develop workshops for advanced trainees in thoracic medicine to practise and optimise this key communication skill, attest to the recognised importance of this interaction.

Advances in molecular characterisation of lung cancer, including cytokeratin and thyroid transcription factor (TTF) expression by adenocarcinomas of primary lung origin, and molecular profiling by microarray analysis are leading to improvements in diagnostic accuracy, reducing misclassifications of primary and secondary tumours within the lung, and thus supporting improved clinical management decisions.

Accurate anatomical and functional staging of lung cancer patients remains a cornerstone of good lung cancer management, and often is a responsibility of the thoracic physician. There is guidance from many quarters such as the forthcoming CAN Australian guidelines, ASCO, ATS/ERS<sup>9</sup>, COIN (the Royal College of Radiologists' Clinical Oncology Information Network), BTS<sup>10</sup>, SIGN (Scottish Intercollegiate Guidelines Network) in addition to primary research papers. Some of these have helped identify problematic issues, eg investigation of adrenal lesions (not enhanced CT, MRI, PET, delayed contrast CT with washout, FNA biopsy), but the lag time between guidelines and new research findings means that the thoracic physician continues to benefit from interaction with our radiology colleagues. For instance, the belief that detailed staging may be not be cost-effective in NSCLC patients planned for curative intent treatment with no adverse symptoms or signs has been challenged by a recent paper from the Canadian Lung Oncology Group<sup>11</sup>.

Prognostic factors are being studied intensively with the aim of trying to identify those who may benefit from adjuvant therapy, and current studies of adjuvant chemotherapy following surgery are eagerly awaited.

## Treatment

Apart from medical treatment of lung cancer symptoms such as obstructive pneumonitis or pain, a major role of the thoracic physician is to encourage the patient to actively participate in the decision-making process towards choosing definitive therapy. In

Australia, lung cancer management appears fairly diverse<sup>12</sup>, and there is increasing recognition of a need to involve the patient in evidence-based decision-making<sup>13,14</sup>.

In this regard, we are fortunate to have a multidisciplinary approach at our institutions that allows the patient efficient and timely access to a coordinated team of dedicated sub-specialists.

Some of the advantages of a multidisciplinary approach are that management is planned proactively via an exchange of professional opinions, as opposed to the linear approach of one specialist after another; imaging and pathology can be reviewed ensuring accurate TNM staging; interaction of all disciplines encompassing up-to-date diagnostic and therapeutic approaches is mutually educational for all members of the team, is conducive to provision of a clear and consistent message to patients, and enables consideration of novel therapies and clinical trials.

Our pulmonary malignancy conferences include nursing staff, thoracic physicians, thoracic surgeons, a radiation oncologist, a medical oncologist, a chest radiologist/nuclear medicine physician, a pathologist, palliative care physicians, and social workers. During assembly of the attendees each week, Medline citations relevant to lung cancer are displayed by data projection to facilitate timely incorporation of emerging evidence into the conference proceedings. Our meetings are generally well-attended and widely regarded as important for optimal patient care and useful for organisational quality assurance. They do however operate within a dedicated "culture", and with commitment of time, resources, and organisation, all of which contribute to their smooth running. A multidisciplinary approach could take a variety of alternative styles to suit different local environments. We have found that an essential component to a successful multidisciplinary approach is a standardised dataform and database. In recognition of this, the Australian Lung Foundation's multidisciplinary Lung Cancer Cooperative Group has endorsed the idea of establishing a database that would be available to institutions that facilitate the organisation of such meetings, with data consistent with the minimum common cancer dataset proposed by the NCCI.

Thoracic physicians have a primary role in the assessment and sometimes management of airway complications of lung cancer. Some are trained in medical thoracoscopies, laser bronchoscopy, stenting and photodynamic therapy, techniques that are important in a particular patient subset. While the surgeon appropriately makes the final decision regarding patient fitness for resection, thoracic physicians can usefully inform this decision by accurate clinical assessment and interpretation of complex lung function indices and exercise physiology. Thoracic physicians have primary responsibility for recognition and treatment of co-existing reversible airway disease contributing to poor lung function independently of lung cancer, so that treatment options are considered in the light of optimal lung function. Apart from local complications of lung cancer and pulmonary side effects of cancer treatments such as chemotherapy and radiation therapy, patients with lung cancer frequently have co-existing emphysema and always require maintenance of maximal lung function, which demands an ongoing commitment from the thoracic physician.

There is a raft of novel targeted therapies being developed for killing lung tumour cells<sup>15</sup>. Several of these will be orally bioavailable, making it likely that thoracic physicians will require a detailed working knowledge of them to use them effectively.

Patients with locally advanced lung cancer not infrequently have a multitude of factors contributing to dyspnoea, including lobar collapse, pleural effusion, emphysema, main pulmonary vessel compression, and radiation pneumonitis. The thoracic physician is often able to assist and contribute to palliative management decisions by suggesting approaches that are most likely to relieve dyspnoea in such complex situations.

In summary, we believe that the thoracic physician has a key role in helping to provide effective multidisciplinary care for patients with lung cancer. More than simply diagnosing lung cancer or recurrence, the thoracic physician is part of a team comprising thoracic surgeons, radiation oncologists, medical oncologists, radiologists, palliative care and pathologists. In this model, one medical practitioner who could be a thoracic physician or any other team member, coordinates and judiciously "tailors" the ever-expanding diagnostic and therapeutic options available to each patient. The ultimate aim is not only to improve patient management via enhanced and timely multidisciplinary communication, but also to communicate effectively with patients, their families and carers, and their family

doctors. The role of the thoracic physician is thus clearly dynamic, and should continue to evolve in concert with the multiplicity of new developments that are occurring in lung cancer.

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This page was last updated on : Thursday, March 04, 2010