Lung cancer screening in Australia: progress or procrastination?

There is progress internationally with lung cancer screening but far slower headway in Australia

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Lung cancer is the fourth leading cause of death and kills more Australians than colon and breast cancer combined.[1] It has a 14% 5-year survival rate as most patients present with incurable disease. The number of years of potential life lost to lung cancer in Australia is estimated to be 58 450, similar to that of colorectal and breast cancer combined.[1] Primary prevention remains crucial and will reduce future lung cancer deaths, but the majority of lung cancer deaths are now occurring in former smokers who remain at elevated lifetime risk of lung cancer.[2]

Should Australia adopt lung cancer screening?

Screening with low-dose chest computed tomography (CT) scan has been proven to reduce lung cancer mortality by at least 20%, and screening is now being implemented in the United States. There is no new treatment modality that can reduce lung cancer mortality by this amount. The International Association for the Study of Lung Cancer (IASLC) recommends the implementation of feasibility screening programs in countries without ongoing lung cancer screening studies.[3] These programs should incorporate smoking cessation initiatives, standardised algorithms for the selection and management of screening participants, and specialist multidisciplinary teams to manage participants with positive screening results.

In Australia, there are about 2 200 000 current or former smokers between the ages of 55 and 74 years who may be eligible for lung cancer screening.[1] Lung cancer screening has been clearly shown to be feasible in specialist centres in many countries.[4] It shifts lung cancer stage at diagnosis from advanced to early stage (potentially curative) disease.[3,4] The cost of such programs, however, remains an important concern.

The incremental cost-effectiveness ratio per quality-adjusted life-year gained of lung cancer screening in Canada, which has a health care structure similar to Australia's, is about A$10 000.[5] This compares favourably with colorectal screening (A$7000, European data)[6] and breast screening (A$45 000, United Kingdom data).[7] The costs of treating advanced lung cancer are greater than the costs of treating the early stage disease.[8] Further, a consequence of rising pharmaceutical costs of cancer treatment is that early detection becomes more desirable both in direct mortality reduction and reduction of downstream treatment costs.[5]

Concerns with screening implementation in Australia

Vital information that is currently lacking in the Australian health care setting includes: an economic evaluation to assess health care cost utility; definition

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of a target population; false-positive rates; and best recruitment and uptake strategies.[9] The feasibility of chest CT screening in the Australian setting has already been demonstrated with the Queensland Lung Cancer Screening Study[10] (long-term follow-up near completion) and the Western Australia-based Asbestos Review Program.[11] However, uncertainties remain over the best recruitment strategies, management of pulmonary nodules and most cost-effective approach. A further evaluation study in WA (LungScreen WA Project) will contribute useful data.

Targeted risk-based approach

The risk of lung cancer is heterogeneous and data from the large US-based National Lung Screening Trial demonstrate that the criteria used to identify at-risk individuals included many who were, in fact, at low risk for developing lung cancer.[4] Subsequently, logistic regression-based risk prediction models have demonstrated improved sensitivity with less CT scans required to identify more lung cancers.[4] This approach has recently been shown to be more cost-effective.[5] A similar, risk-based approach to managing indeterminate nodules (majority are false positive) that require follow-up is also likely to reduce unnecessary repeat CT scans and costs.[4] The use of validated risk-prediction models to both select and manage participants is likely the most effective method for screening and such an approach has been recommended by IASLC.[3]

Future structure

Any future lung cancer screening program in Australia faces a unique challenge. Unlike truly population-based Australian screening programs such as BreastScreen, the National Cervical Screening Program, and National Bowel Cancer Screening Program, which screen people without risk stratification for the disease in question, lung cancer screening would screen participants who have been individually assessed as having a higher than average risk. A national program needs to be community based with shared, informed decision-making between clinicians and potential participants, accredited reporting centres and a central data registry for quality control, monitoring and outcome reporting. Crucially, it must have an integrated smoking cessation intervention, with recent international data supporting the cost-effectiveness,[5] additional mortality benefit[12] and a high sustained quit rate[13] with such an approach. It is a teachable moment that should not be missed.

In the absence of a coordinated approach, ad-hoc screening should be strongly discouraged, with no evidence of benefit and the very real risk of harm. The majority of the outstanding questions for lung cancer screening are likely to be answered in the next few years — Australia needs to generate progress now towards a cohesive national approach and avoid procrastination. The challenge facing Australia is the translation of international results into sustainable, cost-effective clinical practice, ensuring that the desired benefit outweighs the known harms, at the same time as enhancing tobacco control policies.

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