



## Editorials

### New approaches to lung cancer *Changing role for family physicians*

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**T**he article by Lam et al (page 537) in this issue of *Canadian Family Physician* raises an important question on early detection of lung cancer. Should family doctors consider early detection for lung cancer? I think the answer is a resounding yes!

It is both interesting and timely that *Canadian Family Physician* focuses on early detection of lung cancer. Consensus has developed among such organizations as the Canadian Association of Provincial Cancer Agencies, the Canadian Cancer Society/National Cancer Institute of Canada, Health Canada, and the provinces about the need to establish a Canadian strategy for cancer control. While many factors drive cooperative development of an explicit strategy for cancer control in Canada, one of the most important is the increasing burden of cancer. Cancer is now the number one cause of death in most Canadian provinces. Although the incidence of cancer in the Canadian population has risen only slightly (and is likely to remain stable in the near future), the number of people diagnosed with cancer will increase significantly due to aging and population growth. This will have personal, economic, and societal effects.<sup>1</sup>

But another imperative has been the need for coordination and integration of care among a number of providers. Family physicians play a coordinating role, from the point of entry into the cancer control system to providing services to patients in all areas of cancer control.

#### **Why more attention to early detection?**

Attention to early detection of lung cancer is timely for several reasons. Recent developments in cancer research could make early detection possible (but more about this later). More people die of lung cancer than breast, colorectal, and prostate cancers combined. Although lung cancer outcomes have improved as shown by a decline in incidence and mortality rates in men due to changes in smoking patterns, a few interesting facts about lung cancer in women deserve attention. The mortality rate in

women is progressively increasing as a consequence of smoking behaviours established in the 1950s, 1960s, and 1970s. Although the incidence of breast cancer is higher than lung cancer, the poor response to treatment of lung cancer means that the number of women who actually die from lung cancer is greater than the number who die from breast cancer. It is also of concern that women who smoke have anywhere from a 1.5 to 3 times greater chance of acquiring lung cancer when exposed to the same level of risk as men. In addition, lung cancer occurs, on average, 5 years earlier in women than it does in men.

At present, the outcome of treatment for lung cancer is most unsatisfactory with, at best, a 15% 5-year survival rate. This is, in part, due to the late stage of the disease at the time of diagnosis and the poor response to therapy. As a consequence, a great deal of energy and effort has been put into strategies for reducing smoking, and we are beginning to see positive results from these efforts. However, while these strategies are important and should continue, the benefits will only be realized well into the future.

In the meantime, a substantial population of former smokers continues to be at risk. While the risk of acquiring lung cancer is reduced somewhat in former smokers, it still remains at a significantly high level. For those who have quit, the risk of acquiring lung cancer is approximately 80% of that of those who still smoke. In North America, 50% of lung cancers are diagnosed in people who have quit smoking in the past 3 years. As a consequence, there is a very great pent-up risk in the population, which challenges us further to develop more effective strategies to improve outcomes.

#### **Increasing our knowledge**

Knowing what constitutes cancer control will allow us to better understand future directions in controlling lung cancer. Cancer control involves developing and applying knowledge to such activities as

prevention, screening, early detection, diagnosis, treatment, rehabilitation, and palliative care; all of which is directed toward reducing incidence of cancer, reducing mortality, and improving the quality of life of those living with cancer. When we apply this model of cancer control to recent findings about lung cancer's causes and developing methods of detection, it makes sense to focus on strategies for prevention and screening. These strategies are emphasized in view of the poor response to treatment.

### Importance of screening

Screening is an important strategy in cancer control. This is based on the premise that, if either precancerous or cancerous lesions are detected early, treatment has a much greater effect on outcome. This has been clearly demonstrated by the cervical and breast cancer screening programs that now exist in many provinces in Canada.

Recent evidence indicates that, for colorectal cancer, mortality would be reduced by 25% for those screened through an organized program. As a consequence, adopting a national strategy for colorectal screening is being aggressively pursued. Unfortunately, evidence that has accumulated so far about an at-risk population-based screening program for lung cancer would not justify introducing such a program.

Until recently, evidence indicated that screening for lung cancer through sputum cytology (a recently developed technique that enables more precise quantification and characterization of precancerous or early cancerous cells) and chest radiography did not lead to improved outcomes. There are, however, some encouraging scientific developments that are referred to in the article by Lam and associates (page 537). Let us assume that the body of evidence justifies implementing an at-risk population-based screening program for lung cancer.

What would characterize such a program? It would involve assessing risks for those who have smoked a pack of cigarettes a day for 30 years and those for whom lung function testing clearly indicates chronic obstructive lung disease. Such at-risk individuals would undergo quantitative sputum cytology. Patients who have abnormalities in quantitative sputum cytology would then be subjected to blue-light fluorescent bronchoscopy, which identifies and localizes precancerous or early cancerous lesions. With this approach, long-term survival can be improved to 65% to 95%. While these techniques show promise, more work

needs to be done on their application as a screening tool.

When population-based screening programs are introduced, they must be based on well established criteria. With modification, the conceptual framework for screening developed by Wilson and Jungner<sup>2</sup> for the World Health Organization can serve as a guide to assess new screening programs. A screening program should also satisfy the key elements of an organized population cancer screening program as defined in the report of the Screening Working Group of the Canadian Strategy for Cancer Control.<sup>3</sup> In applying these parameters to lung cancer screening, evidence is not yet available to support its application on a population basis.<sup>4</sup>

### What can be done now?

Family physicians, however, are faced with patients who *are now* at risk. Based on current evidence and available technology, what can family physicians do? They can identify high-risk patients based on their smoking history and assess presence or absence of chronic obstructive lung disease through office-based spirometry using inexpensive and simple-to-use portable equipment.<sup>4</sup>

If abnormalities are found, patients can be referred for quantitative cytology and low-dose spiral computerized tomography. Using these techniques, preliminary evidence from an ongoing chemoprevention trial at the British Columbia Cancer Agency would indicate a yield of precancerous and early cancerous lesions of 3% to 4% (personal communication from Dr Stephen Lam); a level that is certainly worthwhile compared with the yield associated with formal screening programs for other types of cancer. These techniques would also enable family physicians to provide prevention education to those at risk and to identify patients who could be enrolled in clinical trials.

Family physicians can also help identify patients who can participate in pilot projects or randomized controlled trials to assess the value of lung cancer screening. This would involve referring high-risk patients to those responsible for conducting pilot projects and trials where applying quantitative cytology coupled with blue-light endoscopy and localized treatment would be assessed. Tissue taken from these lesions can be used to build knowledge about the initiation and genetic progression of lung cancer using genome science techniques. Tissue analysis will also help develop additional strategies directed toward correcting

genetic abnormalities or focusing our efforts on chemotherapeutic developments, which are genotypically specific and directed to the abnormalities detected within tissue samples.

Family physicians would also be contributing to a better understanding of other cancer-causing risk factors yet to be determined. Why do some people get cancer and others exposed to the same risk do not? Are there mutations in tumour suppressor genes, DNA repair genes, or other genetic mechanisms that account for this? What can we learn about the initiation and progression of lung cancer that can lead to better control measures? Does chemoprevention work? What is the relationship between genetic variation in the population and the risk of developing lung cancer?

In cancer control we often talk about the importance of bench to bedside to bench. Perhaps we should extend this concept to include bench to bedside to office and community-based practice and back to bench. Applying these ideas would help us coordinate and integrate our cancer control efforts between organized systems of cancer control and the delivery of health care by family physicians in various communities. ❁

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