

Guest Editorial

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Let's Get Serious About Lung Cancer Prevention

Much has been written in praise of Canadian and European medical care because of a purportedly greater emphasis on preventive medicine compared with U.S. medical systems. In the United States, there are signs the paradigm is shifting in this direction. For example, recent coverage of preventive topics in the mass media indicates an increasing acceptance of the value of this health care approach by the general public. Additionally, health care institutions have begun to include such preventive measures as the use of statins and beta-blockers, aggressive hypertension control, and monitoring of prognostic laboratory parameters (such as lipid profiles and hemoglobin A_{1c} levels) among their quality measures for ambulatory care.

Nevertheless, there remains an overwhelming emphasis on technology rather than prevention when we approach the problem of tobacco use—despite the fact that eliminating use of this damaging substance would be one of the most significant preventive medicine interventions of all time. Indeed, any health care provider working in a public facility realizes not only the burden of chronic disease imparted by tobacco use but also the devastating financial costs incurred from cardiopulmonary and vascular complications.

Our refusal to confront the socioeconomic burden of tobacco use, in favor of a reliance on technologic advances in screening and diagnosis, is embodied by our approach to lung cancer. Lung cancer is truly the neoplasm

of the 21st century. In the United States and worldwide, it is the leading cause of cancer mortality for both men and women.¹ While prostate and breast cancers are more prevalent, lung cancer has the most dismal survival statistics. The five-year survival rate following diagnosis is between 10% and 15%.² A major reason for these gloomy figures is the absence of parenchymal pain fibers in the lung, which relegates early diagnosis to serendipitous radiologic detection of a small nodule. Or, when the disease is detected symptomatically, it usually has progressed well past the stage of resectability and potential cure.

Admittedly, data show that not all lung cancer is directly related to an individual's own use of tobacco.³ The role of such factors as exposure to secondhand smoke or environmental agents in the pathogenesis of primary lung cancer among the 10% to 15%

risk completely once a cumulative exposure of 20 pack-years has accrued, data suggest that at least 10 to 15 years of abstinence can produce a dramatic risk reduction for most former smokers.⁵ By contrast, ongoing smokers have an odds ratio for lung cancer development that is many times higher than that of the nonsmoking population. Indeed, smoking cessation is by far the best approach to lung cancer prevention we have available, but our success here remains extremely limited.

The primary reason for this lack of success, I believe, is that tobacco smoking is a socially acceptable chemical dependency. It is, however, no less an addiction than abuse of alcohol, narcotics, or methamphetamines. Our success with treating chemical dependency, in general, remains poor. Only recently, as large pharmaceutical companies envision a profit, has large-

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of nonsmoking patients who develop the disease is not entirely clear. But no one would seriously dispute the relationship, now well established over many decades, between lung cancer and tobacco use. In short, tobacco use remains the primary risk factor for lung cancer by an overwhelming large margin.⁴

Given this fact, how do we fight this terrible disease most effectively? While smoking cessation does not eliminate

scale research into addiction treatment been undertaken. Federal funding for this type of research still remains grossly inadequate. In addition, rather than aggressively promoting smoking cessation, our approach has been to progressively tax cigarettes. For most people addicted to cigarettes, though, this measure does not provide enough incentive to quit—they are annoyed by the steep prices but they continue to pay them. Furthermore, since individu-

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als in lower socioeconomic groups generally have the highest rates of tobacco use and other chemical dependencies, this tax burden falls most heavily on those who are least able to shoulder it.

So what can we do? We could place the full weight of technology behind lung cancer screening. Of course, such advancements would be available only to individuals who could afford it—mainly, those with health insurance. Unfortunately, this excludes a sizeable portion of the U.S. population.

Additionally, little evidence links the use of screening technology—conventional or more advanced—to reduced mortality. Trials to date of relatively inexpensive and easily obtained plain chest radiographs have failed to demonstrate reduced lung cancer mortality.⁶ Studies also have failed to prove definitively the value of more sophisticated electron beam computed tomography (CT) scanning, mainly due to an absence of control groups. Another key limiting factor is lead-time bias, which refers to a situation in which survival time appears, misleadingly, to be prolonged due to earlier detection. If early detection of lung cancers was to yield more definitive cures, this would represent a real impact on survival. In practice, however, even small lung cancers often have undetectable micrometastases when they are detected and are associated with less than 100% survival five years after resection.⁷

The lung cancer screening data published recently in the *New England Journal of Medicine* includes over 31,000 patients and over 12 years of follow-up.⁸ For this trial, the number of initial and follow-up CT scans totaled in the hundreds of thousands. While many nodules were delineated, only 484 cancers were diagnosed. The 10-year overall survival rate for the patients diagnosed with cancer was estimated at 88%. While this would seem to represent a significant improvement, it's important to note that this

survival was projected rather than actual. Moreover, the lack of a control group does not allow for consideration of lead-time bias and overdiagnosis of very small lesions that would not have contributed to mortality even if undetected by this type of scanning. Given the cost of a CT scan and the number of follow-up scans performed per person in this study, the financial burden on the health care system is not insignificant. CT screening also targets only those individuals deemed at high risk for developing lung cancer. Following the technology approach to reducing lung cancer morbidity and mortality, would it become necessary to perform mass screening on nonsmoking groups who have experienced a rising incidence of lung cancer, such as all postmenopausal women?

High technology lung cancer screening is more “sexy” and less socially provocative than aggressive measures to curtail tobacco use, such as outlawing sales or developing new and more effective treatments for nicotine addiction. Ending tobacco use is not an easily accomplished goal—nor one that is often envisioned. It clearly would take an ambitious, multidimensional effort that would be neither cheap nor quick. But the talent and resources could be mobilized in this country if we had the guts and the will.

By dealing only with the consequences of smoking rather than attempting to eliminate it entirely, the socioeconomic burden of new generations of cigarette smokers is multiplied exponentially. Routing funding to combat the ravages of smoking passes considerable resources to radiologists and manufacturers of technology. But when we put our money behind eliminating the root cause of lung cancer, we remove legalized poison from society. ●

Author disclosures

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