SCREENING WITH LOW-DOSE COMPUTED TOMOGRAPHY: RESPONSE TO THE AMERICAN ASSOCIATION OF THORACIC SURGERY GUIDELINES

To the Editor:

In the recently published American Association for Thoracic Surgery (AATS) guidelines for lung cancer screening,¹ it was recommended that computed tomographic (CT) screening should include current and former smokers of wider eligibility than that recently recommended by Bach and colleagues² on the basis of the National Lung Screening Trial (ages 55-74 years, ≥ 30 pack-year, quit time < 15 years). Such a recommendation recognizes that the National Lung Screening Trial criteria have poor sensitivity (estimated to be $< 50\%$) relating to their exclusion of many high-risk smokers who fall outside these criteria.³ We strongly endorse the broader eligibility criteria for CT screening and outline here why this broadening is justified.

First, as outlined in the AATS guidelines,¹ the age-specific incidence of lung cancer goes up beyond 75 years of age. More importantly, age-specific lung cancer mortality in the US (accounting for competing causes of death) increases exponentially after 50 years of age and peaks at 80 years of age (Figure 1).⁴ These data further support the widening of the eligibility criteria to include those 50 to 79 years old. We estimate that this widening of

FIGURE 1. Mortality (per 1000 people) from lung cancer in men and women in the US according to age and smoking status.⁴

the age criteria¹ will increase the proportion of lung cancer cases eligible for screening by an estimated 10% to 15% (47% with National Lung Screening Trial-based recommendations and 62% with AATS recommendations).³ Similarly, we estimate a widening of the pack-year smoking history (to include 20-29 pack-year) will add a further 10% to 15% of lung cancer cases. We therefore agree with the AATS recommendation¹ to screen current or former smokers with wider age and pack year criteria (50-79 years and ≥ 20 pack-year) with additional risk factors. We suggest that both chronic obstructive pulmonary disease and a genetic predisposition are particularly relevant, because we have found that these risk variables confer 4- to 6-fold and 2- to 10-fold increased risks of lung cancer, respectively, relative to the risk derived from age and smoking history alone.⁵

Although we agree that clinically validated lung cancer risk tools should be used in CT screening selection, we are less convinced that web-based reporting of absolute risk (<http://www.mskcc.org/cancer-care/adult/lung/pre>

diction-tools) is the best way to identify and engage smokers for CT screening.¹ First, this is because risk reported as an absolute risk is a concept poorly understood by doctors and patients alike. It is well documented that for absolute risk to be understood, it needs to be compared with the risks of other people or different circumstances (as illustrated by Jaklitsch and colleagues¹), thereby converting absolute risk into a comparative or relative risk.^{4,5} Second, comparative risk is an important concept in promoting risk mitigating actions such as smoking cessation,⁴ considered an integral part of CT screening in all recommended guidelines to date.^{1,2} We have recently demonstrated that a gene-based risk tool that we developed for lung cancer risk improves both smoking cessation and interest in CT screening,⁶ most likely through increasing motivational tension and undermining the unrealistic optimism commonly seen in smokers. We conclude that wider eligibility criteria for CT screening are justified and that patient-friendly risk assessment can provide a teachable moment with which to target and engage high-risk smokers in

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such risk-mitigating actions as CT screening and smoking cessation.

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Reply to the Editor:

We thank Drs Young and Hopkins for their kind remarks in favor of the American Association for Thoracic Surgery guidelines for lung cancer screening with low-dose chest computed tomographic scans. In creating guidelines on the basis of a successful research protocol, the Association chose to expand the age of the screening population beyond the ages of the participants in the National Lung Screening Trial.¹ The rationale behind this decision included the age distribution of the disease in North America, the fact that increasing age is an independent risk factor for development of cancer, and the improvement in

quality life years expected up to the 9th decade of life. Drs Young and Hopkins offer additional justification for this guideline, namely the age-specific lung cancer mortality in the United States increases exponentially after the age of 50, with a peak at the age of 80 years.

We envision a Web-based program that would allow each citizen to calculate his or her own absolute risk of lung cancer, dissemination of easily updated educational materials, and potential data collection for specific populations. It is our hope that such risk assessment would in turn lead to risk modification and smoking cessation as integrated components of patient care. Personal risk calculators are currently available, but they are not easily accessible to the public. Such a Web-based tool might convert a guideline or instruction into a conversation between physician and patient, including the opportunity to further patient interest in smoking cessation.

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CORRECTION OF FAULTY ASSUMPTIONS IN COST-EFFECTIVENESS ANALYSIS

To the Editor:

We read with interest the Canadian cost-effectiveness analysis by Doble and colleagues¹ comparing transcatheter aortic valve replacement (TAVR) with standard management (SM) for inoperable patients and with surgical aortic valve replacement (SAVR) for high-risk patients with severe,

operable aortic stenosis. Although we found many aspects of this work to be well done, we believe that the published analysis contains a few important factual errors and a few assumptions that have been contradicted by recently published follow-up data from the PARTNER trial.

First, the Sapien valve (Edwards Lifesciences LLC, Irvine, Calif) price in Doble and colleagues' analysis¹ (\$37,606) is \$13,606 greater than the current Canadian price of \$24,000 (all figures are in Canadian dollars). With no other changes to the model of Doble and colleagues,¹ correction of the Sapien valve price would make TAVR slightly cost saving (by \$2453) relative to SAVR in high-risk surgical patients and would reduce the incremental cost-effectiveness ratio for TAVR relative to SM from \$36,458 to \$20,497 per life year gained (or from \$51,324 to \$29,037 per quality-adjusted life year gained). Second, Doble and colleagues¹ estimated the costs of SAVR in Ontario from provincial data for patients aged 70 years and older in Case Mix Group (CMG) 165, cardiac valve repair. SAVR procedures are not coded under this CMG in Ontario, however, but rather under CMG 162 (cardiac valve replacement), which has slightly higher reimbursement. More importantly, we believe that "average" reimbursement values for SAVR in patients aged 70 years and older are likely to underestimate the true costs of SAVR among patients like those in the PARTNER trial, whose baseline characteristics in the clinical trial placed them in the highest 5% to 10% of predicted operative risk.²

In projecting survival for inoperable patients, Doble and colleagues¹ used Canadian life table data for years 2 through 20 of their model for both TAVR and SM patient cohorts. This approach assumes that survivals beyond 1 year would be similar for the two groups, in essence ignoring the