than QFT-G (13) and has recently replaced QFT-G worldwide. Second, we managed treatment in the present study according to a Japanese guideline (6). In the context of this guideline, we did extend the duration of treatment for 3 months in patients with TB with diabetes mellitus and immunosuppressive therapy.

In conclusion, we found a relation between the transitional changes in IFN-γ response and recurrence of TB by following the QFT-G test for 2 years after completion of treatment. When there is an obvious increase in IFN-γ response to TB antigens at completion of treatment compared with those at the beginning of treatment in patients with TB, the risk for recurrence of TB should be considered. ■

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Attitudes about Low-Dose Computed Tomography Screening for Lung Cancer: A Survey of American Thoracic Society Clinicians

To the Editor:

The National Lung Screening Trial (NLST) demonstrated a 20% reduction in lung cancer mortality with annual low-dose computed tomography (LDCT) screening among high-risk individuals (1). Yet LDCT screening can also cause harm. Although several organizations recommend screening (although in different populations) (2–4), others do not (5).

With both Medicare and private insurers set to begin coverage in 2015, LDCT screening is expected to disseminate widely into practice. Whether implementation is successful, appropriate, and cost-effective will depend on clinicians' attitudes and behaviors regarding screening (6). To address this issue, we surveyed an international sample of practicing clinicians who see patients with pulmonary disease.

Methods

We surveyed clinician (MDs, NPs, PAs) members of the American Thoracic Society (ATS) Clinical Problems and Respiratory Cell and Molecular Biology Assemblies (the parent assemblies of the Section of Thoracic Oncology) who regularly see outpatients. ATS sent three emails between March and April 2014 inviting participation in

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an anonymous, online survey about lung cancer screening, offering a $50 incentive for completion. We stratified respondents into "screeners" (those who would offer screening to an NLST-eligible patient) and "nonscreeners" and compared proportions with chi-square tests. We also performed subgroup analyses restricted to respondents from the United States and those from academic centers. Data were analyzed using Stata 10.1 (College Station, TX). The Boston University Institutional Review Board approved this study.

Results

Sample characteristics. Of 5,872 ATS members with a valid email address, 1,444 opened the email and 428 responded (response rate, 7% of all emailed, 30% of opened invitations). Respondents represented a variety of clinical experience and settings (Table 1).

Table 1. Respondent Characteristics

Characteristic	Percentage *(n = 428)*
Male	74
Clinician type	
Physician	99
Clinical specialty	
Pulmonary/critical care/sleep	91
Primary care/internal medicine	6
Thoracic surgery	1
Years since completing clinical training	
Currently in training	15
⩽5	15
6–10	15
11–20	23
>20	33
Outpatient versus inpatient effort	
Exclusively outpatient	7
Mostly outpatient	51
Mostly inpatient	42
Effort spent on clinical activity	
<25%	9
25–49%	16
50–74%	25
⩾75%	51
Practice type	
Academic	64
Community	24
Department of Veterans Affairs	7
Health Maintenance Organization	3
Practice setting	
Urban	74
Suburban	21
Rural	5
Practice location	
United States: Northeast	28
United States: South	12
United States: Midwest	21
United States: West	14
Canada	8
Mexico, Central, South America	4
Europe	6
Asia	4
Other	3

Most respondents reported familiarity with the NLST (52% extremely and 39% somewhat familiar) and LDCT screening guidelines (44% extremely and 45% somewhat familiar). A third of respondents (34%) reported their clinical site already had a screening program in place, and another 30% indicated their site was planning to start one.

General perceptions of screening and evidence and guidelines for LDCT screening. Although most believed that screening tests are an important public health tool (87%), many recognized that screening can cause harm (76%). Most perceived the evidence for LDCT screening to be strong (17% very strong, 57% strong). Most believed that LDCT screening is more effective than prostate-specific antigen screening (56%) but less effective than smoking cessation (80%) at reducing cancer death.

When asked about the ideal population for LDCT screening, 48% selected the NLST inclusion criteria, which form the basis for the American College of Chest Physicians guidelines (age 55–74 yr, with ⩾30 pack-years tobacco use, and smoking within the last 15 yr), 24% the U.S. Preventive Services Task Force criteria (same as NLST except age range 55–80 yr), 11.3% the more liberal National Comprehensive Cancer Network criteria, and 11.0% selected targeted screening (7) for individuals with a 5-year risk of lung cancer death higher than 0.85%. A small minority (4%) believed LDCT screening should not be offered at all.

LDCT screening practices. Most respondents were guideline-concordant in their self-reported screening behavior (Tables 2 and 3): 90% ("screeners") would offer screening to a NLST-eligible patient, and 69% would not offer screening to an NLST-ineligible patient with a remote smoking history. Screeners were more familiar with and more heavily influenced by the NLST and guidelines. Screeners were more greatly influenced by the perceived benefits of screening and the availability of resources for managing screen-detected nodules. In contrast, nonscreeners were more likely to be influenced by the potential harms of screening.

Nonscreeners were significantly more likely to perceive major barriers to implementation of LDCT screening programs (Tables 2 and 3). Overall, clinicians were more likely to perceive insufficient resources as major barriers compared with lack of buy-in from relevant parties.

When asked about a marginal candidate (NLST-eligible but with severe chronic obstructive pulmonary disease), 64% would offer LDCT screening. Clinicians who would not screen this patient were more likely to report that candidacy for surgical

Table 2. Low-Dose CT Screening Practices

Screening Behavior	Yes (%)
Would you offer low-dose CT screening to these patients:	
Guideline eligible (National Lung Screening Trial patient)	90
Guideline ineligible (quit smoking 25 yr ago)	31
Guideline marginal (severe chronic obstructive pulmonary disease with FEV_1 30%)	64

Definition of abbreviation: CT = computed tomography.

Table 3. Low-Dose CT Influences on Decision Making and Perceived Barriers to Implementation

	Screeners (%)	Nonscreeners (%)	*P* Value
Familiarity with and buy-in to relevant information about screening			
Familiarity (extremely/somewhat) with clinical practice guidelines	91	78	0.004
Familiarity (extremely/somewhat) with National Lung Screening Trial findings	91	77	0.007
Belief that evidence for low-dose CT screening is strong or very strong	95	78	<0.001
Major influences on decision whether or not to screen			
Evidence			
Clinical trial evidence	78	60	<0.001
Guidelines for low-dose CT screening	67	47	<0.001
Opinions of my colleagues about low-dose CT screening	20	20	0.48
Potential benefits of screening			
Low-dose CT screening reduces death	64	20	<0.001
Potential harms of screening			
False-positive rate	52	71	0.01
Overdiagnosis of indolent tumors	44	67	0.01
Incidental findings outside lung	31	53	0.009
Radiation exposure	13	42	<0.001
High cost to patient	23	53	<0.001
High cost to system	33	64	<0.001
Patient factors			
Candidacy for surgical treatment	60	51	0.33
Local context considerations			
Access to low-dose CT scanner	58	44	0.13
Availability of local experts in thoracic surgery	44	40	0.03
Availability of local experts to biopsy pulmonary nodules	50	38	0.20
System in place locally for following pulmonary nodules	57	47	0.03
Perceived major barriers to implementation of screening programs			
Lack of buy-in from parties involved with screening			
Lack of buy-in from primary care providers	29	42	0.13
Lack of buy-in from pulmonologists	22	58	<0.001
Lack of buy-in from radiologists	21	23	0.94
Lack of buy-in from local leadership	28	46	0.04
Lack of buy-in from patients	13	16	0.10
Insufficient resources for implementation			
Insufficient infrastructure for screening program	41	64	0.005
Insufficient staff to run screening program	42	60	0.01
High cost of implementation	43	82	<0.001

Definition of abbreviation: CT = computed tomography.
Screeners were defined as those who would offer screening to the National Lung Screening Trial–eligible patient; nonscreeners were defined as those who would not offer screening to the National Lung Screening Trial–eligible patient.

treatment was a major influence on decision making (75% vs. 50%; $P < 0.001$).

Subgroup analyses. U.S. clinicians were more familiar than non-U.S. clinicians with the NLST results (59% vs. 34% extremely familiar; $P < 0.001$), more likely to perceive the evidence for LDCT screening to be very strong (20% vs. 7%; $P < 0.001$), and more likely to offer screening to a NLST-eligible patient (95% vs. 74%; $P < 0.001$). There were no important differences in attitudes or screening behaviors between clinicians at academic versus nonacademic sites.

Discussion

In this first international survey, we found that responding clinician members of ATS support LDCT screening of the NLST-eligible population, believe the evidence for screening is strong, and also recognize potential harms. The most important concerns for clinicians who did not recommend screening were the potential harms and insufficient resources to run screening programs.

This study has limitations. First, our response rate was low, which is unfortunately consistent with the trend of decreasing response rates to physician surveys and email surveys in particular (8). Thus, we cannot be certain that respondents represent the views of all clinicians, or even all ATS clinician members. Individuals who perceive LDCT screening more favorably may have been more likely to participate than those apathetic to this issue, resulting in overestimates of enthusiasm for LDCT screening. However, the enthusiasm our respondents expressed for lung cancer screening is similar to that observed in prior primary care provider and patient surveys (9, 10). Second, responses to hypothetical vignettes may not reflect actual screening behavior. Third, our results capture our respondents' attitudes about LDCT screening in spring 2014; however, clinician perceptions of the new intervention of LDCT screening may evolve over time.

On the eve of the anticipated widespread implementation of LDCT screening, it is encouraging that most clinicians who responded to our survey appeared to be driven by the evidence

and guidelines in deciding which patients should be offered screening; namely, the NLST population. Most were cognizant of both the benefits and harms of LDCT screening and appeared to balance those considerations when deciding whether to offer screening, an ideal scenario for the shared decision making required for Medicare coverage. As screening is widely implemented, education will be important to ensure providers are fully aware of the trial evidence and can discriminate which patients are appropriate for screening. ■

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Overestimation of Coprevalent and Underestimation of Incident Tuberculosis in Close Contacts

To the Editor:

The article by Sloot and colleagues examining traditional beliefs about the proportion of contacts progressing from latent tuberculosis to tuberculosis disease is an important contribution to the literature (1). However, the authors' findings of a high rate of coprevalent disease and a low rate of incident disease may be partially explained by two factors. First, they used a definition of coprevalent disease that differs from that used by the U.S. Public Health Service studies of Ferebee and Comstock and colleagues (2, 3). Sloot and colleagues defined coprevalent disease as disease occurring within 180 days of the index case diagnosis, whereas the U.S. Public Health Service studies defined coprevalent disease as that present at the time the contact investigation was performed. Because contact investigations are usually performed promptly on identification of a source case, Sloot and colleagues' definition results in some cases that prior studies had defined as incident cases moving to the coprevalent category. Such reclassification would also explain why Sloot and colleagues found a higher proportion of coprevalent cases than the 2–4% that have been reported in other contact investigations (4). If the earlier definition had been used, the effect would be to decrease coprevalent cases and increase incident cases by the corresponding number.

Second, as the authors note in their limitations section, there was unavoidable confounding by indication. Persons who were offered, accepted, and completed a course of preventive therapy were very likely to be persons at higher risk than those who did not do so. Thus, although 2.4% of those who did not start preventive therapy progressed to disease, the proportion of contacts who would have developed incident disease in the absence of preventive therapy would undoubtedly have been higher than 2.4%.

In addition, I find the authors' conclusion that "limited impact may be expected of expanding preventive therapy" a bit puzzling. In their article, they show that more than half of first-ring contacts did not start preventive therapy, and of these, 4% (8/201) went on to disease. More vigorous efforts to initiate and complete preventive therapy among such persons would be an important expansion of preventive therapy. In addition, as the authors note and has been previously observed, the risk of disease is strongly associated with age and is also associated with skin test size (5). Expansion of preventive therapy to persons with increased risk for disease, either on the basis of age or skin test size or the presence of medical risk factors that