

Beliefs among Physicians in the Diagnostic and Therapeutic Approach to Non-small Cell Lung Cancer

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Purpose: The American College of Chest Physicians (ACCP) has established evidence-based guidelines for the evaluation and treatment of patients with lung cancer. Physicians' beliefs and practice patterns may differ significantly from established guidelines. We conducted a survey to assess and compare physician beliefs against the evidence-based guidelines.

Methods: A survey was sent by electronic mail (e-mail) in March 2006 to 2100 randomly selected physicians who were members of the ACCP practicing in the United States, followed by two reminder e-mails.

Results: Three hundred forty-seven surveys were completed and evaluable. The majority (84%) of the respondents reported having read, consulted, or used the guidelines to set practice policies, and 75% found the guidelines helpful. The respondents' practice beliefs were in agreement with the guidelines on the evaluation of operable patients with enlarged mediastinal lymph nodes, the role of chemotherapy in the treatment of stage III disease, and the evaluation of a solitary pulmonary nodule. Nevertheless, a significant percentage of respondents' practice beliefs differed from the guidelines on issues such as screening for lung cancer, the survival benefit of chemotherapy in stage IV disease, and postoperative radiation therapy. Only a minority of respondents believed that chemotherapy improved quality of life in stage IV disease. The survey results indicate that there has been acceptance of the adjuvant chemotherapy and increasing integration of positron emission tomography in the evaluation of a solitary pulmonary nodule and in staging the mediastinum.

Conclusions: The majority of physicians found the evidence-based guidelines beneficial; nevertheless, practice beliefs differ from the guidelines in select areas.

Key Words: Survey, Evidence-based medicine, Chemotherapy, Positron emission tomography scan, Quality of life, Combined modality therapy.

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Lung cancer remains the leading cause of cancer death for both men and women in the United States. It is estimated that in 2007, more people will die from lung cancer than from colon cancer, breast cancer, and prostate cancer combined.¹ Pulmonologists and thoracic surgeons see a high concentration of lung cancer patients and are frequently the first physicians to discuss the lung cancer diagnosis with the patient and the patient's family. The initial physician's opinions and attitudes can significantly influence the patient's treatment preferences, and these physicians frequently serve as referents to other specialists, including medical oncologists and radiation oncologists.

A survey we conducted in 1999 revealed that some physicians' beliefs in the evaluation and treatment of non-small cell lung cancer (NSCLC) were not supported in the medical literature.² Since the survey in 1999, the American College of Chest Physicians (ACCP) has established evidence-based guidelines for the diagnosis and management of NSCLC.³ The purpose of these evidence-based guidelines was to provide physicians with a concise, accurate summary of the medical literature. Nevertheless, treatment beliefs and practice patterns can vary significantly from evidence-based guidelines, and this can adversely impact the quality of patient care. Using a survey similar to the one used in 1999, we sought to describe the beliefs among pulmonologists and thoracic surgeons and to assess whether the treatment beliefs were in agreement with the evidence-based guidelines.

MATERIALS AND METHODS

The eligible group of survey recipients consisted of ACCP members practicing adult patient care in the United States. There were 5000 eligible members, and 2100 physicians were selected randomly. The survey (Figure 1) was sent in March 2006, using the e-mail addresses available to the ACCP, followed by two reminder e-mails. Select questions were open ended, asking for written answers. The responses from specialties other than thoracic surgery were combined with the pulmonary responses, and these were compared with the responses of the thoracic surgeons. Respondents who reported never having heard or read the guidelines were combined, and respondents who reported reading part of the guidelines or using them in the management of patient care or to set practice policies were combined. For the questions concerning the effectiveness of adjuvant chemotherapy, postoperative radiotherapy (PORT), and the role of chemotherapy

- 1) Do you diagnosis, evaluate, or treat adult (age 18 or older) patients with NSCLC? If you answer is no, you will be routed to the end of the survey to submit your response
 Yes No
- 2) In which one specialty do you spend the most clinical time?
 Pulmonary Medicine Thoracic Surgery
 General Medicine Other
- 3) How many patients a year do you evaluate with known or suspected lung cancer?
 0-1 2-10 11-25 >25
- 4) Do you believe screening for lung cancer is effective in patients you perceive to be at high risk for lung cancer?
 Yes No
- 5) If you answered yes to the previous question, please define high risk:
- 6) In your opinion, what is the optimal method of mediastinal staging in patients with potentially operable NSCLC and enlarged mediastinal lymph nodes (> 1 cm)?
 CT scan alone
 PET scan
 Histological/Cytological staging (Mediastinoscopy, Transbronchial NeedleAspiration, Esophageal Ultrasound & Needle Aspiration, Transthoracic Needle Aspiration)
 Other (please specify)
- 7) In your opinion, what is the optimal method of mediastinal staging in patients with potentially operable NSCLC and normal-sized mediastinal lymph nodes (< 1 cm)?
 CT scan alone
 PET scan
 Histological/Cytological staging (Mediastinoscopy, Transthoracic Needle Aspiration, Esophageal Ultrasound & Needle Aspiration, Transbronchial Needle Aspiration)
 Other
- 8) In resected stage I NSCLC what is your estimate of 5-year overall survival?
 85% 65% 45% 25%
- 9) A 65-year-old smoker presents with a spiculated 1.5 cm peripheral nodule and a normal mediastinum on CT. He is asymptomatic, otherwise healthy, with good PFTs. The next step you would select is:
 CT scan in 3 months Thoracoscopic wedge resection
 Bronchoscopy Mediastinoscopy
 Transthoracic needle biopsy Lobectomy
 PET scan Other (please specify)
- 10) In resected early stage NSCLC (I-IIIA), what is the effect of adjuvant chemotherapy in comparison to observation on the 5-year absolute survival, in your opinion?
 15% worse 5% worse no effect 5% better 15% better
- 11) In resected early stage NSCLC (I-IIIA), what is the effect of adjuvant radiotherapy in comparison to observation on the 5-year absolute survival, in your opinion?
 15% worse 5% worse no effect 5% better 15% better
- 12) In unresectable locally advanced NSCLC (IIIA/B), what is the effect of chemotherapy plus RT compared to RT alone in your opinion, on the 5-year absolute survival?
 15% worse 5% worse no effect 5% better 15% better
- 13) In metastatic NSCLC (Stage IV), do you believe chemotherapy results in a prolongation of survival?
 Yes No
- 14) In metastatic NSCLC (stage IV), do you believe chemotherapy causes quality of life (symptoms/toxicity) to be:
 Worse About the same Better
- 15) How familiar are you with the ACCP Lung Cancer Guidelines, published January 2003?
 I haven't heard of this.
 Aware of them, but have never looked at the Guidelines.
 I have read at least some parts of the Guidelines.
 I have used the Guidelines to help manage patients occasionally.
 I have used the Guidelines frequently or have used them to define policies in my practice
- 16) Do you find the ACCP Guidelines helpful in your practice?
 Definitely
 Yes, sometimes
 Not sure
 No
 I have not used them in the past, but I will consider using them in the future
 Not applicable
- 17) Completed medical (residency) training
 before 1985 1985-95 after 1995
- 18) Gender
 Male Female
- 19) Principal practice setting:
 Solo
 Small Group (2-9)
 Large Group (> 10)
 HMO
 Academic

FIGURE 1. Survey sent to 2100 American College of Chest Physicians regarding their beliefs in the evaluation and treatment of non-small cell lung cancer.

in combination with radiotherapy in stage III disease, the responses indicating a belief in beneficial or detrimental effects on survival were combined.

Statistical Analysis

General association between beliefs in therapy and physician characteristics was assessed using Pearson χ^2 test or Fisher's exact test (for contingency tables with small and zero cell counts). For ordered response variables (e.g., improved, no effect, and worse in survival), the Mantel-Haenszel χ^2 statistic was used to test mean score-location response shifts. All analyses were two sided. A p value ≤ 0.05 was considered statistically significant. Statistical analyses were performed with SAS statistical software, version 9.1 (SAS Institute Inc., Cary, NC).

RESULTS

Response Rates

One hundred nine surveys were returned as undeliverable, and seven people declined to participate in the survey. Of the remaining 1984 survey recipients, there were 400 responses (20%). Thirty respondents stated that they did not treat adult patients or patients with NSCLC, and 19 respondents began the survey but elected not to complete it. Thus, 347 recipients completed the entire survey.

Respondent Characteristics

General demographic and practice characteristics of respondents are presented in Table 1. Two respondents were in the field of general medicine, and 15 respondents were in specialties other than thoracic surgery. A higher percentage of the thoracic surgery respondents practice at academic

TABLE 1. General Demographic Characteristics of Study Participants

Characteristic	All (%) (n = 347)	Pulmonary ^a (%) (n = 285)	Thoracic Surgery (%) (n = 62)	p
Gender				
Male	90	90	92	0.81
Female	10	10	8	
Principal practice setting				
Solo	12	12	6	0.004
Small group (2–9)	33	34	27	
Large group (≥10)	15	17	5	
Health maintenance organization	2	2	0	
Academic	38	33	58	
Other	2	2	3	
Annual caseload				
Patients				
≤10	11	12	5	<0.0001
11–25	28	33	6	
>25	61	55	89	
Completion of medical training				
Before 1985	36	39	26	0.08
1985–1995	42	41	44	
After 1995	22	20	31	

^a Includes physicians who listed their specialty as “other” or general medicine.

centers (58% versus 33%, respectively) compared with the pulmonary medicine respondents, and a higher percentage of thoracic surgery respondents reported case loads of more than 25 patients per year (89% and 55%, $p < 0.0001$). Eighty-four percent of respondents had read at least part of the guidelines, used them in the management of patients, or used them to set practice policies, and 75% reported finding the guidelines helpful to their practice. Twenty-eight percent responded that the guidelines were definitely helpful to their practice, and 47% responded that the guidelines were helpful sometimes.

Beliefs in Screening and Evaluation of a Pulmonary Nodule

Participants were asked whether they believed in screening tests for patients perceived as high risk for devel-

oping lung cancer. We did not provide a specific definition of *high risk*, because we wanted to leave this to each respondent's judgment. Fifty-four percent of respondents expressed a belief in screening (Table 2). Thoracic surgery had a statistically significant association with a belief in screening. When respondents were presented with a clinical history of a smoker with a spiculated 1.5-cm pulmonary nodule, most respondents (40%) elected to pursue a positron emission tomography (PET) scan, and a significant percentage of respondents elected to pursue a surgical procedure or biopsy (Table 3). Seven percent of respondents elected to answer this question with an open-ended response; the most frequent response was to perform a wedge resection and, if pathology was positive for malignancy, to perform a lobectomy and lymph-node dissection, or to perform a mediastinoscopy and then a lobectomy if the mediastinal lymph nodes were negative for malignancy.

TABLE 2. Beliefs in Screening of High-Risk Patients for Lung Cancer

Characteristic	Belief in Screening	
	Yes (%)	p
All respondents	54	
Pulmonary medicine	47	<0.001
Thoracic surgery	86	
Annual case load		
2–10	50	0.02
11–25	43	
>25	59	

TABLE 3. Evaluation of Spiculated 1.5-cm Nodule in a Smoker

Diagnostic Test	Percentage
Positron emission tomography scan	40
Biopsy (transthoracic or bronchoscopy)	19
Lobectomy	16
Thoracoscopic wedge resection	14
Other	7
Mediastinoscopy	2
Repeat computed tomography scan	1

TABLE 4. Methods of Staging the Mediastinal Lymph Nodes

	CT Scan (%)	Biopsy (%)	PET Scan (%)	Other (%)	<i>p</i>
Lymph node >1 cm					
All respondents	1	77	17	6	
Pulmonary medicine	1	74	19	6	0.12
Thoracic surgery	0	89	10	2	
Annual case load					
2–10	3	74	18	5	0.21
11–25	1	70	20	8	
>25	0	81	15	4	
ACCP guidelines					
Never read	0	72	24	4	0.46
Read	1%	78	16	6	
Lymph node <1 cm					
All respondents	11	38	42	9	
Pulmonary medicine	11	42	40	7	0.001
Thoracic surgery	11	18	50	21	
Annual case load					
2–10	8	40	50	3	0.23
11–25	1	70	20	8	
>25	0	81	15	4	
ACCP guidelines					
Never read	18	40	39	2	0.05
Read	10	38	42	11	

CT, computed tomography; PET, positron emission test; ACCP, American College of Chest Physicians.

Mediastinal Staging

Two questions specifically asked respondents' opinions of the preferred method of staging the mediastinum in a potentially operable patient: one with enlarged lymph nodes (defined as >1 cm on computed tomography [CT] scan) and one with a patient with a normal-sized node (defined as <1 cm on CT scan). Because there are multiple different methods of histologically or cytologically evaluating mediastinal lymph nodes, the method was not specified.

For the patient scenario with enlarged lymph nodes, the majority of the respondents (77%) recommended histological or cytological evaluation (Table 4). A significant percentage of respondents (17%) believed that PET scans were the optimal method of evaluating the enlarged lymph nodes. Five percent of respondents elected to answer with open-ended responses; the most frequent answers included a combination of PET and invasive staging (3%), combined PET/CT (1%), and endobronchial ultrasound and/or endoscopic ultrasound (1%). In the patient scenario of an operable patient with normal-sized lymph nodes on CT scan, the percentages of respondents who elected to pursue PET scanning and histological or cytological evaluation were approximately equal at 42% and 38%, respectively (Table 4). Preference of staging method was significantly associated with specialties (*p* = 0.001). Thoracic surgeons elect to pursue a PET scan at a higher rate than histological staging (50% versus 18%), whereas pulmonary medicine respondents elect PET scanning and histological staging almost equally (40% versus 42%). A

TABLE 5. Estimated 5-year Survival Rate for Stage I Non-small Cell Lung Cancer

	Estimated 5-Year Survival Rate (%)					<i>p</i>
	25%	45%	65%	85%	Other	
All respondents	1	6	62	26		
Pulmonary medicine	1	7	61	27	5	0.42
Thoracic surgery	2	2	68	26	3	
Medical training						
Before 1985	2	9	61	22	5	0.02
1985–1995	0	3	69	24	4	
After 1995	0	5	51	38	5	

TABLE 6. Treatment Beliefs on Postoperative Therapies

	Improved Survival (%)	No Effect (%)	Worsen Survival (%)	<i>p</i>
Adjuvant chemotherapy impact on survival				
All respondents	85	15	<1	
Pulmonary medicine	83	17	1	0.06
Thoracic surgery	95	3	2	
Annual case load				
2–10	78	22	0	0.24
11–25	83	17	0	
>25	87	12	1	
Postoperative radiotherapy impact on survival				
All respondents	35	58	7	
Pulmonary medicine	37	59	4	0.007
Thoracic surgery	28	53	18	
Annual case load				
2–10	46	51	3	0.017
11–25	40	51	4	
>25	31	60	9	
ACCP guidelines				
Never read	40	56	4	0.024
Read	30	61	10	

ACCP, American College of Chest Physicians.

significant percentage (9%) of respondents selected open-ended responses for this question. The most frequent responses were selective use of PET scanning and/or invasive procedures, depending on tumor stage or size, histology, and location (4%); a combined PET/CT scan (3%); lymph-node exploration at the time of surgery (1%); and endobronchial or endoscopic ultrasound (1%).

Survival Estimates

To assess the respondents' perceptions of the prognosis of NSCLC, respondents were asked to estimate the 5-year overall survival rate for stage I NSCLC. The majority of respondents (62%) selected 65%, and 26% of respondents estimated a survival rate of 85% (Table 5). There was a statistically significant difference in the response depending

TABLE 7. Impact of Chemotherapy on Survival in Stage III Disease

	Improved Survival (%)	No Effect (%)	Worsen Survival (%)	<i>p</i>
All respondents	85	14	1	
ACCP guidelines				
Never read	85	14	1	0.89
Read	85	15	0	

ACCP, American College of Chest Physicians.

on the year of completion of medical training. For respondents graduating after 1995, a higher percentage of respondents selected a 5-year survival rate of 85%.

Treatment Beliefs

To assess beliefs regarding treatment efficacy, therapy options were offered by disease stage and potential benefit. The majority of respondents (82%) believed that adjuvant chemotherapy provided an improvement in 5-year survival (Table 6). In regard to PORT, the majority (58%) of respondents believed that it had no effect on survival, whereas 35% believed it offered an improvement in survival (Table 6). A substantial percentage (30%) of respondents who had read the guidelines believed that it improved survival. In the treatment of unresectable stage III NSCLC, the majority (85%) of respondents believed that the combination of chemotherapy and radiation therapy was superior to radiation therapy alone (Table 7). A lower percentage (60%) believed that chemotherapy provided a survival benefit in stage IV disease, and a minority (31%) believed that it improved quality of life (Table 8). A significantly higher percentage of thoracic surgeons reported a belief in the survival benefits of chemotherapy in stage IV disease than did respondents of other specialties (74% versus 56%, $p = 0.01$). Among the respondents who had read the guidelines, 41% believed that chemotherapy did not improve survival, and 47% believed that it worsened the patient's quality of life.

DISCUSSION

The guidelines recommend against screening for lung cancer with chest x-ray and sputum cytology, and they recommend that patients undergo screening with a CT scan only in the context of a clinical trial.⁴ The majority (54%) of respondents expressed a belief in screening for lung cancer for high-risk patients. This is a lower percentage than reported on the previous survey (75%).² Other studies have reported a persistent belief in chest x-ray screening for lung cancer, despite the lack of evidence of a mortality benefit.⁵⁻⁷ Nonrandomized CT screening studies have been performed, and randomized trials are currently ongoing.⁸⁻¹⁰ It is intuitive that the value of a screening test is related to how high the risk of lung cancer is in an individual. Because no definition of *high risk* was provided, a strict interpretation of the survey results is not possible. It is interesting that the belief in screening for high-risk individuals has decreased over time, especially because the wording of this question is identical to that in the 1999 survey. The detection of pulmonary nodules on a CT scan of a patient with a high risk of lung cancer frequently requires additional invasive procedures or follow-up with additional noninvasive tests. The additional testing can cause significant anxiety, inconvenience, and morbidity to the patient. These factors may have tempered enthusiasm for CT screening for lung cancer before definitive evidence of a mortality benefit has been established. It should be noted that this survey was performed before the publication of two recent articles on screening received significant attention.^{11,12}

The expected 5-year survival rate for patients with resected stage I NSCLC in the literature is approximately 65%.¹³ Significant percentages of respondents in this survey (26%) and in the previous survey (30%) have estimated the 5-year survival rate for stage I NSCLC at 85%. In the past, this disease has been associated with a significant amount of pessimism, particularly in fields outside of medical oncology.¹⁴ This attitude may be changing among recent graduates; nevertheless, an overly optimistic impression of this disease also may be detrimental to patient care.

TABLE 8. Chemotherapy Affects on Survival in Stage IV Disease

	Survival		Quality of Life			
	Improved (%)	<i>p</i>	Better (%)	No Effect (%)	Worse (%)	<i>p</i>
All respondents	60		31	22	47	
Pulmonary medicine	56	0.01	29	24	47	0.03
Thoracic surgery	74		42	11	46	
Annual case load						
2-10	50	0.01	18	26	55	0.26
11-25	50		30	25	45	
>25	65		35	19	46	
ACCP guidelines						
Never read	65	1.0	32	22	46	1.0
Read	59		31	22	47	

ACCP, American College of Chest Physicians.

In a medically fit patient with a lesion that is highly suspicious for being a clinical stage I lung cancer, surgical biopsy followed by lobectomy is recommended.¹⁵ Although this answer was common among respondents, many (44%) chose a PET scan. In fact, the guidelines are somewhat confusing in this regard, because PET is given as an option in the section on solitary pulmonary nodules (although it is thought not to be sufficiently reliable for use in highly suspicious lesions) and is recommended for most patients with an operable lung cancer for staging purposes. Because of the structure of the survey, it is unclear whether the PET scan was the initial step before a biopsy or a staging test for mediastinal or distant metastases.

The presence or absence of malignant involvement of the mediastinal lymph nodes plays a critical role in determining whether a patient is potentially operable, and the proper evaluation of the mediastinal lymph nodes can be challenging. The treatment beliefs for the majority of the respondents on this and the previous survey were consistent with the guidelines in electing to pursue a histological or cytological evaluation of the mediastinal lymph nodes in a potentially operable patient with enlarged lymph nodes on a CT scan.¹⁶ Some physicians elect to pursue PET scanning in this clinical scenario. The previous survey did not include questions related to the role of PET scans in mediastinal staging because the survey was performed before the widespread availability of PET scans. The utility of PET scans in patients with enlarged lymph nodes is primarily for extrathoracic staging; the PET scan does not avoid an invasive procedure, because of the substantial false-negative and positive rate of the PET scan in evaluating the mediastinal lymph nodes, and because of the need to histologically or cytologically evaluate for malignant involvement.¹⁷ The role of a preoperative PET scan in a patient with normal-sized mediastinal lymph nodes on CT scan (clinical stage I and II patients) is a controversial subject. There is significant heterogeneity in this patient population, and the probability of mediastinal lymph-node involvement can vary depending on the anatomic location of the primary, the tumor histology, and the presence or absence of level 1 nodal enlargement.¹⁷ Data would suggest that a positive PET scan should be confirmed with a biopsy; nevertheless, it is controversial whether it is necessary to confirm a negative PET scan with preoperative invasive staging. PET scans also may have a role in extrathoracic staging in this patient population. In a prospective study, PET scans detected asymptomatic, extrathoracic metastases in 8% of clinical stage I patients and in 18% of clinical stage II patients.¹⁸ The variability in the responses also may reflect that a PET scan may be used as part of a multistep process. A well-developed set of treatment recommendations or evidence-based guidelines may be valuable for this clinical scenario.

Several questions investigated physicians' beliefs regarding patients with locally advanced or resected NSCLC. The guidelines recommend platinum-based chemotherapy in combination with radiotherapy for patients with unresectable stage III disease.¹⁹ There has been widespread support for this recommendation among respondents in the survey (>80%) and in the previous survey (70%). Another survey of patterns

of care in locally advanced NSCLC has found that current practice patterns in the United States generally match the evidence-based literature in this clinical situation.²⁰ The guidelines state that there is no definitive improvement in survival with PORT. According to the current survey, approximately 35% of physicians believe that PORT improves survival; this response is similar to that in the previous survey (40%). A separate survey has found that approximately 24% of physicians would recommend PORT for a patient with resected stage IIB disease.²¹ The PORT meta-analysis revealed a potential detrimental effect on survival for patients with early-stage disease—thus physicians' belief, and the use of PORT, may adversely impact survival in this patient population.²² It should be noted that this survey was conducted before the publication of a study that has revealed a potential benefit of PORT in resected patients who were found to have incidental lymph-node level 2 involvement.²³

There was strong support for adjuvant chemotherapy among respondents. Another survey has found a similarly high acceptance of adjuvant chemotherapy.²¹ This is in conflict with the guidelines; nevertheless, the guidelines were developed before the recent trials that have revealed improvements in survival with adjuvant chemotherapy in resected lung cancer. The fact that three recent randomized controlled trials have revealed improvements in overall survival may have contributed to the rapid acceptance of this therapy.^{24–26}

The guidelines for stage IV disease state that in patients with preserved functional status, chemotherapy improves overall survival, has a palliative effect on disease-related symptoms, and improves quality of life in comparison with best supportive care.²⁷ A surprisingly high percentage of respondents do not believe that chemotherapy improves survival and believe that chemotherapy worsens quality of life. In the previous survey, approximately a third of physicians believed that chemotherapy provided a survival benefit. A separate survey of physicians' beliefs performed at approximately the same time as our original survey has found that only 15% to 35% of physicians outside the field of medical oncology would recommend chemotherapy for stage IV disease.^{2,28} The skepticism about the benefits of chemotherapy in terms of survival and quality of life may decrease referrals to medical oncology and reduce patient access to this therapy. A review of the Surveillance, Epidemiology and End Results–Medicare database of patients with stage IIIB/IV has revealed that only 31% of patients received chemotherapy.²⁹

The fact that there were significant differences between the treatment beliefs and the guidelines among physicians may indicate that guidelines may not be completely accepted even under favorable circumstances. Other surveys have found significant differences between physician practices and beliefs, and treatment guidelines and evidence-based medicine.³⁰ The reasons for this are probably multifactorial. By definition, evidence-based guidelines cannot provide definitive recommendations when there is limited or poor-quality evidence, or when the evidence is ambiguous. The time it takes to develop and publish guidelines makes it difficult to incorporate new diagnostic tests and therapeutic advances, such as PET scans and adjuvant therapy, into the guidelines.

TABLE 9. A Comparison of Select Demographic Characteristics of the Respondents and the American College of Chest Physicians (ACCP) Membership within the United States

	Respondents (n = 347)	ACCP Members (n = 9822)	p
Gender			
Male	90	85	0.01
Female	10	15	
Principal practice setting			
Academic	38	20	<0.0001
Other	62	80	
Completion of medical training			
Before 1985	36	26	<0.001
1985–1995	42	24	
After 1995	22	50	

These factors can decrease the utility of guidelines in certain clinical scenarios. Some physicians also may have an inherent skepticism about the value of guidelines. Despite the differences in treatment beliefs in select areas, the vast majority of physicians have reported being familiar with the guidelines and finding them valuable.

The optimal method of disseminating treatment guidelines has yet to be determined. Frequent methods of dissemination include the publication of the guidelines in a peer-reviewed journal or presentation at a national meeting. It is possible that other educational methods, such as interactive cases or lectures at local medical centers, may be more effective at disseminating and encouraging the implementation of the guidelines. The availability of guidelines to the general public on the Internet also could make the guidelines more accessible and could increase the use of guidelines.

One weakness of this survey is the relatively small sample size, which limits the sensitivity of the subset analyses such as practice location, case load, and subspecialty. Physicians generally have been a difficult group to survey because of the time constraints of many physicians, the frequent use of a multiple-choice format, and the need to stereotype or generalize issues.³¹ Monetary incentives and short questionnaires have been shown to increase the response rates.³¹ The response rate with e-mail has not been shown to be superior to that of postal mail.³² Many physicians receive multiple survey requests, some of which are marketing surveys, and a significant amount of spam e-mail, which may have contributed to the low response to this survey.

Another weakness of this survey is that the respondents' beliefs may not reflect the beliefs of the entire ACCP membership. When the respondents' characteristics are compared with the demographics of the ACCP membership within the United States, there are significant differences in gender and the year that the training was completed (Table 9). Because of differences in the terminology that the ACCP and the survey used to record practice type, the only direct comparison that could be performed was the percentage of physicians reporting practicing in academic centers. A higher

percentage of survey respondents reported practicing at academic centers (Table 9). A direct evaluation for differences in numbers of lung cancer cases seen by survey respondents and the ACCP members was not feasible. The recipients of the survey were randomly selected; nevertheless, physicians who infrequently see lung cancer patients or who had not read the guidelines may have elected not to answer the questionnaire. These factors may have introduced biases into the survey results.

CONCLUSIONS

The majority of physicians were familiar with the guidelines and found them a valuable asset in the diagnostic and therapeutic management of patients with NSCLC. Treatment beliefs reflect the guidelines; nevertheless, in areas such as the screening for lung cancer, use of PORT, and benefits of chemotherapy for stage IV disease, treatment beliefs differ significantly. These differences may adversely impact the quality of patient care.

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