Pulmonologists' Reported Use of Guidelines and Shared Decision-making in Evaluation of Pulmonary Nodules

A Qualitative Study

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BACKGROUND: Selecting a strategy (surveillance, biopsy, resection) for pulmonary nodule evaluation can be complex given the absence of high-quality data comparing strategies and the important tradeoffs among strategies. Guidelines recommend a three-step approach: (1) assess the likelihood of malignancy, (2) evaluate whether the patient is a candidate for invasive intervention, and (3) elicit the patient's preferences and engage in shared decision-making. We sought to characterize how pulmonologists select a pulmonary nodule evaluation strategy and the extent to which they report following the guideline-recommended approach.

METHODS: We conducted semistructured qualitative interviews with 14 pulmonologists who manage patients with pulmonary nodules at four clinical sites. Transcripts of audiorecorded interviews were analyzed using the principles of grounded theory.

RESULTS: Pulmonologists reported consistently performing steps 1 and 2 but described diverse approaches to step 3 that ranged from always engaging the patient in decision-making to never doing so. Many described incorporating patients' preferences only in particular circumstances, such as when the patient appeared particularly anxious or was aggressive in questioning management options. Indeed, other factors, including convenience, physician preferences, physician anxiety, malpractice concerns, and physician experience, appeared to drive decision-making as much as, if not more than, patient preferences.

CONCLUSIONS: Although pulmonologists appear to routinely personalize pulmonary nodule evaluation strategies based on the individual patient's risk-benefit tradeoffs, they may not consistently take patient preferences into account during the decision-making process. In the absence of high-quality evidence regarding the optimal methods of pulmonary nodule evaluation, physicians should strive to ensure that management decisions are consistent with patients' values.

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With the rising use of CT scanning,¹ pulmonary nodules are being detected increasingly, and more will be found as low-dose CT screening for lung cancer becomes prevalent. It is important to evaluate pulmonary nodules to identify those that represent lung cancer. However, evaluation involves important trade-offs: avoiding the harms of underevaluation (delay in diagnosis and treatment of lung cancer) and over-evaluation (excessive radiation, physical complications of invasive procedures). Moreover, no high-quality studies have compared nodule evaluation strategies, contributing to uncertainty regarding optimal management.

Fortunately, guidelines exist to help physicians choose the most appropriate evaluation strategy for an individual patient.^{2,3} Acknowledging the tradeoffs inherent to nodule evaluation and the limitations of the evidence, the American College of Chest Physicians (CHEST) guidelines suggest a three-step process to selecting a

pulmonary nodule evaluation strategy: (1) assess likelihood of cancer, (2) assess candidacy for invasive testing, and (3) incorporate patient preferences and engage in shared decision-making.² However, physician surveys

FOR EDITORIAL COMMENT SEE PAGE 1365
SEE RELATED ARTICLES PAGES 1405 AND 1422

and studies of practice patterns suggest tremendous variation in nodule evaluation, with frequent deviation from the guideline recommendations.⁴⁻⁸ The reasons for this variation are unclear.

Using qualitative interviews, we explored how pulmonologists approach decision-making for pulmonary nodule evaluation. We analyzed how closely pulmonologists reported that they adhered to the steps recommended in the CHEST guidelines and identified other factors pulmonologists consider in decisions surrounding pulmonary nodule evaluation.

Materials and Methods

We conducted semistructured interviews with 14 pulmonologists at four sites affiliated with two academic centers. Pulmonologists were invited by e-mail to participate. All participants provided informed consent, per the approved institutional review board protocols (Boston University Medical Campus H-31643; Portland VAMC 2630).

Interviews probed how physicians choose a strategy for nodule evaluation, how they discuss options with patients, their views of patients' risk perception and distress related to the nodule, and how they manage patients' concerns. Interviews were conducted by R. S. W. or

C. G. S. (both pulmonologists), digitally recorded, and transcribed verbatim.

We performed a qualitative analysis of the transcripts, facilitated by Atlas.ti software (ATLAS.ti GmbH). Members of the study team (R. S. W., C. G., J. A. C.) independently performed close readings of the transcripts and collaboratively developed a coding scheme that arose from both open coding of emergent themes using principles of grounded theory⁹ and application of prespecified categories (ie, adherence to guideline steps). We systematically attached codes to relevant text segments, discussing coded segments as a group to achieve consensus, and iteratively extracted coded segments for comparison among interviews.

Results

The pulmonologists we interviewed represented a broad range of experience. One-half were attending physicians, with as many as 28 (mean, 6) years of practice in pulmonary medicine (Table 1). The remainder were pulmonary fellows.

Guidelines and Their Limitations as Drivers of Decision-making

Although some pulmonologists acknowledged the limitations of the guidelines ("I don't find the guidelines all that satisfying" [P10]) and the evidence underlying them ("We don't have great data to support this" [P3]), almost all participants referenced the guidelines as the driving force behind their choice of nodule evaluation strategy ("You feel obligated to follow the guidelines" [P6]). Some explicitly mentioned the three steps recommended in the guidelines: "What determines [evaluation] is how

concerned I am [about cancer], what the patient wants, and what the patient can tolerate" (P9).

Guideline Step 1: Assess Risk of Malignancy

All participants reported assessing the risk of malignancy as a critical early step in selecting an evaluation strategy. Pulmonologists considered a variety of risk factors (Table 2).

Guideline Step 2: Assess Ability to Tolerate Invasive Procedures

Many pulmonologists also referenced the second step in the algorithm proposed by the guidelines: assessing whether the patient could tolerate an invasive procedure such as biopsy or resection of the nodule. For example, one pulmonologist summarized these considerations: "the patient's underlying condition...do they have bad emphysema?...Are they likely to tolerate a procedure, are they likely to tolerate a resection?" (P6).

TABLE 1] Characteristics of Participating Pulmonologists

Participant Characteristics	% or Mean
Clinical experience	
Attending (as opposed to fellow) status, %	50
Years since completing training, mean (range), y	7.2 (0-28)
Years at primary clinical site, mean (range), y	7.0 (2-19)
Personal characteristics	
Age, mean (SD), y	40.7 (9.8)
Male, %	50
Race, %	
White	64
Asian/Pacific Islander	29
Not reported	7

Guideline Step 3: Assess Patient Preferences

Most pulmonologists indicated that often there was no single right answer regarding the best evaluation strategy: “In most cases it's not 100% clear” (P5). However, the

TABLE 2] Representative Quotations for Assessing Risk of Malignancy

Quote
“The first thing is identifying risk...you're trying to establish a risk in this particular patient in front of you for what the chances are that this is cancer, and the higher that risk is the more aggressive you would want to be in getting the answer versus the lower the risk is the more comfortable you would feel in just doing surveillance CT scans and trying to reassure the patient....The bottom line is putting together the patient risk factors and then the characteristics of the nodule, family, size, shape and calcification and all of that to identify the risk.” (P5)
“I decide basically on the size and their risk factors, typical clinical risk factors, smoking, age, previous cancer; and CT characteristics, so size, whether it's lobulated, spiculated.” (P1)
“A lot of it is based on risk factors, the stratification of the patients, the stratification of the appearance of the nodule, of the size of the nodule, a little bit about the location of the nodule. And then exposures.” (P8)
“Are they having any constitutional signs or symptoms; do they have any peripheral adenopathy or anything that would be more concerning; and the cancer workup, what does this nodule look like; is it spiculated; is it calcified; is there adenopathy; where is it located?” (P4)
“Do you think they are at risk for having lung cancer? Are they a smoker or asbestos exposed?” (P10)

fact that there were multiple reasonable approaches did not consistently lead to shared decisions. We identified three approaches to incorporating patient preferences: Some reported always incorporating them; others described seldom incorporating them; and most reported a conditional approach, incorporating patient preferences only when patients expressed discomfort with the recommended plan.

Always Incorporate Patient Preferences: Some pulmonologists described always taking the patient's preferences into account before making a decision, acknowledging that this is important given the limited evidence underlying nodule evaluation algorithms:

I feel a strong responsibility to...apply the knowledge that I have in a way that is supposed to be the best evidence....At the same time I know that I don't know everything, I don't know exactly what...the one best answer is, and if there is some variation available there, then I hope that I'm taking patients' preferences into account to make that judgment. (P13)

These doctors provided examples of how they accomplished shared decision-making. Some began with a discussion of the pros and cons of the different options and explored the patient's preferences before making a recommendation:

I try to lay out what the options are and explain the pros and cons [of] the different options, and I try to keep it in layman's terms...Most people are able to give me an idea of which direction. They're like, 'oh, I would worry too much and I just want to have it [removed], or 'I really just don't want to have any surgery.' People are usually pretty clear on what they want....I usually say, 'my preference would be this, but they're both possible options.' (P3)

By contrast, others began with a recommendation and then probed the patient's feelings about that option:

I try to always make sure I ask patients if they are comfortable with that plan, if they understand the reason behind it, and if they are in agreement....[I'll] say, 'This is what I think we should do. How do you feel about that?...'If he's like, 'Doc, I'm really worried about this. I'm going to be up at night thinking about it,' I'd say, 'Well why don't we do [the CT] a little sooner?' (P13)

Finally, others felt they could best engage the patient when they did not provide a specific recommendation:

If [the patient] says, 'whatever you think doc,' I usually don't leave it at that....I'll tell them what the stakes are and what the situation is, and I'll say to them, 'I can't really decide for you.' I'll specifically say, 'Some people, as soon as you mention that there is something in there that could be a cancer, even if it is unlikely, they want it out right away, and other people don't worry about these things at all. What kind of a person are you?...'I think by

and large patients make very appropriate decisions. And I think their adherence to those decisions is enhanced when they have participated. (P14)

Seldom Elicit Patient Preferences: At the other end of the spectrum, some doctors reported that they prefer to make the decision unilaterally. They described making decisions in what they believed was the patient's best interest, without checking whether the patient agreed:

I like to be opinionated about telling [the patient] what we think the right route is....I kind of wait for them to protest or give a strong opinion. (P7)

A majority of times I've made the decision myself.... We'll basically do something in the best of [the patient's] interest. And a majority of the time, I have not had push-back. (P11)

In cases in which patients did express a preference for another strategy, these physicians described reluctance to change the plan: "If they want something that I don't think is the right thing to do, then I will tell them that I'm not comfortable with that" (P8).

Conditional Incorporation of Patient Preferences:

Finally, some pulmonologists described taking the patient's preferences into account only when it became obvious the patient was uncomfortable with the recommended plan:

Some people are super worried....They give you a story about their brother who had cancer and had a very bad experience because the doctors didn't get it in time and now they have metastatic cancer. You're like, 'all right, I guess we'll do the three month [CT]....Would I be convinced to biopsy something I didn't think was [cancer]? Maybe, but certainly not anything more invasive than that. (P2)

Other Factors Influencing Decision-making

In addition to the three key considerations delineated in the guidelines, pulmonologists mentioned six other factors they considered when deciding nodule evaluation.

Convenience: Sometimes convenience (for the patient or physician) influenced management, particularly when determining surveillance intervals: "If they're coming back to see me in seven and a half months and [Fleischner] says 6-12 months, I'll get a CT scan in seven months....So convenience plays in" (P8).

Physician's Personal Preference: Several doctors described selecting the management strategy they were the most comfortable with or that they would want if they were the patient:

I personally prefer to send the patient for surgery rather than CT-guided biopsy. (P11)

Usually, I'm guided by my feeling about what is the best advice....advice that I would hope someone would give me. (P12)

Patient Life Expectancy: Many physicians were influenced by life expectancy, tending to be aggressive with young, healthy patients and more passive with older or sicker individuals:

If it's a young, healthy person and there is any chance [of cancer], I generally don't mess around....I just decide whether or not it can be resected, and if it can be, then resect it. (P3)

One of my patients is clearly dying of her COPD, and she's in her mid-70s and she has a small nodule....I advised her that I didn't know what that was going to change about anything. So, we're not following [the nodule]. (P8)

Physician Anxiety About Cancer: Some pulmonologists described managing nodules aggressively to alleviate their own concern about cancer, even when the risk of malignancy was low: "I follow them a little more closely [than the guidelines suggest], whether there is [an] indication for that or not. I think that's just treating my anxiety" (P1).

Medicolegal Concerns: Some physicians referenced fear of malpractice: "We all have this in the back of our minds, lawsuits" (P8). In particular, some reported discomfort with less aggressive nodule evaluation, even when that was the patient's expressed preference: "I [would] heavily document that the patient did not want a biopsy at the current time. We selected surveillance, even though I didn't think this was the best option" (P2).

Comfort That Comes With Experience: Some pulmonologists commented that with greater clinical experience comes the realization that most nodules do not turn into cancer, and that there is typically more than one way to safely evaluate nodules. This led to greater willingness to involve the patient in decision-making:

My first year as an attending I think was probably the most scared I have ever been in my life and I was super aggressive and I did super thorough workups....As my experience grows, [I'll] become less scared would be my guess. (P9)

Over the years I have probably had more patient participation in [decision-making about nodules] than at an earlier time. (P14)

Discussion

The pulmonologists we interviewed reported consistently following the first two guideline-recommended steps in deciding pulmonary nodule evaluation: assessing the risk of malignancy and assessing the patient's ability to

tolerate invasive procedures. However, they reported more varied approaches regarding the third step of engaging patients in decision-making, with some incorporating patient preferences in all cases, others seldom sharing decisions with patients, and many taking a conditional approach in which patients were invited to participate in decision-making only if they expressed concerns about the recommended plan. We did not find any clear associations between provider characteristics (eg, demographics, site) and particular approaches.

Guidelines suggest that pulmonary nodule evaluation is an optimal setting for shared decision-making, because the evidence does not clearly indicate a single best strategy for nodule evaluation in many cases and there are important tradeoffs among strategies.^{2,10} Many pulmonologists we interviewed acknowledged that decisions about nodule management are neither straightforward nor evidence based, but nevertheless did not report consistently sharing decisions with patients. This suggests missed opportunities to engage patients, a particularly unfortunate circumstance given that most Americans,¹¹ and specifically many patients with pulmonary nodules,¹² want to be involved in decision-making. Although other studies have highlighted missed opportunities to engage patients in shared decision-making surrounding lung cancer treatment,¹³⁻¹⁸ we believe ours is the first to assess pulmonologists' attitudes toward shared decision-making in the setting of pulmonary nodule evaluation and to find similar problems arriving earlier in the spectrum of care. In a related study, we found that primary care providers also do not routinely engage patients in shared decision-making about pulmonary nodule evaluation.¹⁹

Several factors may underlie the failure to routinely engage patients in shared decision-making.²⁰ The literature suggests that graduate medical education falls short in teaching physicians skills in patient-centered communication and shared decision-making.^{20,21} In the face of uncertainty about nodule evaluation, some physicians may wish to avoid the additional complexity they anticipate shared decision-making would entail.²²⁻²⁴ This may reflect in part a reluctance to express uncertainty to patients, for fear the patient will perceive this negatively.²⁵⁻²⁷ In some cases, a paternalistic approach may be appropriate; a small minority of patients do not want to engage in shared decision-making.¹¹ As found in other settings, physicians' decision-making appears to be as, if not more, impacted by factors beyond patient preferences,

ranging from convenience to the physician's personal preferences to medicolegal concerns.²⁸⁻³⁰ Although pulmonologists in our study uniformly expressed a desire to act in the patient's best interest, the failure to incorporate the patient's preferences when choosing a nodule evaluation strategy may in itself result in a decision that is not optimal for the patient.³¹

Our data come from conversations between pulmonologists (the interviewer and the participant), and, thus, provide candid, in-depth insight into physician decision-making. But this study has limitations. Our sample size, which is typical for qualitative studies,⁹ comprised 14 pulmonologists. We cannot be certain that our results are generalizable to other settings or other pulmonologists. However, we deliberately enrolled both faculty and fellows from four diverse settings in two states to obtain broad insight into decision-making about pulmonary nodules and found that the approaches to evaluation were similar across settings and provider types. Accounts of behavior provided in research interviews inevitably reflect the social contexts in which they occur.³² For instance, fellows may have overstated their attention to guidelines when talking with a senior pulmonologist. Yet this dynamic works in multiple ways; tendencies to give socially desirable accounts are countered by unique opportunities for candor.³³ Fellows and attending physicians alike reported a variety of behaviors regarding engaging patients in decision-making. Nonetheless, we cannot be certain that participants accurately reported their clinical behavior. Although this study examined only pulmonologist accounts, in other studies we interviewed patients with pulmonary nodules and found similar accounts of variation in the extent to which their doctors used shared decision-making.^{12,34}

Conclusions

In closing, we found that although pulmonologists reported routinely assessing the patient's risk of cancer and their ability to tolerate invasive procedures, some are reluctant to incorporate patient preferences in the setting of pulmonary nodule evaluation. Optimal strategies to promote shared decision-making are currently unknown.³⁵ Because guidelines contend that nodule evaluation is an ideal setting for shared decision-making² (one in which there is clinical equipoise and important tradeoffs for patients),³⁶ further research should be targeted at promoting shared decision-making in this context.

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