

# Challenges Addressing Lung Cancer Screening for Patients With Multimorbidity in Primary Care: A Qualitative Study

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## ABSTRACT

**PURPOSE** Many individuals who are eligible for lung cancer screening have comorbid conditions complicating their shared decision-making conversations with physicians. The goal of our study was to better understand how primary care physicians (PCPs) factor comorbidities into their evaluation of the risks and benefits of lung cancer screening and into their shared decision-making conversations with patients.

**METHODS** We conducted semistructured interviews by videoconference with 15 PCPs to assess the extent of shared decision-making practices and explore their understanding of the intersection of comorbidities and lung cancer screening, and how that understanding informed their clinical approach to this population.

**RESULTS** We identified 3 themes. The first theme was whether to discuss or not to discuss lung cancer screening. PCPs described taking additional steps for individuals with complex comorbidities to decide whether to initiate this discussion and used subjective clinical judgment to decide whether the conversation would be productive and beneficial. PCPs made mental assessments that factored in the patient's health, life expectancy, quality of life, and access to support systems. The second theme was that shared decision making is not a simple discussion. When PCPs did initiate discussions about lung cancer screening, although some believed they could provide objective information, others struggled with personal biases. The third theme was that ultimately, the decision to be screened was up to the patient. Patients had the final say, even if their decision was discordant with the PCP's advice.

**CONCLUSIONS** Shared decision-making conversations about lung cancer screening differed substantially from the standard for patients with complex comorbidities. Future research should include efforts to characterize the risks and benefits of LCS in patients with comorbidities to inform guidelines and clinical application.

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## INTRODUCTION

The United States Preventive Services Task Force (USPSTF) guidelines recommend lung cancer screening (LCS), with an annual low dose–computed tomography scan of the chest, for individuals who meet age and smoking history criteria.<sup>1</sup> Despite receiving a Grade B from the USPSTF, this recommendation has not been well adopted, with only 5.8% of eligible patients undergoing LCS annually.<sup>2</sup> This is in contrast to screening for breast cancer, which similarly has a Grade B designation by the USPSTF, but has an uptake rate of 76% among eligible individuals.<sup>3</sup> Medicare policy since 2015 has stipulated that LCS must be offered in the context of “shared decision making, in an effort to promote informed, value-concordant decisions.”<sup>4</sup> A similar Medicare policy does not exist for breast, colorectal, or prostate cancer screening, and its impact on LCS adherence rates remains unknown.

Shared decision making is an approach whereby clinicians and patients make decisions together; physicians discuss available screening options, review the likely benefits and harms of each, and elicit their patients' goals and values to arrive at a decision that is congruent with patient preferences.<sup>5,6</sup> Shared decision-making conversations can be supported by the use of decision aids, which help mediate clinician-patient discussions, provide educational information, consider potential benefits and harms, and assist patients in arriving at decisions that reflect their goals of care and personal values.<sup>6</sup>

Many individuals who are eligible for LCS have comorbid conditions (eg, cardiovascular or cerebrovascular disease, chronic obstructive pulmonary disease)

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because of the shared risk factor with lung cancer from tobacco exposure.<sup>7-11</sup> These comorbid conditions may alter the risk-benefit ratio from LCS by influencing the risk of complications from lung cancer diagnostic and curative procedures, modifying eligibility for lung cancer treatment, and negatively influencing quality of life and life expectancy.<sup>10-12</sup> The influence of comorbidities among individuals who are eligible for LCS is acknowledged in many guidelines; the USPSTF recommends that annual screening continue until age 80 years or until patients “develop a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.”<sup>11</sup> The American College of Chest Physicians more directly advises that LCS not be offered to individuals with “comorbidities that substantially limit their life expectancy and adversely influence their ability to tolerate the evaluation of screen detected findings.”<sup>12</sup> Given the medically complex history of individuals with comorbidities, LCS shared decision making requires a clinician to consider the nuances of each condition while keeping in mind a holistic view of the patient.

The extent to which comorbidities influence the considerations of primary care physicians (PCPs) when engaging in shared decision making with patients otherwise eligible for LCS remains unknown. The goal of this qualitative study therefore was to learn more about how PCPs reason through the LCS decision-making process with complex patients having comorbidities.

## METHODS

### Participant Selection

We conducted a qualitative study between October 2020 and February 2021 with PCPs to assess their views on the potential impact of patient comorbidities on LCS shared decision-making conversations. We identified attending PCPs from the faculty roster of 4 internal medicine practices affiliated with the Mount Sinai Health System in New York City. The PCPs recruited and interviewed were all participants in a larger study described in detail elsewhere.<sup>13</sup> The study was approved by the institutional review board at the Icahn School of Medicine at Mount Sinai (protocol 19-02795), and all participants gave informed consent.

### Setting and Data Collection

A study research coordinator enrolled and obtained the consent of participants. After giving consent, the PCPs participated in a 45-minute recorded Zoom (Zoom Video Communications Inc) video conference interview with a PCP and clinical researcher (M.S.K.) and a health/social psychologist and behavioral scientist (M.A.D.), both of whom were experienced in qualitative data assessment.

Several domains of the theoretical domains framework (TDF)<sup>14</sup> were assessed during the interviews. The TDF is validated for use in health care settings as part of implementation research to identify barriers and facilitators when introducing

new or changing existing clinical practices. By integrating 128 constructs across 14 domains, the TDF synthesizes information from 33 behavioral change theories to create a comprehensive lens to view the processes involved in and the factors that influence behavior. We used the TDF domains to create a semistructured interview guide to focus discussions with the PCPs. Question prompts examined PCPs' understanding of how comorbidities influence LCS and explored the presence and extent of shared decision-making discussions in the context of comorbidities. The study interview guide and a complete list of question prompts are included in the [Supplemental Appendix](#). The interviewers used a semistructured interview method, and all audio recordings were transcribed professionally, deidentified, and audited for accuracy.

### Analysis

Three investigators (J.S., M.S.K., M.A.D.) all independently conducted a thematic analysis following the approach of Braun and Clarke.<sup>15</sup> The Dedoose web-based application (Socio-Cultural Research Consultants, LLC) was used to organize and analyze the research data.<sup>16</sup> After coding the first 3 transcripts, the investigators discussed, refined, and revised the identified themes by consensus, and applied the codebook to all subsequent transcripts. Every 5 transcripts were reviewed by the coders to ensure appropriate intercoder reliability. Throughout this process, the completeness of the codebook was verified. No new themes emerged after 15 interviews, indicating thematic saturation had been achieved. At the end of the study, a fourth study team member (O.M.) reviewed the themes relevant to considerations of patient comorbidity to confirm that each was unique and internally consistent.<sup>17</sup>

## RESULTS

Our sample consisted of 15 PCPs from 4 academic-affiliated primary care practices. Their characteristics are shown in Table 1. On average, they had been practicing for 15 years and had ordered 70 low-dose computed tomography scans.

Analyses of the interviews to assess impact of patient comorbidities on LCS shared decision-making practices revealed 3 main themes: (1) to discuss or not to discuss this screening, (2) shared decision making is not a simple conversation, and (3) ultimately, the decision is up to the patient. We discuss these themes and subthemes, and provide illustrative quotes below.

### Theme 1. To Discuss or Not to Discuss

Theme 1 addressed PCPs' use of subjective clinical judgment, or the gestalt of the patient's clinical case, to decide whether to initiate discussions of LCS with a patient with comorbidities. PCPs reported doing a mental cost-benefit analysis to decide whether to raise the topic in this context. They described self-created estimates assessing the patient's health, life expectancy, and quality of life. In addition, the PCPs considered psychosocial factors—whether the patient had the

**Table 1. Physician Characteristics (N = 15)**

Characteristic	Value
Age, mean (SD), y	47 (14)
Female, %	60
Race/ethnicity, %	
White	73
Black or African American	7
Asian	7
Latine/Hispanic	20
Years in practice, mean (SD)	15 (14)
Number of LDCT scans ever ordered, mean (SD)	70 (75)
Sources of lung cancer screening education, %	
Medical school	33
Grand rounds	47
Continuing education	67
Other	20

LDCT = low-dose computed tomography.

support system, mobility, and cognitive capacity to be able to adhere to follow-up diagnostic and treatment protocols if anything were to be found on LCS.

The PCPs quickly synthesized their perceptions of all of these factors to decide whether a discussion of LCS was likely to be productive and beneficial. It should be noted that, at times, the clinical judgment heuristics overrode USPSTF guidelines,<sup>1</sup> so that some patients who met criteria for LCS were not informed that it was an option. This internal heuristic theme is exemplified by a comment from one PCP: "That patient with 20 medications and 10 different specialists, and all these comorbidities, chances are life expectancy [isn't] that high, so maybe the utility of lung cancer screening is pretty low and less than the other things they have going on. So, I use my judgment. I don't have a specific [criterion] that I say, 'Oh, if they have this, this, and this, I won't ask them.' I just kind of use judgment."

Theme 1 had 4 subthemes, each an essential variable in the PCPs' heuristic assessment. The subthemes were (1a) How sick is my patient?, (1b) How long does my patient have to live?, (1c) How likely is my patient to follow up?, and (1d) How does patient quality of life factor into this?

**Table 2. Illustrative Quotes of Subtheme 1a, How Sick Is My Patient?**

Respondent	Quote
Respondent 1	I have had patients of mine that have got way too much going on, they're too fragile in their other competing priorities that I would shy away from a number of preventive measures that would involve any risk of preventing something else from getting done.
Respondent 3	People who have other malignancies, pretty significant dementia, I guess I don't usually bring it up. If they bring it up, I'm happy to talk about it with them, but [LCS is] not something I'm using [for these patients] right now.
Respondent 6	If I were to go further and talk about the risk stratification ... I guess, conditions would prevent me from asking [about LCS]. Okay, so if they're already being treated for cancer, I'm not going to bring [LCS] up, because they're already in that pipeline and screen all that, with a CT scan already, usually. If it is something like cardiac, like a stage IV congestive heart failure, I probably will not bring [LCS] up either. They're on stage IV, right? Then their quality of life has already changed quite a bit, and they might be at higher risk.
Respondent 7	Well, that's a very difficult thing, but somebody with very advanced heart failure ... dementia, people who are very basically bedbound and who are probably not going to be—I mean I actually have a patient with MS who's been living for 10 years, but that's unusual. She's bedbound, but anyway, do I use any scores? No, but sometimes with people with ejection fractions of under 25%, who are basically barely getting out of the house and have a lot of readmissions to the hospital, I may not bring it up.
Respondent 9	Yes [a patient's comorbidities influence whether I recommend LCS]. If I have someone that's got ... stage 2 cancer in some other organ and undergoing treatment, I'm probably not going to recommend [LCS] at that point, or if it's like one of those patients that has like—they're on dialysis, they've had a liver transplant, they have like everything in the book, and they're very complicated and they have a lot going on, and they see 20 different specialists, I may not.
Respondent 12	Definitely [there are cases where LCS is not on my radar even if they are eligible]. Sometimes if I think a patient has many active issues currently going on, then I probably wouldn't bring it up like right away. I probably would wait a little a bit. Like if they were in the middle of transitioning, like if they were getting a fistula in place, they can be on dialysis in the next few months, I would probably hold off from bringing it up. If they have like a big coronary event earlier in the year, and they're still following up with their cardiologist very closely, I probably would wait a little bit.
Respondent 13	Yes. I think I'm more concerned that they have some other much more—well, I've already defined significant morbidity and whatever the diagnosis is, whether it's like a severe CHF, things like significant other issues that—bringing this up and it's almost like we'll revert them with something that may not at the end help them as much as it would have helped the person who didn't have those.

CT = computed tomography; CHF = congestive heart failure; LCS = lung cancer screening; MS = multiple sclerosis.

**Table 3. Illustrative Quotes of Subtheme 1b, How Long Does My Patient Have to Live?**

Respondent	Quote
Respondent 1	I would say that my general approach to cancer screening across the board is to take into account life expectancy with a general rule of thumb of the benefits outweighing the risks of cancer screening if patients have roughly more than a 10-year life expectancy.
Respondent 5	My perception of the time to benefit for lung cancer screening is like a year or 2. It's like relatively quick. It's more to sort of think of the like—would I be surprised if they died in a year—kind of question. Like if the answer is like no, that I wouldn't be surprised, I might not bring [LCS] up. That's what I guess is like who is like the denominator of all people who might be screened, but then the people who like actually get screened tend to be people who I perceive have a longer life expectancy, or at least a suitably long one or who have a ton of other issues, or mostly just people who have fewer like acute and chronic conditions to manage.
Respondent 6	I have to think about what is their life expectancy, right? If their life expectancy isn't more than 5 years, I'm not sure that I would choose another thing for them to consider at this point.
Respondent 14	I think we all typically don't necessarily screen or push screening as hard for patients who we think have less than a 10-year life expectancy. I think that would be sort of we'll be able to use our clinical judgment for that. Even if they have significant comorbidities but I think they still have a life expectancy of more than 10 years, I would send [them] for screening regardless. I don't think that I would—I think the key point there is life expectancy. Even if they have significant comorbidities but have a longer life expectancy.
Respondent 15	How many years you would have to be expected to live before the lung cancer screening becomes beneficial. I have a sense of some of the other cancers, the cancer screening we do. Let's say if somebody looked like they had other illnesses that would cause their life to be over in 5 years, 7 years, I would probably not be enthusiastic about screening. If somebody had significant heart failure, it wouldn't be something that would be high on my list of things that I'll offer.

LCS = lung cancer screening.

**Subtheme 1a. How Sick Is My Patient?**

The PCPs described assessing the patient's current health status to judge whether LCS should be raised (Table 2). Overall, they stated that they would likely not raise the topic with patients having high disease burden. PCPs believed that such patients did not need more on their plate, and decided that other issues should and would take priority in their appointment with the patient. Some of the vignettes the PCPs described show extreme, and often rare, levels of comorbidity. The ways in which they thought through their decisions, however, are translatable to patients with varying levels of comorbidity. For example, one PCP discussed a patient with stage 2 cancer and stated they would not recommend that the patient undergo LCS. Although cancers of this stage are generally treatable, this scenario suggests that the PCPs ascribe to a "one diagnosis at a time" approach to patient care and management. When they believed that their patient needed to focus on another condition, that view often precluded broaching LCS decision-making conversations with the patient.

**Subtheme 1b. How Long Does My Patient Have to Live?**

The PCPs reported using the patient's clinical history to predict how long a patient had to live (Table 3). Without consulting validated life expectancy prognosticators, PCPs relied on heuristics to assess patient life expectancy and risk.<sup>18</sup> In doing so, they used subjective metrics for patient history to calculate life expectancy. After determining life expectancy subjectively, PCPs described placing subjective cutoff points, ranging between 1 and 10 years, at which the patient's life could be

prolonged with LCS. These estimates were then used to determine whether screening was worth discussing with the patient.

**Subtheme 1c. How Likely Is My Patient to Follow Up?**

The PCPs also considered the patient's likelihood of being able to follow through on treatment should they receive a lung cancer diagnosis (Table 4). The psychosocial factors considered included the patient's support system, transportation barriers, the patient's past adherence, and how often the patient expressed reluctance to attend medical appointments. PCPs inferred from current and past trends in behavior whether the patient would adhere to treatment follow-up. They did not consider whether a cancer diagnosis would alter that behavior.

**Subtheme 1d. How Does Patient Quality of Life Factor In to This?**

Questions concerning the patient's current quality of life came up (Table 5). The PCPs used quality of life as a key component in determining whether LCS would be the best option for their patient, considering the patient's engagement in and enjoyment of activities at present and the potential of LCS outcomes to change that for better or worse.

**Theme 2. Shared Decision Making Is Not a Simple Discussion**

Once PCPs decided that LCS was worth raising with a patient, they turned their focus to how the conversation would take place (Table 6). Some PCPs were able to have open and objective discussions of the pros and cons, whereas

**Table 4. Illustrative Quotes of Subtheme 1c, How Likely Is My Patient to Follow Up?**

Respondent	Quote
Respondent 4	Maybe somebody who may be elderly or older, but maybe having dementia and has a lot of needs and other people are taking care of them, like is this really somebody who I'm trying to diagnose with lung cancer?
Respondent 5	I think it's 2 things. One is sort of like my mental bandwidth to think about [LCS]. Then the second is I think my perception of [the patient's] ability to kind of follow through.
Respondent 11	So, like if they're on dialysis, and they are on oxygen, and like their arms are amputated already, I mean kind of also the thing you have to think about is like who's going to take care of them when they're undergoing, like, treatment.
Respondent 12	Like if they didn't have a good support system, like how do they even survive? It's like also what's their mental state like because if they're like, "Oh, I don't want to know if anything happens." Then like let them know that they have cancer not being able to do anything about it, is it going to kind of make them not sleep at night? Then that might be a decision to not go ahead.
Respondent 13	I mean these are good tests. I'm sure we can pick up tumors in the early stage and then we can do an intervention and potentially have a curable cancer, but [LCS] wouldn't tell you you'd be willing to do [follow-up] and also well enough to do [treatment] ... well enough to do this and that, as much as would it be something that you'd be willing to do should it be abnormal.  I think just kind of getting the sense of how concerned they are and how willing they are to go for [LCS] and then for the follow-up workup.

LCS = lung cancer screening.

**Table 5. Illustrative Quotes of Subtheme 1d, How Does Quality of Life Factor in to This?**

Respondent	Quote
Respondent 12	I kind of take into account, is my patient enjoying the life that they're living a lot? Like are they partaking in all the things that they want to partake in? If they are really enjoying it, I wouldn't want them to go through a treatment if I thought it would harm them, but if I think the treatment would benefit them and the disease would harm them, then I would want them to go through it.  For my more fragile patients, I usually don't [bring up LCS]. Like if they have many other comorbidities and their quality of life is already pretty poor, then I usually don't. In people, whose quality of life I think can be improved, then, yes, I definitely do.
Respondent 13	I have a patient that is in her late 50s, early 60s, with pretty advanced diabetes. She is status-post BKA. The other leg isn't doing that well either, advanced kidney disease, name it, she has it. We feel her quality of life is pretty difficult, and she doesn't really get around much. She kind of just like stays at home. She already is kind of miserable and everything. I don't know if she would really benefit [from LCS] as much. Like I would talk to her about [LCS], but I think the treatment might be really difficult for her on top of everything else.  I have like a 75-year-old, or like early mid-70s patient that still goes running every day, spends lots of time with his family, enjoys cooking. He is very involved in like movies and the arts, and tries to keep really busy. So, for him, for example, even if he did have CAD, diabetes, CKD and he was a smoker, he has a pretty good quality of life and he appears very well for his age. So, I would still recommend [LCS] to him.

BKA = below-knee amputation; CAD = coronary artery disease; CKD = chronic kidney disease; LCS = lung cancer screening.

others struggled with how to balance honesty with putting a thumb on the scales.

### Theme 3. Ultimately, the Decision Is Up to the Patient

Most PCPs believed that ultimately, their role was more to advise patients on LCS than to make the final decision on whether to proceed (Table 7). They believed that at the end of the process, the patient was the one who should make the final decision even if the clinician personally disagreed with that decision. The PCPs stated that the patients were the ones who had to live with the decision, and as such, it was theirs to make.

## DISCUSSION

Comorbidities may influence the risk-benefit ratio of LCS by affecting workup complications, quality of life, life expectancy, and patient eligibility for lung cancer treatment, all of which should be discussed during shared decision making. In our qualitative study of PCPs from 4 academic-affiliated primary care practices at a large urban health care center, we observed LCS shared decision-making conversations differed substantially for patients with complex comorbidities. For patients with complex comorbidities, the differences in these discussions were not limited to the content of the conversations; importantly, PCPs were found to take additional steps before initiating LCS discussions that

ultimately reduced the frequency of shared decision-making conversations.

Many PCPs reported using clinical judgment when deciding whether to discuss LCS rather than strictly adhering to the guidelines to engage all eligible patients in shared decision-making conversations. Clinical judgment was influenced by patient characteristics (eg, comorbidities); life expectancy; opinions about the patient's personality, including their expectations of and attitude toward medical care; and the presence of a support system. Patients who were perceived as likely to adhere to recommendations and as having a high quality of life were more likely to be advised to complete LCS as opposed to those who had previously reported frustration or dissatisfaction with their state of health and well-being. Although PCPs believed their judgments helped

determine which patients were good candidates for LCS, they were, in effect, determining which patients were eligible for shared decision-making conversations and as such, which patients deserved a say in the decisions concerning their care.

A limitation of our study is that we included only inter-nists, and findings may not be generalizable to the practices of physicians of other specialties, including pulmonologists. In addition, all of the PCPs were recruited from practices affiliated with the same urban health system, further limiting generalizability of findings; however, our sample of PCPs was diverse, with varying years of clinical practice, and the use of one medical center can also be viewed as a strength because it eliminates any potential for differences in the LCS referral processes (eg, centralized vs decentralized) affecting their practices of shared decision making. Although some did

**Table 6. Illustrative Quotes of Theme 2, Shared Decision Making Is Not a Simple Discussion**

Respondent	Quote
Respondent 2	How are you going to present this to a patient? You want to present it as best as you can in a nonbiased way, but you also want to be honest. So, I would say to them, "[LCS] is available. It's something we can do, but then we have to think about the next step because I never order a test without having a plan for what I'm going to do with the results. If we get a negative result, that's great, right? If we get a positive result where we see something that really looks suspicious, is treatment something that you would be eligible for and that you could tolerate, right?"  I'm very honest. I say, "When they did the study, this is what they found when they studied the population, but for people like you, maybe you wouldn't have been included in the study or maybe it's not as clear given your age or that you have these other medical conditions, it's not clear that this would be as beneficial to you as other patients and there could be more risks involved," and also, the question is, "Are you someone who's eligible to act on the results?" I think that's really the bigger issue, right?
Respondent 5	I do have to talk [about] if the goal is to cure at that point and ask them what do they want the last years of their life to look like and what interventions, if anything, are they looking into, right? At that point, it's sort of like, "Do you want to continue screening for colon cancer, breast cancer, lung cancer?" Right? If they do, then I'm like, "Okay, well, you are at higher risk for any complications given your lung capacity or your heart condition, or whatever. So, I'm going through the shared decision-making conversation with you partly because if a complication were to happen, you may have a higher morbidity than others. It may curtail your life more."
Respondent 7	I always talk about the stress of knowing for what I think is something that's not appropriate, so I'll start with the emotional aspect of "Do you really want to know? This is something that you might be at risk for. Do you really want to have a test that may lead to need for biopsies and other testing?" As you know, these things are very sensitive and so all these patients have nodules so it becomes anxiety provoking for patients. So I address the emotional aspects of knowing, that you have a lung nodule that we may not do anything about. So that is one way I approach it.
Respondent 11	I mean, if they're like really frail, I will bring it up and like that this is something that we could do, but that I'm not sure that it would be the right thing for them given everything that they're already going through like seeing 15 specialists. They're managing all their comorbidities.
Respondent 12	Like I kind of lay down the facts. I would say, "Okay. If you went through screening and then they find something, and then you have to go a biopsy, and then it's cancer. Then you'd get a treatment, which potentially involves like X, Y, Z. Then how would you manage that? Like how would you do all those things, go to all those appointments? Do you have any help at home? I mean, the treatment might potentially be very toxic. You could have a lot of weakness. Like, you might not be able to eat. That can be very painful." Things like that.
Respondent 13	Asking them what they would do with the abnormal findings should they happen and then the patients which really have like things that are—have other issues that are outstanding, they have other—like I said, really, if they have prior strokes, or if they have ... heart failure, if they have heavy-duty stuff, not your typical mild asthma, that's [unintelligible]. But if they have a lot of things that are like, may not put them in a position that they would be able to go easily for further evaluation and workup, I probably definitely bring it up. But I have that discussion with them where I kind of say, "Well, you know, if we find something there that is accepted maybe for invasive testing, would that be something you would be up to?" I usually do that with a really sick patient.

LCS = lung cancer screening.

**Table 7. Illustrative Quotes of Theme 3, Ultimately, the Decision Is Up to the Patient**

Respondent	Quote
Respondent 3	I'll go through the process and if they want to do [LCS], then I'll certainly order it for them. I'm not going to withhold the test.
Respondent 4	If the patient comes to me specifically requesting some type of testing and they meet the criteria, I do not feel like it is—not that I don't feel like it's my place, but if the patient is requesting something that they clearly meet criteria for, regardless of how I feel the rest of their life is going to go, I don't see it as my place to deny them that service.
Respondent 11	I do believe that ultimately the patient has to make that final decision because—I mean, it is something they have to live with. I would do my best to counsel them based on, I guess, all my concerns and my thoughts about the risk, benefits, but in the end, if they really strongly go for [LCS], then I will go along with their decision. I do think that in the end, [LCS] is the patient's decision because it is their body, their own body. No matter what happens it's like, even as a doctor, you can't fully understand what it's like to be the patient. Like, you might think that's something—like from my standpoint, I might think, "This is the wrong decision," but, I mean, ultimately whatever happens to the patient they have to deal with it. So, in the end, if they feel really strongly, I would go on with what they want. Yes. I mean sometimes I counsel patients against [LCS], but ultimately, it's their decision to make. I usually go along with whatever the patient says. If they're like, "Hey, I still want to screen because I would want to do anything like to treat a cancer if possible," then I still go ahead and I do screening, and I see what happens.
Respondent 15	If the patient can make a compelling case for getting [LCS], even though I think it may not be in their—wouldn't necessarily be my recommendation, I'll pursue it. I'll let them pursue it. So, if people are ... declare themselves as somebody who'd want to do [LCS], "I'd be willing to take that extra risk of more imaging and procedures for the chance of living longer. I'm willing to take that risk," then we would do [LCS].

LCS = lung cancer screening.

reference patient anxiety as a potential factor influencing the shared decision-making process, PCPs were not directly asked and did not specifically address the LCS decision-making process in the context of patients having psychiatric comorbidities. Given that national reports show smoking rates of people with psychiatric conditions are double those without,<sup>19</sup> it is interesting that when asked to describe previous experiences of shared decision making with complex patients, PCPs did not include any patients with noteworthy psychiatric conditions. Future research should investigate the impact of mental health comorbidities on gestalt clinical judgments made by PCPs when determining patient eligibility for LCS.

Other studies investigating LCS shared decision making have found low PCP engagement with patients in these conversations. Previous studies have attributed the paucity of these conversations to factors such as time allowed per visit,<sup>20,21</sup> individual PCP biases,<sup>22,23</sup> and inadequate physician knowledge of the shared decision-making process,<sup>24,25</sup> all of which identify the need for communication skills training.<sup>24,26-29</sup> Our study presents a possible unseen factor precluding shared decision-making conversations: the clinical judgments made a priori by the PCP. Our findings indicate PCPs make clinical judgments using the content typical of shared decision-making conversations ahead of time and without the patient to decide whether to engage the patient in a discussion about LCS. They reported making these clinical judgments most commonly in cases where patients had complex comorbidities.

The reliance on subjective clinical judgment, or the gestalt of the presenting patient, is not surprising given

that there is little evidence-based guidance on the benefits of LCS in interpreting an individual's life expectancy and the salience and severity of comorbidity. There is also little guidance on how these assessments should influence clinical decision making on LCS referral, as it is challenging to combine in a single conversation the need for screening, the patient's life expectancy, and the potential complications of comorbidities. Studies to determine when outcomes of LCS are no longer favorable have yielded conflicting results. In one study of individuals from the Prostate, Lung, Colorectal, and Ovarian Screening Trial, individuals with a history of coronary artery disease had an increased likelihood of high-risk complications after a positive LCS result, and individuals with chronic obstructive pulmonary disease were at high risk for respiratory complications after LCS.<sup>30</sup> In a study of 1,741 veterans who underwent invasive evaluation after a positive LCS result, comorbidities did not increase the likelihood of high- or intermediate-risk complications.<sup>31</sup> The conflicting data on LCS in patients with comorbidities could explain in part PCPs' conversation hesitancy and perhaps temper their confidence in providing clinical guidance and recommendations on this screening to their complex patients.

Lung cancer screening is the only type of cancer screening where eligibility involves having a behavioral risk factor (smoking) that also increases the patient's likelihood of multiple comorbidities. The increased risk from a smoking history, and its resulting comorbidities, likely contributed to the Medicare decision to have a policy of shared decision making that takes into account individual patient history.<sup>4</sup> Although a request for shared decision making may seem straightforward,

the conversation can take many forms, and guidelines about how to shape the conversation are vague. Not only are there multiple ways to communicate options to patients, there exist a variety of validated option-presenting methods and models, including the Enhanced Autonomy Model and the Independent Choice Model.<sup>32</sup>

The confusion about implementing the shared-decision policy on LCS<sup>4</sup> puts clinicians in a problematic situation for which the only solution—eliminating the policy—is denied by the circumstances inherent to the situation. The policy was added to address the increased prevalence of complex patients and patients with comorbidities in the screening population, but it creates confusion about patient eligibility and distracts from the importance of LCS. It also possibly contributes to PCP ambivalence in recommending this screening to patients with complex comorbidities. The ambivalence of PCPs to discuss LCS with these patients could perhaps be seen in their responses to those with a strong opinion on this screening. Regardless of whether the patient was for or against undergoing LCS, many PCPs deferred to the patient and let them decide. Such findings stand starkly in contrast to current updates on preventive medicine models emphasizing quaternary prevention, in which PCPs are advised to be discerning with screening so that patients are not overscreened and overtreated.<sup>33</sup> PCPs deferring to their patients to make a decision, especially in light of the heightened focus on clinician judiciousness, may reflect the lack of confidence the physicians feel in making LCS decisions. It could be that PCPs deferred to patients with comorbidities to make their own choice because the PCPs themselves were unsure of whether LCS would be appropriate for the patient.

Future research that includes real-world data from a generalizable population, as well as modeling studies, will determine the specific impact of comorbidities on complications from the workup of positive LCS tests. In addition, research should aim to understand PCP selection bias when engaging patients in shared decision-making conversations and the extent to which PCPs consider patient goals when deciding whether to discuss screening. Doing so is particularly important to create decision support strategies in cases of older adults with multiple comorbidities, and efforts should be made to evaluate the outcomes of actionable frameworks, such as ones discussed by Boyd et al.<sup>34</sup> Initiatives to create tools that standardize shared decision-making conversations will likely improve the frequency with which truly patient-centered decisions are to be reached.<sup>20-22,24,28,29</sup> These tools have been shown to not only increase the rate of shared decision conversations, but also to improve patient outcomes of care as streamlined and centralized processes have been found to improve LCS adherence and follow-up.<sup>35</sup> The inclusion of LCS as a Healthcare Effectiveness Data and Information Set (HEDIS) measure in 2024 will likely spur the development of centralized interventions to promote screening.<sup>36</sup>

There should also be increased research into outcomes from involving members of the care team, other than PCPs,

to contribute to shared decision-making conversations. The outcome of a Medicare policy decision in 2022 that expands the type of health care professional able to engage patients in shared decision making beyond physicians and nurse practitioners remains unknown.<sup>4</sup> At present, it may be that other members of the health care team do not have sufficient time or training to conduct the nuanced information sharing, collaboration, and supported deliberation required of shared decision making.<sup>37</sup> With the proper education and skills training, however, there is opportunity to effectively create a new role that acts in tandem with the rest of the care team and is focused specifically on LCS decision-support counseling. As lung cancer treatment options evolve and better-tolerated therapies are developed, patients will have an increase in their choices that will need to be reflected in the LCS shared decision-making conversations. With expanding treatment options, clinicians will need to pursue additional education, and patient-clinician shared decision making will likely be not just one discussion, but rather an ongoing conversation with continual patient education sessions, as decisions may change with new treatment options. Using a single member of the care team to provide LCS decision support will relieve other members of the growing responsibilities involved in patient education and may be an effective time management strategy as LCS conversations become more involved. With supplemental staff facilitating LCS shared decision-making discussions, there will be increased opportunities to improve patient access to support, including the potential to expand LCS education beyond the clinical setting and into the community. Population health tools and community-based education programs could be developed with health professionals trained in LCS education and decision support to lead group information sessions, after which there could be an opportunity for 1-on-1 shared decision making for those eligible and interested.<sup>38</sup>

## CONCLUSIONS

Our study is the first to characterize how PCPs consider chronic diseases and fitness for LCS in the context of comorbidities. Our findings indicate that PCPs make clinical judgments to assess whether the patient is a good candidate for LCS before approaching the patient, rather than determining whether the patient is well suited for this screening during a shared decision-making discussion. Once the conversation begins, PCPs do try to present unbiased and honest information. When faced with a patient with a strong opinion on LCS, however, regardless of whether the patient was for or against, the PCP deferred to the patient's wishes.

Our findings show PCPs taking additional steps before discussing LCS with patients with complex comorbidities, indicating hesitancy in recommending this screening for this group. PCPs deferring to patient opinions rather than providing education and counseling support also indicates reluctance to impose their own opinion on LCS for patients with

comorbidities. These behaviors are likely accentuated by conflicting data on LCS outcomes in patients with comorbidities, and by the dearth of evidence-based directions for guiding physicians' approach to the screening in this population. Our findings support the call for continued research to determine the impact of comorbidities on LCS risks and benefits as well as its clinical application. PCPs need more evidence-based information on LCS in cases of complex comorbidities to be able to effectively conduct shared decision making with this population. As much as these steps are necessary to reduce PCP hesitancy to discuss LCS with patients, it will also be key to conduct research, establish protocols, and develop tools to reduce selection bias for patient-clinician shared decision-making conversations. Ambivalence of PCPs in referring patients for LCS likely reflects their uncertainty about its benefit and confusion from complicated guideline recommendations. Efforts should be made to streamline protocols and make LCS guidelines more clear for patients and clinicians, as the additional policy designed to emphasize caring for a high-risk population may indeed be undercutting the very people for whom it was designed to protect.



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**Key words:** lung cancer screening; preventive medicine; comorbidities; multimorbidity; clinical reasoning; judgment; paternalism; beneficence; personal autonomy; risk-benefit assessment; life expectancy; quality of life; counseling; education of patients; shared decision making; patient-centered care; holistic health; primary care; practice-based research

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[Supplemental materials](#)

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