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Attitudes of Clinicians about Screening Head and Neck Cancer Survivors for Lung Cancer Using Low-Dose Computed Tomography

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Abstract

Objective: National guidelines recommend lung cancer screening (LCS) using low-dose computed tomography (LDCT) for high-risk patients, including survivors of other tobacco-related cancers like head and neck cancer (HNC). This qualitative study investigated clinicians' practices and attitudes toward LCS with LDCT with patients who have survived HNC, in the context of mandated requirements for shared decision making (SDM) using decision aids.

Methods: Thematic analysis of transcribed semi-structured clinician interviews and focus group.

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Results: Clinicians recognized LCS's utility for some HNC survivors with smoking histories. However, they identified many challenges to shared decision making in diverse clinic settings, including time, workflow, uncertainty about guidelines and reimbursement, decision aids, competing patient priorities, unclear evidence, potentially heightened patient receptivity and stress, and the complexity of discussions. They also identified challenges to LCS implementation.

Conclusions: While clinicians feel that LDCT LCS may benefit some HNC survivors, there are barriers both to implementing LCS SDM for these patients in primary care as currently recommended and to integrating it into cancer clinics. Challenges for SDM across settings include a lack of decision aids tailored to patients with cancer histories. Given recommendations to broaden LCS eligibility criteria, more research may be required before refinement of current guidelines.

Keywords

Head and neck neoplasms; Lung neoplasms; Early detection of cancer; Decision making; shared; Qualitative research

Introduction

The National Lung Screening Trial (NLST) reported in 2011 that low-dose computed tomography (LDCT) screening reduced lung cancer mortality in heavy smokers, ages 55 to 74.[1] Professional societies and advocacy groups subsequently issued guidelines recommending annual LDCT for heavy smokers (30-pack-year smoking history, either current smoker or quit within 15 years) who meet age criteria. The National Comprehensive Cancer Network and American Association for Thoracic Surgery added complexity by recommending that higher-risk patients, including survivors of a tobacco-related cancer such as head and neck cancer (HNC), first consider screening at an earlier age (50 years) and at a lower pack-year smoking history (20) than the standard recommendations.[2]

These guidelines also advised clinicians to inform patients about the potential benefits and harms of screening, balancing the small absolute reduction in lung cancer mortality (3 in 1000 over 7 years) against the high probability of false positive testing,[3] the risks of invasive diagnostic procedures and treatments, radiation exposure, overdiagnosis, and incidental findings. Recognizing the complexity, the Centers for Medicare & Medicaid Services (CMS) issued an unprecedented requirement for shared decision-making (SDM) counseling using a decision aid prior to screening.[4] Achieving SDM for patients meeting screening criteria is challenging. Studies have shown that cancer screening discussions in primary care often fail to present both the pros and cons of screening, and patient values and preferences are infrequently elicited.[5, 6] Primary care clinicians and patients appear uncertain about how best to make lung cancer screening (LCS) decisions, given current evidence and guidelines.[5, 7, 8] Providing decision aids can facilitate better LCS decision making because they present information on the benefits and harms of screening, clarify eligibility criteria, highlight the importance of smoking cessation, and help patients clarify their values and preferences.[9] Several LCS decision aids are publicly available.[10–13]

Problematically, though, current decision aids do not provide benefit and harm data for cancer survivors, who were excluded from the NLST. Furthermore, the American Cancer Society advises that these shared decision-making discussions occur in primary care settings, even though these clinicians struggle with time to fully discuss less complex screening interventions. Implementing LCS guidelines is challenging, and little is known about how clinicians address LCS with cancer survivors. We interviewed cancer specialists and primary care providers (PCPs) to determine their attitudes, beliefs, and behaviors about offering LCS to HNC survivors.

Materials and Methods

Study Setting and Sample

We conducted one-on-one, semi-structured interviews with cancer specialty clinicians and PCPs, and a follow-up focus group. Participants were recruited from The University of Iowa Hospitals and Clinics (UIHC), an academic tertiary facility. Interviews solicited each clinician’s current practice and perceptions. The focus group solicited cancer specialists’ practices on topics that emerged as potentially significant during interviews. The study was approved by the University of Iowa Institutional Review Board.

Data Collection

The interview guide explored five domains: 1) perceptions of LCS, 2) considerations of LCS risks and benefits specific to HNC survivors, 3) attitudes about shared LCS decision making, 4) perceptions of LCS decision aids, and 5) perceptions of best practices for LCS discussions. Before interviews, clinicians reviewed three decision aids: 1) “Is Lung Cancer Screening Right for Me?” (print, AHRQ[12]), 2) “Lung Cancer Screening: Is It Right for Me?” (video, MD Anderson[10]) and 3) “Lung Cancer CT Screening: Should I get screened” (web-based, www.shouldiscreen.com11).

Between November 2016 and April 2017, we conducted one-hour interviews with PCPs and cancer specialty clinicians involved in HNC care. To gather additional data about the cancer clinic, we held a focus group in April 2017 addressing three domains: 1) smoking cessation conversations in LCS decision making with HNC survivors, 2) LCS coordination, and 3) the distinction between screening and surveillance. Interviews and the focus group were recorded and transcribed.

Data Analysis

We conducted an iterative thematic analysis, using MAXQDA 11™ (VERBI GmbH), a qualitative data management program, to facilitate coding. Qualitative team members (KD, AS, MVB) first reviewed 4 transcripts to inductively identify preliminary codes. Using these and codes derived from the project’s research questions, they developed a codebook, independently coded transcripts, then collaborated to achieve consensus. The multidisciplinary study team helped interpret emergent findings.

Results

We interviewed 11 clinicians: 4 surgical oncologists, 2 medical oncologists, 1 radiation oncologist, 1 otolaryngology physician assistant (all called “cancer specialists” to avoid identifying individuals), and 3 PCPs. The focus group included 8 cancer specialists (one not previously interviewed).

Current LCS Practices

Clinicians reported discussing LCS with patients who fit recommended age and smoking history criteria. Six volunteered the guidelines they used. All reported tailoring LCS conversations based on patient characteristics, preferences, and health perspectives; smoking status and pack-year history; and general functional health status, including comorbidities. Cancer specialists also considered whether the patient’s HNC was tobacco-related. While all reported receptivity to LCS decision aids and two used them, several were unfamiliar with them. No formal coordination about LCS recommendations was reported between PCPs and specialists, across specialists, or with the survivorship clinic.

Most cancer specialists did not consistently distinguish when or whether lung imaging was used for surveillance monitoring for metastatic disease or screening for a second primary lung cancer. Few discussed with patients the scan’s purpose or potential differences in outcomes between a lung metastasis and a second primary cancer. Cancer specialists often referred patients after 2 years to the survivorship clinic, while discussing LCS with patients they continued to see.

PCPs reported rare involvement in the short-term follow-up care of HNC survivors. For their broader patient population, they described managing LCS discussions while addressing other recommended preventive services.

Perspectives on LCS with LDCT for HNC Survivors

Most clinicians felt that LCS would be appropriate for survivors of tobacco-related HNC who smoked or had quit recently. However, they expressed uncertainty about its benefit for these patients. While they acknowledged the benefit of possible early detection and intervention, they also noted concerns about the high false positive rate, potential overdiagnosis or overtreatment, and potentially heightened patient anxiety because of false positives and the frequent ambiguity of CT results. LDCT was thought to identify many potential problems, possibly leading to further tests and their attendant risks, which sometimes dissuaded clinicians. Especially for older HNC survivors with poor lung and overall health, clinicians felt the need to balance any potential benefit with the burden of intervention following a suspicious finding, including additional imaging, lung biopsy, or cancer treatment.

All clinicians expressed general familiarity with current guidelines for LCS with LDCT but had varying knowledge of the specifics. Some exhibited ambivalence about the evidence behind the guidelines, either in general or as applied to HNC patients. A few specialists expressed concern over the potential difference in evidence for cancer survivors, who had been excluded from the NLST. One questioned the guidelines' broader age criteria, noting potential harm for younger patients of long-term radiation exposure from annual imaging.

Most clinicians expected continued improvement in LDCT technology and LCS guideline revisions, with several noting an expected decreased false positive rate due to standardized reporting, not yet reflected in guidelines or decision aid materials. Others pointed to a longer-term shift in practice, from chest radiography to LDCT, as indicative of a trajectory of clinically relevant LCS progress.

Perceptions of LCS Discussions

Both PCPs and HNC specialists discussed benefits of LCS discussions in their clinics. PCPs felt well positioned to discuss LCS with patients with HNC histories, emphasizing their extensive patient knowledge and screening conversation experience allowed them to balance recommendations with patients' attitudes and comorbidities. Cancer specialists also were confident that they considered patients' health perspectives and comorbidities in LCS discussions. One suggested cancer specialists may know survivors' recent health and tolerance better than PCPs. Some cancer specialists perceived that survivors often preferred following up with them, while a PCP preferred to postpone assuming primary care for HNC survivors. One cancer specialist and one PCP cautioned that patients might perceive more pressure in a cancer screening recommendation from cancer clinicians.

All clinicians acknowledged that patients' knowledge and personal health values shaped their LCS receptivity. Many felt their patients wanted clinician guidance in LCS decision making (a characteristic some attributed to regional difference in patient population) and were reluctant to provide strong guidance. They also recognized that their own ambivalence about recommendations and guidelines could complicate discussions.

Many clinicians described asking about smoking habits and discussing cessation during LCS conversations. However, they did not discuss LCS as a key moment for smoking cessation. Both PCPs and cancer specialists described engaging patients on smoking cessation at multiple points, gauging their readiness to quit, and linking them with cessation services when appropriate. Some cancer specialists discussed cessation in treatment conversations; a few preferred to separate conversations about LCS and smoking cessation.

Challenges to LCS Counseling and SDM

Both cancer specialists and PCPs discussed numerous challenges to SDM. They identified the complexity of the LCS conversation as a significant challenge, including concerns about whether and how best to discuss the different implications of surveillance and screening, the ambiguity of likely incidental findings, and the potential difficulty of distinguishing between a metastasis and second primary. They perceived the time needed for these complex discussions as a significant barrier. While receptive to decision aids, clinicians also identified important challenges to using them in their clinical contexts, including time, workflow, and barriers to certain aid formats (e.g., lack of space, televisions, web-enabled computers). Several also mentioned that SDM could be affected by scheduling issues, potentially exacerbated by long distances and rough weather in a rural state (e.g., a patient who does not want to return for screening may rush the decision). One identified patient language and literacy as challenges.

Many clinicians felt that limited patient understanding—about LCS, SDM, screening goals, imaging practice changes, CT interpretation, and screening and treatment decisions—could complicate SDM. They noted that patients' existing screening preferences, levels of comfort with uncertainty, and cancer histories affected their screening decisions, and described the challenges of accurately assessing those preferences. Many also worried that introducing LCS could increase patient anxiety. Several felt that preparing patients for likely findings and discussing potential for treatment was important in the screening discussion itself. Despite their own reservations, many (both PCPs and cancer specialists) suggested that some cancer survivors might be more receptive to LCS.

For PCPs, further challenges included managing the relative emphasis and timing of LCS discussions among health maintenance recommendations, and managing patients with cancer histories and other comorbidities, especially given limited clinician time, potentially infrequent visits, and potentially urgent concerns. One PCP also identified discussion complexity and reimbursement as a challenge, suggesting the possibility of a dedicated LCS clinic as a potential solution.

Challenges to Implementing LCS

Potential barriers to implementing LCS recommendations included insurance issues, other costs (gas, parking) associated with screening or treatment, logistical barriers (travel, distance), lack of patient adherence to screening over time, or potential HNC-treatment-related health issues that could complicate screening. One clinician suggested that cessation counseling as required for CMS reimbursement might deter current smokers.

Some reported confusion or uncertainty about LCS reimbursement criteria. A few worried about LDCT accessibility outside the tertiary care center, CT scans done in low-volume centers, or potential difficulties in pursuing suspicious findings. A PCP also identified the clinical challenge of scheduling and monitoring CTs and follow-ups within a typical yearly appointment, after likely abnormal CT findings.

Discussion

Recent research into clinician perceptions and practices regarding LCS demonstrates that both cancer specialists and PCPs encounter barriers to implementing LCS recommendations and may lack knowledge about recommendations,[5–7, 14–17] and express concerns about screening the targeted groups.[18] Our study is the first to qualitatively examine clinician perspectives about LCS specifically for survivors of tobacco-related HNC. We found that, while clinicians feel there may be benefit to LCS with LDCT for some members of this population, the survivorship context presents challenges for engaging patients in SDM. Given recommendations to broaden eligibility criteria for screening survivors of tobacco-related HNC, clinicians need guidance about how to appropriately and effectively discuss LCS with these patients and would like more LCS evidence relevant for HNC survivors.

Additionally, addressing concrete patient and clinician barriers to discussing and implementing LCS recommendations is vital.

Our findings also reveal that clinicians' reservations about LCS for HNC survivors could affect SDM processes. While we found that HNC survivors have heightened LCS receptivity,[19] many clinicians involved in their care (both cancer specialists and PCPs) expressed ambivalence about LCS's overall utility and skepticism of patients' ability to understand screening implications (e.g., the uncertainty of suspicious findings, the likelihood of subsequent diagnostic procedures). Cancer specialists more often also discussed concerns about LCS's benefit for HNC survivors, especially considering survivors' often compromised health and the limited evidence about potential benefits and harms for this population. Indeed, evidence suggests that the mortality benefits for HNC survivors with a second primary lung cancer might be less than LCS-eligible people in the general population who have not had cancer.[20] These findings underscore the importance of having shared decision-making materials with relevant evidence for the target population--currently unavailable for HNC survivors.

While SDM and clinician counseling has been shown to improve patients' knowledge and decisions,[21] the research presented here also complicates the clinical context for LCS discussions. Guidelines recommend LCS discussions for the general population take place in primary care. Despite broader screening eligibility for survivors of HNC or other tobacco-related cancers, evidence is lacking about the magnitude of harms or benefits for these survivors.[22] In our study, PCPs believed that their holistic perspective about patient health and values was useful when considering screening for individual patients. However, they acknowledged having to balance addressing LCS with other health maintenance priorities, chronic medical conditions, and acute patient concerns. They also reported little experience with HNC patients. Cancer specialists felt they understood the patients' recent cancer experience and perceived that patients value specialist input for survivorship care. Current guidelines do not adequately address the specific circumstances of different eligible populations or discuss relevant challenges in following recommendations about where conversations should be held.

Our study also identified important clinician concerns about implementing LCS in general and for HNC survivors. Echoing clinician concerns about LCS for the general population,[5, 6, 16, 23] clinicians in our study emphasized time constraints and challenges in incorporating SDM and decision aids into clinic workflow. While elsewhere PCPs also identified limited access to high-quality screening centers and difficulties arranging follow-up diagnostic and surveillance testing as potential challenges,[5, 18] relatively few clinicians in our study volunteered similar concerns, possibly reflecting the relative privilege of the tertiary care institution in the quality of its own resources and the assumption that patients would receive screening there. Thus, diversity among hospitals and practices complicates a single recommendation for implementing LCS recommendations.

Our findings also suggest that, for survivors of tobacco-related cancers, the LCS discussion might not be the ideal moment to emphasize smoking cessation. Recommendations for, and CMS-mandated support of, smoking cessation counseling as part of LCS SDM are based upon research indicating that LCS can be a teachable moment for patients, when their motivation to quit is heightened.[24] Yet it is unclear that survivors of tobacco-related cancers experience a similarly heightened motivation from LCS discussions. The cancer specialists we interviewed provided evidence that tobacco-related cancer survivorship is not necessarily a comparable context to that of smokers in the general population, and one discussed different teachable moments during cancer care for a smoker with a tobacco-related cancer, including diagnosis and preparation for radiation treatment. Both PCPs and cancer specialists also framed cessation as an important recurring conversation. Conducting smoking cessation discussions in the LCS context is not straightforward and requires thoughtful engagement by clinicians and counselors.[25, 26]

PCPs and cancer clinicians could work together to elevate their concerns about LCS implementation at a national level. Future research evaluating the benefits and risks of LCS with LDCT for patients with cancer histories would contribute evidence that clinicians could weigh in discussions with their patients. However, in the absence of this evidence, guideline committees should consider the important barriers to implementing SDM in primary care as currently recommended, and develop material tailored to discussions with different eligible populations to more accurately describe the application of existing evidence to these populations. This could enable a wider range of clinicians to more confidently use SDM about LCS with LDCT in discussions with survivors of tobacco-related cancer, including HNC. Clinicians also could consider tailoring their LCS discussions with HNC survivors to balance patients' possible heightened receptivity against the potential ways in which evidence about benefits and risks in current decision aids may not apply to the individual patient.

Our study has limitations. We interviewed a small sample, all clinicians working for one tertiary care institution and practicing in a rural state with predominantly white patients. Their practices, attitudes, and beliefs may differ from clinicians practicing in urban or suburban contexts or other medical settings. However, our findings demonstrate the difficulties diverse clinicians may encounter in implementing national LCS recommendations for patients with HNC histories. While we recognize, given our small sample of PCPs, that more research into PCP knowledge and attitudes toward LCS in HNC patients is warranted, we included these findings because they illuminate potential differences across clinician specialties.

Our study is one of the first to investigate clinicians' practices, perceptions, and attitudes about LCS specifically with patients included in guidelines' broader eligibility criteria. While our findings echoed some found in other studies about LCS more generally, the methodology allowed us to gather in-depth data on clinician conceptions of LCS specifically for HNC survivors and identify important concerns about implementing LCS with LDCT for these patients. While clinicians feel that LDCT LCS may benefit HNC survivors, the survivorship context presents challenges for SDM. Given recommendations to broaden eligibility criteria for survivors of tobacco-related HNC, clinicians would like additional evidence, need guidance about how to appropriately and effectively discuss screening with these patients, and identify concrete barriers to effective SDM in diverse clinic settings. Additional research may be required prior to refinement of current guidelines.

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Table 1.

Domains and Selected Illustrative Clinician Comments about Lung Cancer Screening (LCS) with Low-Dose Computed Tomography (LDCT) for Patients with Histories of Head and Neck Cancer (HNC)

Domain	Clinician Comment
Current Practices for LCS	"We discuss it with survivors that either currently still smoke, or have a relatively long history of smoking, um, or, … quit relatively recently. … we tend to, at least bring it up, and say, 'you know, everything looks good, from a head and neck perspective, but … there's always the possibility of lung cancers and other synchronous cancers.'" (CS)
	"… many of them, when I see them out after two years, I say we can pretty much relax. Your main reasons now for seeing me are not to look for a recurrence, but to be concerned about uh, second primaries, morbidity from treatment and then um, just follow-up to see what's new and what we can do to help you along the way." (CS)
	"I haven't done a lot of lung cancer screening, 'cause I'm a little bit hesitant about the data. I'm worried about the false positives and the consequences of that." (PCP)
	"I would say most specifically for lung cancer screening, I'm thinking about whether they have a smoking history because that kind of qualifies them or doesn't qualify them." (PCP)
	"In my mind, it's probably not always terribly clear, and I don't think it has to be, whether I'm doing it to look for a second primary or whether I'm doing it to look for a metastasis." (CS)
	"I don't know that I frame it specifically as 'I'm also going to look to make sure you don't have a primary lung cancer.' But it's 'we're gonna look at your lungs to make sure that there isn't a tumor there.'" (CS)
	"… it's infinitely better to have prepared patients to understand what you're looking for and what the implications are of finding something." (CS)
	"Oftentimes in our institution, patients have been transitioned to the survivorship clinic by that time. And so I'm not necessarily the person that's making that decision or having that conversation." (CS)
	"Beyond the five years, um, I'm a little more hesitant to order annual chest imaging. … I'm not entirely certain of its utility. We would always weigh if the patient remains a current smoker and if they're younger, so that if we find something then we'd … have the ability to act on it with curative intent." (CS)
	"Always the first thing that comes to mind is, is this something that this patient would--is gonna do anything about? … if we found a one centimeter nodule in their lung, what would that do? … would that create a ridiculous amount of anxiety? Would it be something that they would address? Are they healthy enough to do that? So it's usually, like, the aftermath that I'm thinking about." (PCP)
Perspectives on LCS with LDCT for HNC Survivors	"…I know I'm kind of being a hypocrite when I say I'm not convinced by the data, … I don't think it's necessarily any worse than mammograms or, you know, some of the other screening tests I do…" (PCP, 10)
	"We still end up with the problem of false positives and that leading to additional anxiety, additional work up, additional cost, additional procedures that have their own morbidity." (CS)
	"I think in many patients we end up pursuing things that don't end up being tumors, and that brings up a lot of anxiety for them, and it brings up a lot of appointments that they don't need to have and healthcare dollars that perhaps would've been better spent other ways." (CS)
	"… how does screening impact the head and neck cancer surviving population? Is there a survival benefit…? And that might depend on their stage of cancer, and on the type of treatment they receive for their head and neck cancer. … do those causes of mortality from long term complication of their treatment … reduce the benefit of screening for their lung cancer?" (CS)
	"We don't know a whole lot really about the advantages specific to our population of patients, because the one lung trials study was done in a broader population of patients." (CS)
	"… our current, you know, data that we have available and decision-making tools are mostly for the … lung cancer risk and smoking, um, history. Not necessarily taking into account the patient's cancer history." (CS)
	"I wish we had a test that was as good as the one that patients are imagining they're getting 'cause, you know, what patients want is … we focus it at the right people, and we minimize their, uh, false positives, and we minimize the false negatives, and it tells them if they are ok. That's what they wanna know. … that's, uh, unfortunately not the test we have." (CS)
Perceptions of LCS Discussions	"We know them the best.… We've seen 'em over years. We kinda know where they fall on that spectrum of how much they want to do…or how little, what their fears are, what has happened to them in the past, and how that has shaped their ideas about things." (PCP)
	"I would probably know the patients and their recent tolerance in medical health better than, say, their primary care doctor would. They don't know how rough it was to get through radiation, … how long it took them to

Domain	Clinician Comment
	recover from that. … how that has impacted their employment status and their eating and all of these kinds of things.” (CS)
	“It’s hard to send people back, even though we try, to their primary doctor ‘cause they have all their faith in the people that treated them here. … I’m sure the primary care doctors could do it. I’m just saying it’s patient preference.” (CS)
	“I usually let the cancer people do the follow-up [for HNC survivors]. Often, you have to look inside their mouth in a certain way, and there are certain tests that they do, … I let them handle that kind of follow-up, until it’s been maybe a longer time, like five or ten years post-cancer. And then everyone tends to relax a little bit after that.” (PCP)
	“…if I’m talking to a cancer doctor about cancer screening, …. the implication for me is that he wants me to have it done.… I think that’s baggage that we [PCPs] don’t have.” (PCP)
	“…if you, as their cancer-treating physician, recommend or elicit their input into what they think about getting a screening test…, I think that might be different than it might be coming from their primary care provider. … they might put more weight on it, maybe, ‘cause you were their cancer-treating physician.” (CS)
	“No, I don’t trust patients to really, really grasp that [false positives/overdiagnosis]. … the one level is like, ‘should I screen?’ And the next level of decision is like, ‘what do I do if it’s suspicious?’ Like, ‘yes, no,’ is ok, but what I do if it’s a like, ‘well, maybe,’ type of thing?” (PCP)
	“[Discussing LCS] requires a lot of work on the front end to, like, paint this picture of what ifs. ‘Ok. What if we see this? What if we see this? What if we see this?’ ‘Cause I feel like the times that I’ve ordered the low dose CT, there’s always something on it.” (PCP)
	“…every time they come in, about smoking, you should offer some comment.” (PCP)
	“I think talking about smoking cessation is worth at the time bringing it up at each visit. Talking about it is more impactful on the person’s health. Talking about, um, lung cancer screening can be a very involved discussion if you really work your way down to all decision-making points, and is not as worth the time, in my opinion.” (CS)
	“I most often have that conversation at the get go, … at the time that I’m meeting them for consultation for head and neck cancer. Because there’s many reasons I can advocate for smoking cessation. Whether it would be … the fact that they’ll tolerate the radiation better because they’ll have fewer irritation to the mouth and throat area and the fact that we do have proof that people that continue to smoke have worse outcomes.” (CS)
	“I talk to all my patients each visit about whether they smoke. And if they do smoke I ask, you know, whether they’re interested in quitting … I don’t talk to them about smoking cessation relative to lung cancer screening.” (CS)
	“I typically will in follow ups with my patients, if I’m seeing them once a year or every six months, we’ll talk about their smoking status. And that discussion for me, tends to be separate from my discussion about lung cancer screening.” (CS)
Challenges to LCS Counseling and Shared Decision Making with Decision Aid	“Some patients have a very personal or emotional reason why they think certain screening is important … or why they will or won’t pursue it. … if this woman’s mother had breast cancer at age 45 and died, she’s gonna want a mammogram. It doesn’t matter if I tell her mammograms will cause her more harm than good. She wants one. So for some people, going over the data is not beneficial.” (PCP)
	“If anything, they’re [survivors of HNC] more interested in being proactive and finding things before it’s gone too far.” (CS)
	“I can’t say that I’ve ever brought in another counselor or a, a pamphlet or decision-making tool or anything like that to help. Often our clinics are so limited by time that even like patients occupying the space of a clinic room to say take time to fill out an online tool or whatever would really slow the clinic work flow.” (CS)
	“[Shared decision making about lung cancer screening] was just taking up too much time in each clinical visit, ‘cause it’s too complicated to work through all that to be a shared decision. … that’s one of the things that probably points me towards in a practical sense, you know, focusing on other things in clinical visits.” (CS)
	“They [screening discussions] take a long time. … they almost always have questions or concerns or reservations that you have to address. … there’s a lot of unknowns, … Like, ‘how much difference is this gonna make?’ And I can’t answer that for most things that we do, so that’s extremely frustrating.” (PCP)
	“We have some people that don’t read. We’ve got a fair number of patients, not only that, that don’t read English. We have to have it in Spanish too.” (CS)
	“…we may have planned to talk about colon cancer screening, but then they come in… they’re short of breath, and they have a flare of their asthma …. Well, obviously, then their colon cancer screening gets pushed off to the next time. So it’s often what is most urgent for that day, and you try to find a visit where there’s not as many urgent things that you can sneak some of those things in. … I feel like this is where we should have these conversations. I wish we had more time to do it.” (PCP)

Domain	Clinician Comment
	"One thing that I struggle with … is that we have these guidelines and sort of recommendations, but I think people want the sense that you're taking them into account as an individual, … like, that you're using their individual situation to make recommendations." (PCP)
	"[Some patients say] 'I will take your advice. Whatever you tell me to do, that's what we're gonna do, if you tell me I need it,' and their presumption is that I'm telling them to do more stuff." (CS)
	"I think to get reimbursed for Medicare, you have to use a decision aid, and … there are all these rules to get reimbursed…. So sometimes I'm not sure that I'll follow all of the rules and do it the right way. That wouldn't necessarily stop me from doing it, but, but making it a more routine part of my practice, I think that might slow me down a little bit …" (PCP)
Challenges to Implementing LCS with LDCT	"I worry more about the national implications of the guidelines. You know, someone in rural Iowa who does the low-dose CT scan, finds the nodule, and then sends it to a pulmonologist who only does a few of these in a year. Then what happens to those patients when they have complications? … I'm not as, as worried about that complication here, although it still is a risk, certainly." (PCP)
	"We tend to try to do things here, just because it's easier to make sure we're getting quality studies, and we're getting them in sort of appropriate timeframes." (CS)
	"I don't necessarily have a system for saying, like, ok, I had that conversation with her in February about lung cancer screening, and I ordered it. Did that ever get done? Like, I wouldn't necessarily be alerted to the fact that it didn't get done until the next time I saw that person. Which might be years, … if they don't come back all the time." (PCP)