Primary Care Providers' Views on a Future Lung Cancer Screening Program

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Running head: Primary Care Providers' Views on a Future Lung Cancer Screening Program

Key Messages

- Variable primary care provider preferences for role in lung cancer screening
- Primary care providers want information about lung cancer screening
- Allied health professionals may have role in assessing eligibility for screening
- Smoking cessation is a key strategy in any lung cancer screening program

Abstract

Background: The National Lung Screening Trial demonstrated that screening with low dose computed tomography significantly reduces mortality from lung cancer in high risk individuals.

Objective: To describe the role preferences and information needs of primary care providers in a future organized lung cancer screening program.

Methods: We purposively sampled primary care providers from diverse health regions of Ontario and from different practice models including family health teams and community health centres. We also recruited family physicians with a leadership role in cancer screening. We used focus groups and a nominal group process to identify informational priorities. Two analysts systematically applied a coding scheme to interview transcripts.

Results: Four groups were held with 34 providers and administrative staff (28 (82%) female; 21 (62%) physicians; 7 (20%) other health professionals; 6 (18%) administrative staff). PCPs and staff were generally positive about a potential lung cancer screening program but had variable views on their involvement. Informational needs included evidence of potential benefits and harms of screening. Most providers preferred that a new program be modelled on positive features of an existing breast cancer screening program. Lung cancer screening was viewed as a new opportunity to counsel patients about smoking cessation.

Conclusions: The development of a future lung cancer screening program should consider the wide variability in the roles that primary care providers preferred. An explicit link to existing smoking cessation programs was seen as essential. As providers had significant information needs, learning materials and opportunities should be developed with them.

Key words: multidisciplinary care; primary care; risk assessment; screening; smoking reduction; smoking / tobacco use

Introduction

Lung cancer has a poor prognosis with approximately 10% five-year relative survival rate for Stage IVa that is primarily due to late detection (1). Prognosis improves if cancer is found at an early stage. The relative survival for Stage Ia and Ib non-small cell lung cancer is 92% and 68% respectively (1).

The National Lung Screening Trial (NLST) in the United States (2) demonstrated, and the Lung Cancer Screening Trial Pilot in the United Kingdom (3) suggested that screening with low dose CT scans (LDCT) significantly reduces mortality from lung cancer among high risk individuals aged 55 to 74 years as compared to chest x-rays. In the NLST, there were potential harms associated with LDCT screening (4). Averaged across three annual lung scans, 11.2% of screens were followed by an extra scan (with additional radiation), 0.9% of scans led to diagnosis of lung cancer (10-15% of which would not have appeared during the patient's remaining life), 0.5% of scans led to biopsy or bronchoscopy that did not find cancer, and 0.3% of scans led to surgery that did not reveal lung cancer.

Guidelines in Canada and the United States now recommend LDCT screening for high risk individuals (5-8). In Ontario, primary care providers (PCPs) are instrumental in screening for other types of cancer, specifically cervical, colorectal, breast cancer. For cervical cancer screening, providers perform pap smears; for colorectal cancer screening, they distribute fecal occult blood test kits and / or refer for colonoscopy; and in some settings, they refer for screening mammography. (https://www.cancercareontario.ca/en/get-checked-cancer). For PCPs, there may be challenges in identifying patients who are eligible for LDCT screening since criteria include duration and amount of smoking as well as age (5-8). Although several US studies have reported PCP interest in LDCT screening (9,10), we did not identify Canadian data on PCP preferences for involvement in an organized LDCT screening program.

The purpose of the present study was to describe the views of PCPs and staff members on their potential roles and informational needs in an organized LDCT screening program. We were also interested in whether PCPs would be willing and able to identify screen-eligible persons and counsel interested persons regarding potential benefits and harms of LDCT screening. At the time of this study, an organized LDCT screening program for lung cancer was not available in Ontario although pilot work for a potential program is underway (https://www.cancercare.on.ca/pcs/screening/other_cancers/).

Methods

This descriptive qualitative study (11) was one of five components of a health technology assessment on LDCT screening in Ontario, Canada (Principal Investigator: L Paszat). The other components were 1) modelling benefits, risks, and cost effectiveness (12), 2) a feasibility study of an electronic pre-screening form in primary care (13), 3) a qualitative study of the views of both individuals who were long-time smokers and PCPs, and 4) the creation of a risk assessment tool.

Sampling and Recruitment:

Sampling: We aimed for maximum variation (14) by purposively sampling practicing PCPs from diverse health regions (North East, South West and Central Local Health Integration Networks (LHINs)) in Ontario, Canada and from different practice models (including fee-for-service, family health teams (FHT) and community health centres (CHC)). Approximately 75% of Ontarians are patients in medical 'homes' which involve some type of capitation (15). About half of capitation practices employ allied health professionals (AHPs). All PCPs in Ontario, regardless of practice setting were eligible to receive bonuses for achieving screening targets, although the effectiveness of this incentive has been questioned (16). We also recruited Cancer Care Ontario Regional Primary Care Leads (RPCL) for a focus group. RPCLs are family physicians with a formal, recognized regional leadership role in cancer care in the province

(https://archive.cancercare.on.ca/pcs/primcare/primary_care_network/). They are knowledgeable about primary care in their respective LHINs and provide continuing education to local PCPs.

Recruitment in North Eastern Ontario was by email from the RPCL for the LHIN. Recruitment of the CHC in the South West LHIN was via email by one of the research team (LP) to the site lead physician; recruitment for the FHT in the Central LHIN was via email by another team member (FS) to the FHT lead physician. Recruitment of the RPCLs was by email from staff at Cancer Care Ontario, the cancer organization in the province. For the FHTs and CHCs, PCPs, AHPs including nurse practitioners, nurses, prevention counsellors, and administrative staff were invited to participate by the site lead physician.

Data Collection: An interview guide was developed by two team members (DL, MAO) and reviewed with the team. Focus groups were used to explore attitudes toward LDCT screening. Within each focus group, a modified nominal group process (17) was used to identify and prioritize information needs of PCPs. Before each focus group, participants were sent slides containing information on the current study and NLST findings (Table 1). Focus groups were held between June and October 2014, were led by an experienced qualitative researcher (DL) and co-facilitated by other researchers (FS and/or MAO).

Coding and Analysis: Two researchers (DL, MAO) developed a coding scheme then applied it independently to each interview transcript. NVivo software (NVivo 9, QSR International) was used for data management. Meetings were held to resolve disagreements. Overarching themes were derived from the coded data using principles of the constant comparative method (18). We reached informational saturation (19). All analytic steps were documented in an audit trail (20). To ensure study rigor, we followed principles proposed by Malterud (21) including a systematic process for the analysis and examination of data for evidence of confirming and disconfirming views. We used the consolidated criteria for reporting qualitative research (22) to prepare the manuscript (Supplemental Table S1).

Individual PCPs and teams were offered $200.00 CAD for their participation. The study was approved by the Sunnybrook Health Science Centre Research Ethics Board.

Results

Four in-person focus groups were held with 34 PCPs and staff: 28 (82%) female; 21 (62%) physicians, 7 (20%) AHPs, and 6 (18%) administrative staff. AHPs included nurse practitioners, nurses, and prevention counsellors (Table 2).

Most PCPs had positive attitudes toward a potential LDCT screening service in Ontario. Physicians recounted difficult experiences with patients with Stage 4 lung cancer and hoped that screening would lead to increased early detection and treatment.

A family physician said,

"…this is something that I'm excited about being able to do. Anyone who has been in practice for a length of time has seen these patients…, you see the spot on the x-ray or they have a symptom and you know what's coming and it's devastating to you and your patient." PCP, CHC

The analysis resulted in five major themes; these are summarized below.

Themes

1. Variable preferences for involvement of PCPs in identifying eligible patients for LDCT screening

Several PCPs were supportive of some involvement in LDCT screening such as running searches on electronic medical records (EMRs) to identify eligible patients and by discussing pros and cons of LDCT screening with patients. These activities were similar to those undertaken by PCPs in other areas of cancer screening.

"… I think we could very well be involved... we target smokers and we can run searches on our EMRs to find patients, exactly the ones you're looking for, so... we do it for all the big four, colon cancer and so on." PCP Northern Ontario

While only a few PCPs thought they could implement full eligibility screening, others said they could conduct a pre-assessment for patients. For example,

"I can't speak for other doctors but I'd probably be doing it [pre-assessment] in the office myself if it was an easy sort of handout …. That way you could refer the person with the score and then it was either denied or approved based on that." PCP FHT

However, other PCPs who were concerned about increased workload, preferred a minimal role in screening such as advertising in waiting rooms.

"[In] 10 to 15 minutes I cannot see myself conscientiously committing to doing anything else … I like our [EMR] reminders… of the PAPs, the mammograms, the faecal occult blood. This could certainly be something else that's there. But I cannot conscientiously say that I'm going to be able to do this." PCP Northern Ontario

PCPs also noted that unlike other screening programs that are largely age-based, LDCT screening for lung cancer is based on other factors such as smoking history. PCPs expressed that there was potential for confusion about eligibility for screening based on age and smoking history alone especially since smoking history may not be well-documented in the EMR.

2. Other primary care practice professionals may have a role in LDCT screening

Allied Health Professionals (AHPs)

PCPs indicated that AHPs –such as Nurse Practitioners, Registered Nurses, and Registered Practical Nurses- could, in certain situations play an active role in identifying eligible patients and by providing information about LDCT screening. Physicians said that AHPs could conduct brief lung cancer risk assessments for new patients. Nurses in the FHT and CHC groups concurred and emphasized the importance of their training and experience that would enable them to conduct risk assessments. It was noted that AHP involvement in the identification of eligible patients might not be feasible in practices with few and/or busy AHPs.

"…for us it would be an RN [Registered Nurse] or a RNA [Registered Nursing Assistant] who's processing the patient, sees that the person's a smoker, has been for a long time, and that she would have more time." PCP Northern Ontario

AHPs raised another positive aspect of preliminary screening by nurses such as helping patients with low literacy. For example,

"We have a lot of clientele that have barriers to learning so I don't want to get them agitated if we're asking them to do a survey and they can't read or even write... so maybe it's a good thing even if the nurses did a little bit of the survey with them..." AHP, CHC

Role of Front Desk Staff

PCPs did not think that it would not be appropriate for front desk staff to conduct the eligibility assessment of patients for LDCT screening and that staff would have a very limited role in supporting patients. Front desk staff indicated that staff training would be essential for them to understand all steps in a screening program so they could in turn, describe them to patients. Front desk staff emphasized their role in communicating with patients and the importance of taking a customer service approach so that patients would not be confused or misinformed about LDCT screening.

For example,

"Even when we have to send people down to get an x-ray or to get a MRI they hear the names but they really don't know what they're going for. They don't really understand it." Staff member, FHT

Staff described that they were an important source of information and related several situations with other screening programs whereby patients expressed uncertainty about next steps and turned to staff for help.

3. PCPs and AHPs have high information needs about LDCT lung cancer screening

Across all four focus groups, PCPs and AHPs discussed their information needs about LDCT screening. PCPs rated the following topics as high priority for information: evidence for LDCT screening including potential benefits and harms such as false positive results; program eligibility criteria including descriptions of those considered to be at high risk to develop lung cancer; suggestions for communicating risk information to patients; details of a proposed screening process; and the follow-up process for abnormal results. AHP and office staff wanted to know more about eligibility criteria and the screening process so they could provide accurate information to patients. Participants recommended that LDCT screening programs provide standardized information packages to PCPs for distribution to patients.

4. PCPs recommend that a future LDCT screening service be modelled on the current Ontario Breast Screening Program (OBSP)

PCPs expressed that they have learned what works for their patients and their practices from experiences with three existing cancer screening programs (breast, cervical, and colorectal) and prefer the model of the OBSP. PCPs highlighted two reasons for their views: a) program communicates well; and b) program arranges follow-up for patients with positive results.

a) Program communicates well: PCPs commented that a strength of the OBSP was that they were kept "in the loop" of the screening process. For example,

"I, as a family doctor, would like to know that there was a 4 mm lesion found, it's been reviewed by a thoracic surgeon…and the recommendations are there." PCP, Northern Ontario

b) Program arranges follow-up for patients with positive results: PCPs relayed frustration with screening programs other than the OBSP when the PCP's office is responsible for contacting a specialist. PCPs described that staff often made multiple phone calls to secure a specialist appointment which often resulted in delays for patients. This frustration with follow-up was endorsed by PCPs in all groups.

For example,

"Is this gonna come back to me and say well there's an abnormal CT chest with a two centimeter nodule, have a nice day, or is it recommend CT, three months to gauge interval, recommend biopsy immediately for suspicious lesion? I mean how much is gonna be communicated to me to what happens when the CT doesn't come back normal?" PCP, FHT

5. Links to smoking cessation is crucial for PCPs to support a future program

PCPs strongly expressed that smoking cessation services should be a key component of a lung cancer screening program. PCPs were highly supportive of smoking cessation services while acknowledging that there were regional differences in service provision. PCPs perceived that a new LDCT lung cancer screening program would provide an impetus for them to re-engage with patients who continued to smoke.

"… this is a phenomenal opportunity for those people who are identified as not being eligible for the low dose CT to have a discussion regarding smoking cessation. That's absolutely crazy not to use this as an opportunity." PCP, RPCL

RPCLs explained that the effective integration of smoking cessation services into the screening process would be a key feature to increase acceptability of LDCT lung cancer screening among Ontario family physicians.

Discussion

Our study examined PCPs' views of their potential roles in an organized LDCT program, identified significant knowledge needs and highlighted program features that are desired based on experiences with other screening programs. We found that most PCPs were generally supportive of an organized LDCT lung cancer screening program; however, there was considerable variability in PCPs' preferences for their role. An implication of this finding is that a future organized LDCT screening program in Ontario that relies on PCPs to identify potentially eligible patients, refer them for screening, and follow up on results may not be feasible. PCPs also expressed concerns about the identification of high-risk patients in the EMR especially those who had quit smoking within the last 15 years. Greiver et al. have reported that identifying smoking history from the EMR may be difficult (23).

The current study contributes information about implementation of organized LDCT screening programs including the roles of PCPs and AHPs. As LDCT screening is being implemented outside of a trial setting, it is important to investigate the perspectives of key stakeholders including PCPs who will have some role in such a program. PCPs routinely screen patients for other types of cancers- breast, cervical, and colorectal. They have trusting relationships with patients and are well-placed to counsel them about the risks and benefits of screening. LDCT screening is known to have high false positive rates (6) and it is important that patients understand such risks and potential benefits before agreeing to participate in a LDCT screening program. There is emerging evidence that patient decision aids may be helpful to provide information about risks and benefits of LDCT screening (24,25) although, participants in our study were unaware of such tools.

Several of our findings are similar to other primary care research (9, 26-28). For example, Hoffman et al. described the perspectives of PCPs from New Mexico, US. In their study, several PCPs were unaware of the NLST and its application to their setting. PCPs in that study also expressed concerns about the high false positive screening rate (9). Kanodra and colleagues conducted a qualitative study of the views of patients (n=28) and PCPs (n = 13) at a Veterans Administration medical centre. While 58% of these providers were aware of US Preventive Services Task Force screening guidelines, few providers could describe eligibility criteria. Providers indicated that shortage of time was a significant factor in limiting their ability to counsel patients about LDCT screening. They preferred that a screening coordinator review any incidental findings with patients and need for ongoing screening (26).

Our study found that PCPs preferred a specific model for a future organized LDCT screening program, in which the program arranged screening and follow up while communicating with PCPs, based on experience with an existing organized screening program for breast cancer patients that worked well for PCPs, their staff and patients.

Strengths and Limitations: We conducted our study in several health regions in Ontario, Canada and sampled PCPs from different practice types including FHTs and CHCs, and included AHP and staff in our focus groups. This is important as our results show that AHPs may have a key supportive role in a screening program and referrals to smoking cessation programs. The extent that our findings would be similar to those in other health regions or in different practice types is unknown. Although we attempted to recruit physicians from a purely fee for service payment model, none of the volunteer participants were from this type of model and we do not know if our findings would apply to them.

Conclusions

A future Ontario LDCT lung cancer screening program should consider the variability in PCPs' preferred roles.

PCPs preferred that a future lung cancer screening program be modelled on the OBSP including follow up of positive findings and have explicit links to smoking cessation programs.

A future program should provide information materials and learning opportunities tailored to PCPs' identified needs.

Word Count: 3000 limit: 3000 words

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Disclosures

Ethics: The Sunnybrook Health Sciences Centre Research Ethics Board approved this study. Approval date: April 16, 2013; #106 - 2013.

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Table 1. Summary of topics in low dose CT lung cancer screening slide deck

Topic	Number of slides
Purpose of focus group	3
Brief description of lung cancer	2
Overview of National Lung Cancer Screening Trial	3
Potential options for high risk lung cancer screening program in Ontario	3
Potential roles for family physicians	1
Potential costs and safety of high risk lung cancer screening	1

Table 2. Number and type of participants in low dose CT lung cancer screening focus groups

	Location[1] of Focus Group in Ontario			
	North East	South West	Central	Regional Primary Care Leads[2]
Number of practices (n)	2	1	1	6
Physicians (n)	10	2	3	6
Allied Health Professionals (n)	0	6	1	N/A
Staff (n)	0	2	4	N/A

1 Location refers to the Local Health Integration Network region

2 The focus group for the Regional Primary Care Leads was held in Toronto, Ontario

N/A; not applicable

Supplemental Table S1: Consolidated criteria for reporting qualitative studies (COREQ) [1]

Item	Description	Response
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	DL conducted the focus groups. MAO was the co-facilitator for 3 groups; FS co-facilitated 1 group (Northern Ontario).
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	MAO-PhD; DL-PhD; FS-MD, PhD; LP-MD, MSc
3. Occupation	What was their occupation at the time of the study?	MAO-Assistant Professor; DL-Lead Qualitative Researcher; FS-Professor; LP-Scientist and Radiation Oncologist
4. Gender	Was the researcher male or female?	MAO-Female; DL,FS,LP-Male
5. Experience and training	What experience or training did the researcher have?	MAO and DL are experienced qualitative researchers
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	DL/MAO/LP: A relationship with participants was not established prior to study commencement. FS practiced in the same general setting as participants in one focus group.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Participants received a study information form which explained the purpose of the study.
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and	All researchers introduced themselves at the beginning of the group.

	interests in the research topic	
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Descriptive qualitative study with thematic analysis.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Purposive sampling was used.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Participants were approached via email.
12. Sample size	How many participants were in the study?	34 participants were included in the study.
13. Non-participation	How many people refused to participate or dropped out? Reasons?	None of the participants dropped out. We do not know how many people refused to participate.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Focus groups were held in primary care clinics or in a hospital meeting room.
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	No one else was present during the focus groups.
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data	Sex and type of profession are reported.

Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The interview guide is available from the authors. The guide was pilot tested prior to the first focus group.
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	Repeat interviews were not carried out.
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Audio-recording was used.
20. Field notes	Were field notes made during and/or after the interview or focus group?	Field notes were made by DL and MAO after the focus group.
21. Duration	What was the duration of the interviews or focus group?	Approximately 2 hours
22. Data saturation	Was data saturation discussed?	Yes, data saturation was discussed. See Methods.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No. The transcripts were not returned to participants. DL checked the transcripts against the audio for accuracy.
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	DL and MAO coded the data.
25. Description of the coding tree	Did authors provide a description of the coding tree?	A description of the coding tree is available from the authors.
26. Derivation of themes	Were themes identified in advance or derived from the data?	Themes were identified from the data.
27. Software	What software, if applicable, was used to manage the data?	NVivo Version 9 (QSR International) was used.

28. Participant checking	Did participants provide feedback on the findings?	The participants did not provide feedback on the findings.
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number	Yes. Each quotation is identified by the type of participant and the setting.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	We believe that there is consistency between the data and findings.
31. Clarity of major themes	Were major themes clearly presented in the findings?	The major themes are clearly presented.
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Minor themes were not presented. Instead, disconfirming views were identified.

1. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups International Journal for Quality in Health Care 2007;19:349–357