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A Roadmap for Collaborative Selection of Implementation Strategies

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Learning Objectives:

1. Identify steps for collaborative selection of implementation strategies.
2. Discuss methods for identifying key barriers with partners.
3. Describe the process of workflow mapping with partners.



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Collaborative Selection of Implementation Strategies for Improving Smoking Cessation Treatment & Lung Cancer

Screening in FQHCs

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December 10, 2025



Division of General Internal Medicine

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Smoking cessation

1 in 10 U.S. adults (10%) smoke cigarettes—the leading preventable cause of death and a major driver of health disparities

Tobacco accounts for ~12% of U.S. healthcare spending

Behavioral and pharmacologic treatments are cost-effective and widely available, yet fewer than one-third of smokers use them when trying to quit.

Barriers to cessation:

- Patient-level: lack of insurance, transportation, coverage, stigma
- Provider-level: lack of time, training, reimbursement¹

Lung cancer screening

USPSTF recommends annual LDCT for high-risk adults: ages 50–80 with ≥ 20 pack-years

Universal LCS could have saved ~500,000 life-years since 2013.

Only 4.5–14.4% of eligible adults completed LCS as of 2022.

Barriers to LCS: Patient-level: lack of awareness, cost, access, stigma, cancer worry

Provider-level: guideline awareness, identifying eligibility, low confidence in shared decision-making

System-level: screening capacity, insurance coverage

Why FQHCs?

- FQHCs are a key provider of services to people who smoke in the US
 - Serve almost 32 million Americans, or 1 in 11 people
 - Generate \$24 billion in healthcare savings
 - Smoking prevalence is 25.8% among U.S. FQHC patients

<https://www.nachc.org/resource/Americas-health-centers-by-the-numbers/>; Zeliadt et al. Am J Prev Med 2018; Flock et al. Prev Chronic Dis 2017

Objective

- To assess feasibility, acceptability, appropriateness of a roadmap method for selecting implementation strategies for improving delivery of smoking cessation treatment and lung cancer screening in FQHCs

Study Design

Pilot study

Two Massachusetts
FQHCs

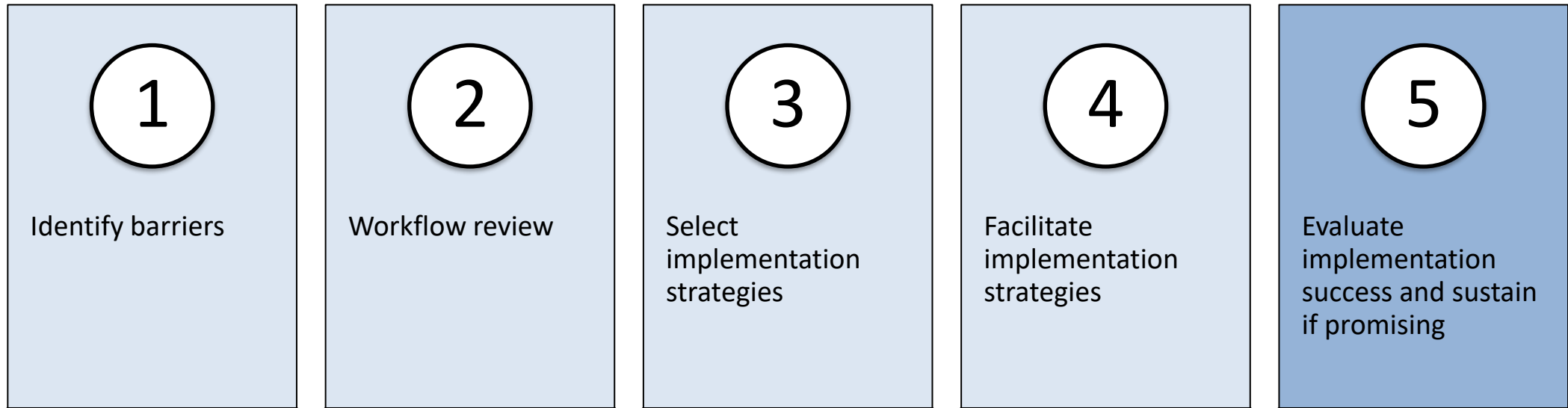
- Participated in implementation roadmap processes over 5 months

Timeline: Dec 2022 –
May 2023

Internal FQHC
implementation teams
partnered with external
implementation team

Roadmap Method Steps

The roadmap process for implementation team selection and evaluation of implementation strategies

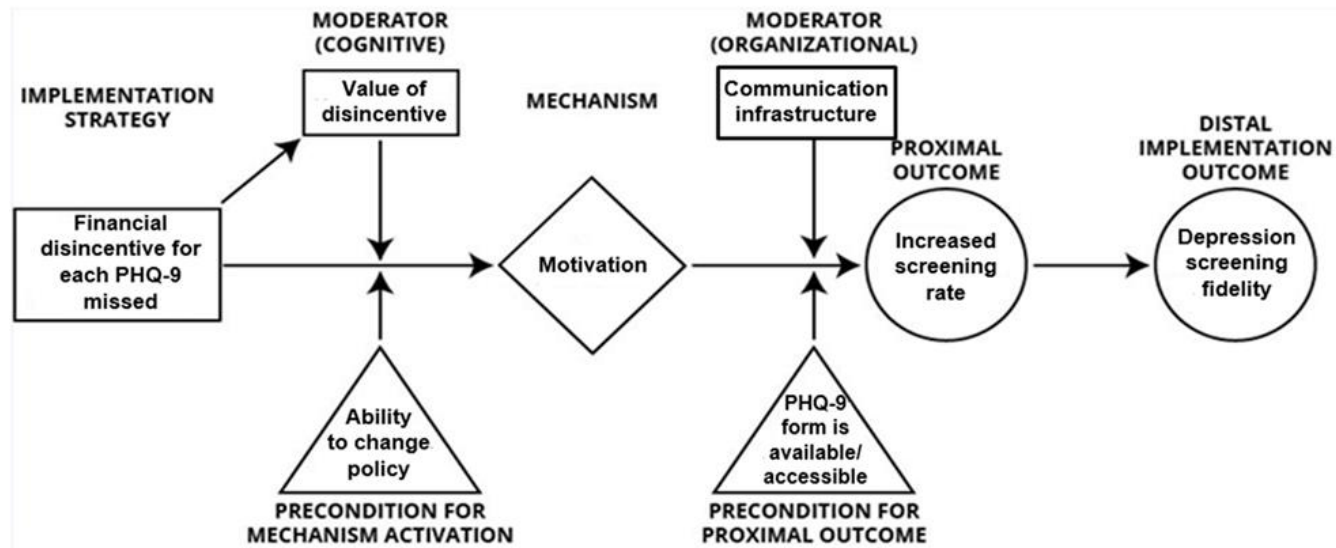
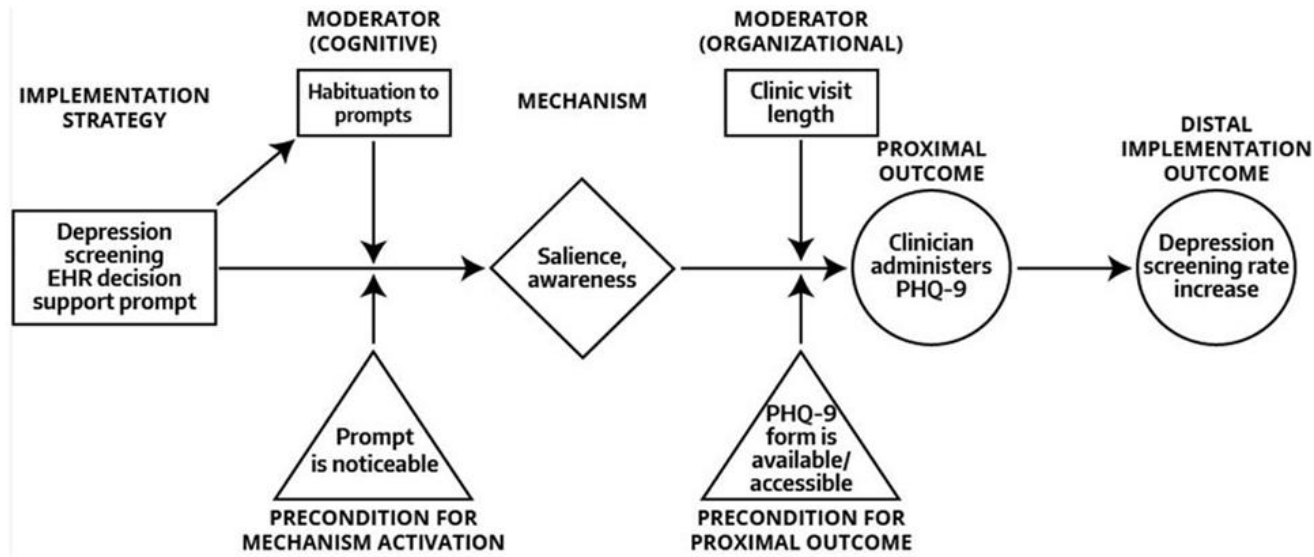




From Classification to Causality: Advancing Understanding of Mechanisms of Change in Implementation Science

Cara C. Lewis^{1,2,3}, Predrag Klasnja^{1†}, Byron J. Powell⁴, Aaron R. Lyon³, Leah Tuzzio¹,
Salene Jones⁵, Callie Walsh-Bailey¹ and Bryan Weiner⁶*

Term	Definition
Mechanism	Process or event through which an implementation strategy operates to affect desired implementation outcomes
Precondition	Factor that is necessary in order for an implementation mechanism to be activated
Determinant	Also commonly referred to as “barriers” and “facilitators,” a factor that enables or hinders the implementation strategy from eliciting the desired effect
Mediator	Intervening variable that may account for the relationship between the implementation strategy and the implementation outcome
Moderator	Factor that increase or decrease the level of influence of an implementation strategy
Proximal outcome	The product of the implementation strategy that is realized because of its specific mechanism of action, the most immediate, observable outcome in the causal pathway
Distal outcome	Outcomes that the implementation processes is ultimately intended to achieve, not the most immediate outcome in the causal pathway



Step 1: Identify Barriers



Data and population
health infrastructure

LCS not tracked, limited
reporting options
Incomplete smoking history
in EHR



Provider knowledge gaps



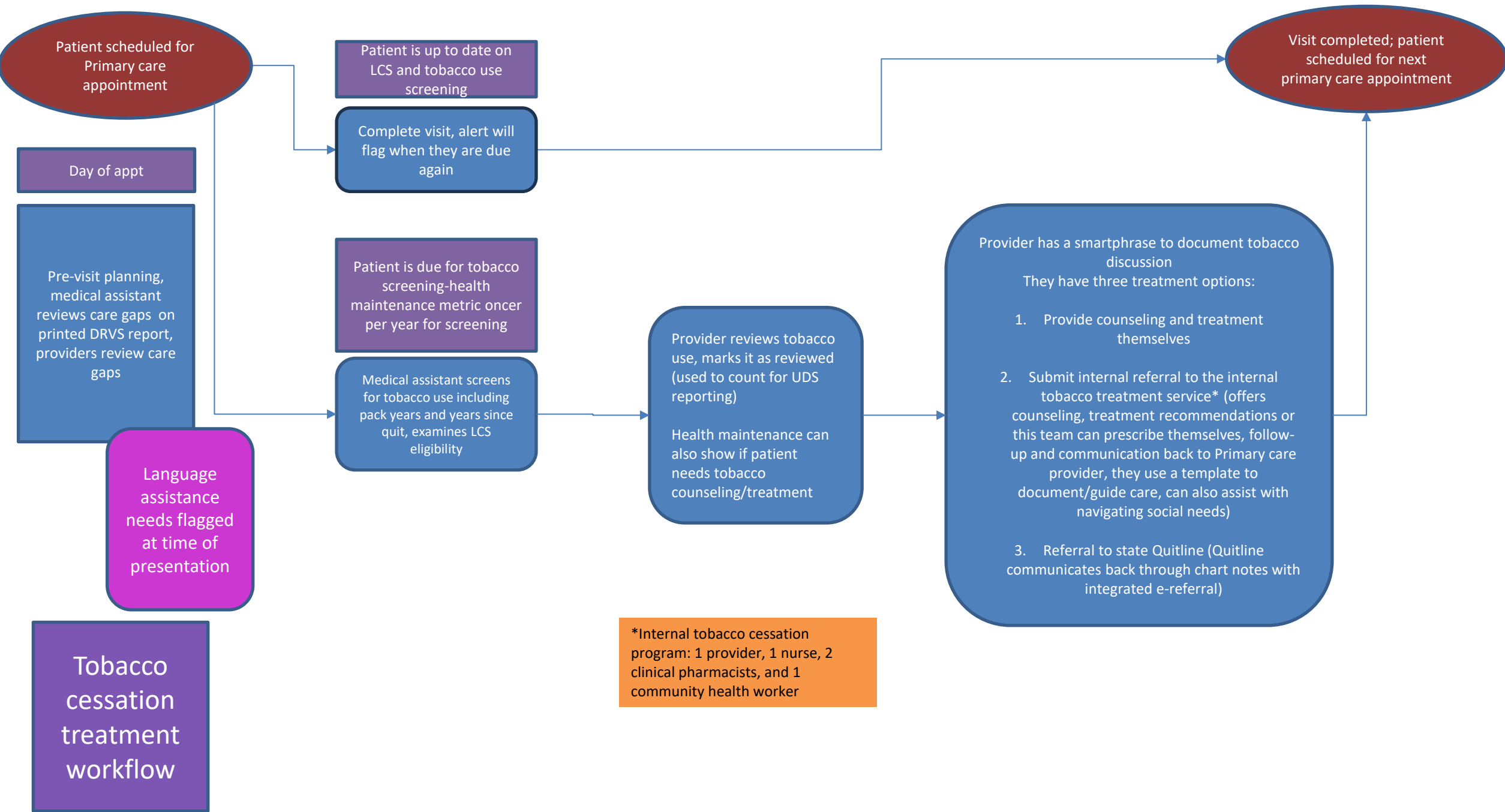
Patient travel challenges



Communicating with patients about low-dose CT
process

Step 2

WORKFLOW REVIEW



Patient scheduled for Primary care appointment

Day of appt

Pre-visit planning, medical assistant reviews care gaps on printed DRVS report, providers review care gaps

Language assistance needs flagged at time of presentation

Tobacco cessation treatment workflow

Patient is up to date on LCS and tobacco use screening

Complete visit, alert will flag when they are due again

Patient is due for tobacco screening-health maintenance metric oncer per year for screening

Medical assistant screens for tobacco use including pack years and years since quit, examines LCS eligibility

Provider reviews tobacco use, marks it as reviewed (used to count for UDS reporting)

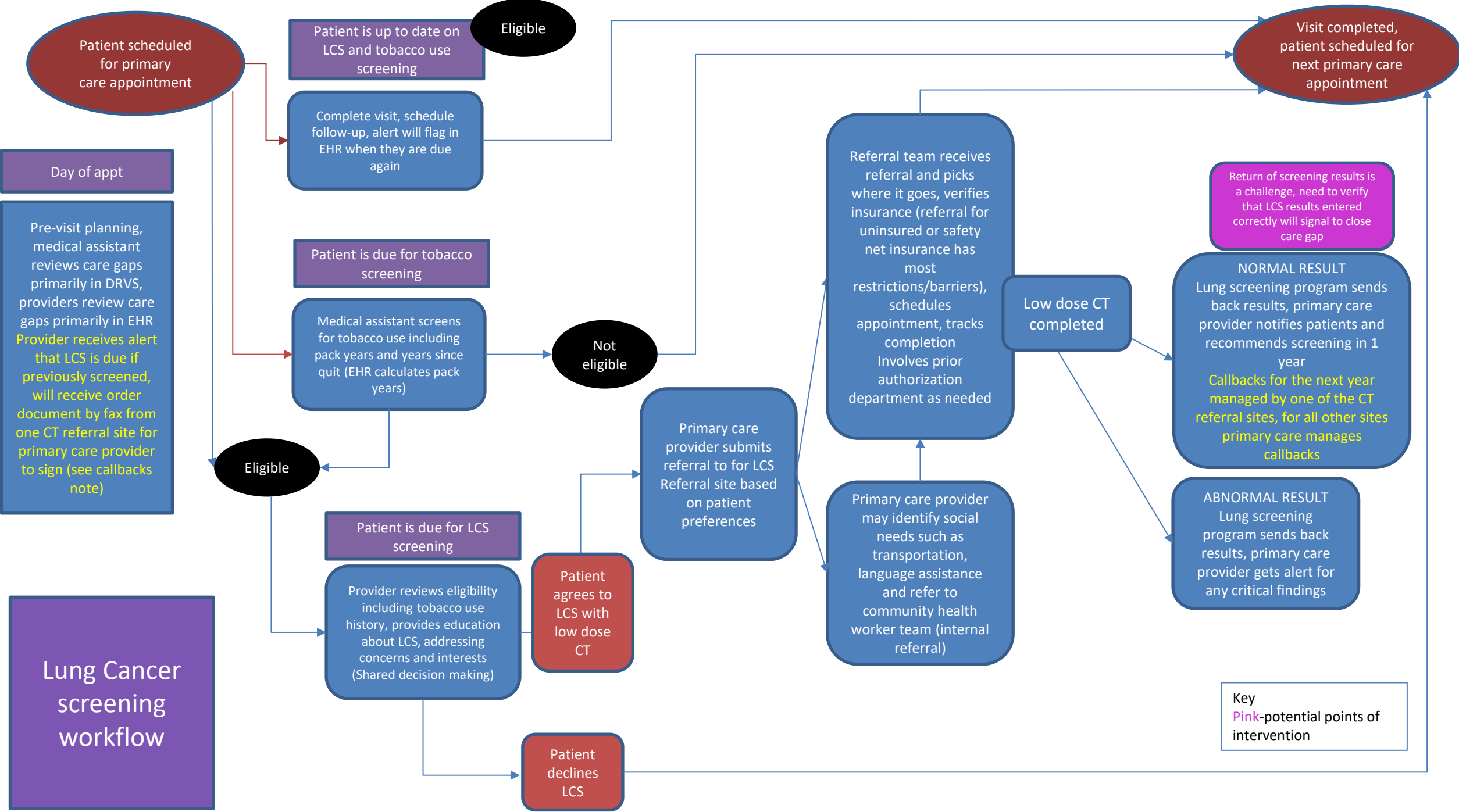
Health maintenance can also show if patient needs tobacco counseling/treatment

Provider has a smartphrase to document tobacco discussion
They have three treatment options:

1. Provide counseling and treatment themselves
2. Submit internal referral to the internal tobacco treatment service* (offers counseling, treatment recommendations or this team can prescribe themselves, follow-up and communication back to Primary care provider, they use a template to document/guide care, can also assist with navigating social needs)
3. Referral to state Quitline (Quitline communicates back through chart notes with integrated e-referral)

*Internal tobacco cessation program: 1 provider, 1 nurse, 2 clinical pharmacists, and 1 community health worker

Visit completed; patient scheduled for next primary care appointment



Day of appt

Pre-visit planning, medical assistant reviews care gaps primarily in DRVS, providers review care gaps primarily in EHR. **Provider receives alert that LCS is due if previously screened, will receive order document by fax from one CT referral site for primary care provider to sign (see callbacks note)**

Lung Cancer screening workflow

Patient is up to date on LCS and tobacco use screening

Eligible

Complete visit, schedule follow-up, alert will flag in EHR when they are due again

Patient is due for tobacco screening

Medical assistant screens for tobacco use including pack years and years since quit (EHR calculates pack years)

Not eligible

Eligible

Patient is due for LCS screening

Provider reviews eligibility including tobacco use history, provides education about LCS, addressing concerns and interests (Shared decision making)

Patient agrees to LCS with low dose CT

Patient declines LCS

Primary care provider submits referral to for LCS. Referral site based on patient preferences

Primary care provider may identify social needs such as transportation, language assistance and refer to community health worker team (internal referral)

Referral team receives referral and picks where it goes, verifies insurance (referral for uninsured or safety net insurance has most restrictions/barriers), schedules appointment, tracks completion. Involves prior authorization department as needed

Low dose CT completed

NORMAL RESULT
Lung screening program sends back results, primary care provider notifies patients and recommends screening in 1 year.
Callbacks for the next year managed by one of the CT referral sites, for all other sites primary care manages callbacks

ABNORMAL RESULT
Lung screening program sends back results, primary care provider gets alert for any critical findings

Return of screening results is a challenge, need to verify that LCS results entered correctly will signal to close care gap

Key
Pink-potential points of intervention

Visit completed, patient scheduled for next primary care appointment

Step 3: Select Implementation Strategies

FQHC	Strategy	Key barrier	Proximal outcome measure(s)	Precondition(s)
Site A	Add LCS to provider quality scorecards	LCS not tracked, limited reporting options	Scorecards distributed, LCS referrals/month	Mapping smoking and LCS in population health software
	Provider LCS education	Provider understanding of eligibility and shared decision-making requirement	Provider meeting attendance, LCS referrals/month	Education material availability
Site B	Retraining staff in smoking assessment and SCT protocols	Incomplete smoking history in EHR	SCT care gaps closed	Staff availability
	Implement LCS alerts	LCS not tracked	LCS orders, LCS completion	Mapping smoking and LCS in population health software
	Automatic referral to navigator to assess transportation needs after LCS order	Patient travel time and distance	LCS missed visits	Navigator availability
	Establish communications with radiology provider(s)	Communicating with patients about low-dose CT process	LCS missed visits	Radiology contact(s)

Step 4: Facilitate Implementation Strategies

External
implementation
team

3 physician researchers with complementary expertise in smoking cessation research, cancer screening, FQHC populations, and community-engaged implementation science

2 clinical research coordinators with part-time effort to manage communications and administration of the project

3 advisors with LCS and implementation science expertise to guide application of the strategy selection method

Step 5: Evaluate

- Qualitative group interviews (guided by CFIR)
- Staff survey: feasibility, acceptability, appropriateness
 - Likert scale ratings (median [IQR])

Observed proximal outcomes

FQHC	Strategy	Proximal outcome measure(s)	Total observed outcomes
Site A	Add LCS to provider quality scorecards	Scorecards distributed, LCS referrals/month	LCS flagged as care gap in EHR (n = 393) LCSs ordered (n = 23) LCSs scheduled (n = 3) LCSs completed (n = 9)
	Provider LCS education	Provider meeting attendance, LCS referrals/month	Providers in attendance (n = 16)
Site B	Retraining staff in smoking assessment and SCT protocols	SCT care gaps closed	Patients screened for tobacco use (n = 1560) Patients counseled on tobacco (n = 569) NRT prescriptions (n = 34)
	Implement LCS alerts	LCS orders, LCS completion	LCS ordered (n = 24) LCS scheduled (n = 7)
	Automatic referral to navigator to assess transportation needs after LCS order	LCS missed visits	Lung CT missed visit (n = 1)
	Establish communications with radiology provider(s)	LCS missed visits	Lung CT missed visit (n = 1)

Feasibility, Acceptability and Appropriateness

Median (IQR) summary scores of internal implementation team ratings of the roadmap process

Site	No. of respondents	Feasibility	Acceptability	Appropriateness
Total	7	4.0 (3.3-5.0)	4.0 (4.0-5.0)	4.0 (4.0-5.0)
FQHC site A	4	3.9 (3.4-4.5)	4.5 (4.0-5.0)	4.5 (4.0-5.0)
FQHC site B	3	4.0 (3.3-5.0)	4.0 (3.3-5.0)	4.0 (3.3-5.0)

Response options were scored from 1 to 5, with 5 indicating the most favorable outcome (e.g. more feasible, more acceptable, or more appropriate).

Results

Themes reflecting determinants of implementation of LCS and SCT from interviews with n = 9 internal implementation team members

CFIR domain	Themes	Exemplar quotes
Inner setting	Benefits of mission alignment	Being able to have something like that at a time in primary care and community health when we are really fatigued is just, it's like a joyful burden. If I can say so. It's something that we feel responsible for, but it's something that's also uplifting because we know at the end of the day, if we're helping facilitate a patient to get an absolutely necessary screening that could prevent . . . a fatal outcome if overlooked or not completed, and certainly to encourage them in their journey to reduce or quit use of tobacco to begin with, that's always [going to] be the right thing to do. And it's very heartening to be able to come together as a group. [Internal implementation team interview]
	Compatibility with existing initiatives	I think probably [FQHC team member] made the initial decision and I think that was because it aligned well with work that we're already doing on the tobacco side and this being such an important cancer screening . . . even though it's not a UDS [Uniform Data System ^a] measure. [Internal implementation team interview]
	Lack of available infrastructure for outreach for lung cancer screening relative to other screenings	Historically, we've had mobile mammo [mammogram], where it would go out into communities and find people where they are and offer screening to really try to increase awareness. . . . But we haven't—that I'm aware of—there's no policy in place or projects in place to try to advance that with something like CT [computed tomography] for lung cancer. [Internal implementation team interview]

Results

CFIR domain	Themes	Exemplar quotes
Inner setting	Limited time during busy provider meetings	One challenge is the limited time during the provider meetings. As these are only 2x a month, there is a lot of information to cover in each meeting, understandably, limiting the time for this presentation and discussion. [Monthly pilot progress report]
	Challenges of missing data needed for eligibility assessment and provider quality scorecards	There are gaps in the currently mapped lung cancer screening registry. The tobacco data will only pull into the report if a [tobacco use] start date is indicated. [Monthly pilot progress report]
	Staffing shortages affect multiple points in workflow as well as morale	Nurses are on maternity leave. . . . [FQHC has] MAs [medical assistants] that are out on PTO [paid time off]. Nurses are also overwhelmed. Shortages impact employee morale and overwhelm some team members. [Facilitation meeting notes]
		Referrals department is very understaffed at the moment. Providers are placing referrals, but nothing happens for weeks. [Facilitation meeting notes]

Results

CFIR domain	Themes	Exemplar quotes
Outer context	Challenges of working with external stakeholders	This is one of those screenings where we do need to have external stakeholder partners . . . to have someone receive the patient on the other end [of the referral]. [Internal implementation team interview]
	Performance measurement as a key driver of service delivery	One of the main differences is also because it's not a UDS measure or regulatory measure that we're tracking. We don't necessarily have the data readily available like we do with a lot of the other cancer screening metrics. And so, because of that, we don't have staff who . . . [are] allocated to this area of work. [Internal implementation team interview]

Key Insights



Roadmap process
worked in FQHCs



Strategies were
actionable and relevant



Importance of internal-
external collaboration

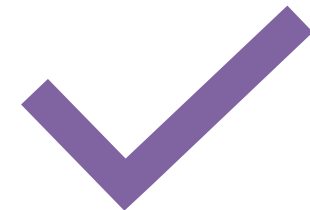
Limitations



Small sample (2 FQHCs)



Short pilot period



Partial implementation
of some strategies

Implications & Next Steps

Potential for scale-up

Need for larger trials

Integration with broader tobacco control and cancer screening efforts

Acknowledgements and References

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Center

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-Genevieve Shafer '26

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