

Lung Cancer Screening (LCS) in a US Healthcare System: from efficacy trials to effectiveness research in the new Population-Based Research to Optimize the Screening Process (PROSPR II) Initiative

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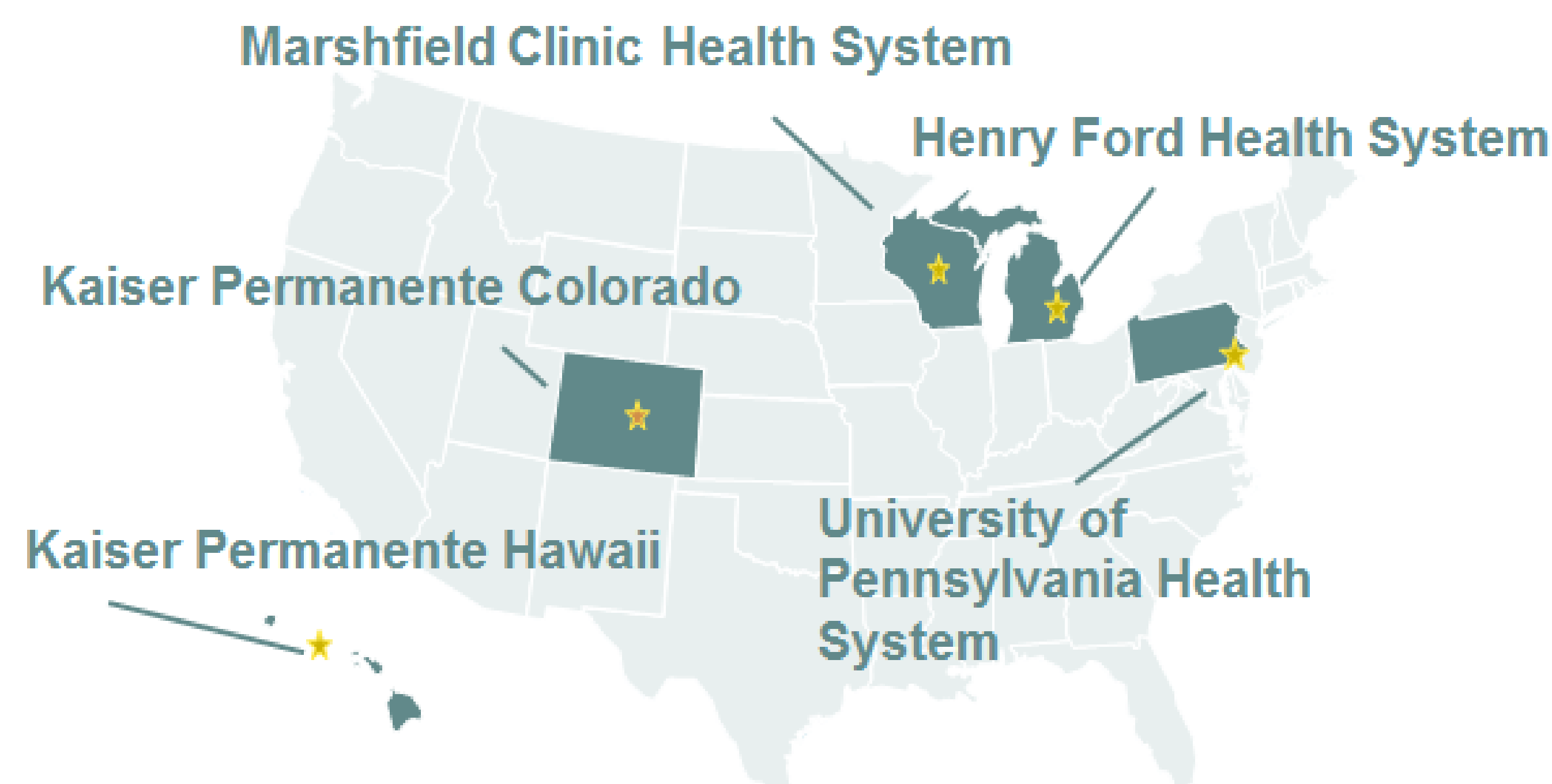
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PROSPR

Marshfield Clinic
HEALTH SYSTEM

Introduction

- Marshfield Clinic (MC), an integrated healthcare system in rural Wisconsin, participated in the US National Cancer Institute (NCI) National Lung Screening Trial (NLST), which **demonstrated efficacy of Lung Cancer Screening (LCS) with low-dose CT** in long term smokers, and led in 2015 to prevention guidelines and health insurance coverage for LCS in routine clinical practice.
- In 2018, Marshfield Clinic joined **LOTUS** (Lung Cancer Screening Optimization in The US), a network of 5 US health systems funded by NCI's PROSPR II initiative **to describe LCS delivery, enhance effectiveness, and reduce disparities.**



Specific Aims for the LOTUS network

- Build LCS ecosystem, conceptual model, and data repository with focus on LCS delivery, quality metrics, multi-level system factors, and health disparities
- High impact observational studies on uptake, yield, smoking cessation, imaging biomarker stratification, and equity
- Develop and test pilot interventions at the patient, provider, system, and societal level

Purpose/Approach

- First project, a work in progress, aims to leverage Marshfield's experience in NLST and LOTUS **to explore translation from efficacy trials to effective LCS delivery in real-world care.**
 - Initial **comparison** of populations and baseline screening outcomes in **NLST and LOTUS** at Marshfield Clinic
 - Preliminary observations from **discussions with Marshfield Clinic stakeholders in Primary Care, specialty care departments, and Quality Improvement.**

Results/Observations

- 3062 MC subjects in NLST + Lung Screening Study (LSS) pilot
 - **1479** in intervention arm and screened with CT, 2000-07
- 2062 MC patients received an LCS baseline CT, 2014-18
 - 2014: 11; 2015: 190; 2016: 476; 2017: 556; 2018: 829
 - **385** of these in current LOTUS analytic cohort – screening data capture will be expanded for future analyses

Table 1: Characteristics of baseline LCS CT recipients at Marshfield Clinic

	LSS N=237	NLST N=1242	LOTUS N=385	p-value
Age, yrs mean (SD)	63.1 (5.3)	62.5 (5.0)	64.8 (6.6)	<0.0001
Female num. (%)	99 (41.8)	456 (36.7)	185 (48.1)	0.0003
White Race num. (%)*	160 (99.4)	488 (99.8)	381 (99.0)	NS
Non-Hispanic Ethnicity num. (%)*	221 (99.1)	1177 (99.7)	377 (99.5)	NS
* Calculated among those with non-missing values				

Table 2: Baseline screening results* of LCS CT recipients at Marshfield Clinic

	LSS N=237	NLST N=1242	LOTUS N=385**	p-value
Negative screen, w/ or w/o other findings***	212 (89.5)	810 (65.2)	299 (77.9)	
Positive screen	25 (10.6)	432 (34.8)	85 (22.1)	<0.001
* mapping across different outcome classification systems				
** 1 subject missing				
*** other findings = very low risk nodule(s) or other unrelated findings				

- MC primary care providers had limited role in NLST trial (not eligibility assessment, recruitment, screening orders, etc.); much of LCS processes in routine practice is primary care-dependent.
- Centralized LCS program elements at MC to date focused more on program tracking, follow up in specialty departments.
- Considerable variation across MC's ~40 primary care clinics, in LCS awareness, interest, eligibility assessment, approaches to smoking cessation and shared decision making, referrals.

Discussion/Next Steps

- LCS patients in routine care are older and more likely to be female than LCS trial participants.
 - future analyses: current smoking, comorbidities, etc.
- Difference in LCS positivity rate between trial participants and patients in routine care suggests effectiveness of LCS may vary.
 - future analyses: lungrads, biopsies/surgeries, cancers
- Need for evaluation, interventions to optimize LCS impact
 - future semi-structured interviews with MC providers to characterize process variability, underlying perspectives

This work was supported in part by NIH/National Cancer Institute Grant # 1UM1CA221939-01 (Ritzwoller/Doubeni Co-PIs) via sub-award RNG209451-MCRI (Greenlee PI) from Kaiser Foundation Research Institute.

We gratefully acknowledge LOTUS partner health systems, the US NCI, the PROSPR II coordinating center at U. Wash., and health system stakeholders at Marshfield Clinic.

