Learning Health Systems

Healthy Futures Summit
December 5, 2019

COMPLEXITY

Structure

Knowledge

Patients

COSTS

“…a learning healthcare system that is designed to generate and apply the best evidence for the collaborative healthcare choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care”

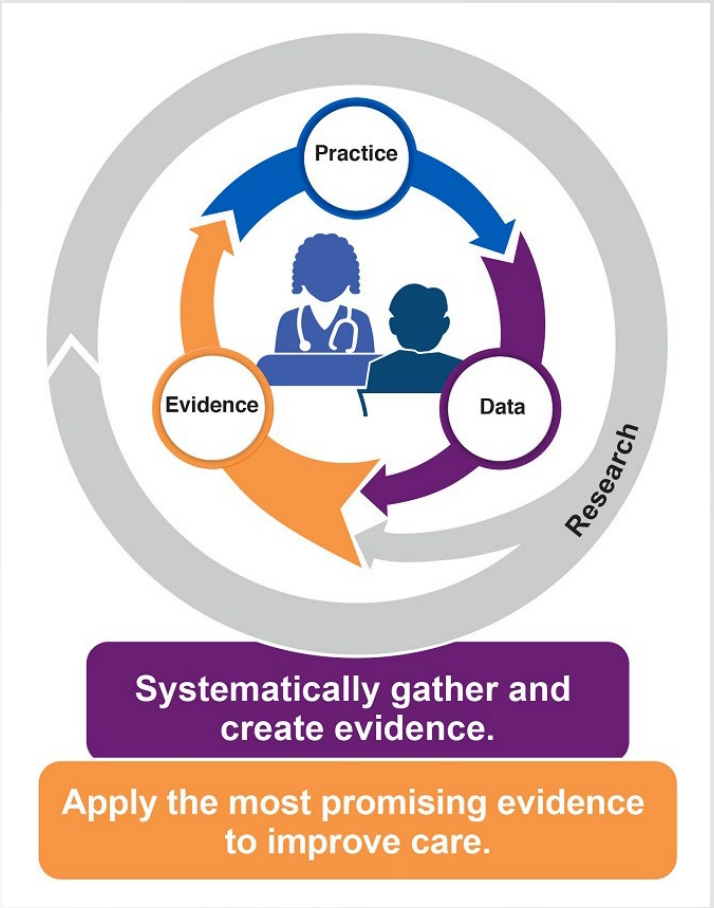
Roundtable on Evidence-based Medicine 2006

Learning Health Care System in America 2012

National Academy of Medicine

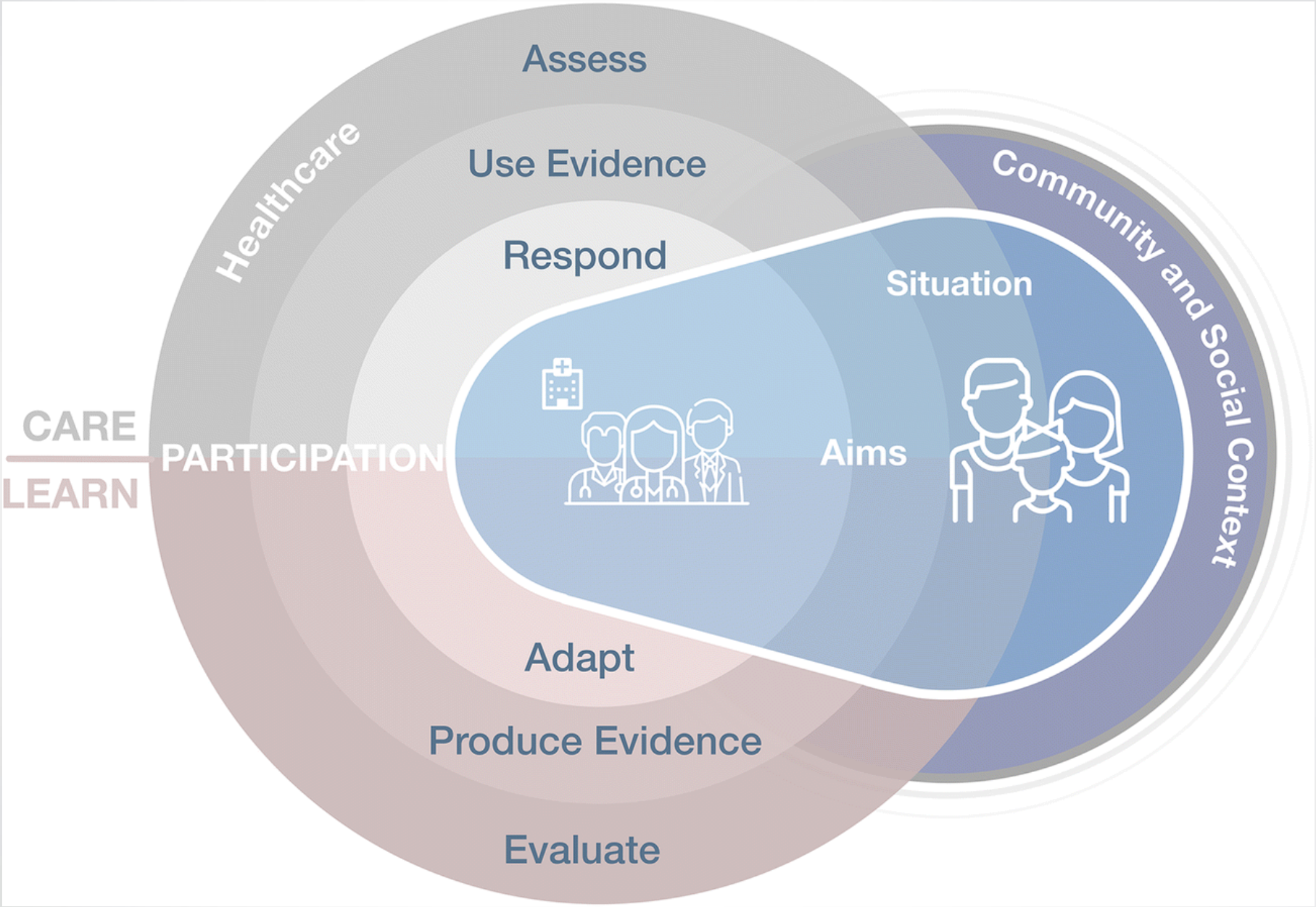
Learning Health Systems—

- Have leaders who are committed to a culture of continuous learning and improvement.
- Systematically gather and apply evidence in real-time to guide care.
- Employ IT methods to share new evidence with clinicians to improve decision-making.
- Promote the inclusion of patients as vital members of the learning team.
- Capture and analyze data and care experiences to improve care.
- Continually assess outcomes refine processes and training to create a feedback cycle for learning and improvement



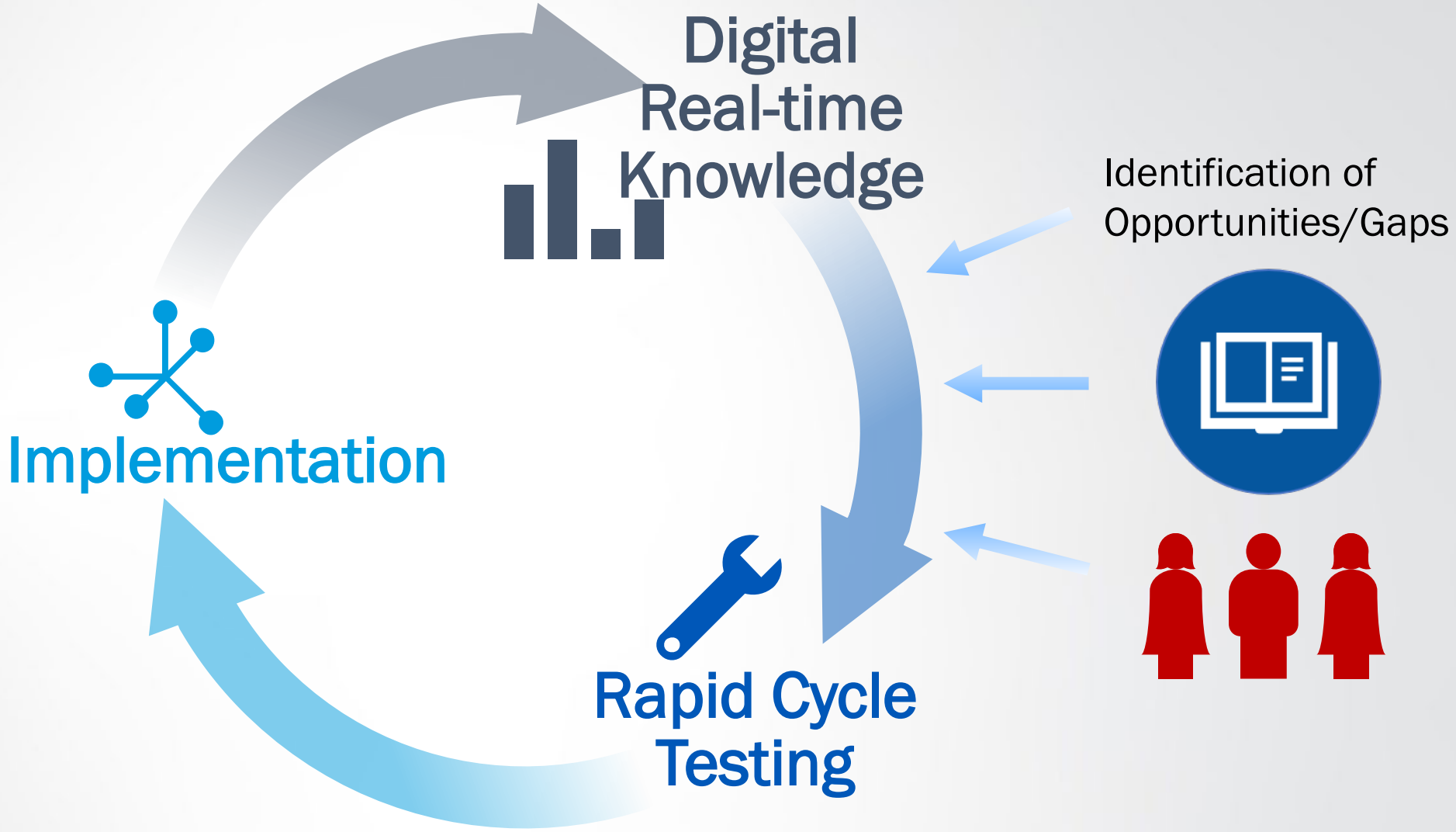
Source: https://www.ahrq.gov/learning-health-systems/about.html

Care and Learn Model



Source: Montori et. Al; 2019

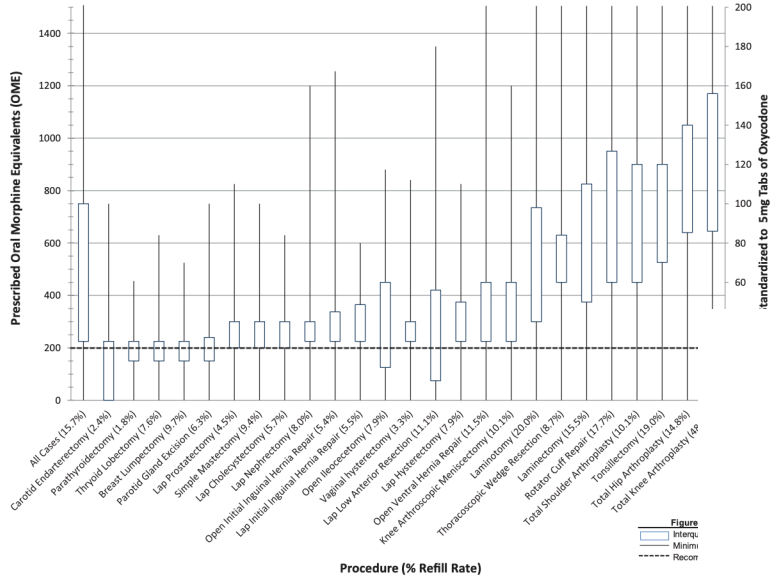
Learning Health Systems Solutions Model



Application to Opioid Prescribing

ASA Paper

Wide Variation and Overprescription of Opioids After Elective Surgery



Results of a Prospective, Multicenter Initiative Aimed at Developing Opioid-prescribing Guidelines After Surgery

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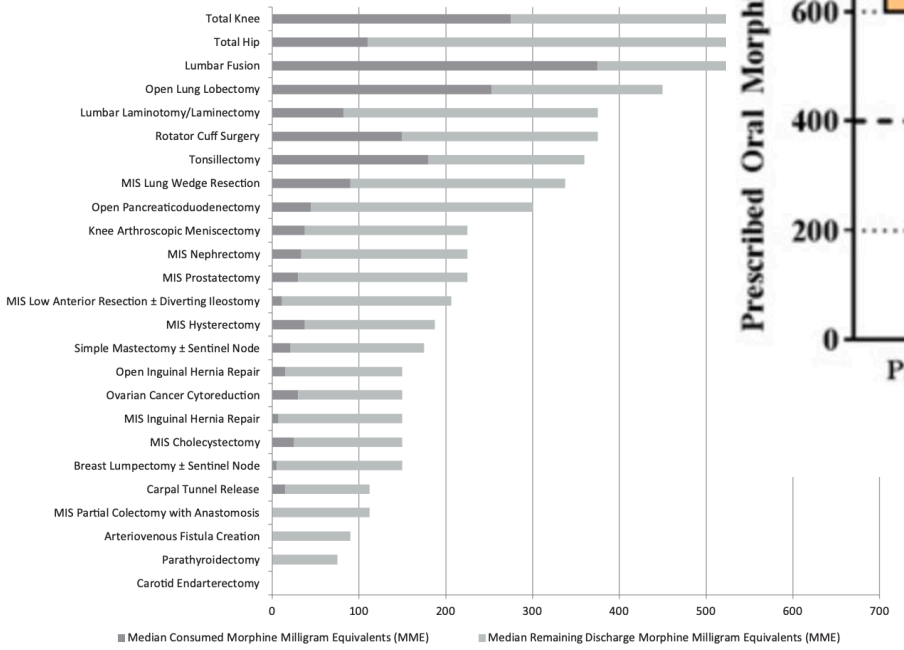
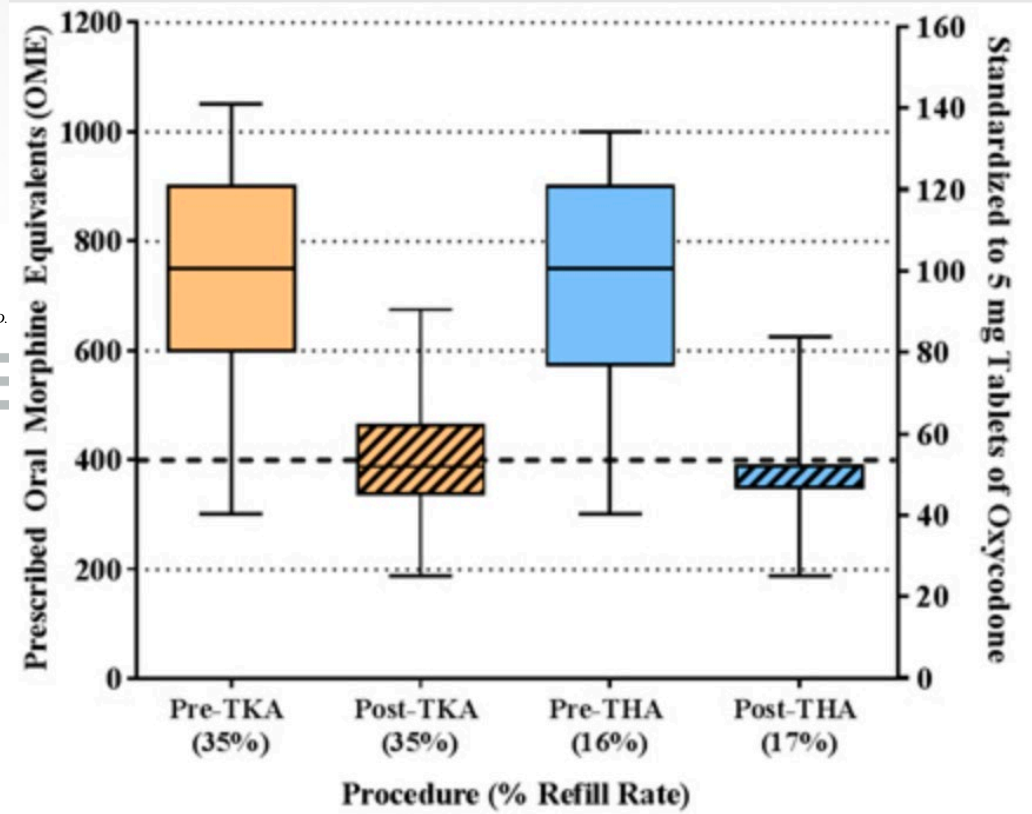


Clin Orthop Relat Res (2019) 477:104-113
DOI 10.1007/s11999.0000000000000292

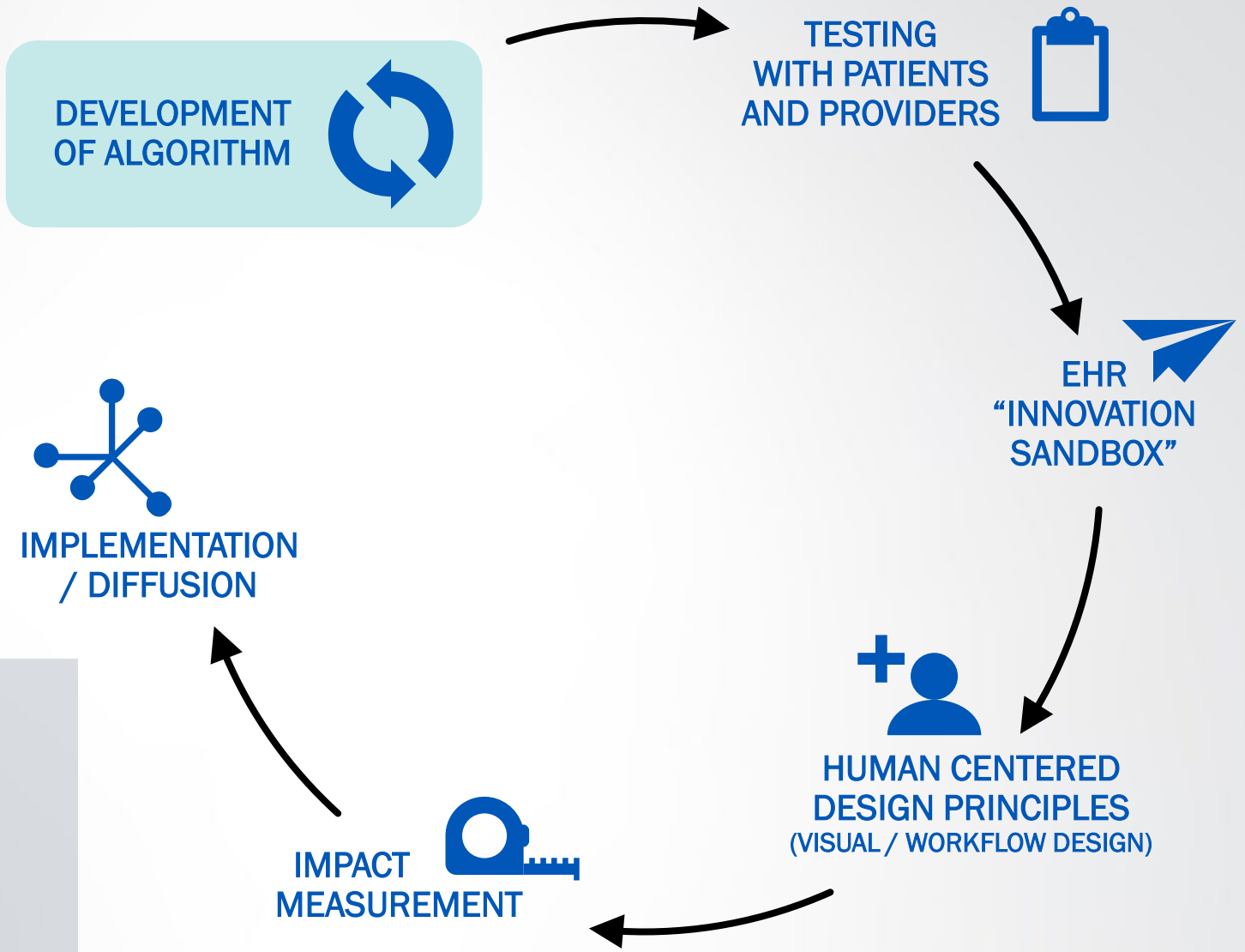
Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

2018 Knee Society Proceedings

The 2018 Chitranjan S. Ranawat, MD Award: Developing and Implementing a Novel Institutional Guideline Strategy Reduced Postoperative Opioid Prescribing After TKA and THA



Rapid Cycle Testing



Goals:
- Better care
- Provider efficiency
- Satisfaction
- Higher value

Applying Rapid Cycle Testing to AI

Rapid Cycle Testing

Goals: Better care
Provider effic
Provider satis
Reimbursable

ORIGINAL ARTICLE

WILEY

Prospective validation of a deep learning electrocardiogram algorithm for the detection of left ventricular systolic dysfunction

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ECG AI-Guided Screening for Low Ejection Fraction (EAGLE): Rationale and design of a pragmatic cluster randomized trial

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Background A deep learning algorithm to detect low ejection fraction (EF) using routine 12-lead electrocardiogram (ECG) has recently been developed and validated. The algorithm was incorporated into the electronic health record (EHR) to automatically screen for low EF, encouraging clinicians to obtain a confirmatory transthoracic echocardiogram (TTE) for previously undiagnosed patients, thereby facilitating early diagnosis and treatment.

Objectives To prospectively evaluate a novel artificial intelligence (AI) screening tool for detecting low EF in primary care practices.

Design The EAGLE trial is a pragmatic two-arm cluster randomized trial (NCT04000087) that will randomize >100 clinical teams (i.e., clusters) to either intervention (access to the new AI screening tool) or control (usual care) at 48 primary care practices across Minnesota and Wisconsin. The trial is expected to involve approximately 400 clinicians and 20,000 patients. The primary endpoint is newly discovered EF ≤50%. Eligible patients will include adults who undergo ECG for any reason and have not been previously diagnosed with low EF. Data will be pulled from the EHR, and no contact will be made with patients. A positive deviance qualitative study and a post-implementation survey will be conducted among select clinicians to identify facilitators and barriers to using the new screening report.

Summary This trial will examine the effectiveness of the AI-enabled ECG for detection of asymptomatic low EF in routine primary care practices and will be among the first to prospectively evaluate the value of AI in real-world practice. Its findings will inform future implementation strategies for the translation of other AI-enabled algorithms. (Am Heart J 2020;219:31-36.)

Heart failure (HF) is a progressive chronic disease affecting

ventricular systolic dysfunction (ALVSD), i.e., low ejection