Using Nudges to Improve the Delivery of Health Care

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Disclosures

- Research funding
  - NIH, VA, Donaghue Foundation, Doris Duke Charitable Foundation, Deloitte Consulting
- Advisory Board Member
  - Life.io, Healthmine Services, Holistic Industries
- Consulting
  - Catalyst Health
  - www.miteshspatel.com

Human behavior is the final common pathway

Patel, Volpp, Asch. *NEJM.* 2018

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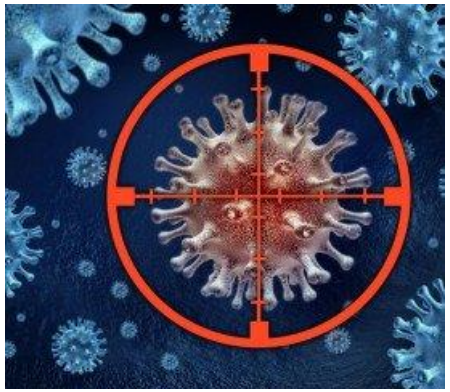

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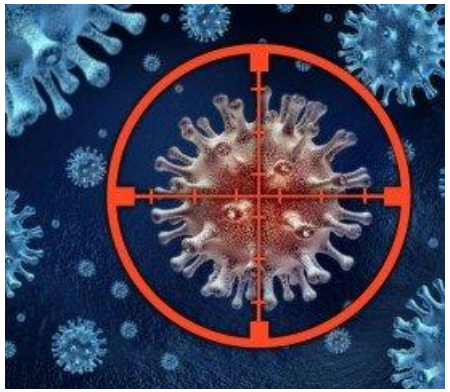

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90% of clinicians

80% of US adults

Using nudges to improve our decisions

- Subtle changes in design that can have an outsized impact on our behavior

- Remind, guide, or motivate decisions

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- Subtle changes in design that can have an outsized impact on our behavior
- Remind, guide, or motivate decisions
- Examples
  - Setting the default to the preferred option
  - Prompting an active choice now rather than delaying the decision
  - Framing information through increased transparency or social comparisons

Nudges are prevalent in other industries

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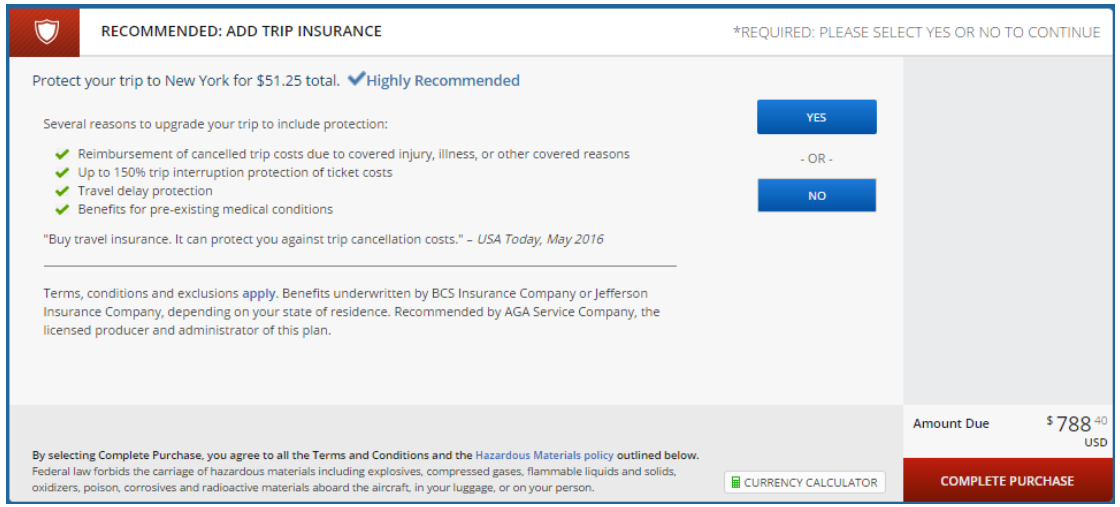

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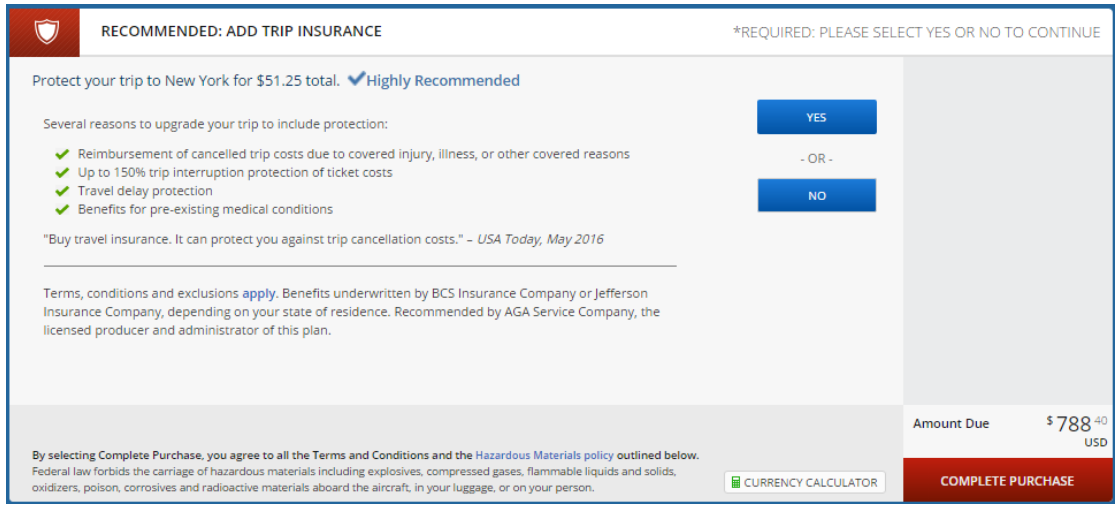

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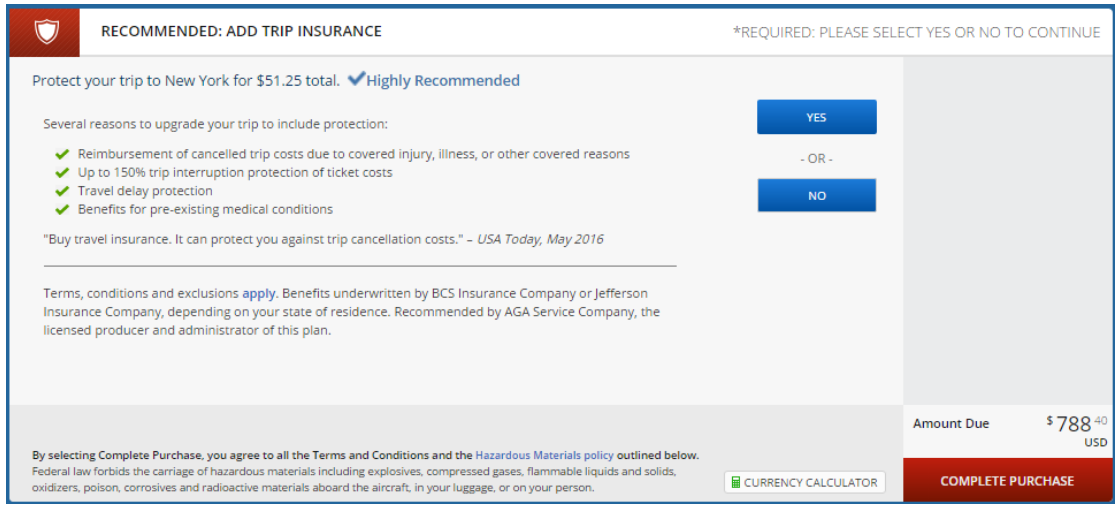

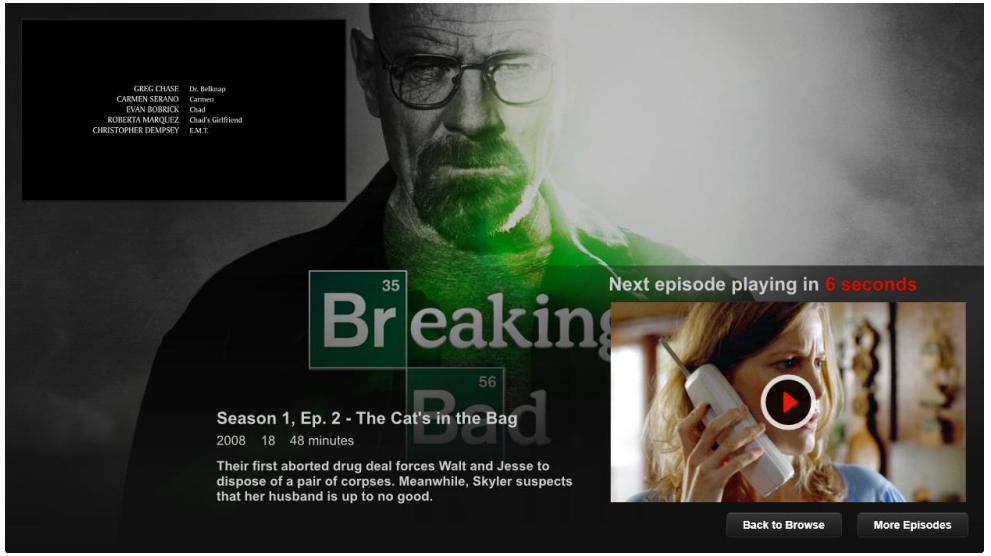

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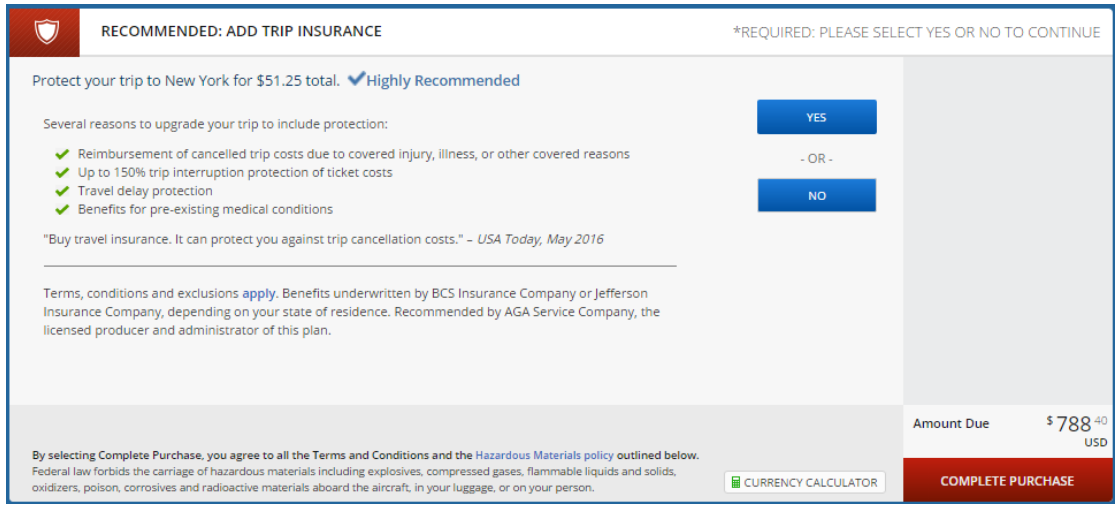

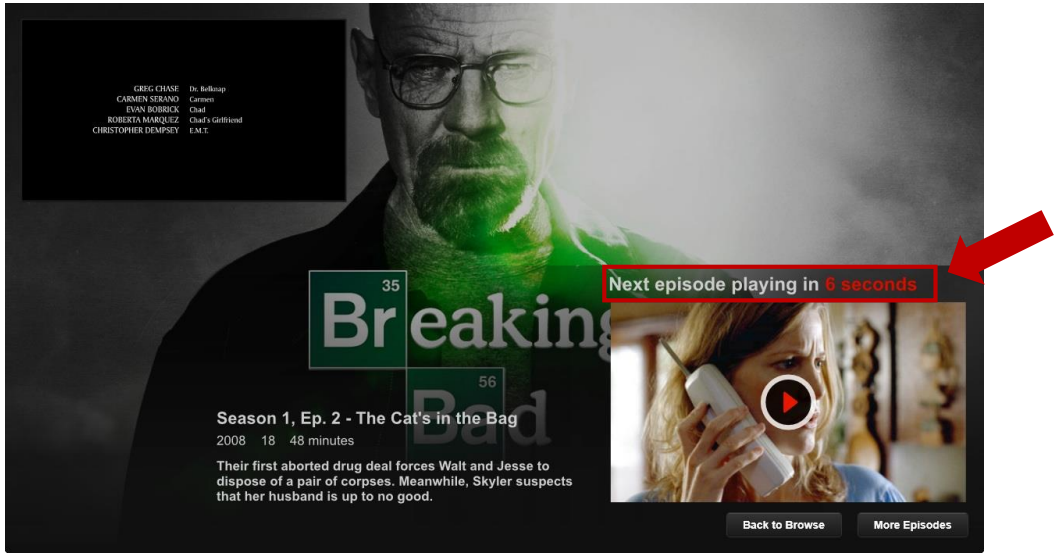

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Nudge units are behavioral design teams

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- UK Behavioral Insights Team
  - Launched in 2010 by the United Kingdom's Government
  - Quickly demonstrated that small changes could lead to significant impact
    - Efficiency: tax payments
    - Health: organ donor consent rates
    - Social good: charitable contributions

Nudge units have spread around the world within governments

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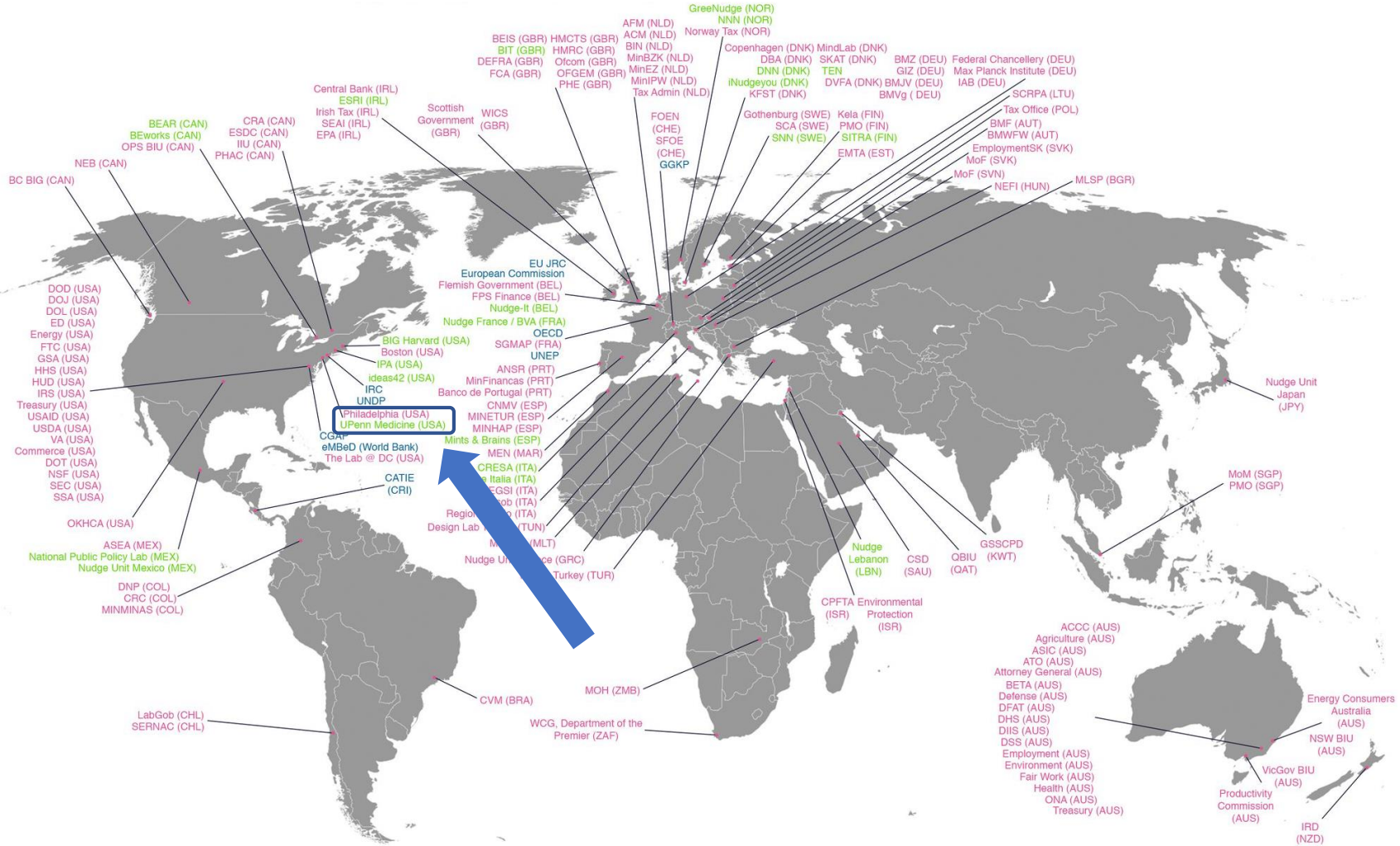

World’s first behavioral design team embedded in a health system

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Mission

To leverage insights from behavioral economics and psychology to design and test approaches to steer medical decision-making toward higher value and improved patient outcomes

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CENTER FOR HEALTH CARE INNOVATION
Accelerating Ideas to Transform Health Care

Our role

Advise

Provide guidance on the design and implementation of interventions to improve the delivery of health care.

Implement

Engage frontline clinicians, health system leadership, and patients to test pragmatic interventions.

Evaluate

Rigorously assess impact of interventions to inform larger scale deployment and optimize future efforts.

Disseminate

Share insights from our work in peer-reviewed publications, on social media, and in-person at conferences or our annual Nudges in Health Care Symposium.

Our Work

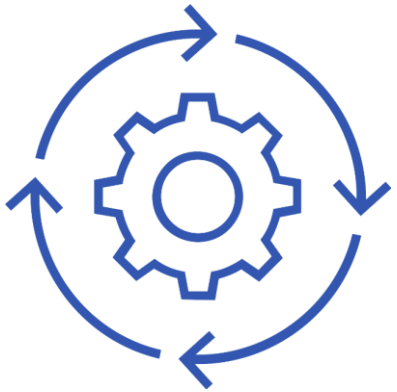
Nudge Clinicians

The design of practice environments heavily influences medical decision-making. We test and implement nudges to improve workflow and steer decisions towards evidence-based care.

Nudge Patients

Health behaviors have a significant impact on longer-term patient outcomes. We design and study interventions that increase engagement and significantly change behaviors.

Impact



50+
projects

12+
specialties

20+
team
members

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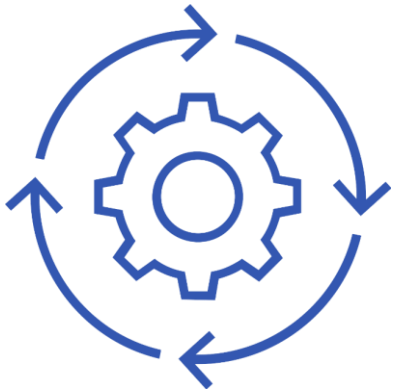

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Pediatrics
Endocrine
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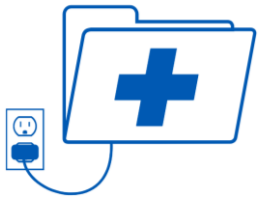
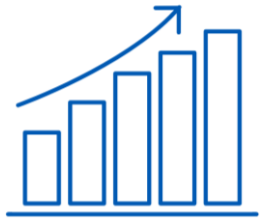
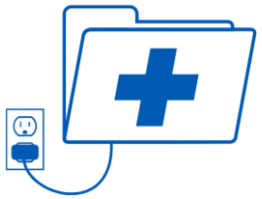
Prioritizing opportunities

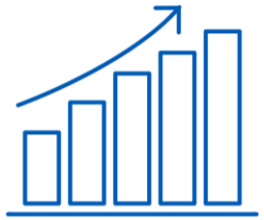




Prioritizing opportunities

Right fit for a nudge





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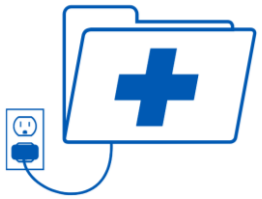

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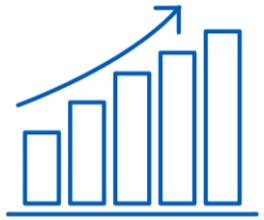

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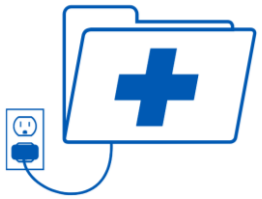

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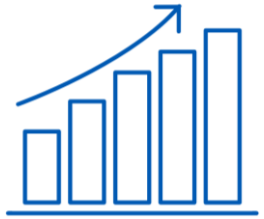

Potential for significant impact

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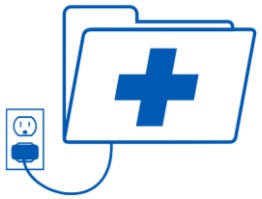

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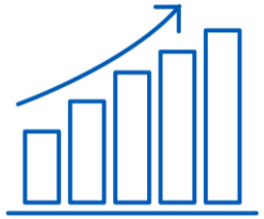


Potential for significant impact

David Asch, MD, MBA
Executive Director, Penn Medicine Center for Health Care Innovation

Patrick Brennan, MD
Chief Medical Officer and Senior Vice President, University of Pennsylvania Health System

Susan Day, MD, MPH
Associate Chief Medical Informatics Officer, University of Pennsylvania Health System

C. William Hanson, MD
Chief Medical Information Officer, University of Pennsylvania Health System

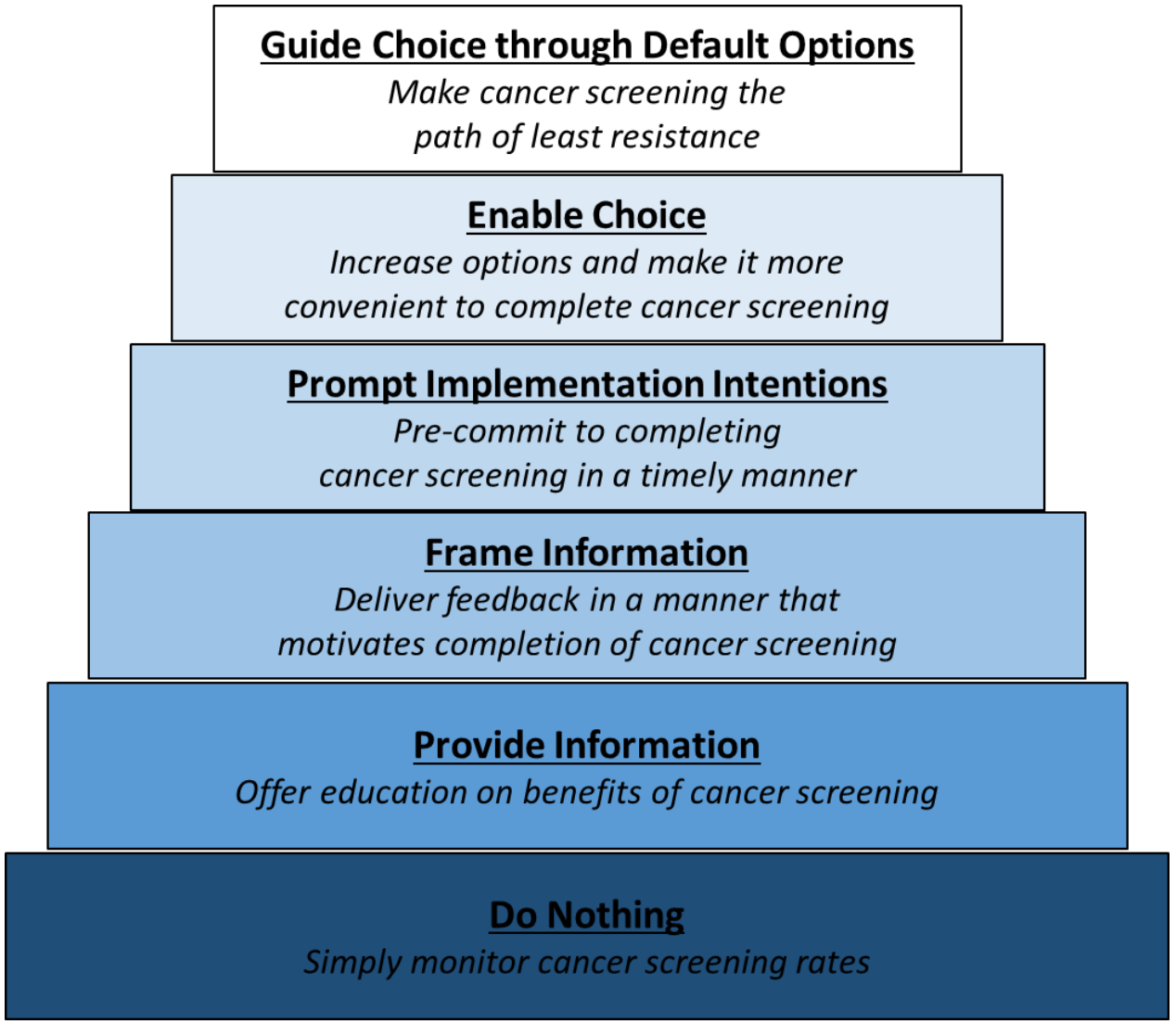
Judd Kessler, PhD, MPhil
Assistant Professor of Business Economics and Public Policy, The Wharton School of the University of Pennsylvania

Roy Rosin, MBA
Chief Innovation Officer, Penn Medicine

Christine VanZandbergen, MPH, MS PA-C
Associate CIO of Clinical Applications, University of Pennsylvania Health System

Kevin Volpp, MD, PhD
Janet and John Haas President's Distinguished Professor of Medicine, Medical Ethics and Health Policy, and Health Care Management Perelman School of Medicine and the Wharton School, University of Pennsylvania
Director, Center for Health Incentives and Behavioral Economics (CHIBE)

Nudges vary in their approach and effectiveness



Patel, Navathe, Liao. *JACR.* 2019

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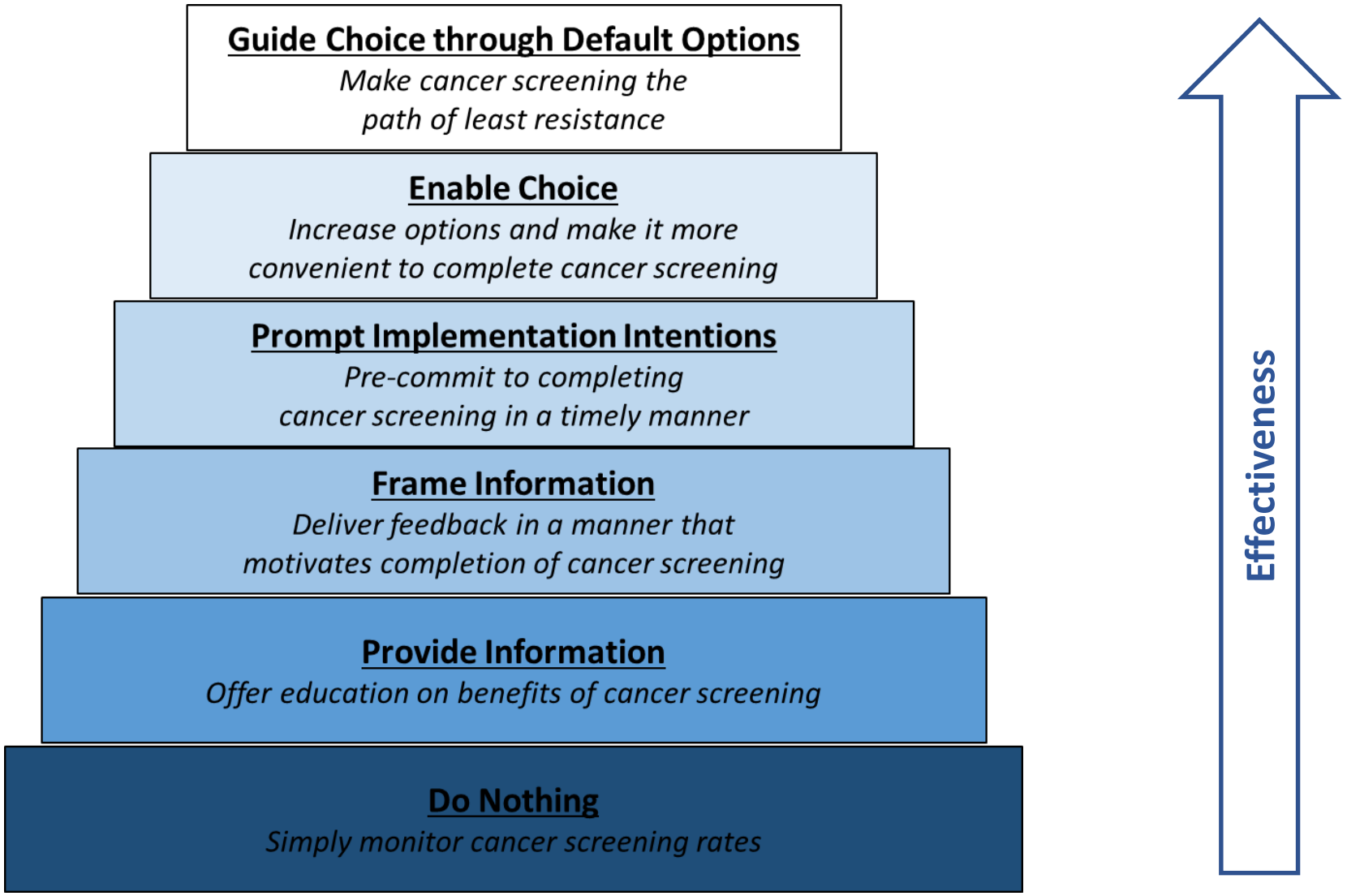

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Lessons from the Penn Medicine Nudge Unit

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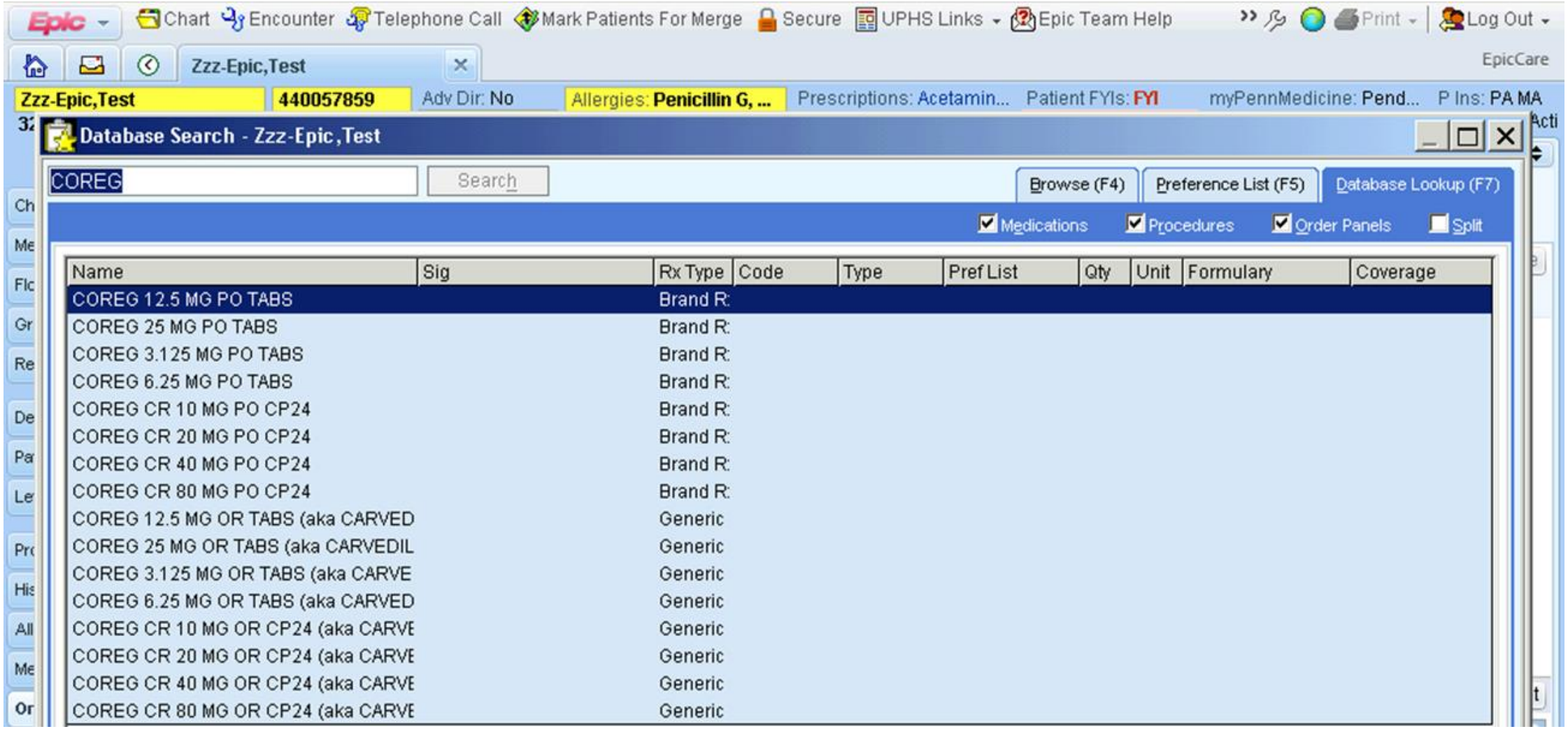

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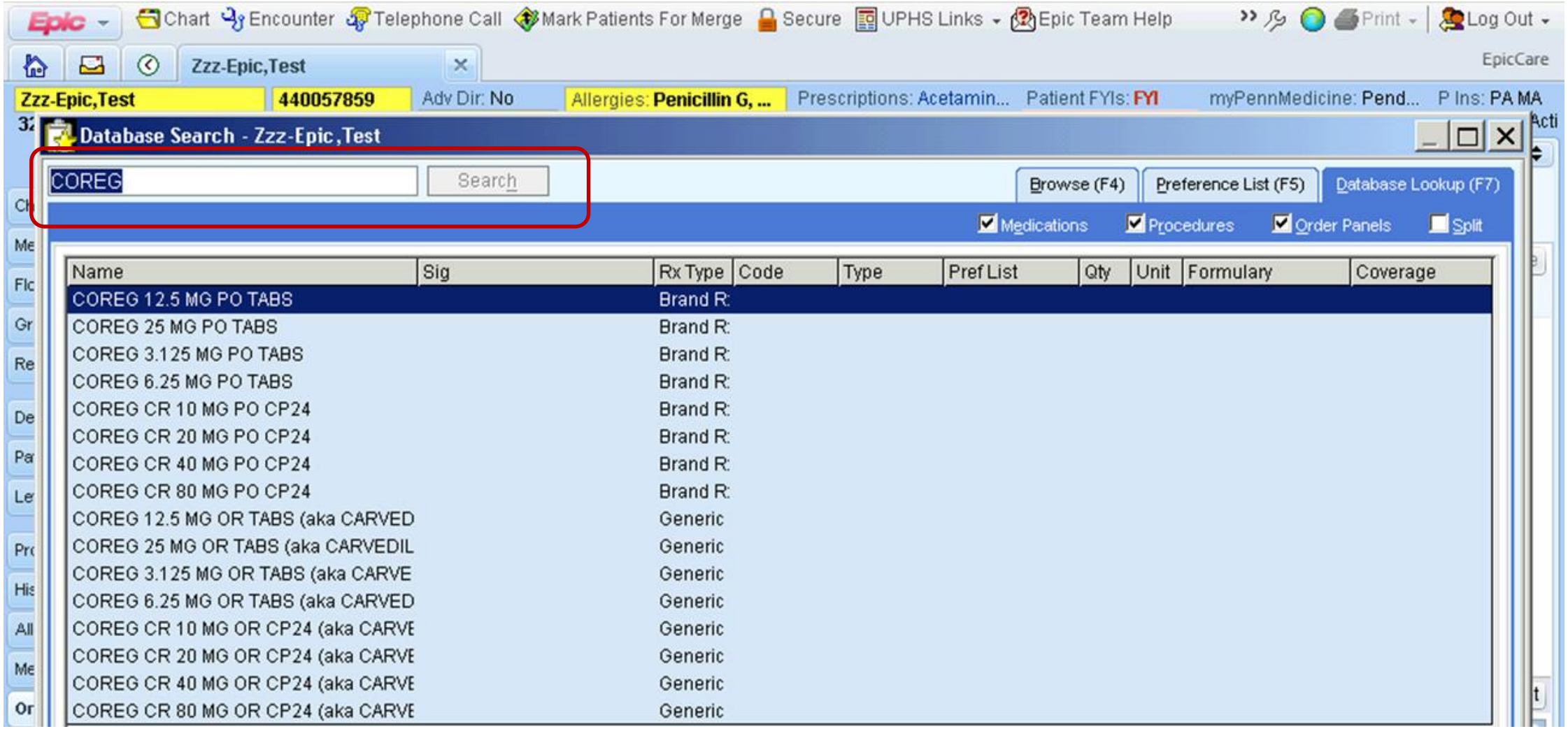

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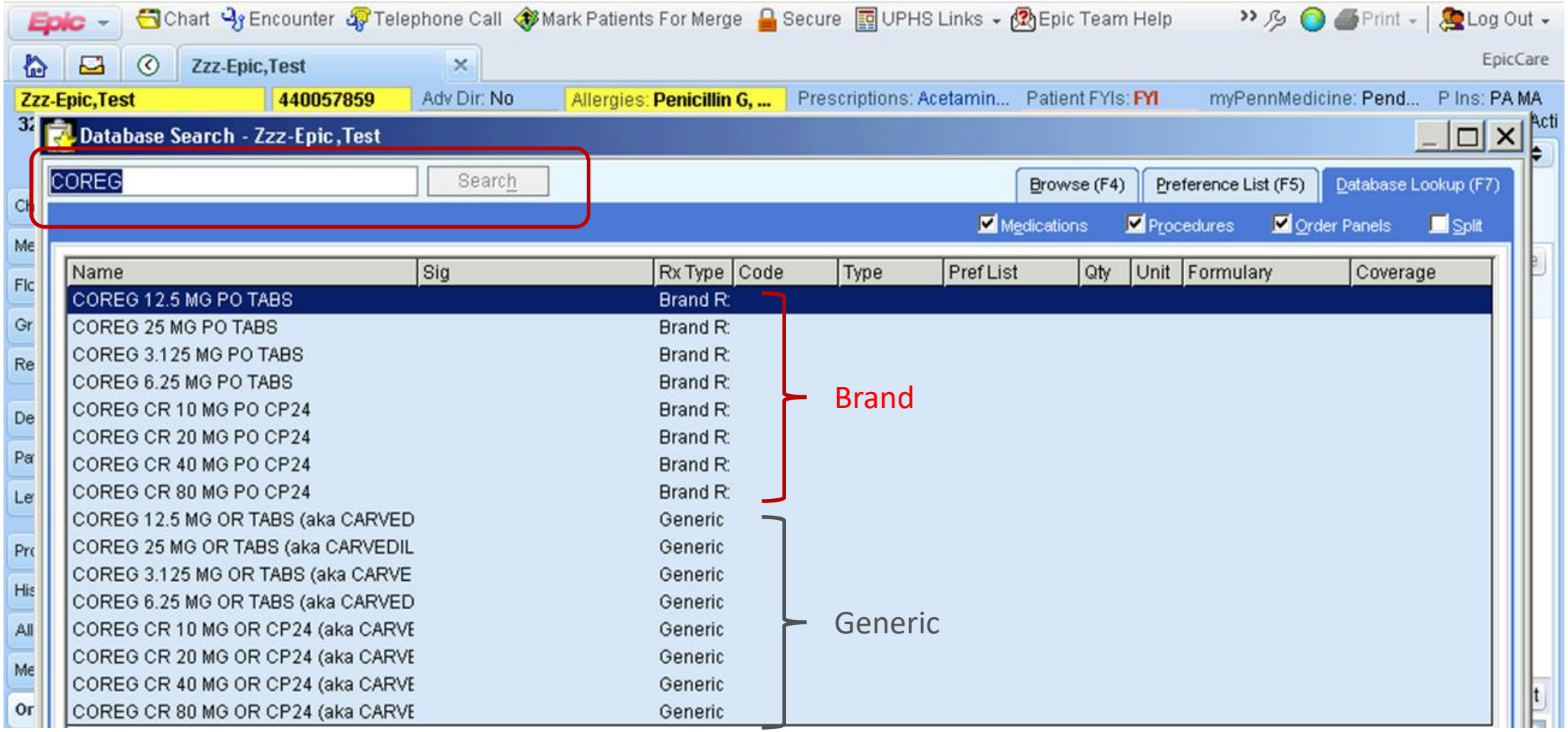

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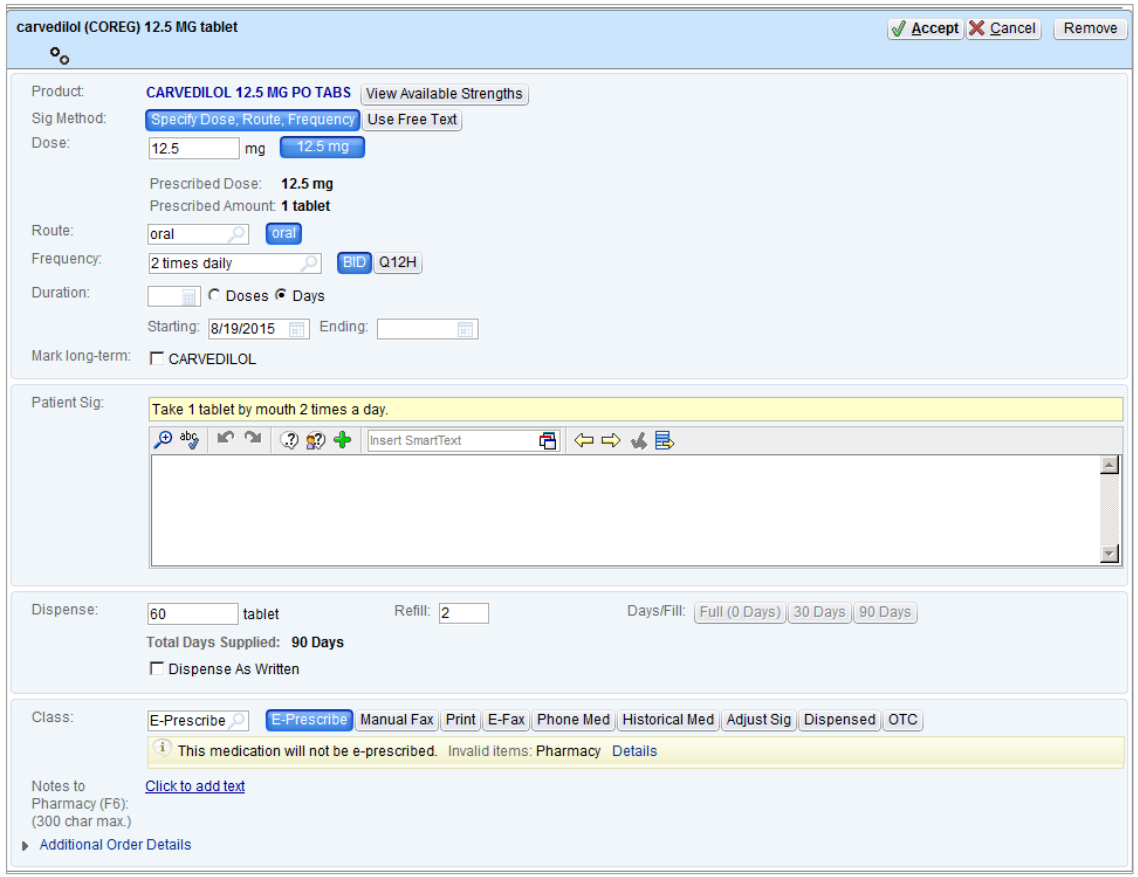

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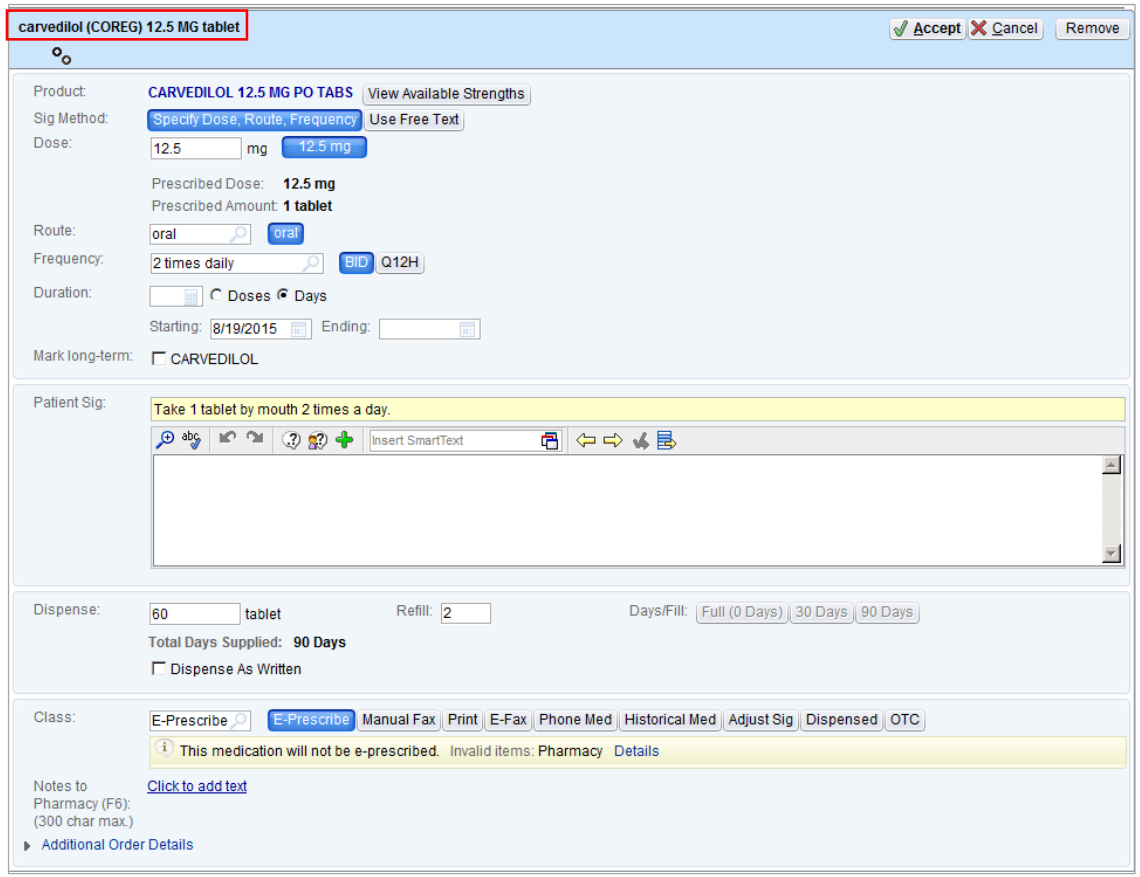

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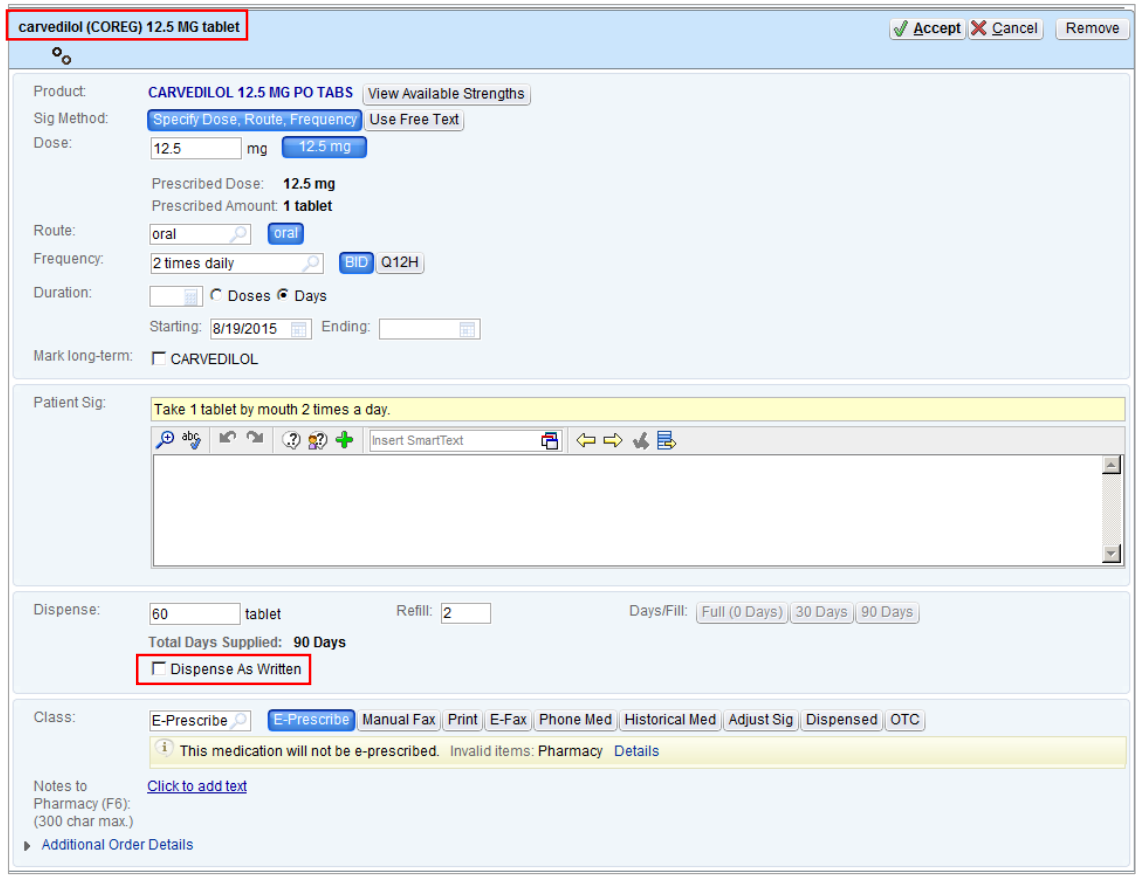

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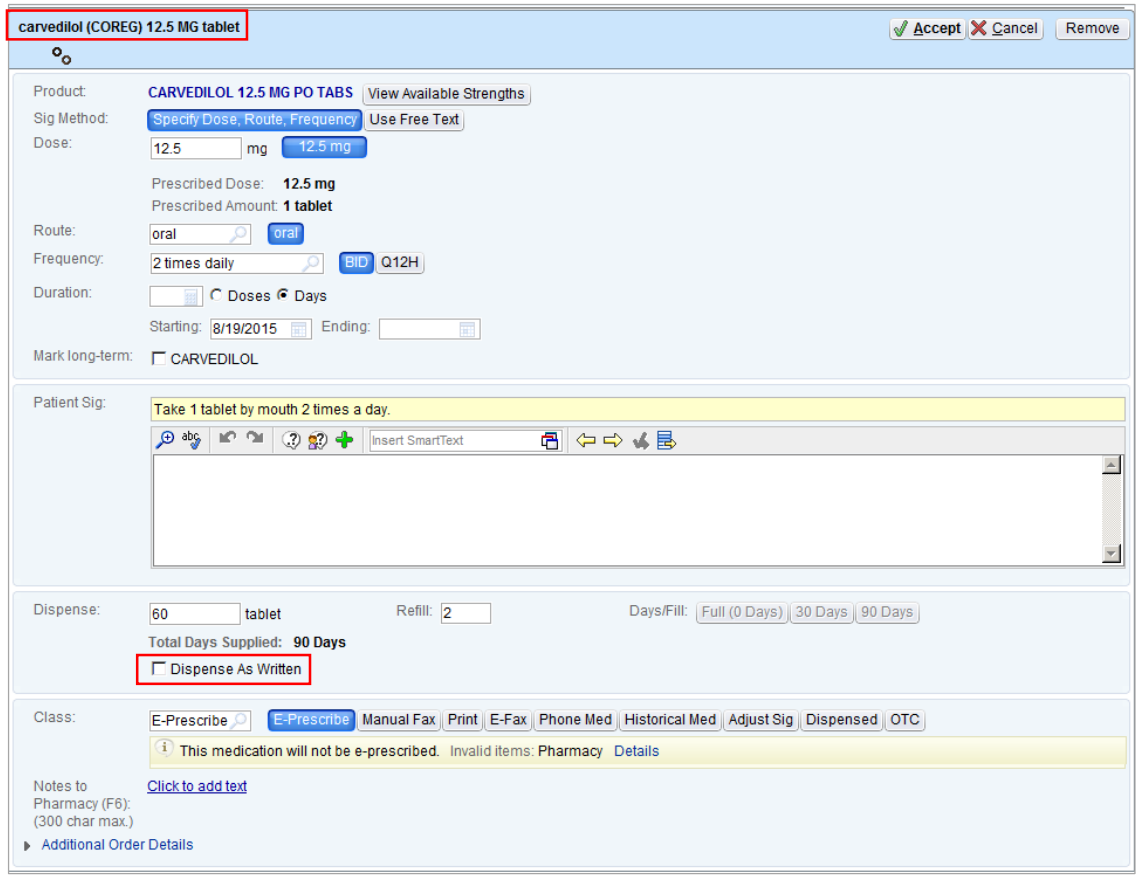

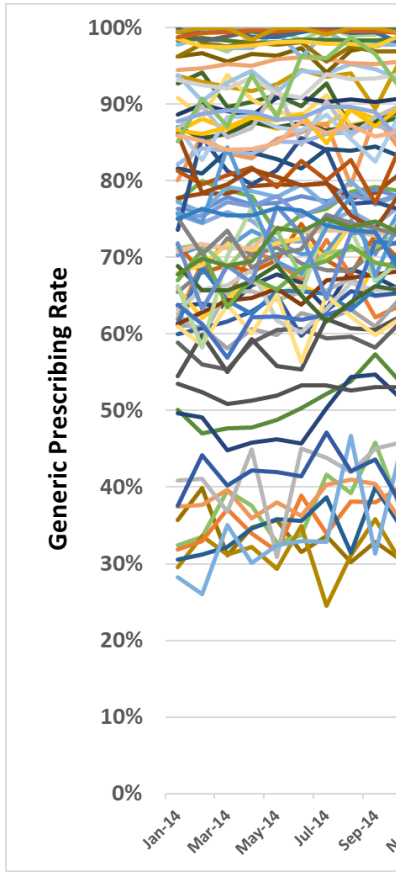

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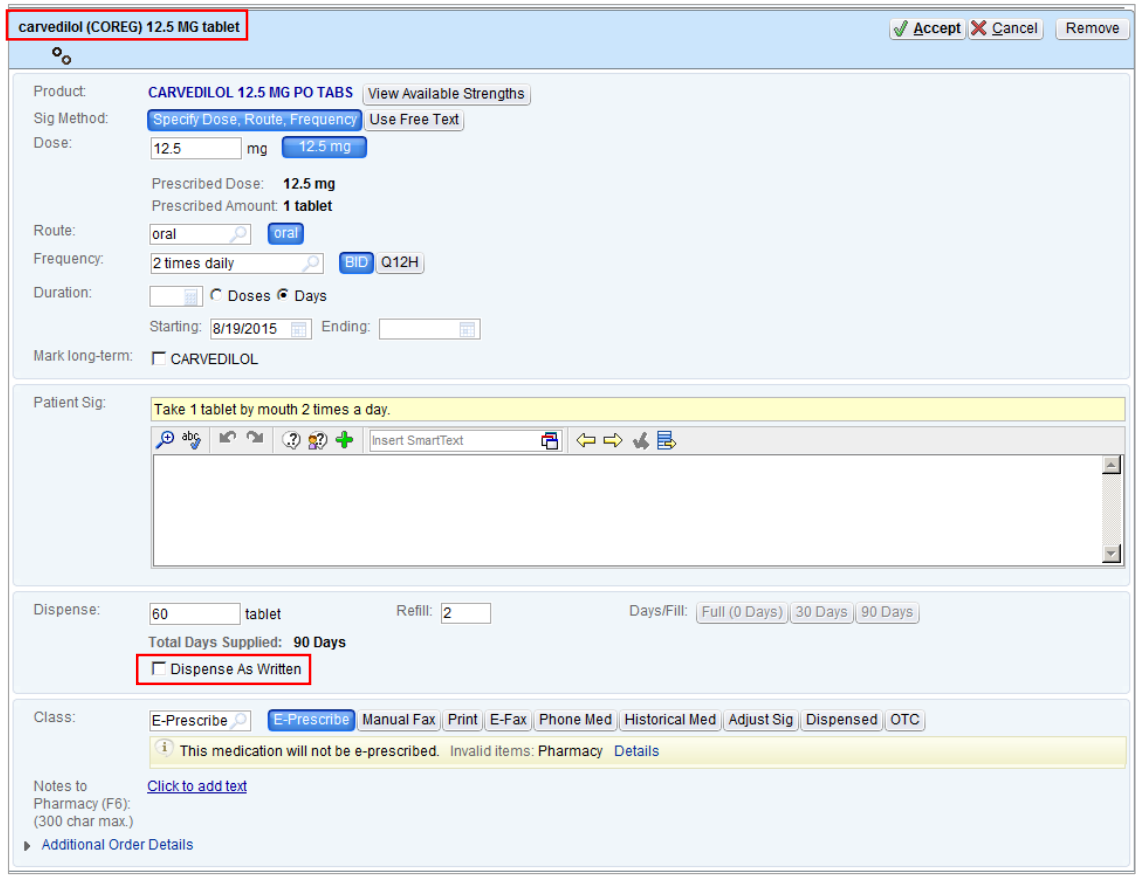

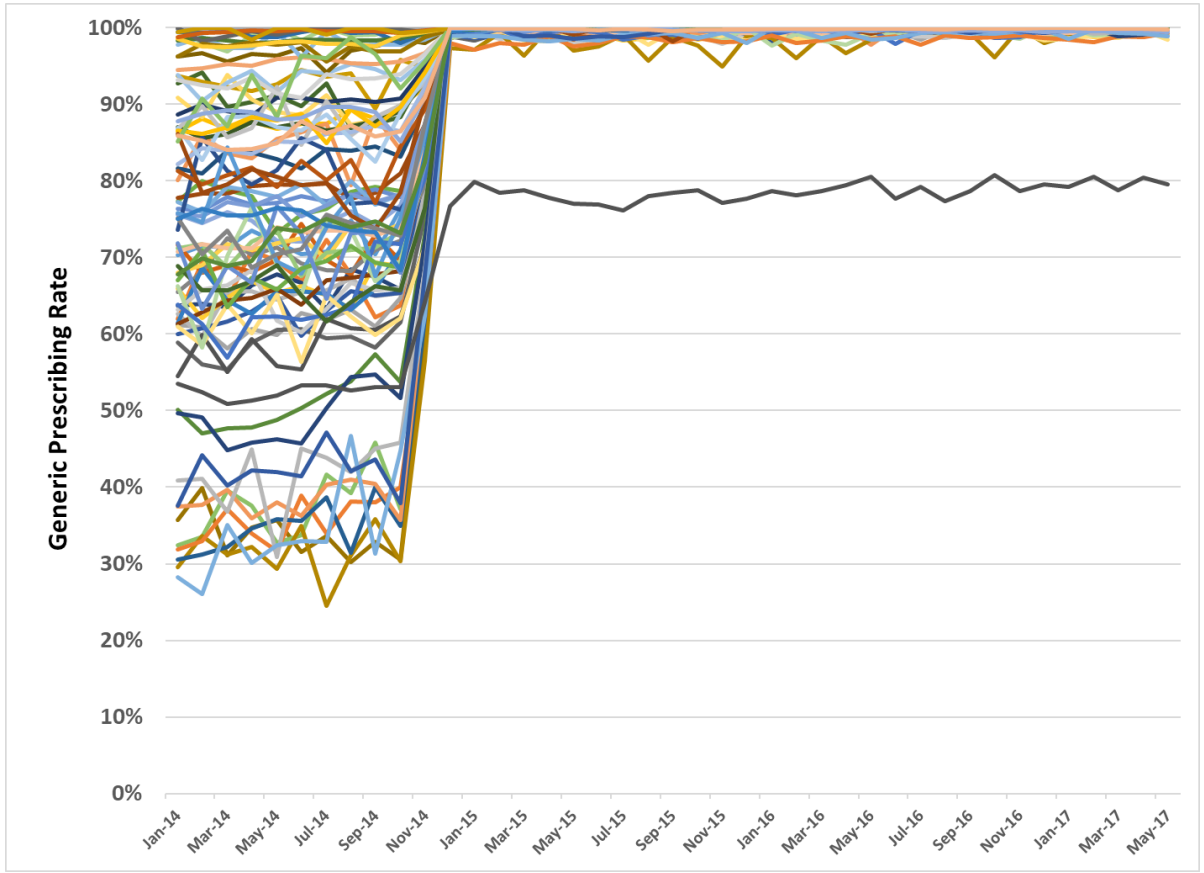

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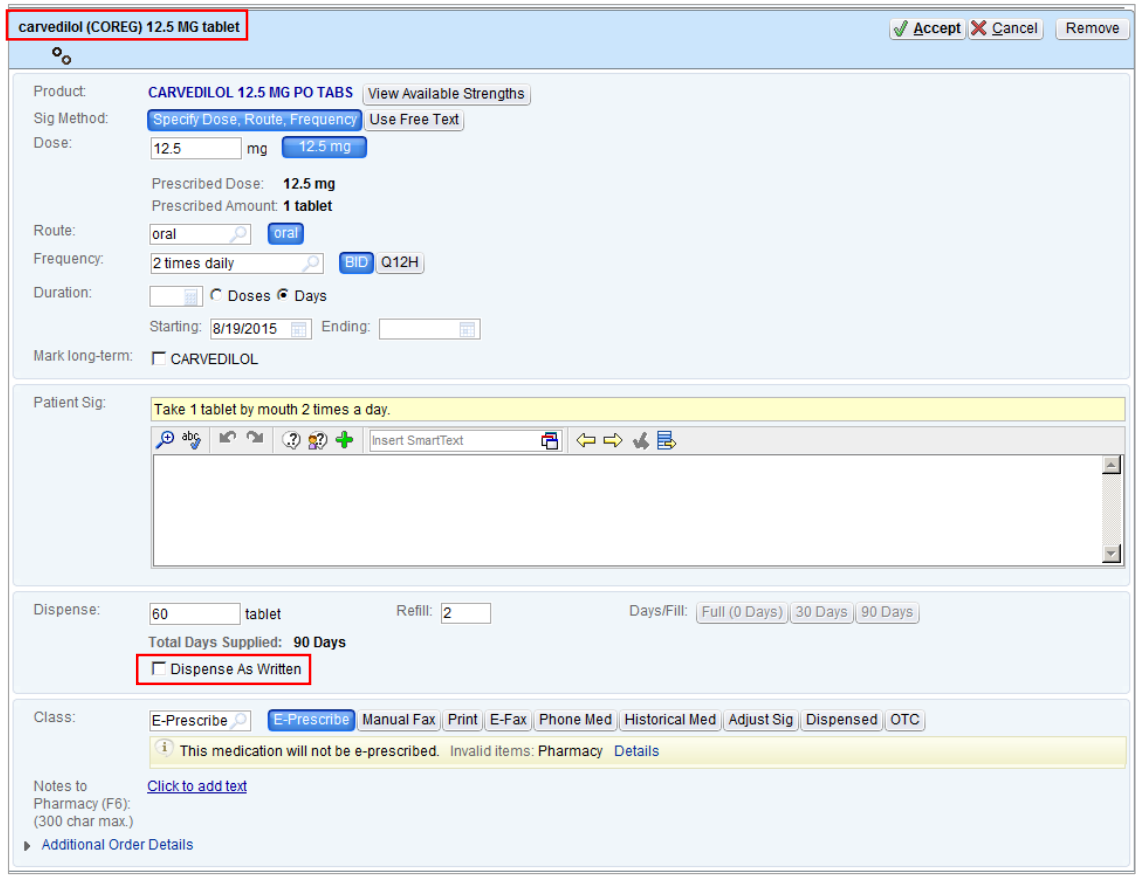

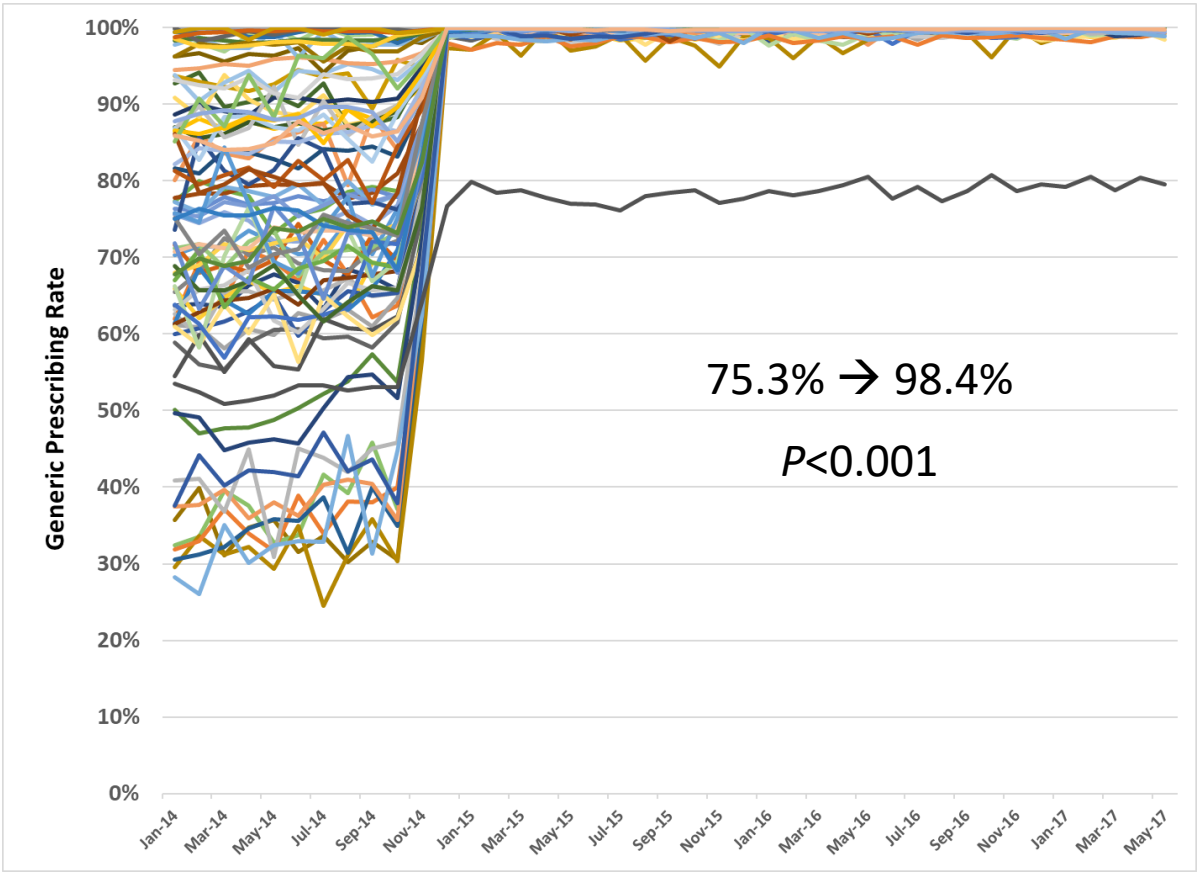

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CHIBE

Opioid addiction is linked to the size of the initial prescription

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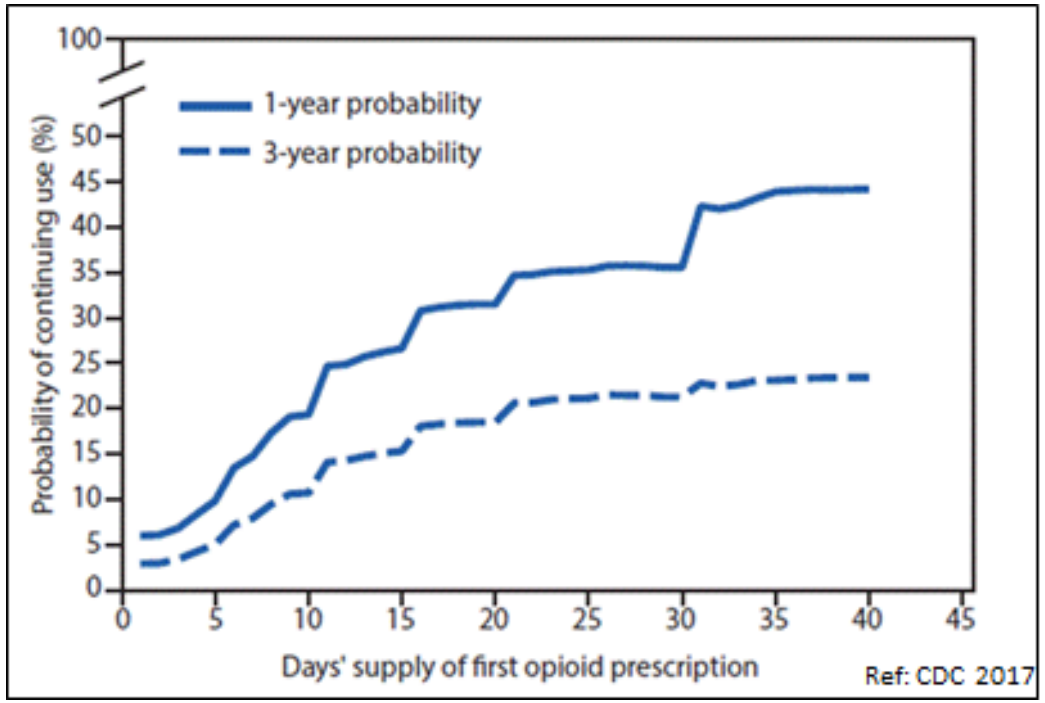

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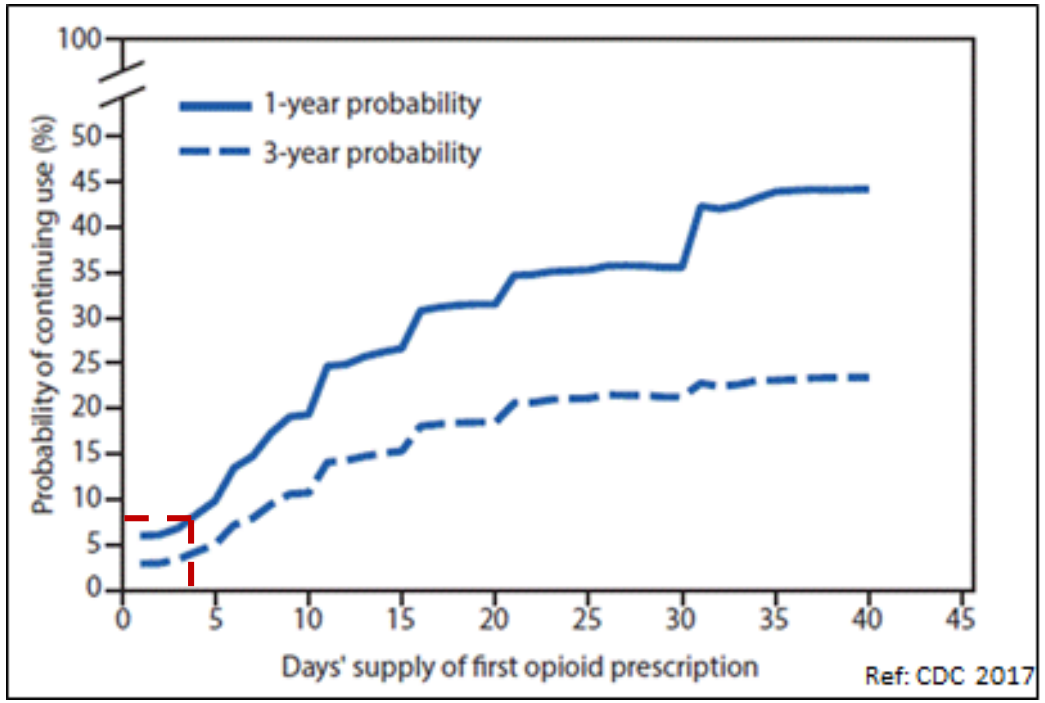

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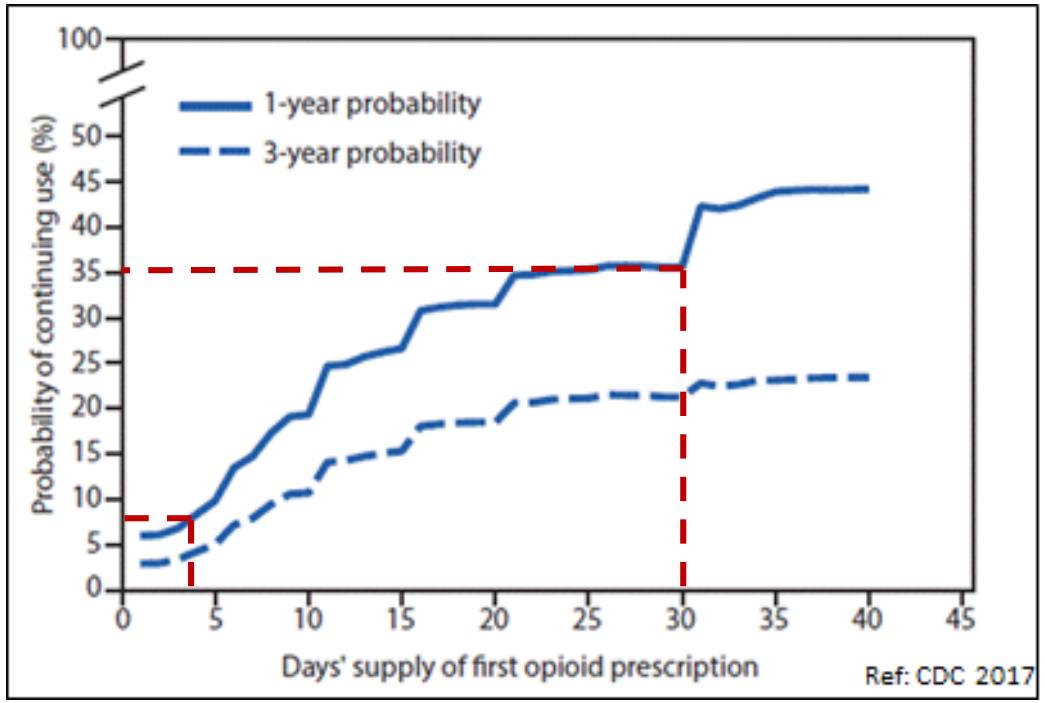

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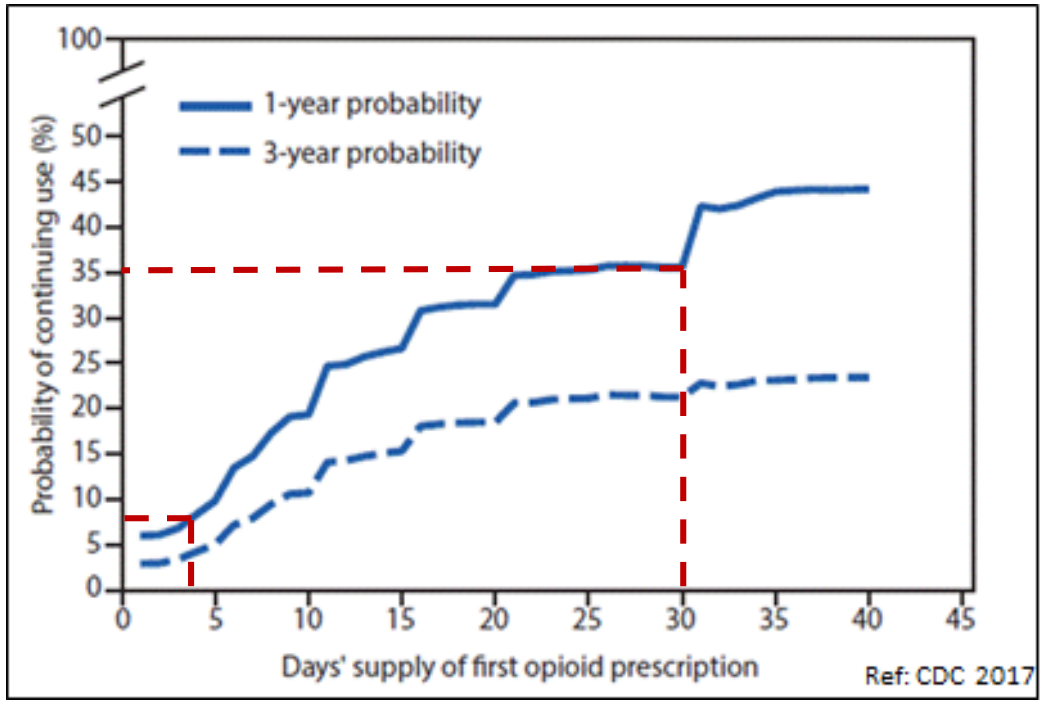
Implemented Opioid Prescription Defaults in the ED



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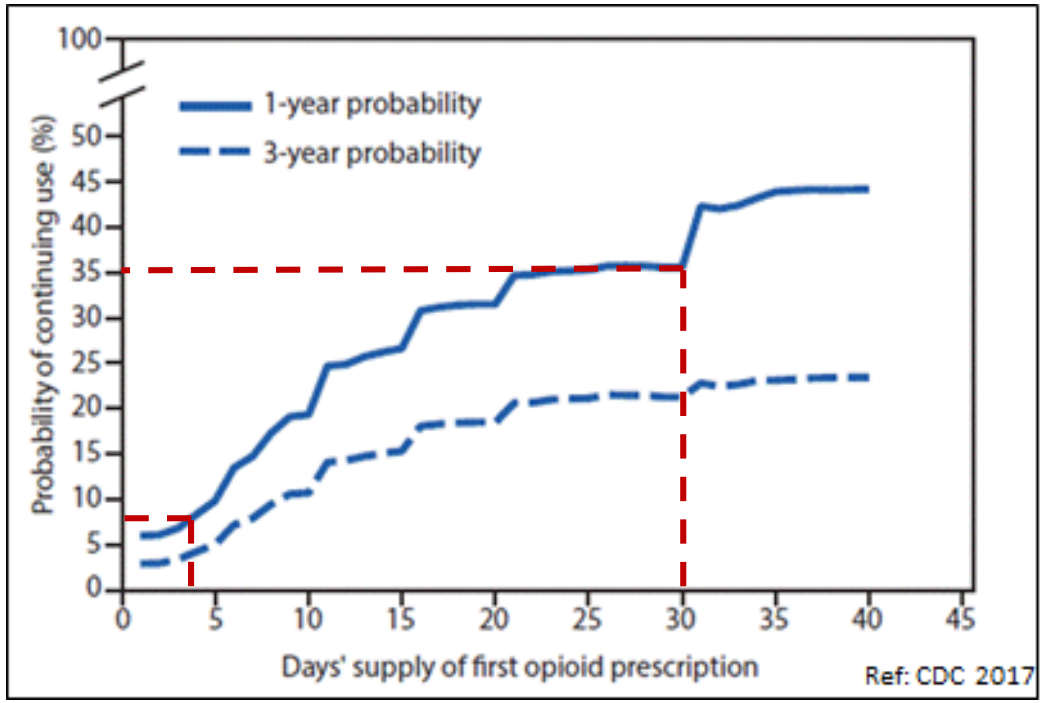

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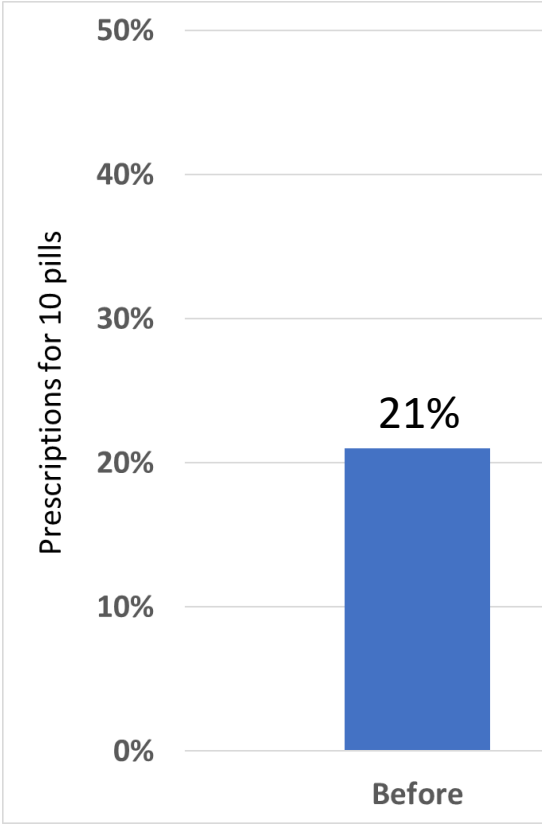

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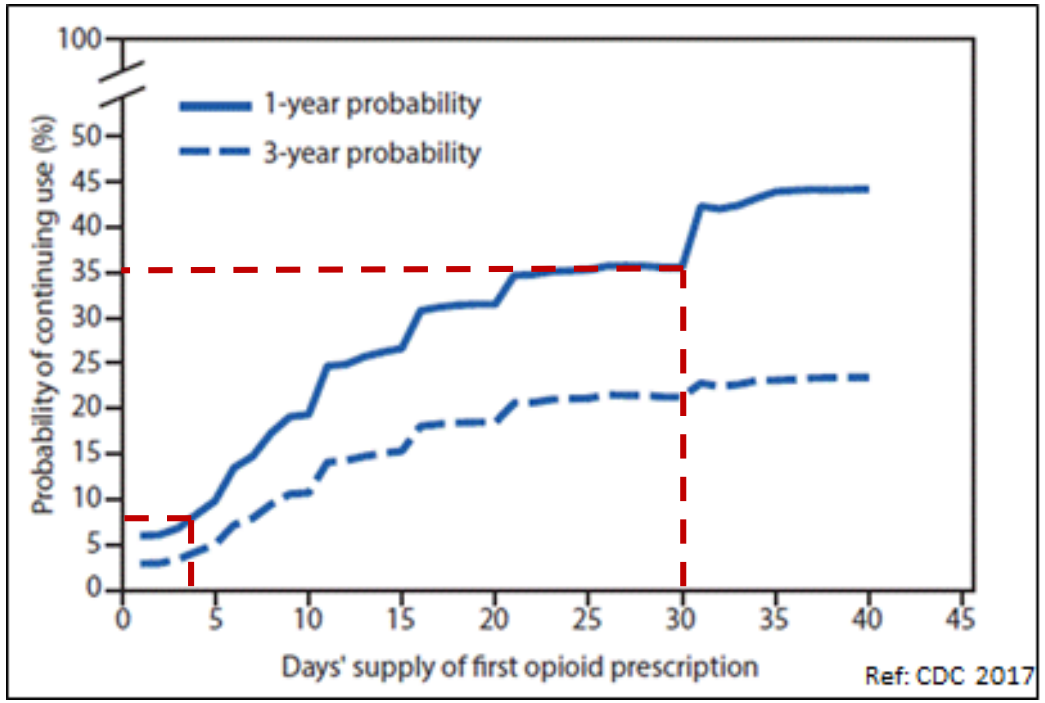

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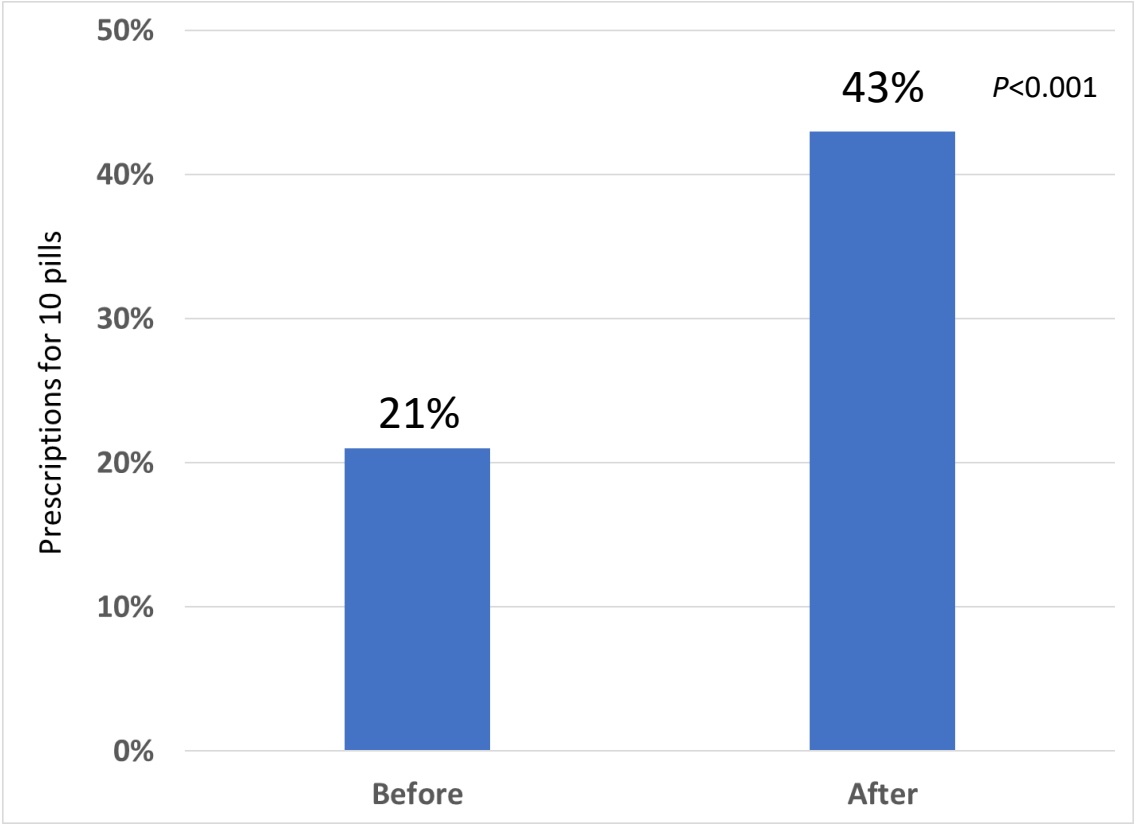

Delgado et al. *JGIM.* 2018

Reducing Unnecessary Imaging

Reducing Unnecessary Imaging

National guidelines recommend that palliative cancer patients do not have imaging to align radiation therapy

Reducing Unnecessary Imaging

National guidelines recommend that palliative cancer patients do not have imaging to align radiation therapy

80% of these patients at Penn Medicine received daily imaging

(e.g. 14 CT scans for a 2-week course of radiation)

Selecting a nudge intervention

Selecting a nudge intervention

Penn Medicine	Perelman Center for Advanced Medicine Department of Radiation Oncology
Patient Name: <Full Name>	**MRN:** <Patient Id 1>
DOB: <Date of Birth>	**Oncologist:** <Primary Care Physician-Name (Default)>
Treatment Instructions: General	

INSTRUCTIONS FOR:	
Course: <Course-Elapsed Days of Treatment (Default)> ☐ x All Plans OR ☐ Specific Plans:	
IGRT-LOCALIZATION INSTRUCTIONS:	
PRIMARY (Match for Treatment)	**SECONDARY (EVAL)**
Modality: CBCTNone	Modality: -Select-
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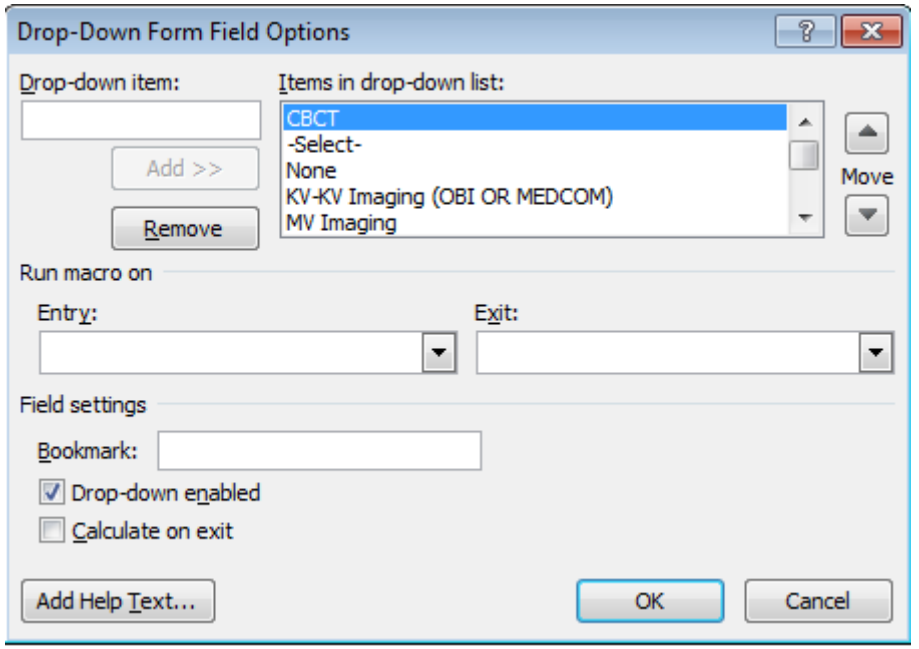

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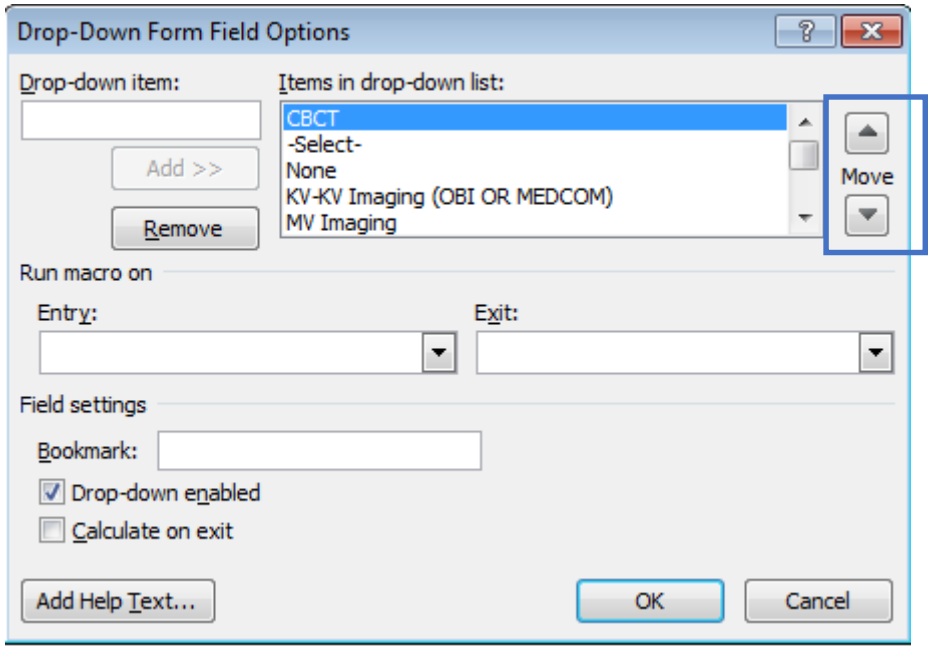
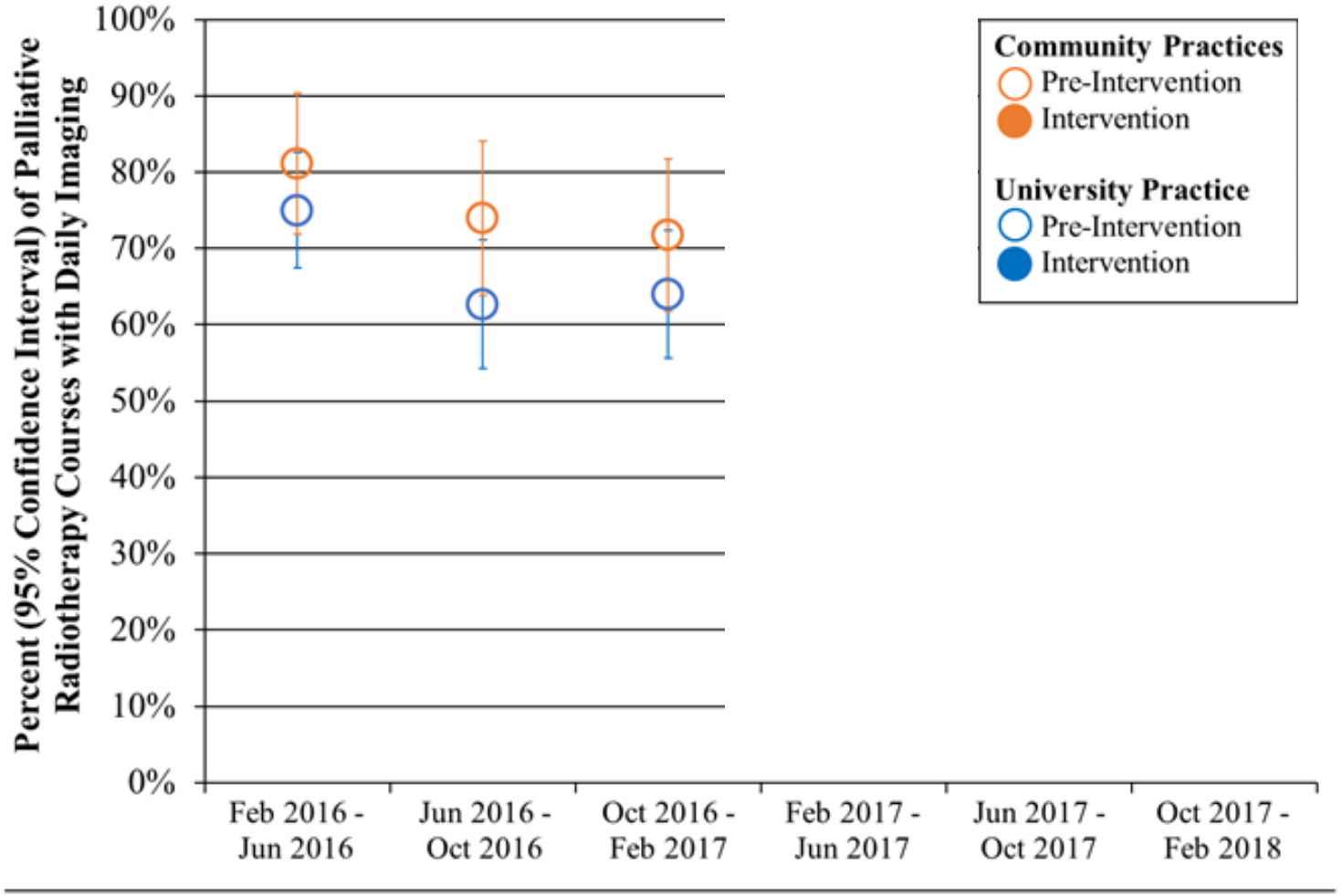


Imaging for Palliative Cancer Patients

Sharma et al. *JAMA Oncology.* 2019

Imaging for Palliative Cancer Patients

Figure. Unadjusted Trends in Daily Imaging During Palliative Radiotherapy



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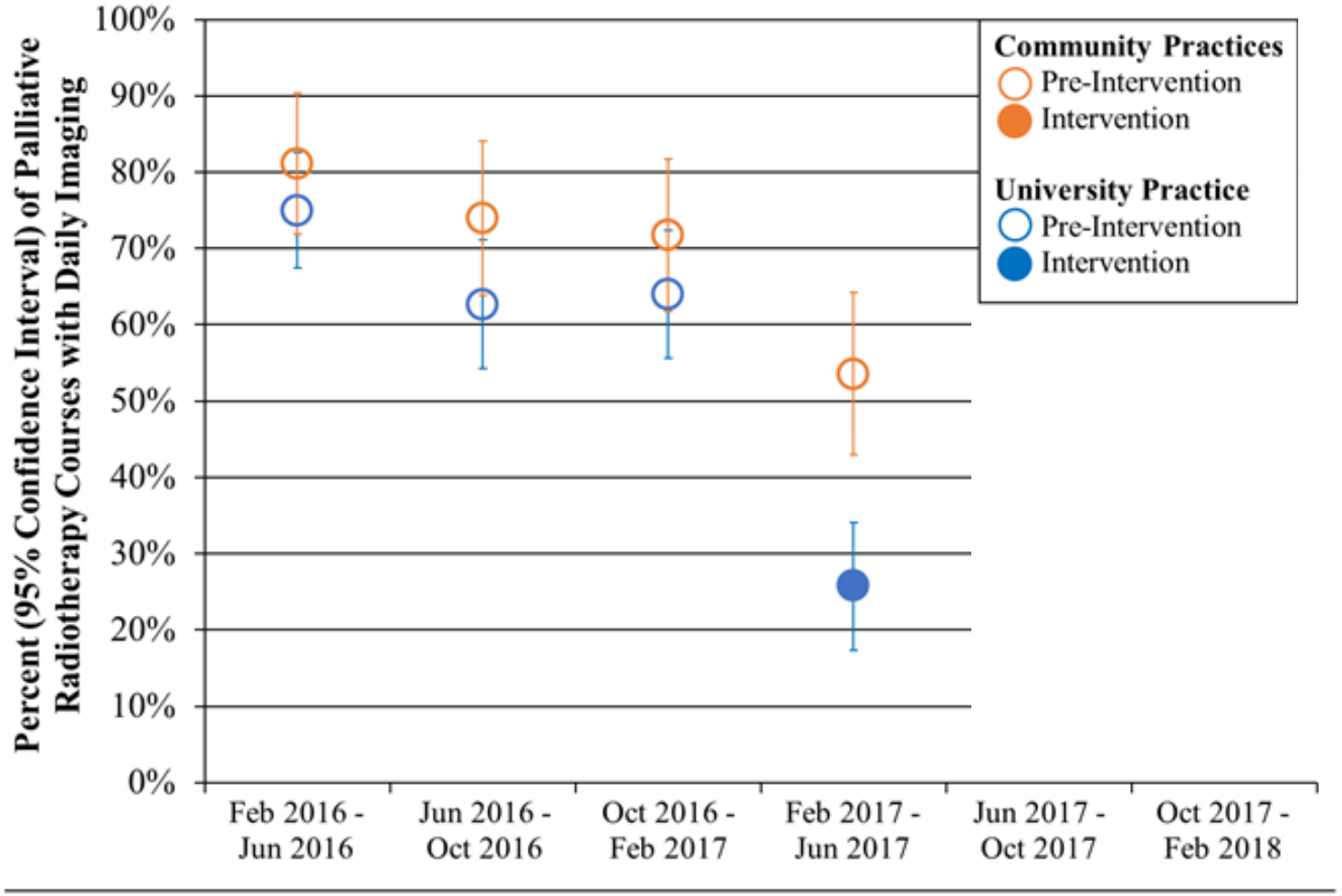

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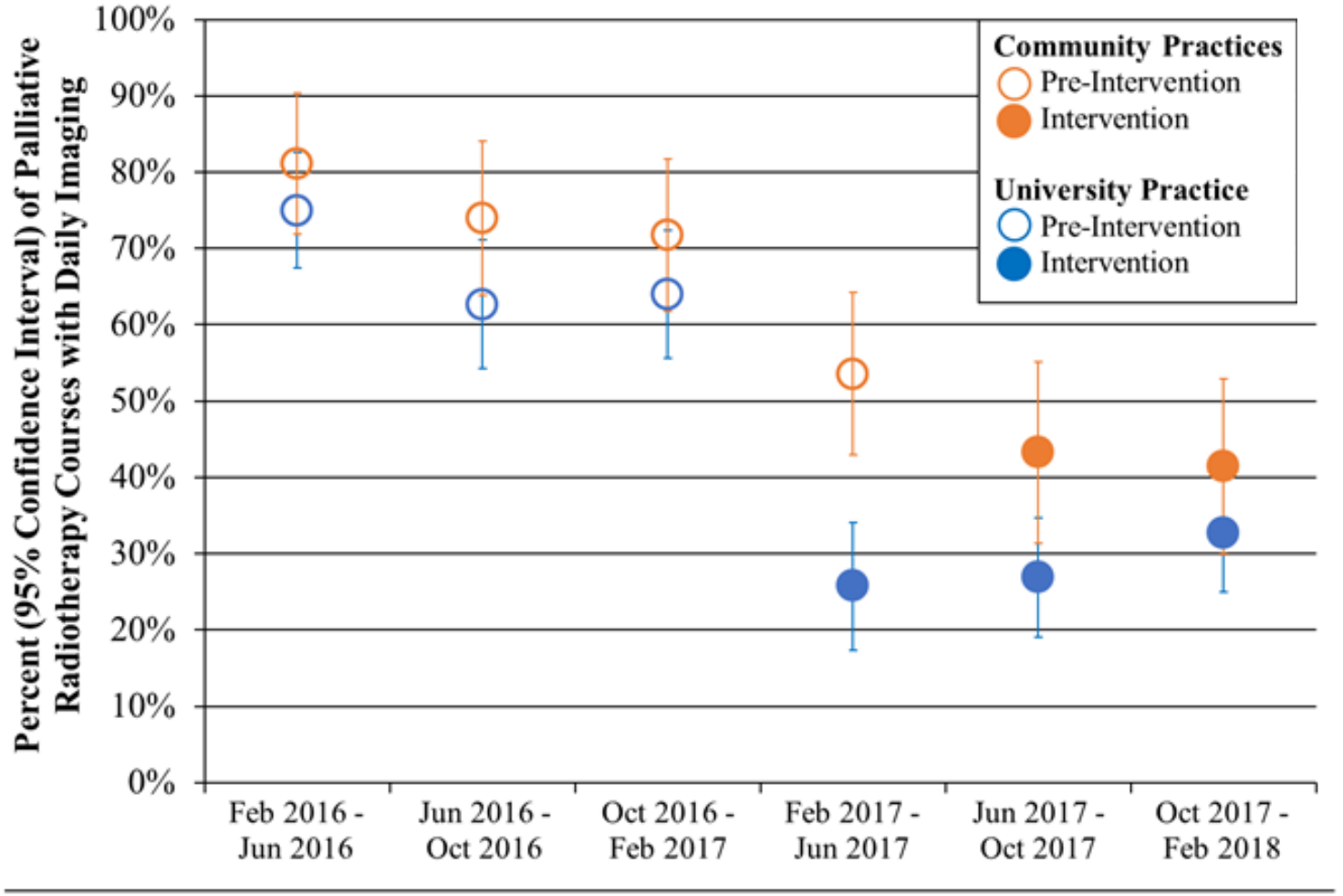

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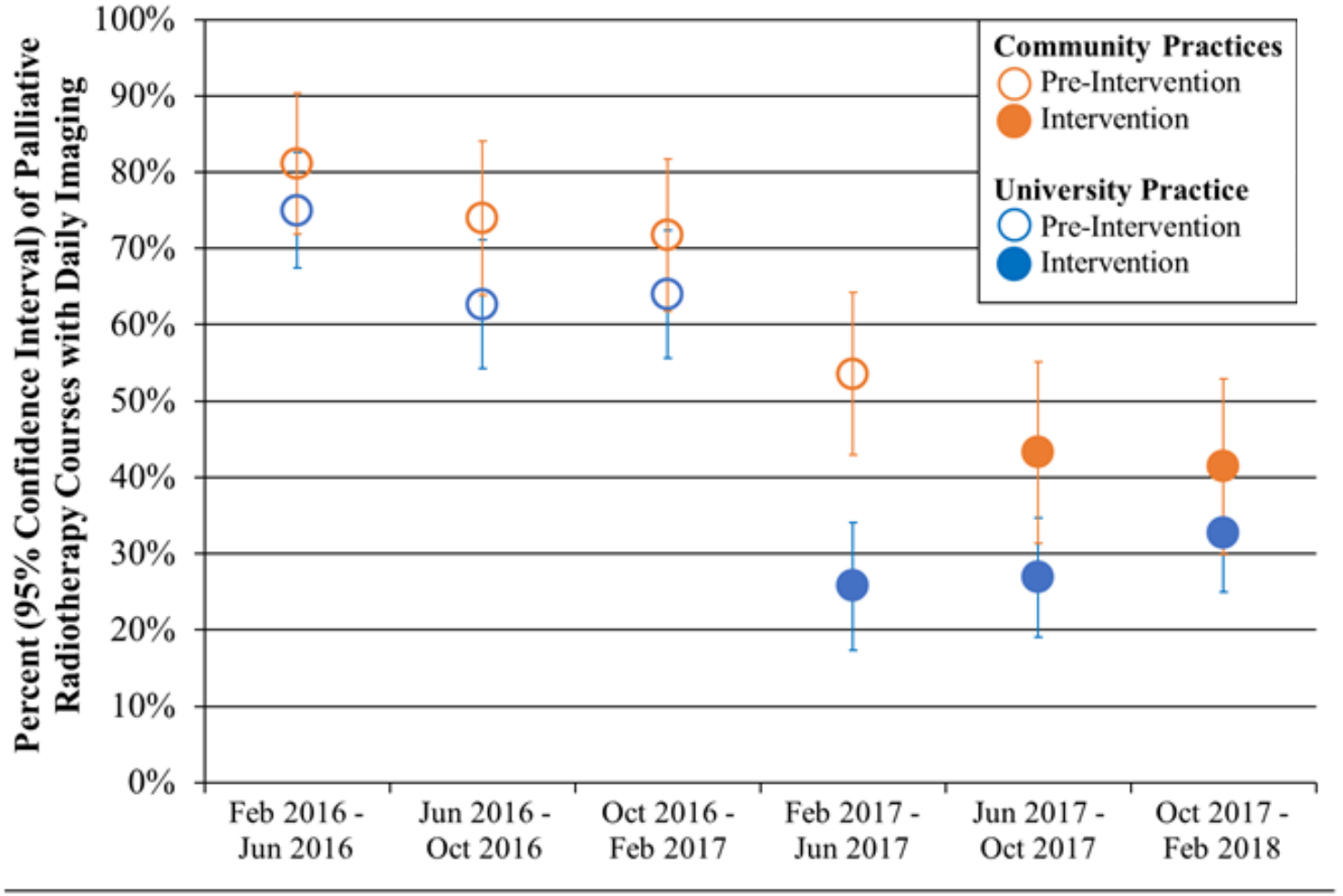
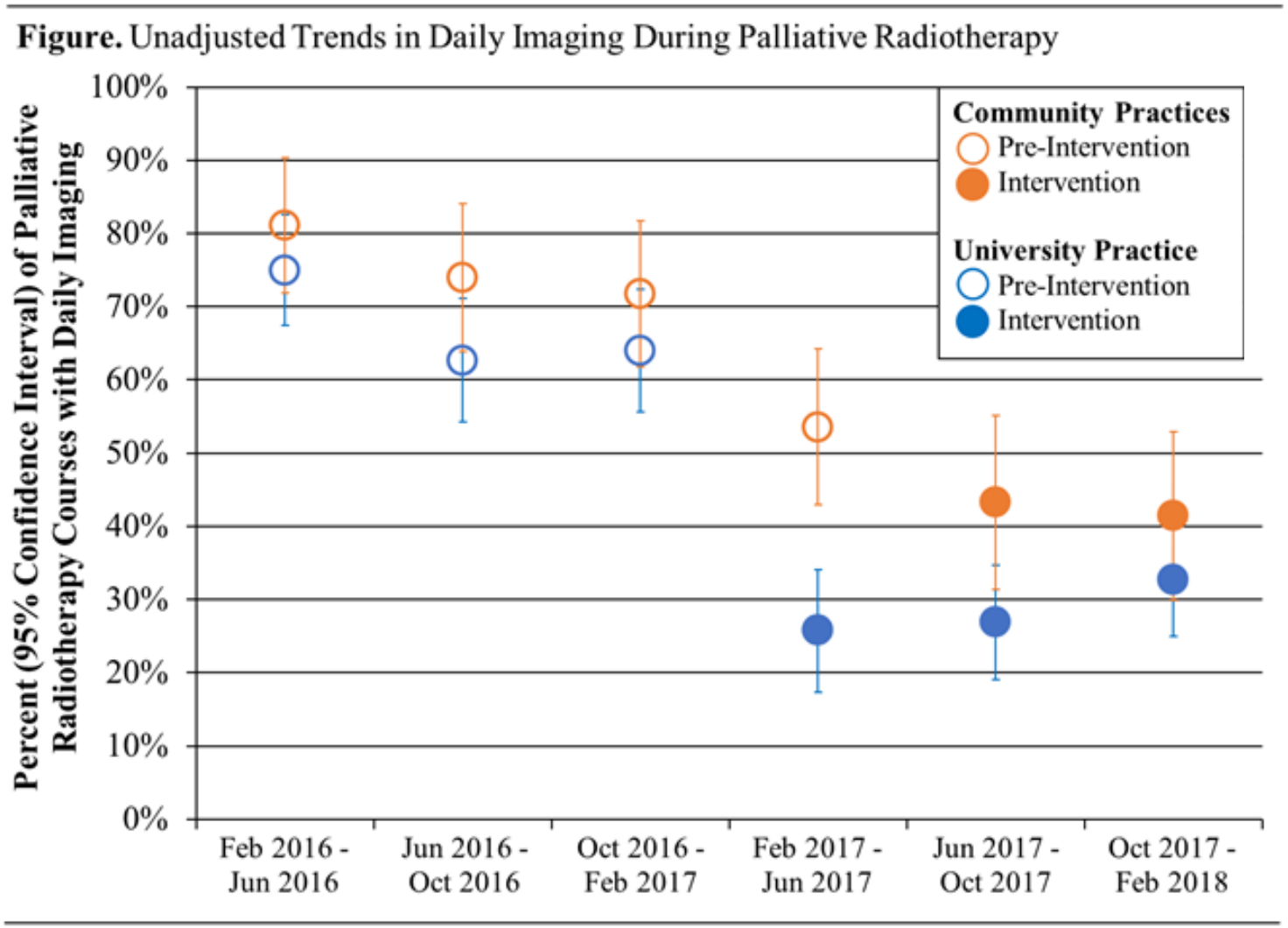


68.2% → 32.4%

***P*<0.01**

Sharma et al. *JAMA Oncology.* 2019

Imaging for Palliative Cancer Patients



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3000 less imaging tests per year

The Nudge Unit | Penn Medicine

Sharma et al. *JAMA Oncology.* 2019

CHIBE

Complex Decision Pathways

Cardiac rehab referral

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- Evidence-based pathway
  - Demonstrated to reduce mortality and readmissions by up to 30%

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  - More than 25% of hospitals in the US refer less than 20% of their patients
- Manual opt-in process
  - Cardiologists had to complete paper form with 12+ fields while on rounds
  - Patients had to identify a rehab center on their own and check insurance coverage

Redesigned as an opt-out decision pathway

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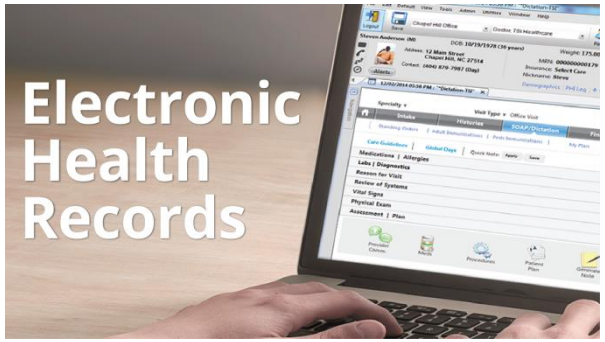
Automate identification and notification



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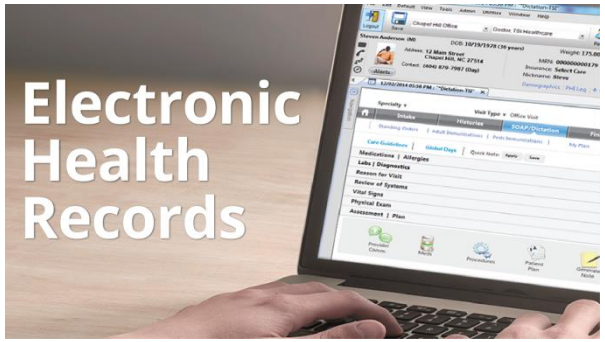
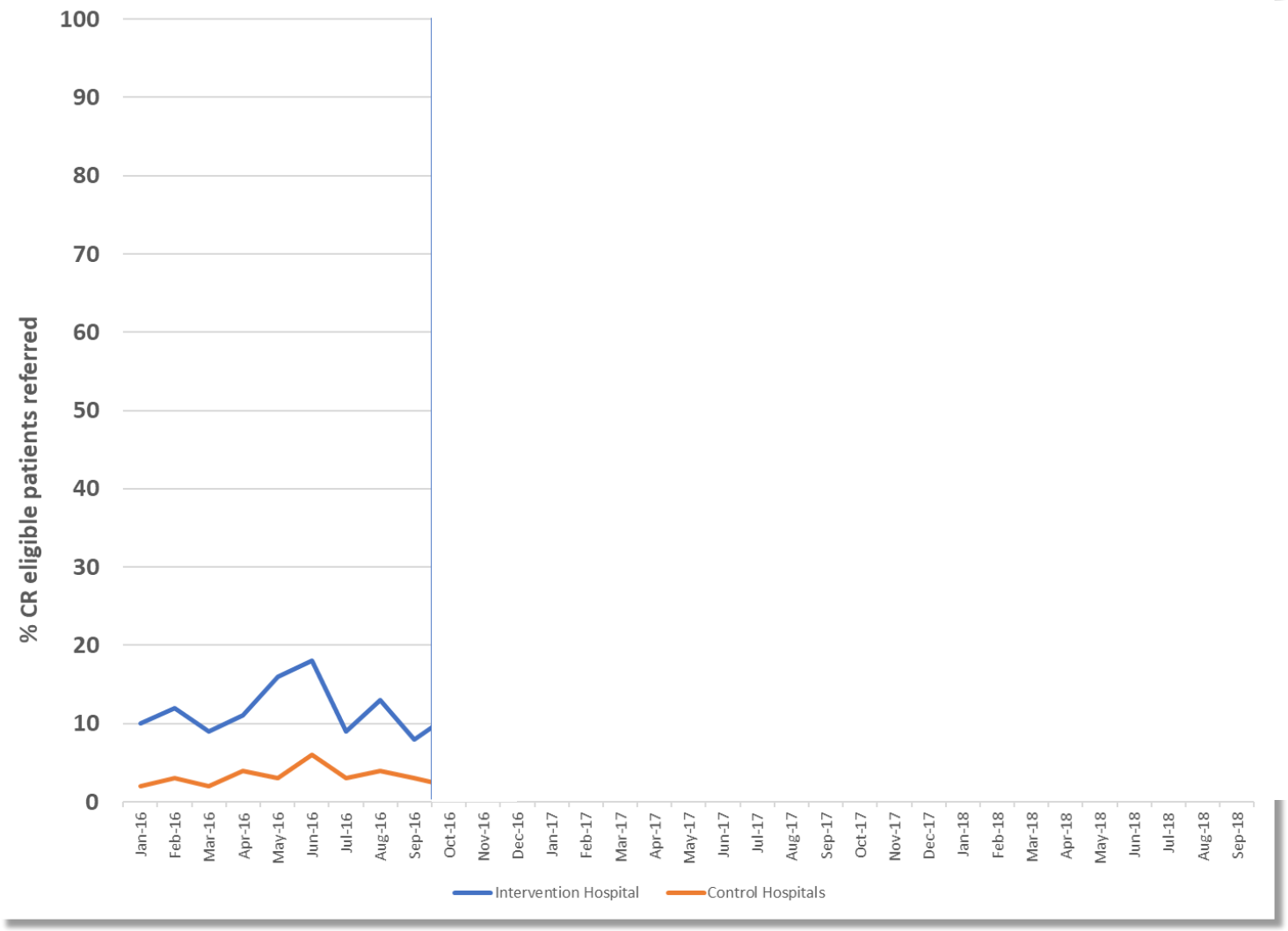


Restructure rounding and discharge process

Cardiac Rehab Referral Rates Over Time



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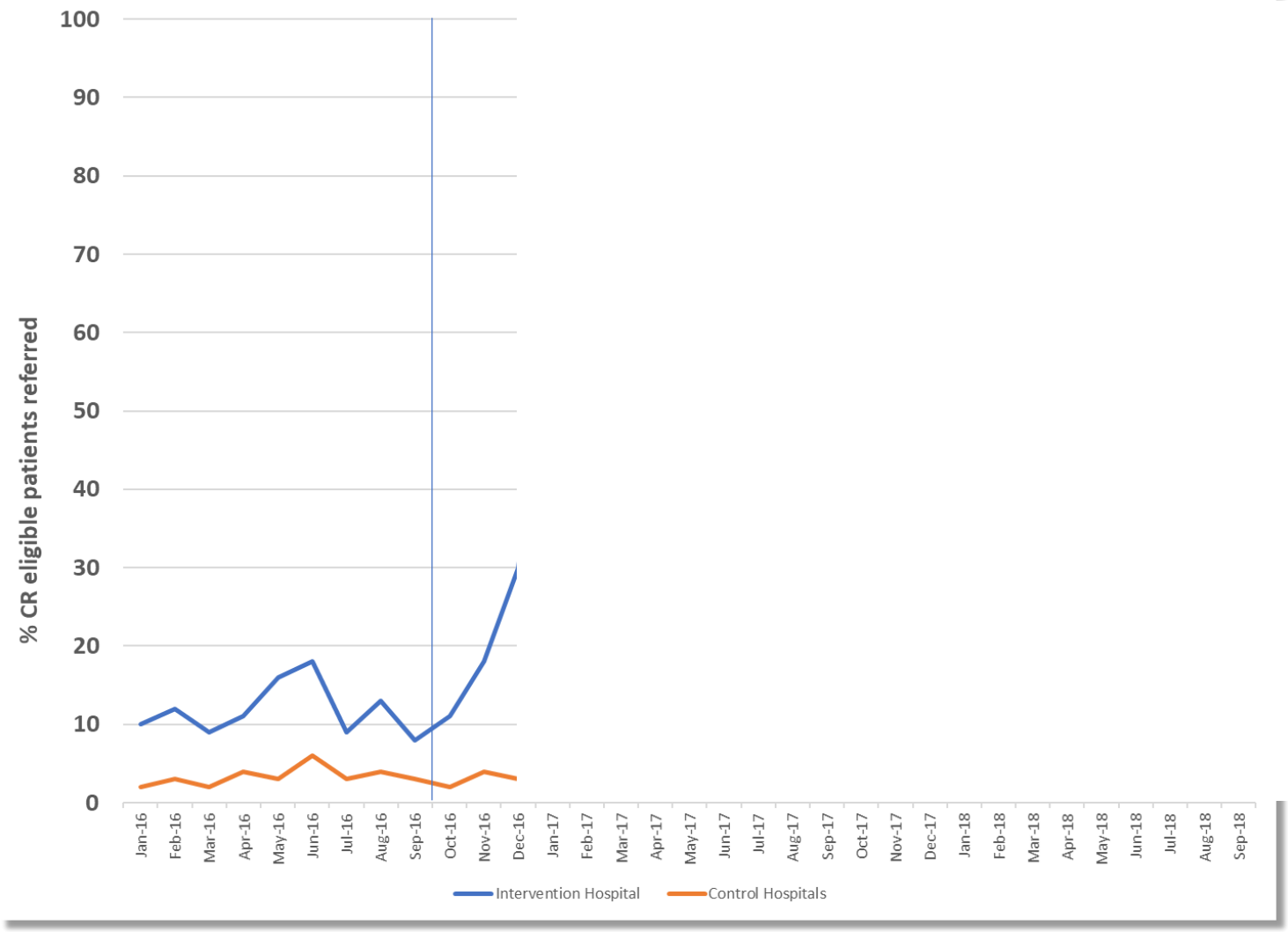

Adusumalli, Patel et al. *Under Review*

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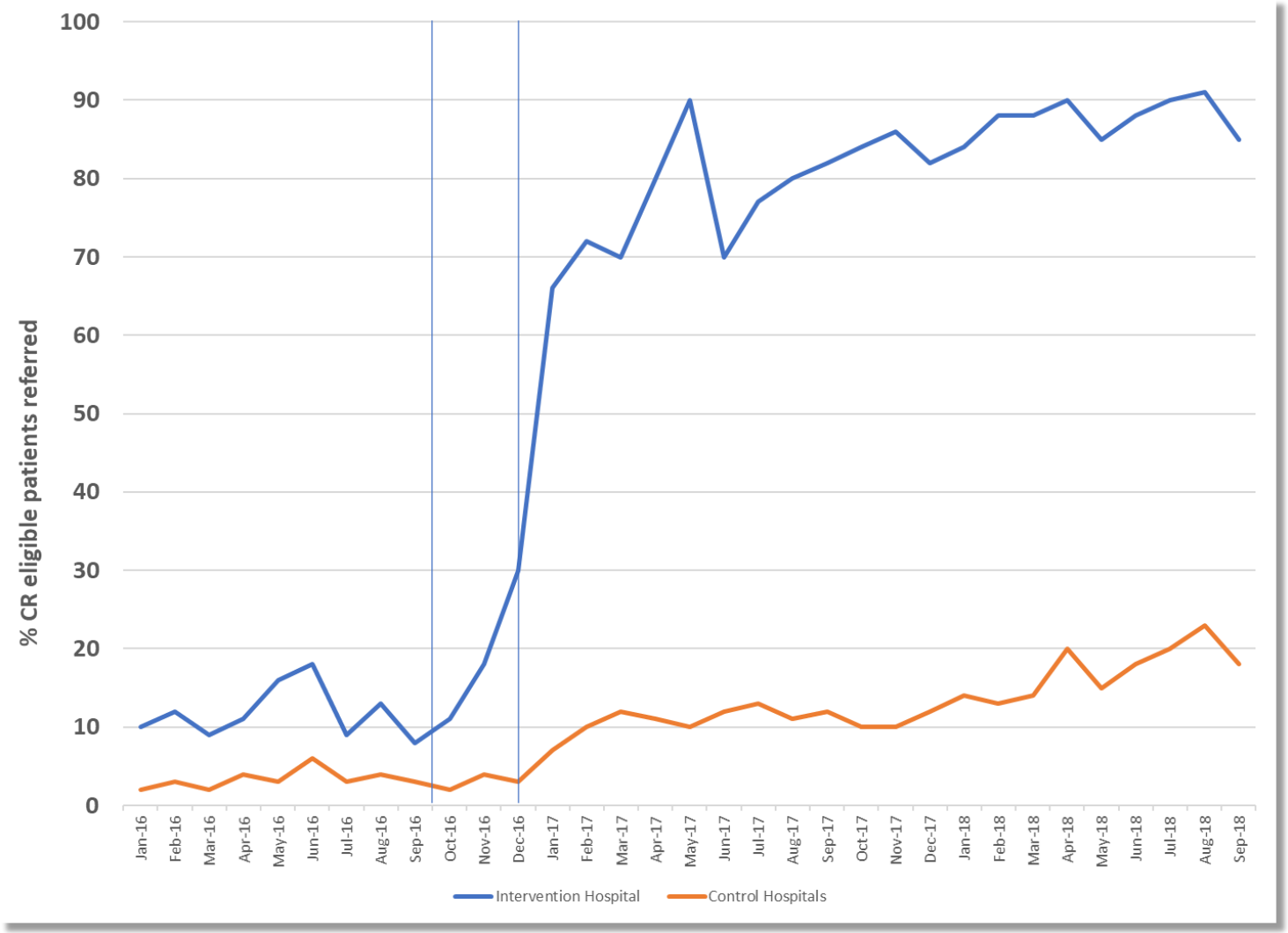

Adusumalli, Patel et al. *Under Review*

Active Choice Framing

Active choice to prompt decision-making

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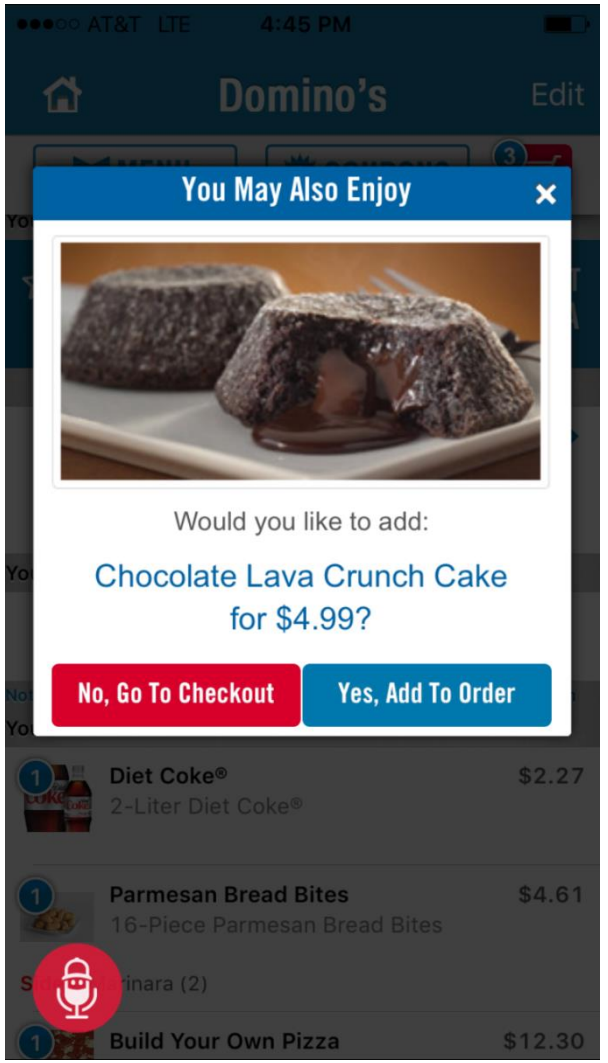

Influenza vaccination rates

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Patel et al. *JGIM.* 2017

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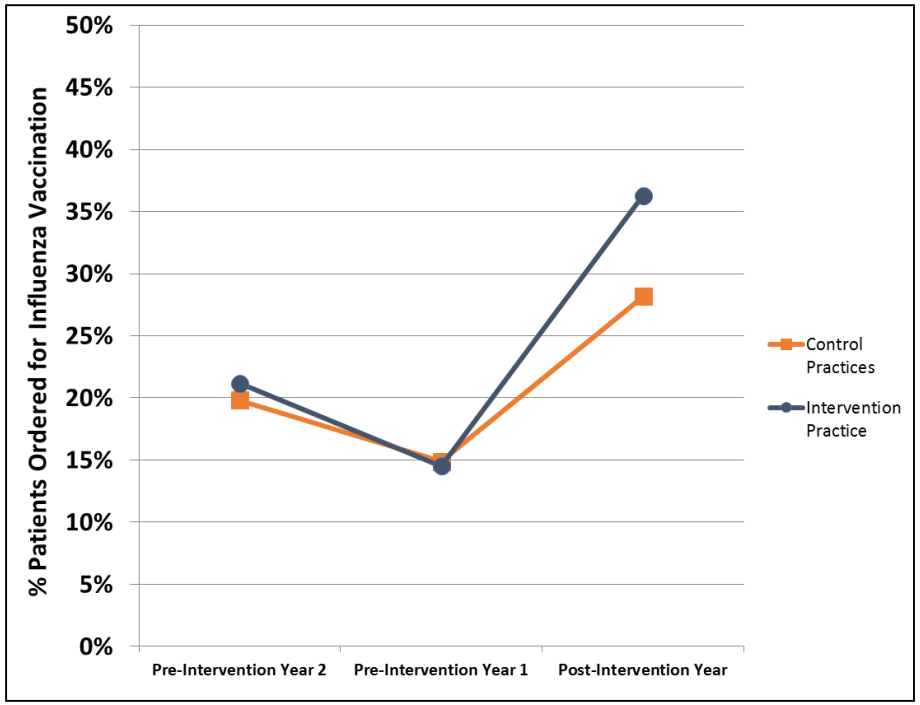

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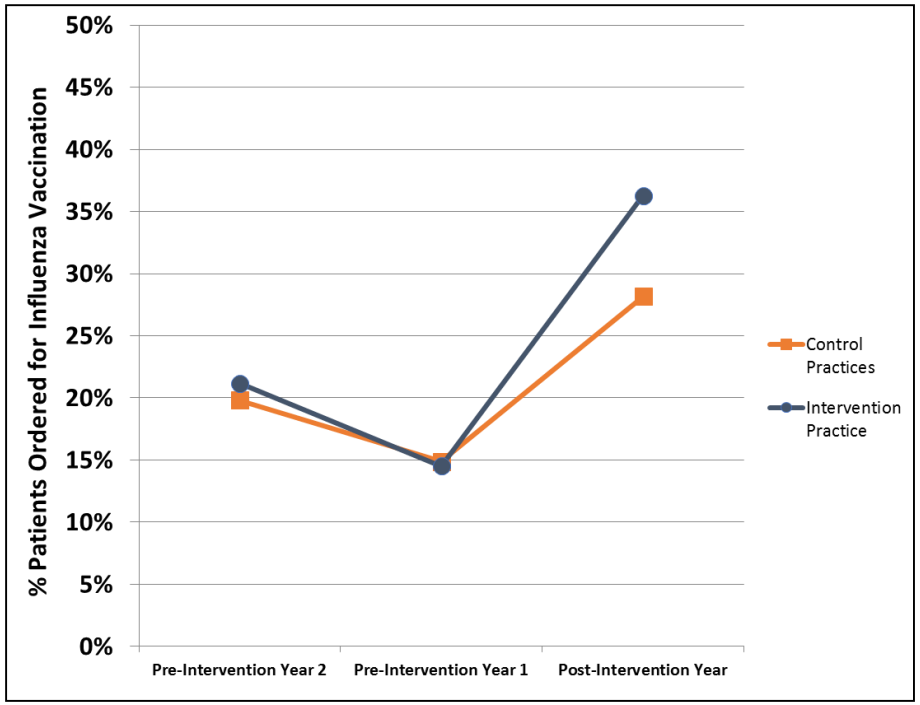

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Patel et al. *JGIM.* 2017

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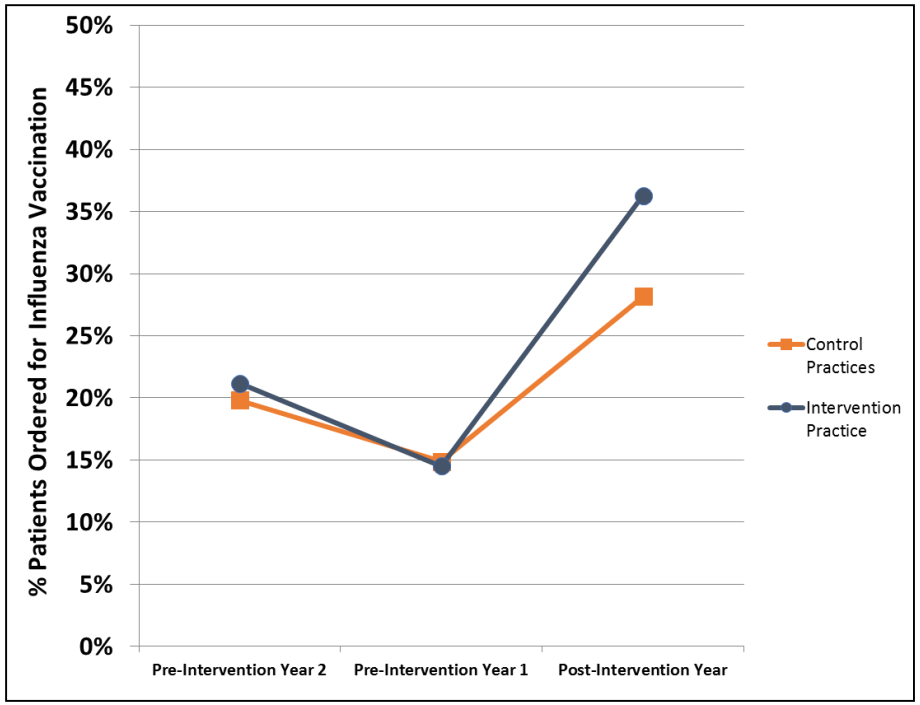

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  - **6.6 percentage point increase (P<.001)**
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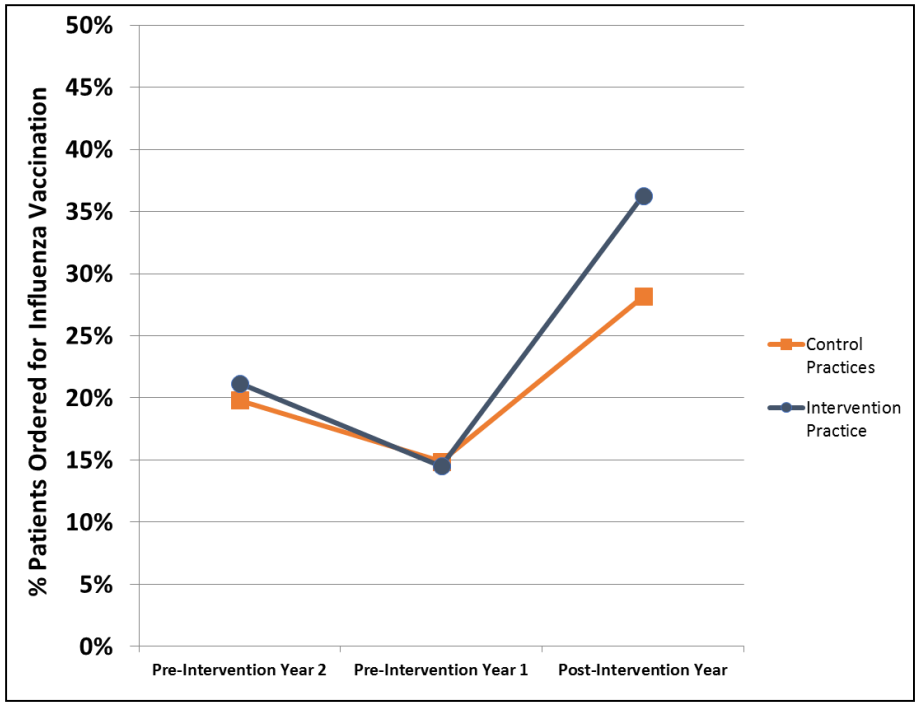
Patel et al. *JGIM.* 2017

Influenza vaccination rates



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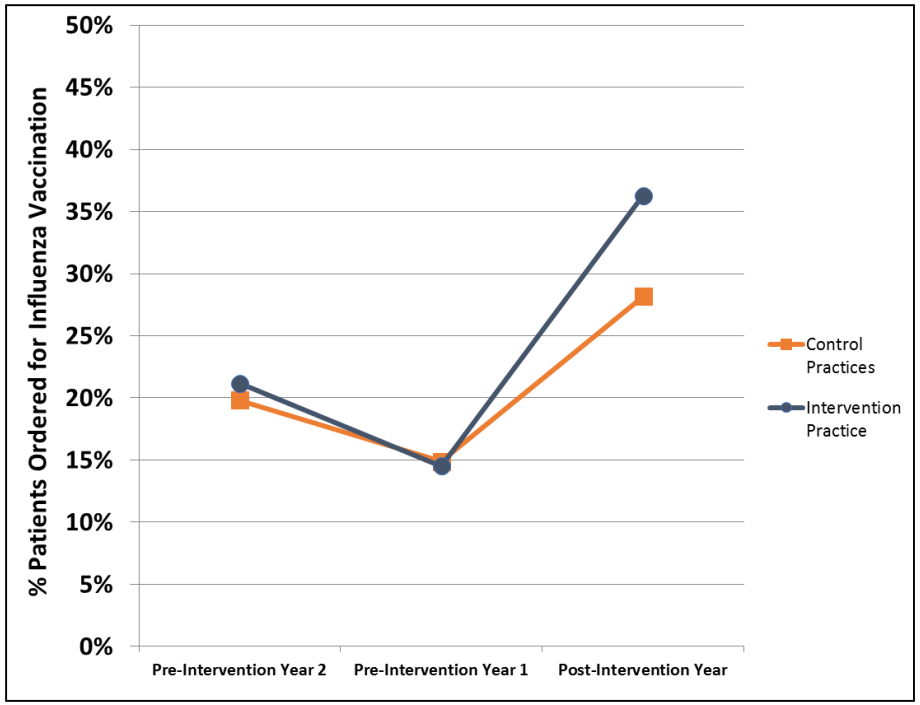

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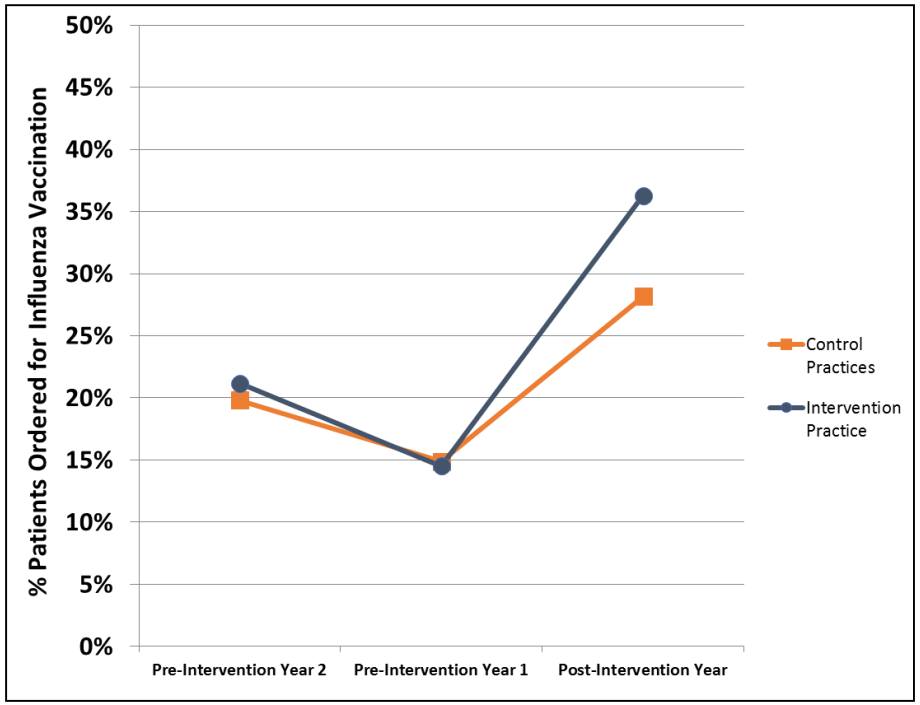

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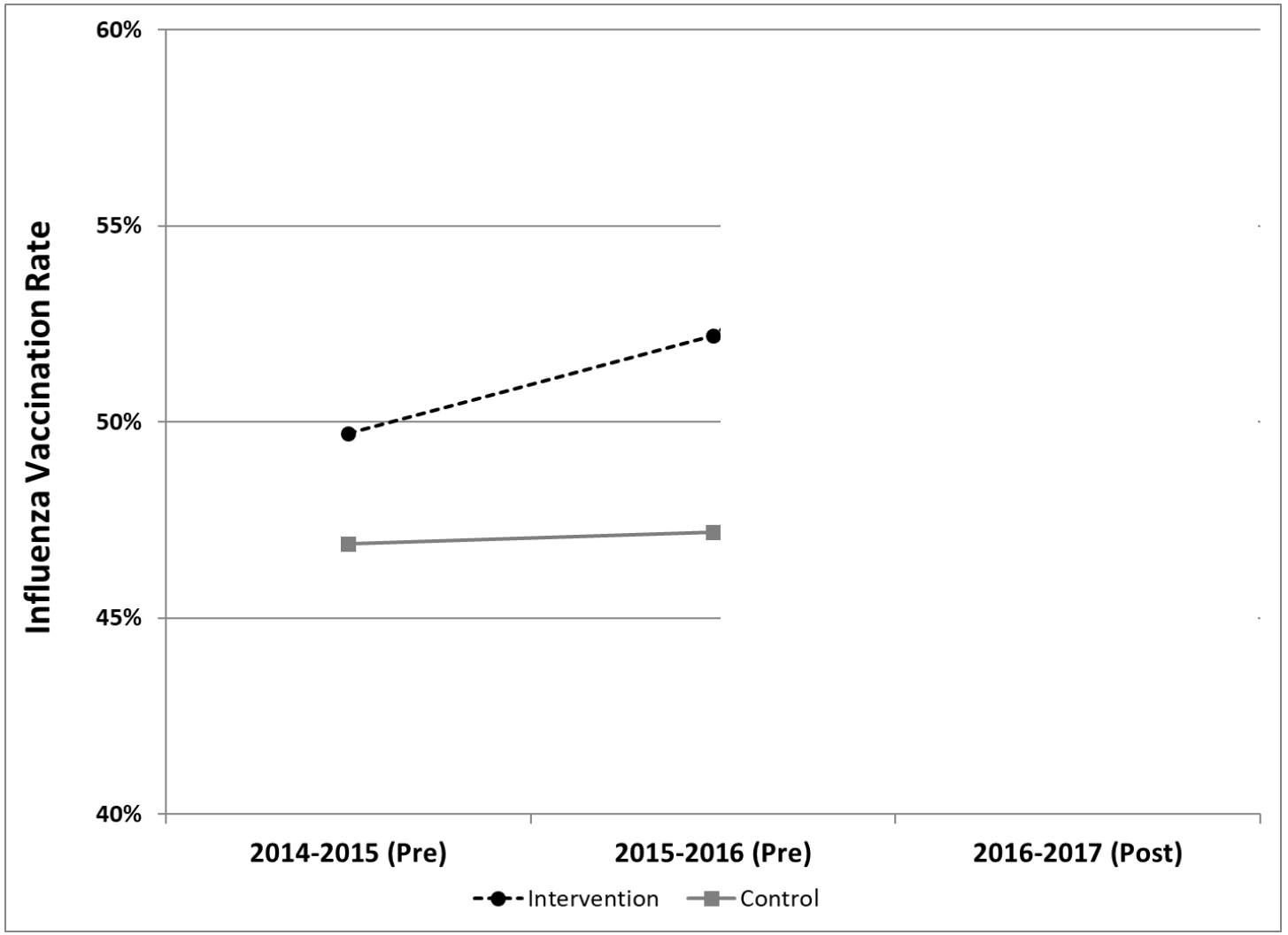
  - Redirected to medical assistants to template orders for physicians

Patel et al. *JGIM.* 2017

Influenza vaccination rates after an active choice intervention



Kim, Patel et al. *JAMA Network Open.* 2018

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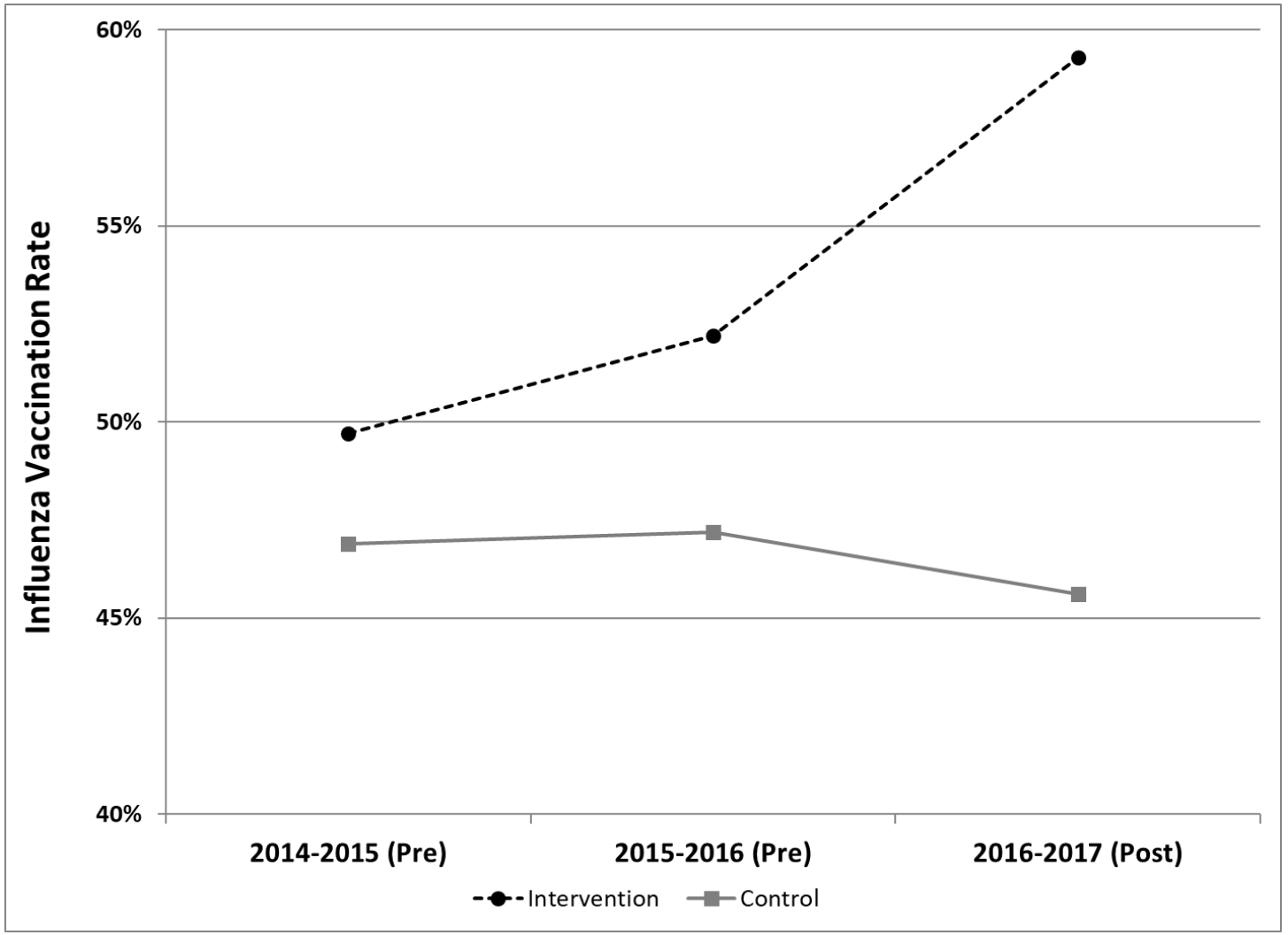

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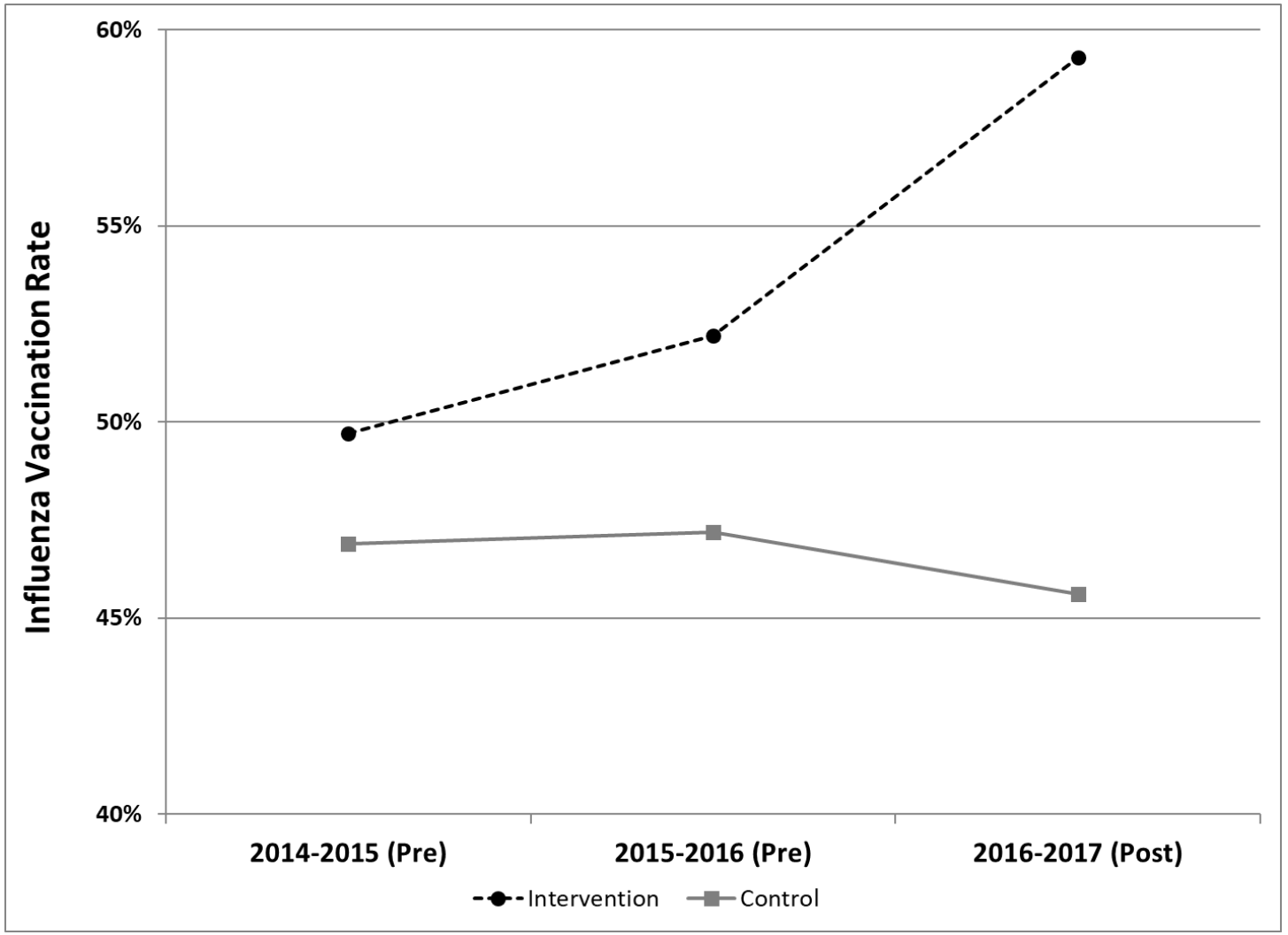

Compared to Control

Adjusted difference

9.5 percentage points

95% CI: 4.1 – 14.3

P<0.001

The Nudge Unit | Penn Medicine

Kim, Patel et al. *JAMA Network Open.* 2018

CHIBE

Nudges for Population Health

Nudges for Population Health

40,000 patients at Penn Medicine
meet national guidelines for statin therapy

Nudges for Population Health

40,000 patients at Penn Medicine
meet national guidelines for statin therapy

Only about 50% have ever been prescribed a statin

Study design

- Sample
  - 96 PCPs from 32 practice sites comprising 4774 patients eligible but never prescribed a statin

- Randomized, controlled trial
  - Usual care
  - Active choice dashboard
  - Active choice dashboard + peer comparison feedback delivered once by email

Patel et al. *JAMA Network Open.* 2018

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Fake Backend

- Data from clinical warehouse
- Study team sent email to PCP
- PCP uses secure website to submit orders
- Study team templates orders in EHR
- PCP logs into EHR and signs orders
- Prescription sent to pharmacy electronically
- Study team sends letter to patient

Description of health system initiative

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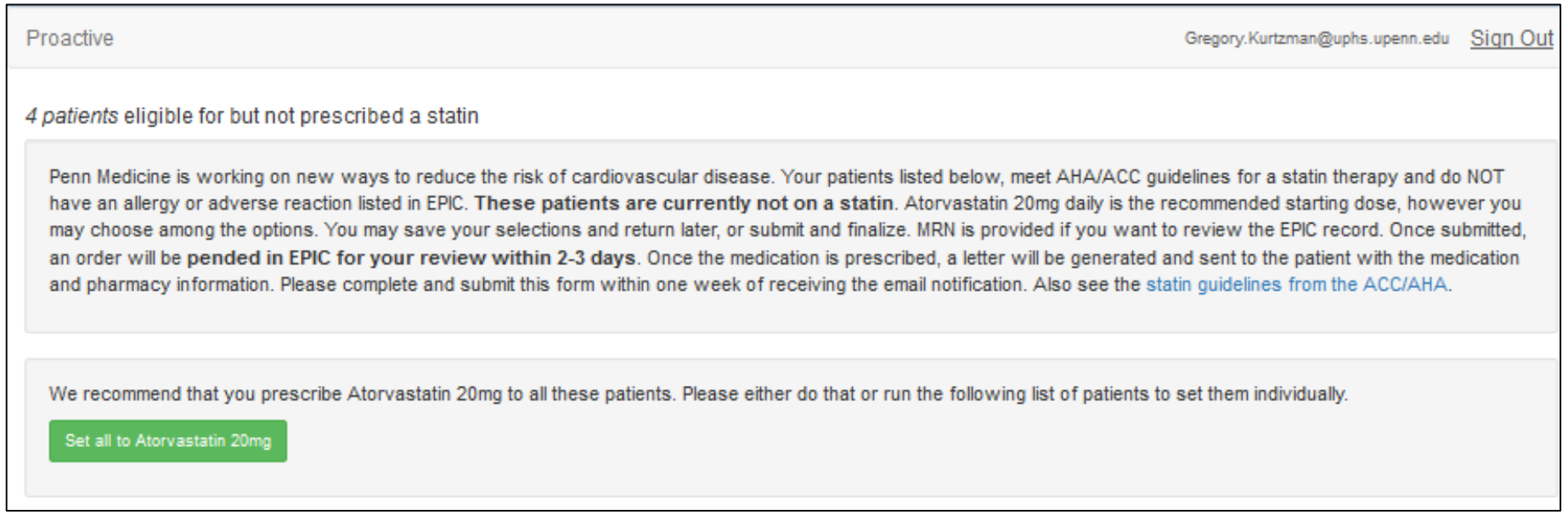
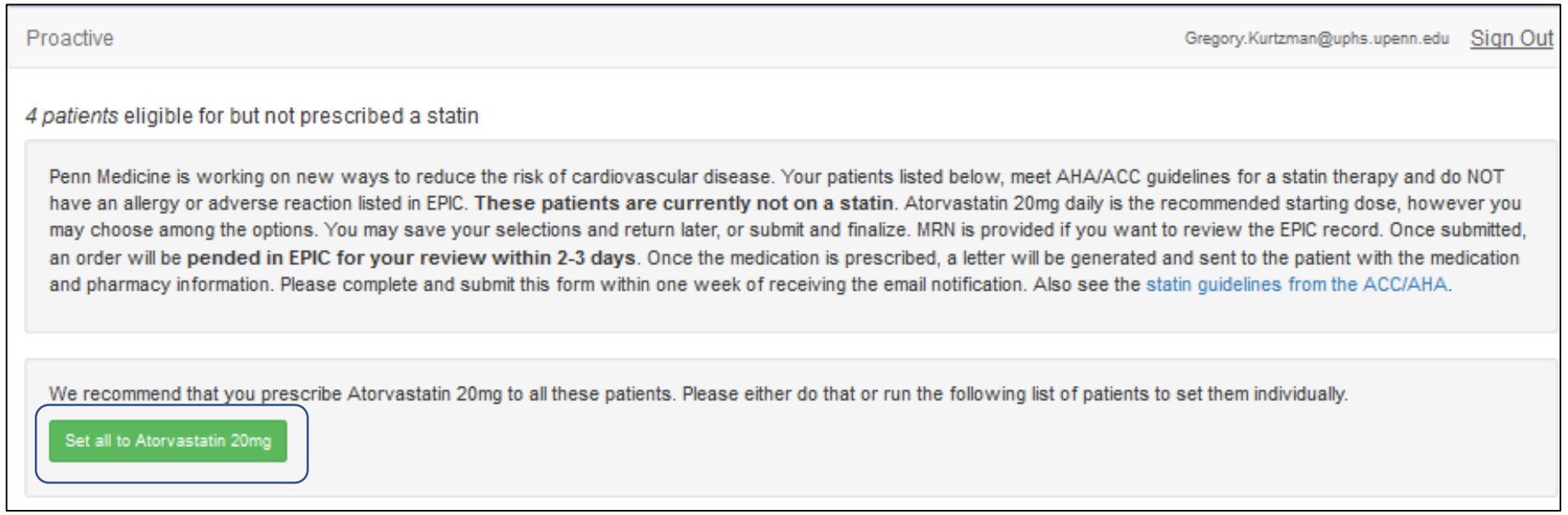


Patel et al. *JAMA Network Open.* 2018

Description of health system initiative



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Automated patient dashboard

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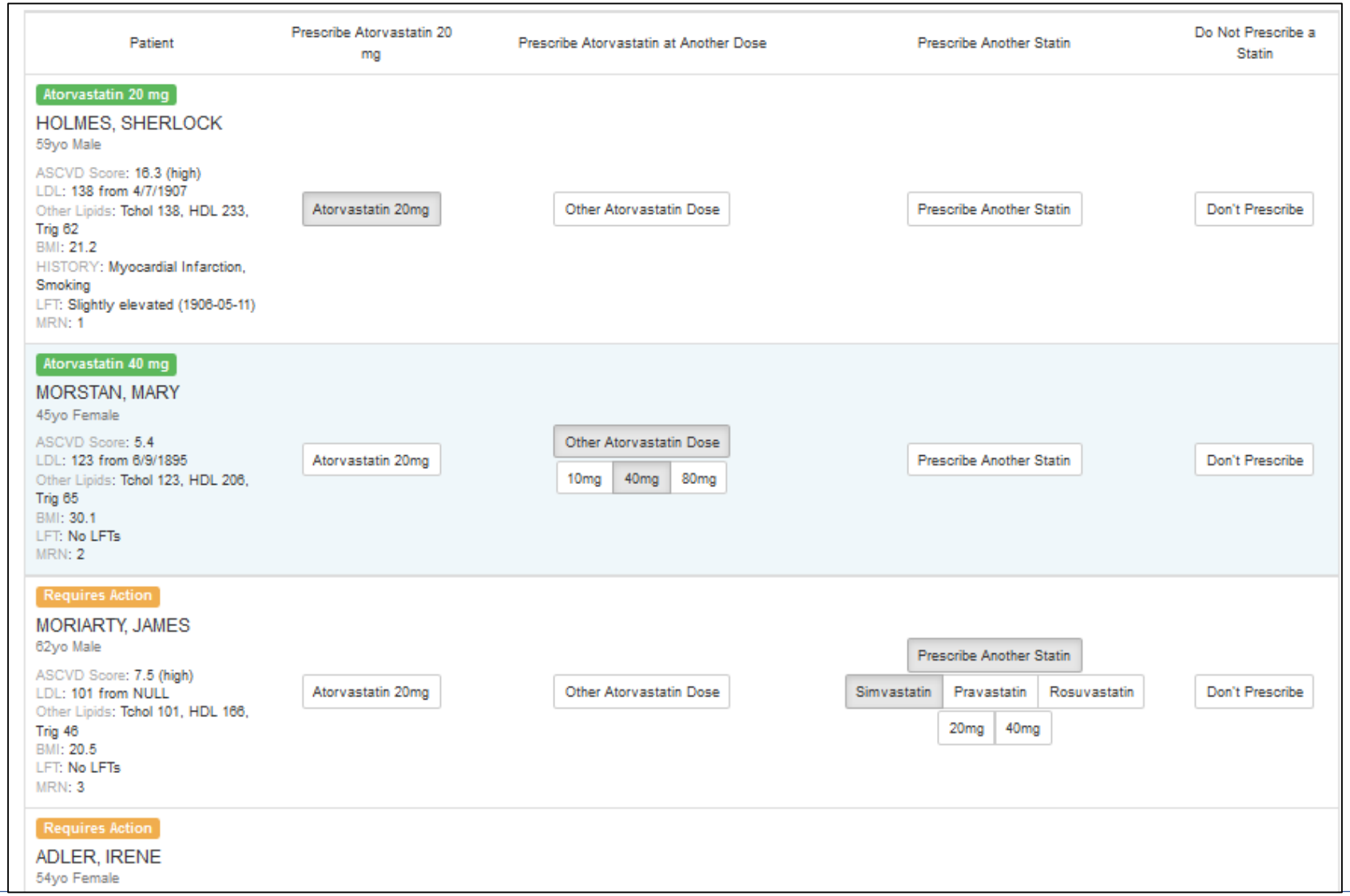

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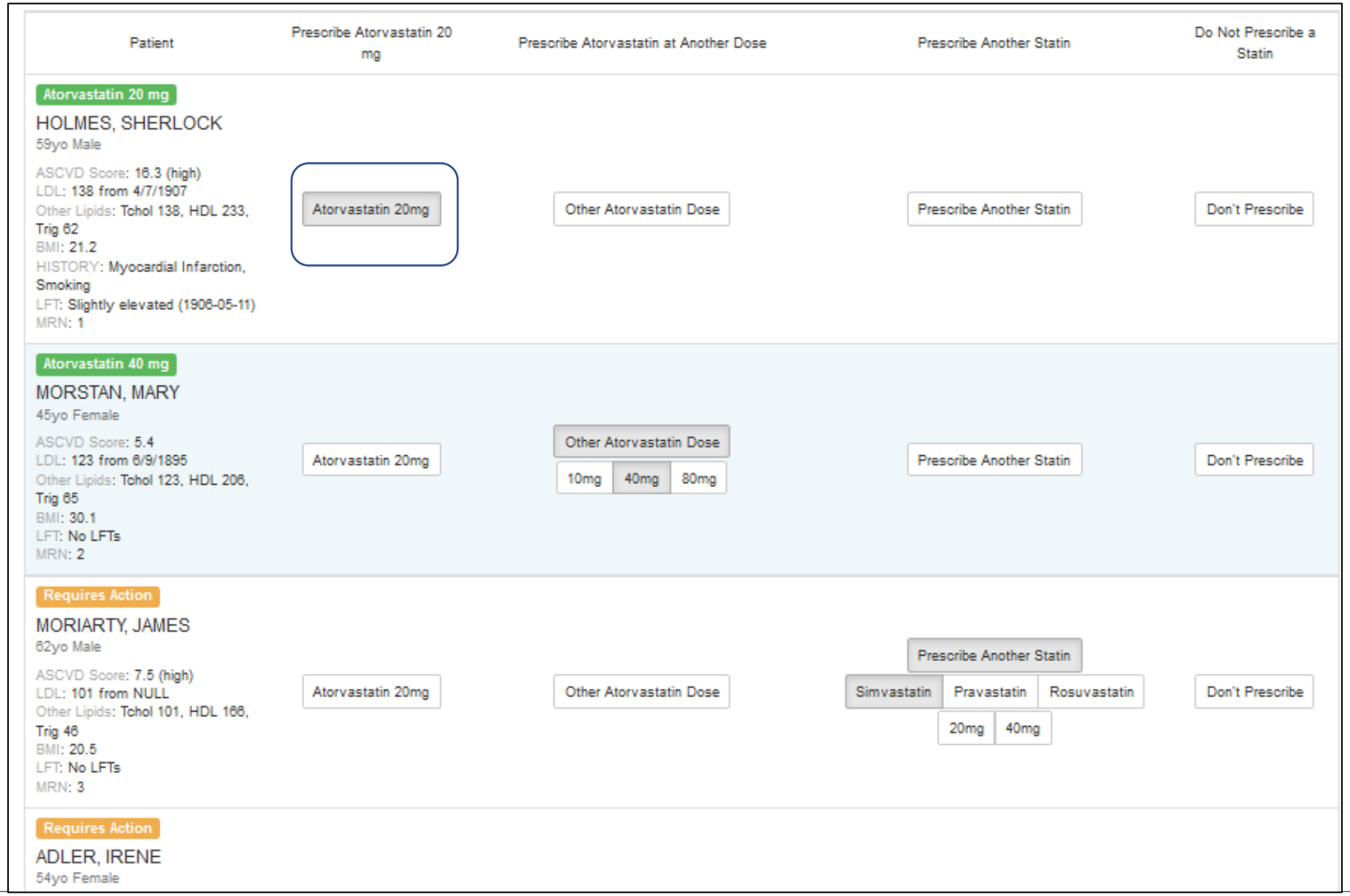

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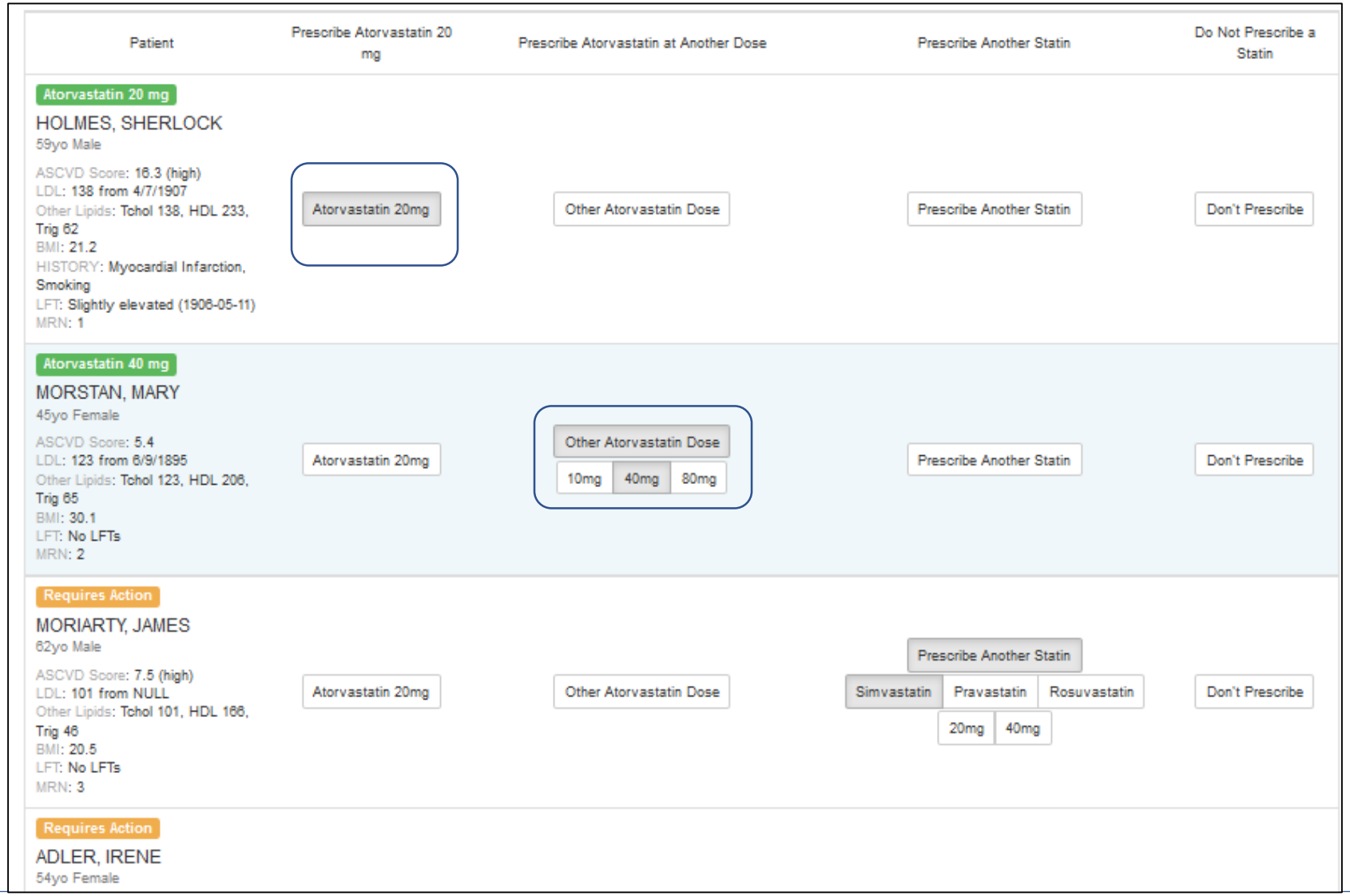

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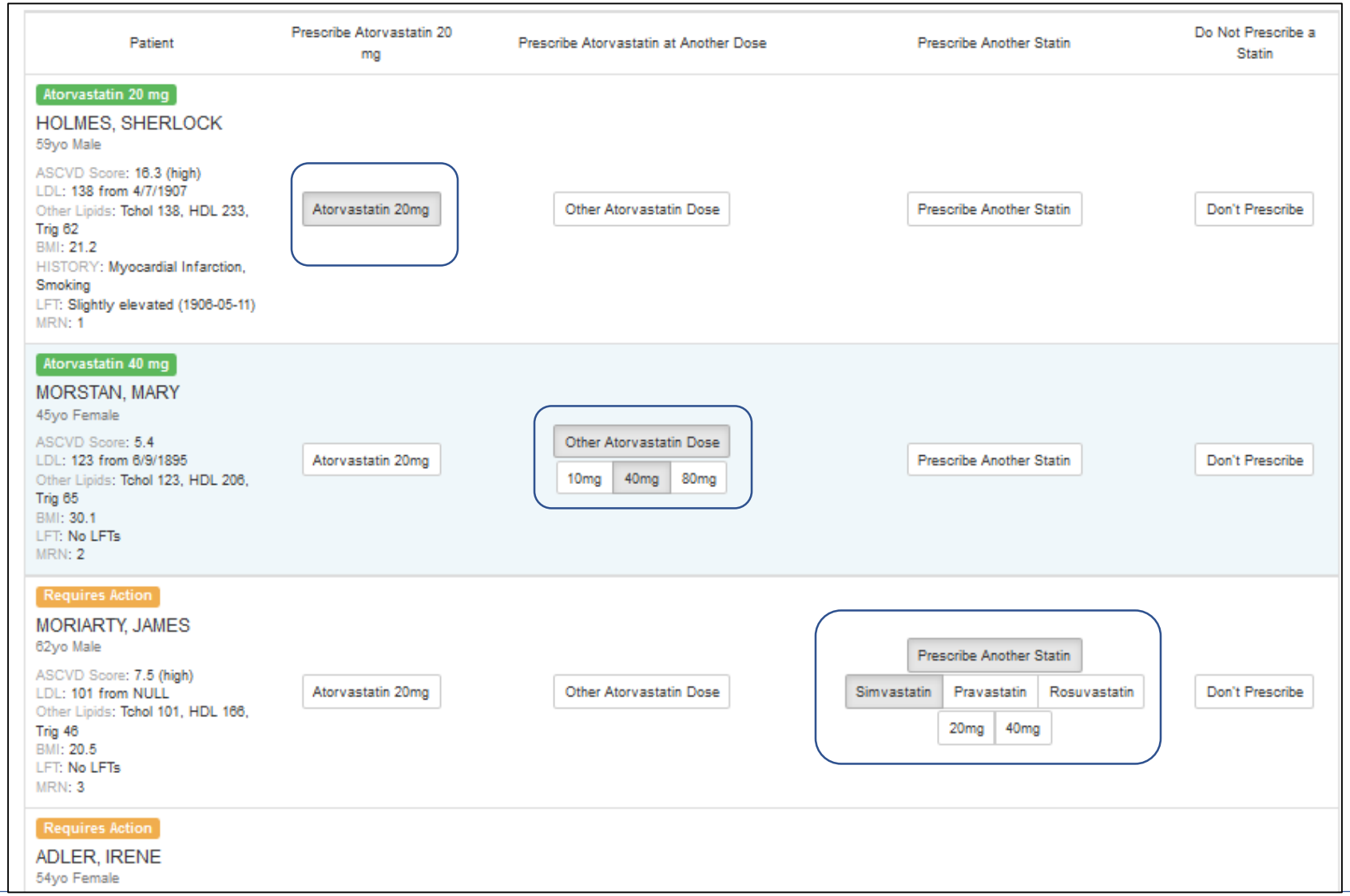

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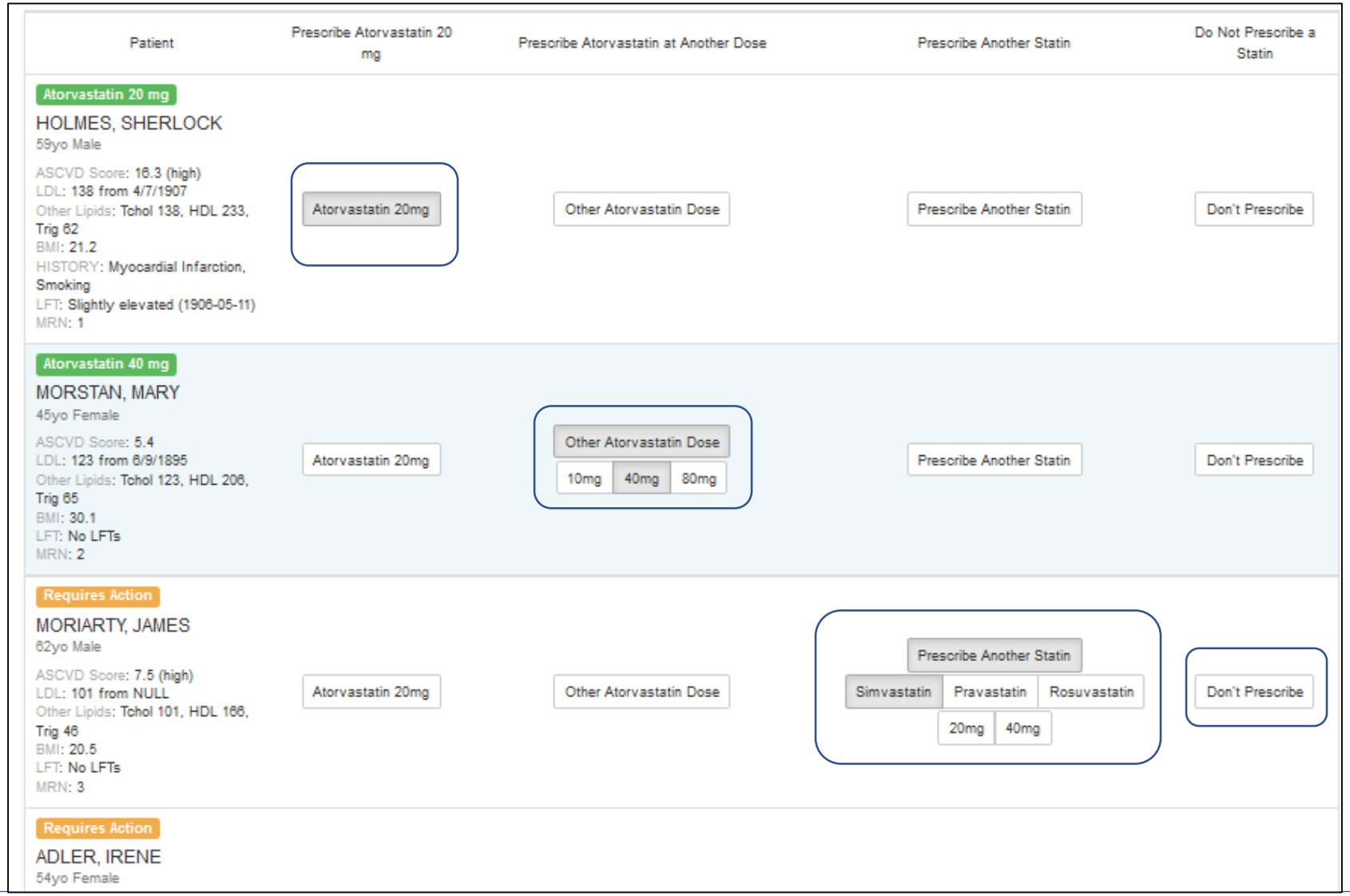

Patel et al. *JAMA Network Open.* 2018

Dashboard Utilization

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Accessed Dashboard	16/32 (50.0%)	12/32 (37.5%)
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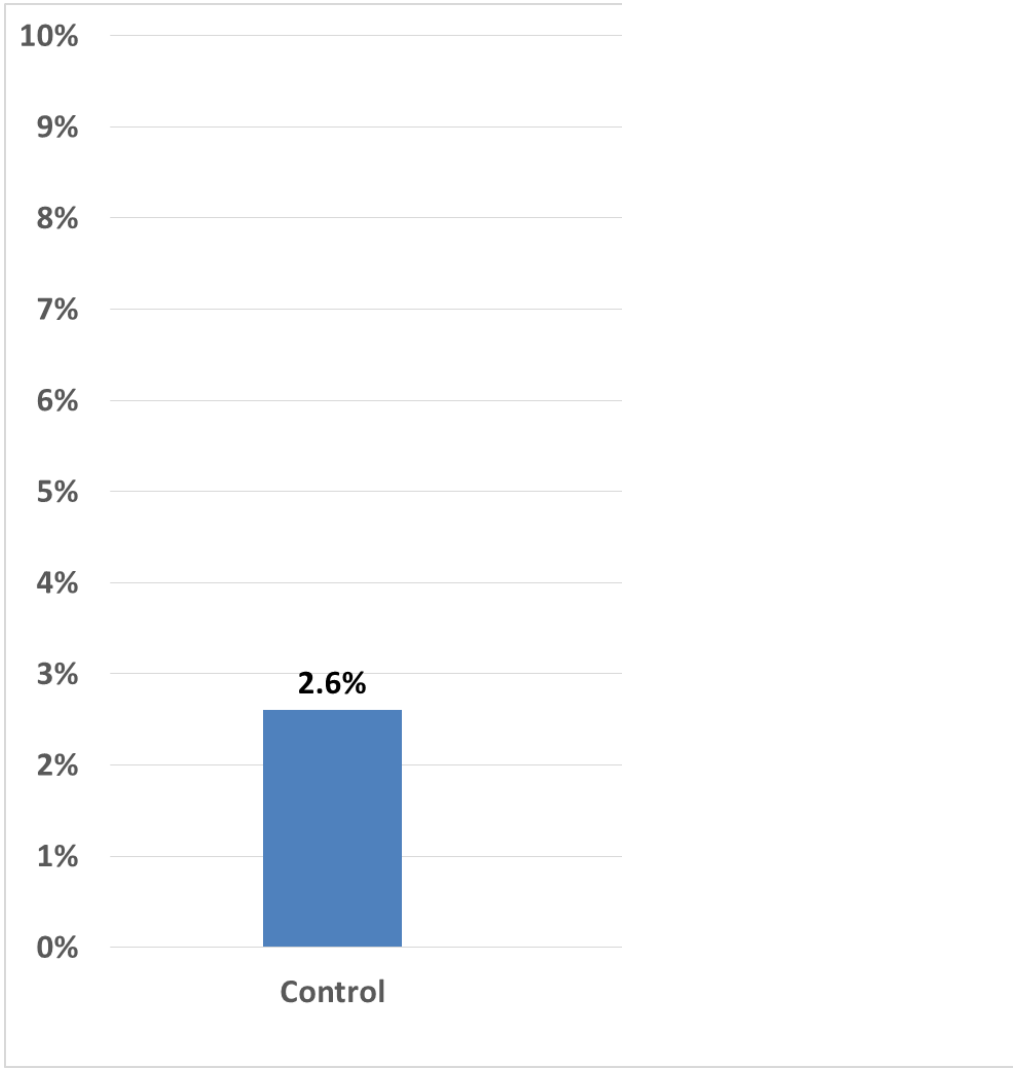
Active Choice Dashboards to Increase Statin Prescribing



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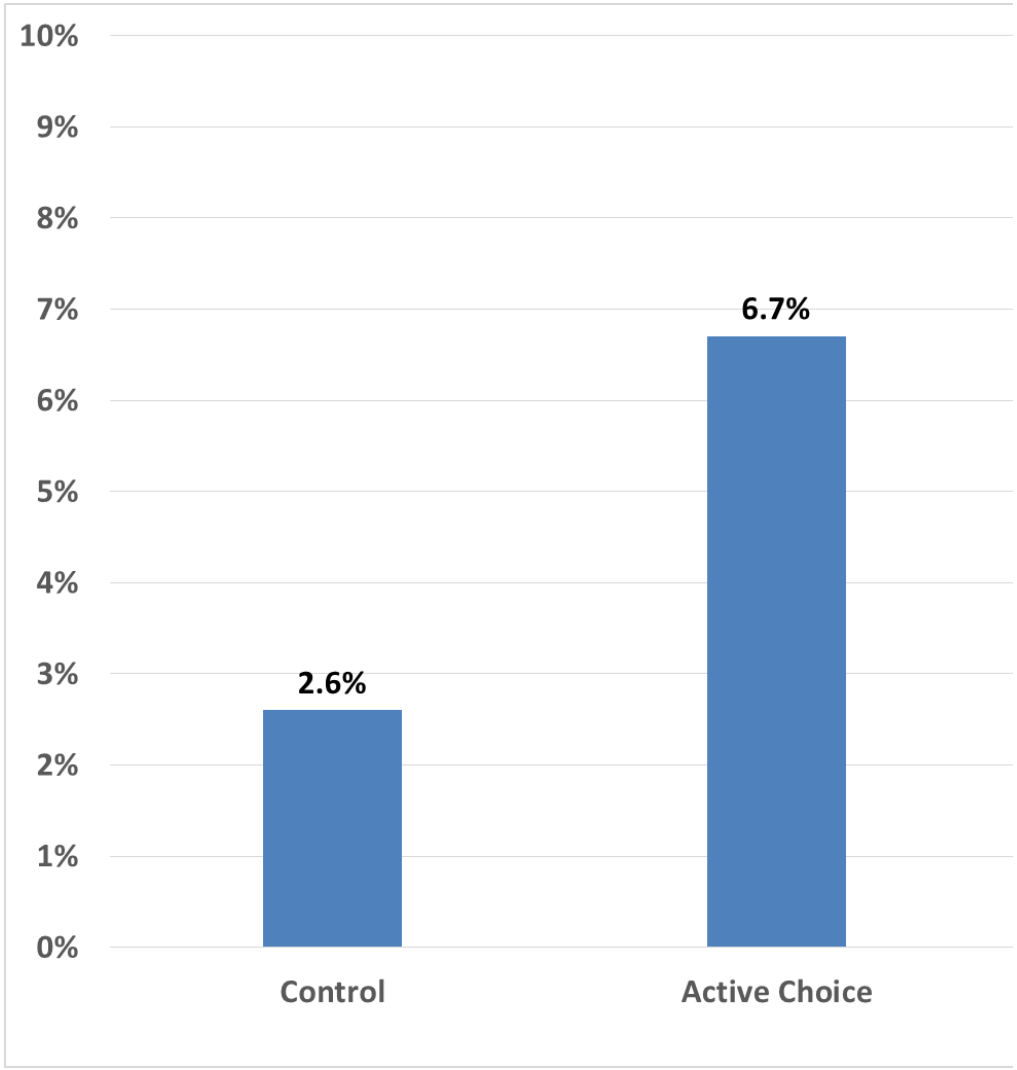

The Nudge Unit | Penn Medicine

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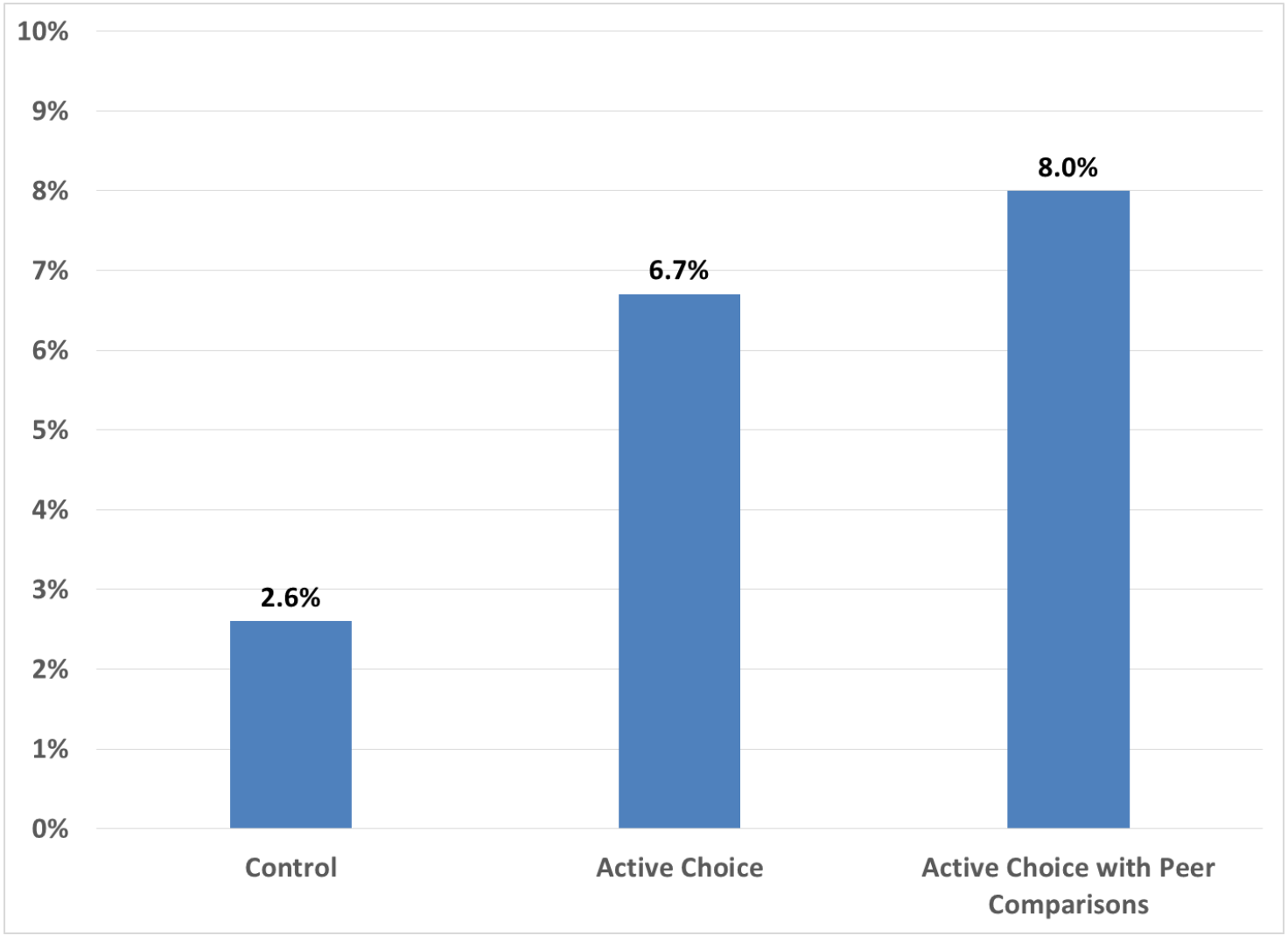
CHIBE

Active Choice Dashboards to Increase Statin Prescribing



Patel et al. *JAMA Network Open.* 2018

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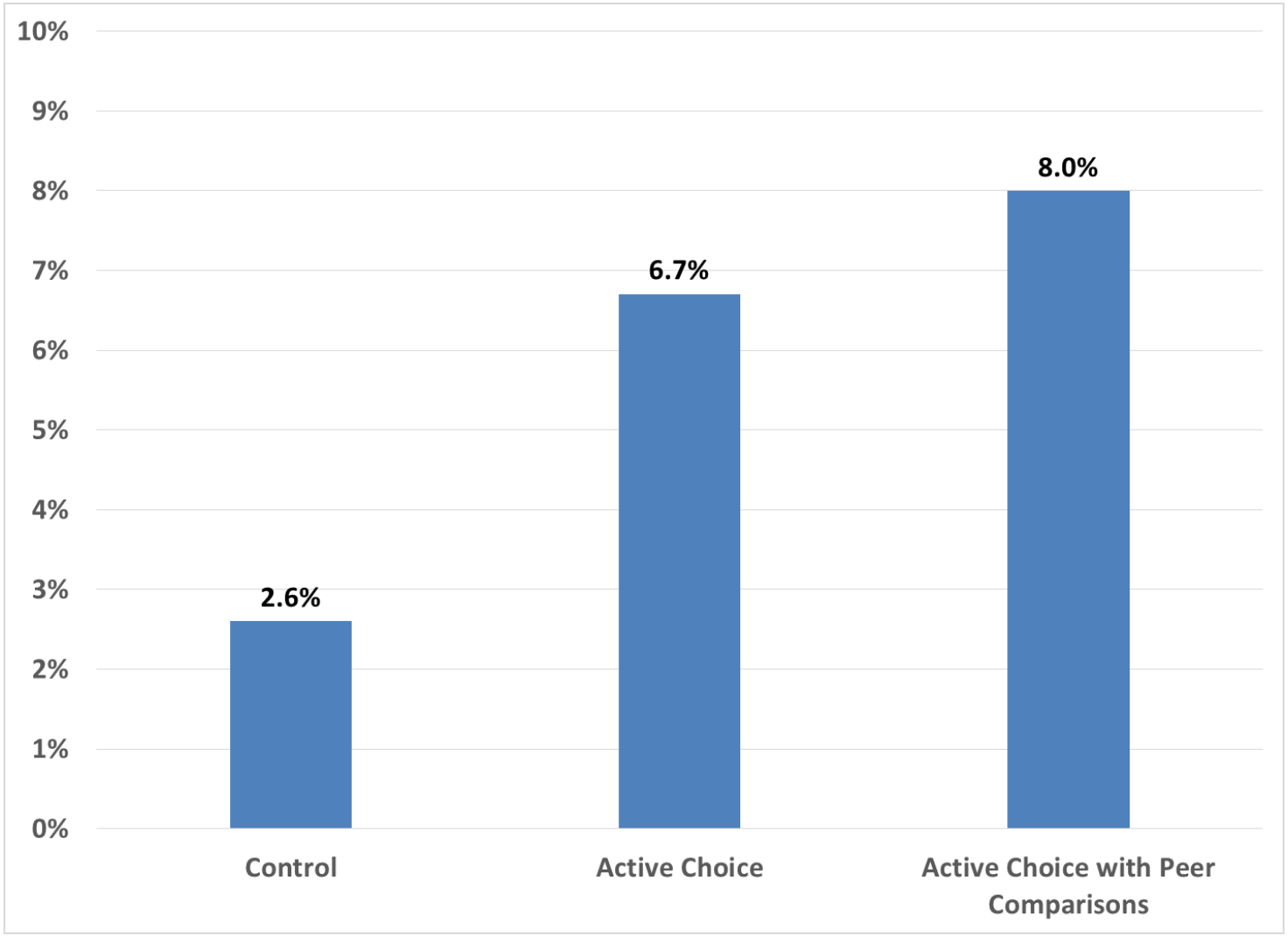


Active choice and peer comparisons

5.8 percentage points

95% CI: 0.9 to 13.0

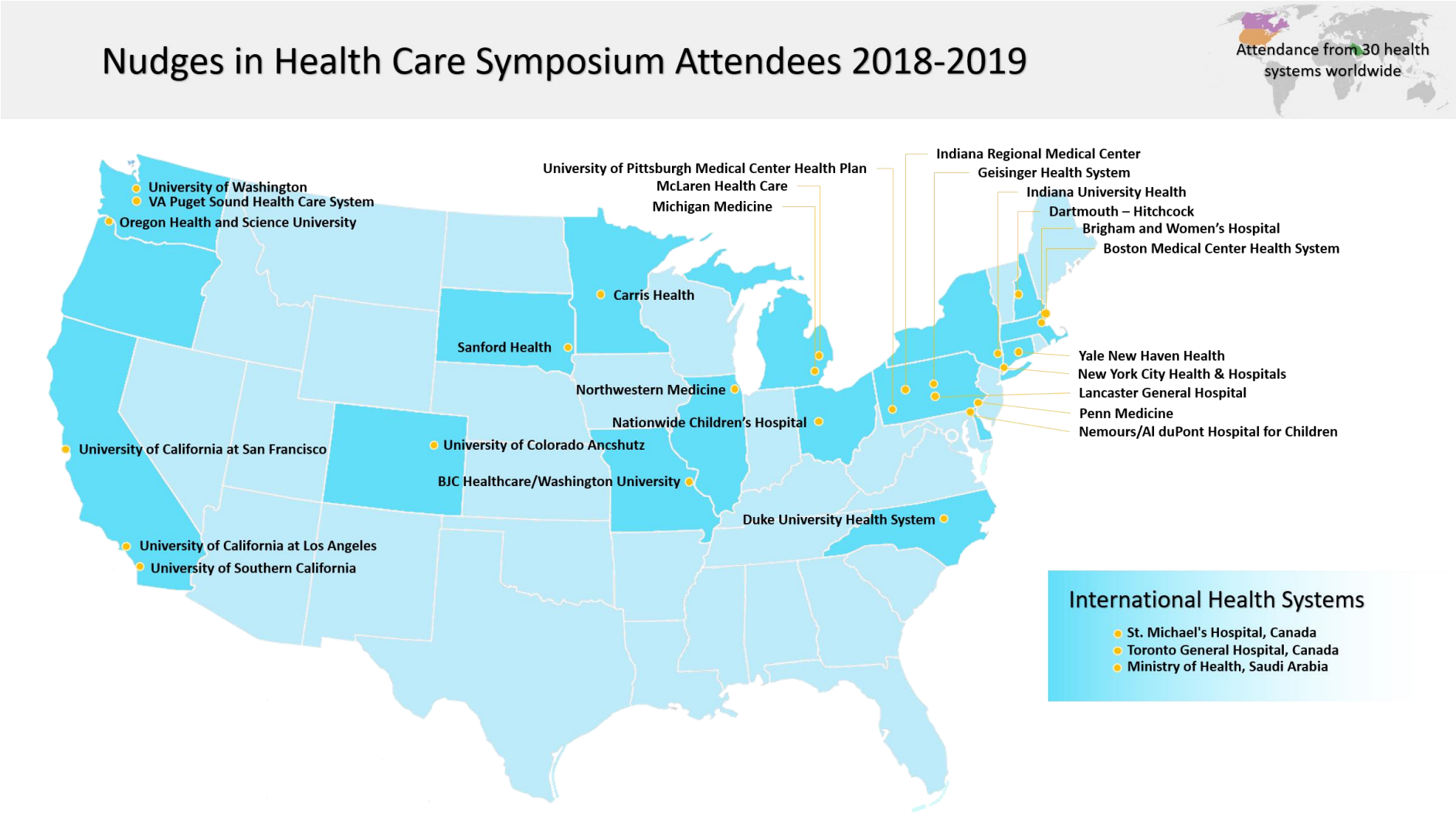
P<0.01

The Nudge Unit | Penn Medicine

Patel et al. *JAMA Network Open.* 2018

CHIBE

Growing interest in implementing nudge units in health care



The Nudge Unit | Penn Medicine

Changolkar, Patel et al. *NEJM Catalyst.* 2019

CHIBE

Summary: Nudging Medical Decision-Making

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Summary: Nudging Medical Decision-Making

- Medical decision-making is often suboptimal
- Design of choice environments influences our behavior
  - We are already being nudged but are often unaware of it
  - Strategic attention to align design with our goals
- Nudge units can improve the delivery of health care
  - Systematic approach to design, implement, and test interventions
  - Steer decisions towards higher value and better patient outcomes

Using Nudges to Improve the Delivery of Health Care

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