
Evaluating Opportunities to Decrease Low-Value Prescribing (EVOLV-Rx)

The Development of a Metric and Related Interventions to Reduce Low-Value Prescribing in Older Adults

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Disclosures

- Grant funding: NIH, VA HSR&D
- Commercial funding: None

OBJECTIVES



Define low-value prescribing, why it's a serious health problem, and existing research gaps



Review the overarching development process for EVOLV-Rx



Present qualitative research findings and results of the Delphi Panel that informed the development of EVOLV-Rx



Discuss the application of a theoretical model for a deprescribing intervention that incorporates EVOLV-Rx

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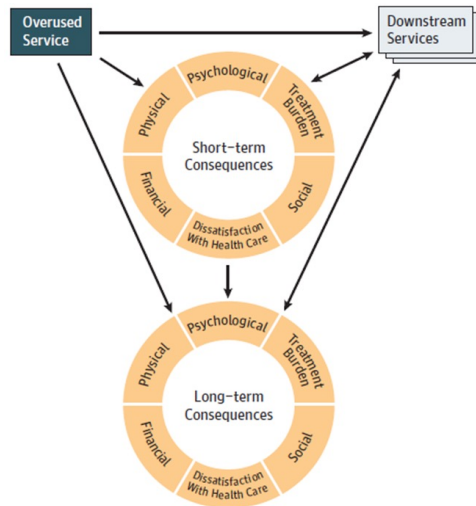
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What is low value care?

- Any health service that confers a risk of harm or cost that exceeds its benefit



Korenstein D, et al. JAMA IM 2017

The Healthcare Value Equation

$$\begin{array}{c}
 \mathbf{V} \\
 \text{(VALUE)}
 \end{array}
 = \frac{
 \begin{array}{c}
 \mathbf{Q} + \mathbf{S} \\
 \text{(QUALITY) (SERVICE)}
 \end{array}
 }{
 \begin{array}{c}
 \mathbf{\$} \\
 \text{(COST)}
 \end{array}
 }
 \times \mathbf{APPROPRIATENESS}$$

(Right time/place/patient/context)

<https://uofuhealth.utah.edu/innovation/algorithms/2015/two.php>

Quality

Likelihood of benefit
Potential for harm



Quality

Likelihood of benefit
Potential for harm



Appropriateness

Right patient, time, and context

Quality

Likelihood of benefit
Potential for harm



Appropriateness

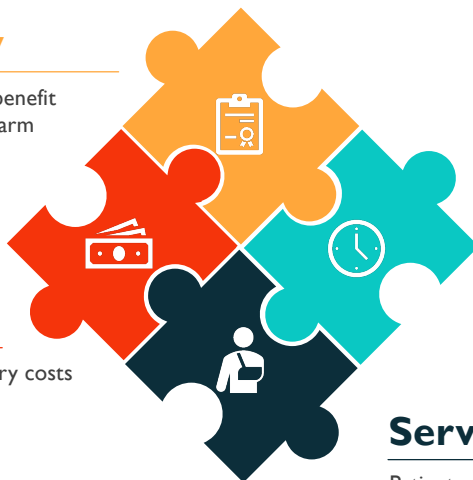
Right patient, time, and context

Service

Patient experience
Preferences/Goals of care

Quality

Likelihood of benefit
Potential for harm



Appropriateness

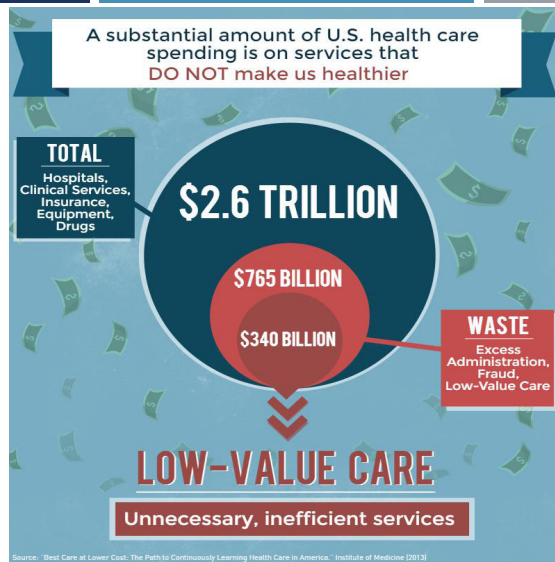
Right patient, time, and context

Cost

Monetary and non-monetary costs
System and patient level

Service

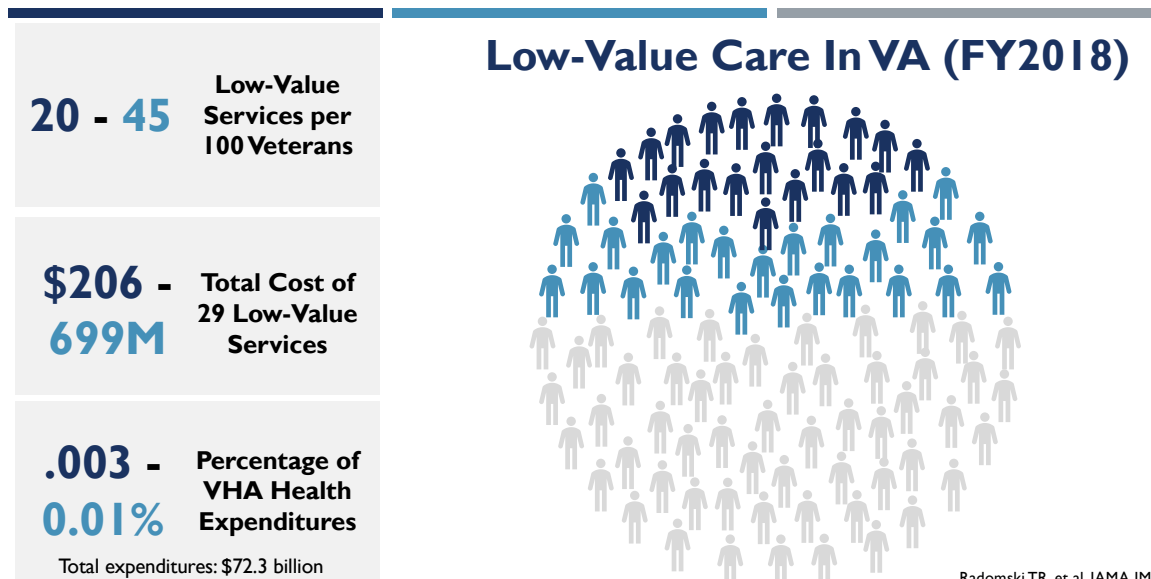
Patient experience
Preferences/Goals of care



"Best Care at Lower Cost: The Path to Continuously Learning Health Care in America." IOM. 2013



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Why is Low-Value Prescribing a Problem?

- **30 – 50%** of older adults have received a potentially inappropriate medication
- Over **40%** of adults aged ≥ 65 are subject to polypharmacy
- Among Part D beneficiaries, **35%** have reported difficulty affording their medications
- High out of pocket costs for appropriate treatment of common medical problems



Gaps In
Healthcare
Value Research
Related to
Prescribing and
Deprescribing

Gaps In Healthcare Value Research Related to Prescribing and Deprescribing

Emphasis on tests and
procedures and not prescribing

Gaps In Healthcare Value Research Related to Prescribing and Deprescribing

Emphasis on tests and
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Existing recommendations
focus on medication safety

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Measurement tools not
validated for use in
administrative data

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Emphasis on tests and
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Existing recommendations
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Measurement tools not
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Exclude patients' and
practicing clinicians'
perspectives

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Objective And Specific Aims

To develop, validate, and apply a metric that will characterize specific low-value prescribing practices using administrative data and that reflects the perspectives of patients, prescribers, and payers as they relate to health care value.

1. Development
2. Validation
3. Application

K23AG0612170 (NIA)
PI: T. Radomski

Reducing Low-Value Care and Improving Health Care Value

Transitioning to a state of health care delivery that prioritizes value over volume will require balancing "top-down" policy prescriptions with a "bottom-up" approach unique to health systems and practices.



CHERP

Efforts to move away from a culture in which low-value care is a default practice will require health systems and payers to promote organizational behavioral change.



Oakes AH, Radomski TR. JAMA. 2021

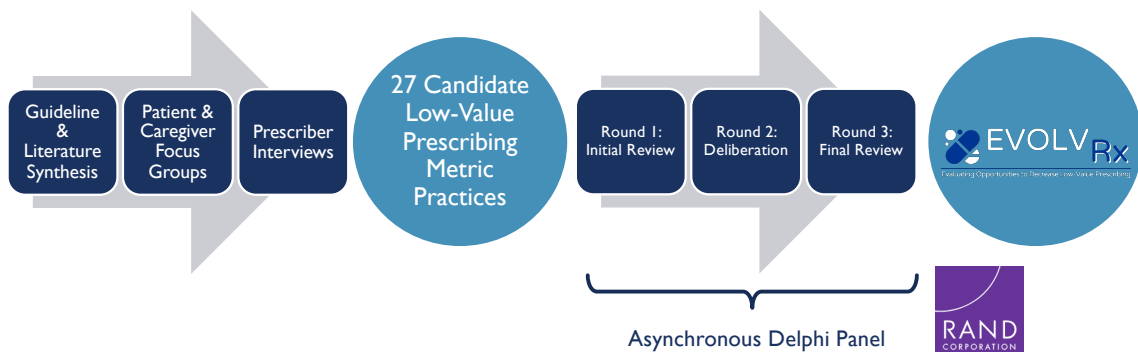


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Original Investigation | Geriatrics

Development of a Metric to Detect and Decrease Low-Value Prescribing in Older Adults

Thomas R. Radomski, MD, MS; Alison Decker, MPH; Dmitry Khodyakov, PhD; Carolyn T. Thorpe, PhD, MPH; Joseph T. Hanlon, PharmD, MS; Mark S. Roberts, MD, MPP; Michael J. Fine, MD, MSc; Walid F. Gellad, MD, MPH



@TomRadomskiMD

Theoretical Model

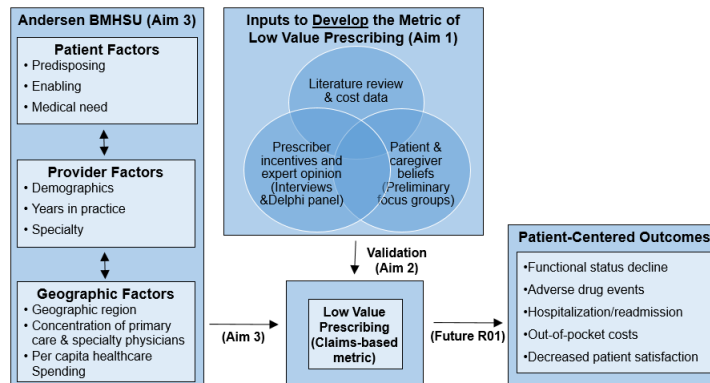


Figure 1. Conceptual Model Linking Low-Value Prescribing, Related Factors, and Outcomes

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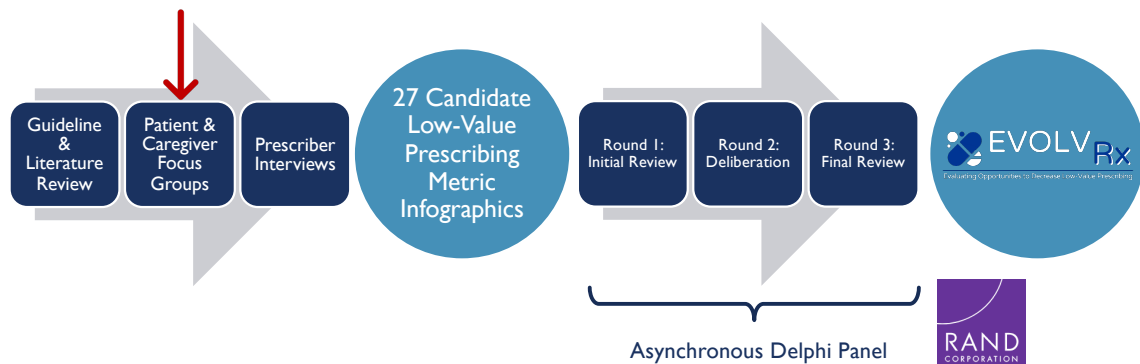


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Approach To Metric Development (Aim 1)



Older Patient And Caregiver Perspectives On Medication Value

- **Objective:** to identify the most significant factors that impact the perceived value of a medication from the perspective of patients and caregivers
- 6 focus groups of patients aged ≥ 65 (or their respective caregivers) and who were prescribed ≥ 5 medications
- Explored their views on factors that enhance or diminish their perception of a medication's value and may motivate their decision to discontinue its use

KEY THEMES

Perceived Effectiveness

Impact on Quality-of-Life

Cost

Key Themes

Perceived Effectiveness

Impact on Quality-of-Life

Cost

- Improvement in symptoms
- Objective improvement in clinical values
- Prescriber's recommendation

Key Themes

Perceived Effectiveness

Impact on Quality-of-Life

Cost

- Severity and impact of side effects
- Discomfort associated with administration
- Inconvenience related to daily routine

Key Themes

Perceived Effectiveness

Impact on Quality-of-Life

Cost

- Absolute out-of-pocket cost
- Need to make subsequent material sacrifices

Key Themes

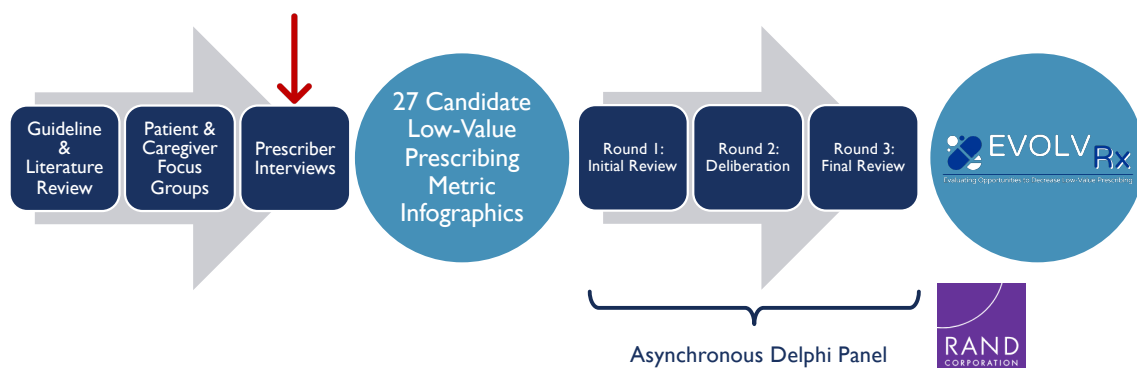
Perceived Effectiveness

Impact on Quality-of-Life

Cost

“You [have] to take care of your necessary bills, ... I will make sacrifices.... if I have to go [without] cable [for example]. I'll do what I have to do, but if you cannot afford it you just cannot.”

Approach To Metric Development (Aim 1)



Prescribers' Perspectives On Low-Value Prescribing

- Objective: to identify the characteristics that affect the value of a medication and those factors influencing low-value prescribing from the perspective of primary care physicians
- 16 semi-structured interviews of primary care providers who care for adults aged ≥ 65
 1. Characteristics and examples of low-value prescribing in older adults
 2. The factors that incentivize them to engage in such prescribing
 3. Interventions that would make them less likely to engage in low-value prescribing

Walter EL, ... Radomski TR, J Am Geriatr Soc. 2021
Pickering AN, ... Radomski TR, BMC Geriatrics. 2022



KEY THEMES

Low-Value Prescribing is Common

Default Practice

Interventions must address underlying drivers

Key Themes

Low-Value Prescribing is Common

Default Practice

Interventions must address underlying drivers

- Medication and patient-level factors
- 43 different medication or medication classes
- Cost

Key Themes

Low-Value Prescribing is Common

Default Practice

Interventions must address underlying drivers

- Driven by patient, provider, and health system level factors
- Patient requests and deference to sub-specialists
- Misaligned quality incentives and automatic refills

Key Themes

Low-Value Prescribing is Common

Default Practice

Interventions must address underlying drivers

“The outpatient environment is very busy and... there are so many things to talk about in an office visit that going through the medications and really trying to figure out if something is low value for the patient... that sometimes doesn't make it to my to-do list for that office visit.”

Key Themes

Low-Value Prescribing is Common

Default Practice

Interventions must address underlying drivers

- Engagement of multidisciplinary teams
- Improved utilization of the EMR
- Enhanced targeting of value-based incentives

Key Themes

Low-Value Prescribing is Common

Default Practice

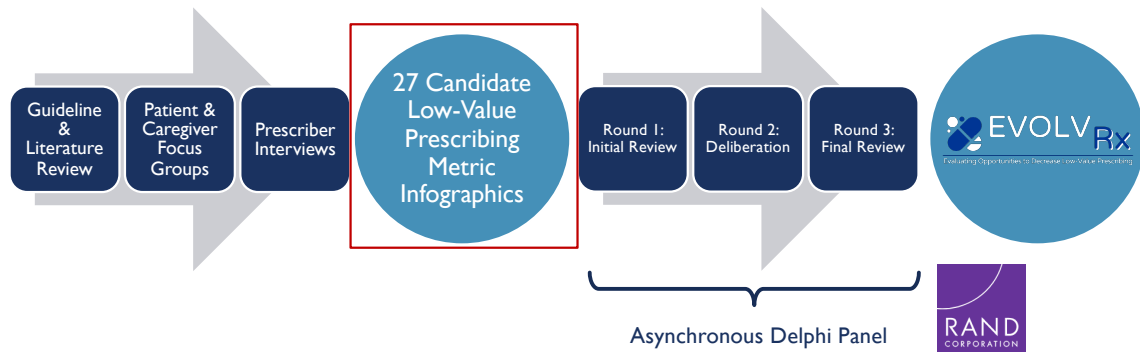
Interventions must address underlying drivers

“Health systems or insurers could start incentivizing doctors by identifying people over a certain age with over a certain number of pills and ... give an incentive to think (about deprescribing), but they'd have to be very careful about what they were trying to achieve because some people really do need to be on multiple medications”

Summary of Qualitative Findings

- Patients apply a multi-faceted approach when adjudicating the value of their medications and are open to deprescribing when it aligns with these values
- Low-value prescribing is well-recognized default practice by physicians
- Successful interventions to address low-value prescribing must not only consider physicians' perspectives, but also the patient, prescriber, and health system factors that make low-value prescribing common

Approach To Metric Development (Aim 1)



EVOLV-Rx Candidate Low-Value Prescribing Metrics

- 27 candidate low-value prescribing metrics
- Focused on medications most prescribed in Medicare Part D
- Categorized considering the following value domains:
 - Lack of efficacy
 - Potential for harm
 - Excessive cost
 - Prescribing cascade

EVOLV-Rx Candidate Low-Value Prescribing Metrics

- Each candidate metric was defined by **sensitive & specific criteria**
- Allows for the incorporation of guidelines from multiple sources
- Establishes a range of potential low-value prescribing
- Enhances the versatility of EVOLV-Rx



PROLONGED USE OF PROTON PUMP INHIBITORS

PROPOSED LOW-VALUE PRESCRIBING PRACTICE DEFINITIONS

Base (Sensitive) Criterion	Additional Specific Criteria (Any one of the following)
Use for greater than 2 consecutive months	<ul style="list-style-type: none"> No guideline concordant indication for prolonged use (e.g. erosive esophagitis, refractory GERD, etc.) (E) No concurrent use of chronic NSAIDs or steroids (H) Use of a brand-name PPI (C)

SYNOPSIS OF THE EVIDENCE

- Proton pump inhibitor (PPI) therapy is common among older adults, affecting greater than 10 million Medicare Part D beneficiaries. In a single center study, 1/3 of PPI prescriptions in older adults were potentially low-value (1).
- In several observational studies, older adults have been shown to be at increased risk of experiencing adverse consequences related to PPI use, including but not limited to dementia, chronic kidney disease, and hip fractures:
 - In a prospective cohort study of ~75,000 older adults, PPI use was associated with a 44% increased risk of dementia (HR 1.44, 95% CI 1.36-1.52) (2).
 - In a retrospective cohort study of 10,482 adults with a mean age of 63, PPI use was associated with an increased risk of incident Chronic Kidney Disease (HR 1.50, 95% CI 1.14-1.98) (3).
 - In a systematic review and meta-analysis of observational studies, PPI use was associated with an increased risk of hip fracture (OR 1.42, 95% CI 1.33-1.53) (4).
- In a randomized controlled trial of adults (mean age 68 years) prescribed pantoprazole, use up to 3 years was not associated with adverse events, except increased risk of enteric infections (5).

COST AND USE IN MEDICARE PART D (2017)*

12,122,05	Total beneficiaries
\$2,384,836,248	Total spending
\$1922 vs \$106	Average annual spending per beneficiary (brand vs generic)

*Values represent prescription use for any reason

CURRENT GUIDELINES

MEDICATION LIST	SUMMARY OF RECOMMENDATIONS
Choosing Wisely	Long-term acid suppression therapy should be titrated to the lowest effective dose needed to achieve therapeutic goals.
Beers List	Avoid scheduled use for >8 weeks unless for high-risk patients, erosive and Barrett esophagitis, pathological hypersecretory condition, or demonstrated need for maintenance treatment.
STOPPPrail	Avoid PPIs at full therapeutic dose, unless persistent dyspeptic symptoms of lower dose.
FORTA	Use PPIs only if necessary. If older patient must be treated with NSAID, then concurrent PPI should be standard of care.

PROFESSIONAL ORGANIZATION	RECOMMENDATIONS FOR APPROPRIATE USE*	Duration of Therapy
CFPC (2017)	Uncomplicated GERD, mild to moderate esophagitis, Upper GI symptoms with resolution for 3 days	4-8 weeks
		>8 weeks
AGA (2017)	Uncomplicated GERD	Continue if Barrett's esophagitis, symptomatic GERD or chronic NSAID use

*Adapted from CFPC, College of Family Physicians of Canada; AGA, American Gastroenterological Society.

STAKEHOLDER PERSPECTIVES

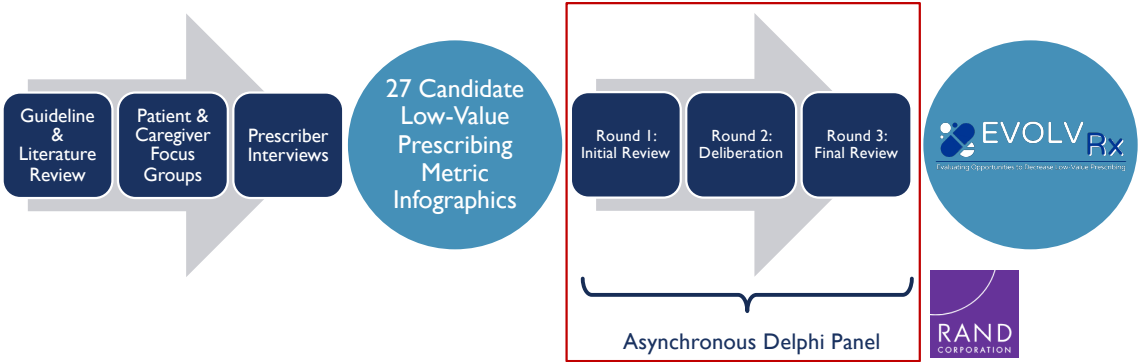
PATIENTS AND CAREGIVERS <ul style="list-style-type: none"> Valued by patients as a medication that improves symptoms 	PRACTICING PRESCRIBERS <ul style="list-style-type: none"> Continued unnecessarily beyond appropriate duration
--	---

*Thomas AN, Bostrom TS, et al. Older Patient and Caregiver Perspectives on Medication Value and Discontinuing a Quinine Study. Journal of the American Geriatrics Society. 2015; 63(6): 1016-1021

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Approach To Metric Development (Aim 1)



Institutions Represented By The Delphi Panelists & Research Team

15 Delphi Panelists

- Ken Schmader, MD
- Gordon Schiff, MD
- C. Bernie Good, MD, MPH
- Elizabeth Bayliss, MD, MSPH
- Michael Steinman, MD
- Holly Holmes, MD, MS, AGSF
- Tim Anderson, MD, MAS
- Mark Friedberg, MD, MPP
- Chris Moriates, MD
- Zach Marcum, PharmD, MS
- Natasha Parekh, MD, MS
- Winfred Frazier, MD, MPH, FAAFP
- Matthew Joseph, MD, PharmD
- Emily Reeve, BPharm, PhD
- Justin Turner, BPharm, MCLinPharm, PhD



Delphi Panel Process

- In collaboration with RAND, applying the ExpertLens Platform
- 3 rounds, each lasting 1 to 2 weeks
 - Initial review
 - Asynchronous deliberation and metric revision
 - Final review
- Rated the scientific validity and clinical usefulness using a 9-point Likert scale
- Candidate metrics where there was agreement and that received median scores of ≥ 6.5 were included in the final EVOLV-Rx metric

Results

Delphi Panel Ratings	Round 1	Round 3
Scientific Validity		
Median rating ≥ 6.5		
IQR 7-9		
Usefulness in Clinical Practice		
Median rating ≥ 6.5		
IQR 7-9		

*Starting with 27 Candidate LVP Metrics

Results

Delphi Panel Ratings	Round 1	Round 3
Scientific Validity		
Median rating ≥ 6.5	19	
IQR 7-9	10	
Usefulness in Clinical Practice		
Median rating ≥ 6.5	20	
IQR 7-9	11	

*Starting with 27 Candidate LVP Metrics



Results

Delphi Panel Ratings	Round 1	Round 3
Scientific Validity		
Median rating ≥ 6.5	19	
IQR 7-9	10	
Usefulness in Clinical Practice		
Median rating ≥ 6.5	20	
IQR 7-9	11	

After Round 2
Deliberations...
19 Revisions or
Clarifications

*Starting with 27 Candidate LVP Metrics



Results

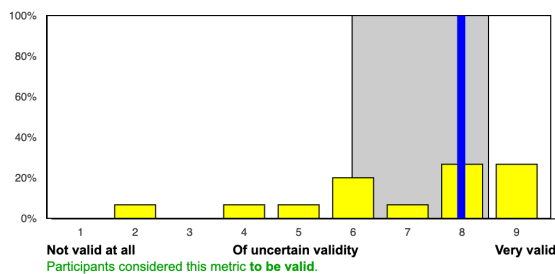
Delphi Panel Ratings	Round 1	Round 3
Scientific Validity		
Median rating ≥ 6.5	19	21
IQR 7-9	10	18
Usefulness in Clinical Practice		
Median rating ≥ 6.5	20	20
IQR 7-9	11	18

After Round 2
Deliberations...
19 Revisions or
Clarifications

*Starting with 27 Candidate LVP Metrics



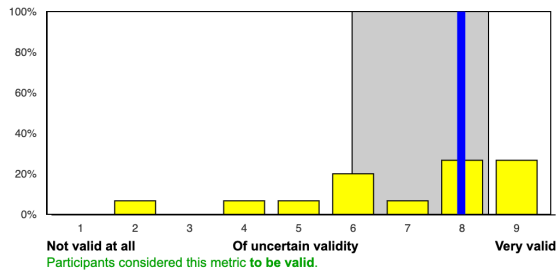
Round 1: Prolonged Use of Non-Steroidal Anti-Inflammatories



Not valid (1-3)	•It may be hard to determine chronic use. Intermittent use is common
Of uncertain validity (4-6)	•Use of OTC NSAIDs will pose a challenge to measurement •There is solid evidence of harms, but not sure if evidence supports that occasional PRN dosing is harmful.
Valid (7-9)	•Evidence of harm is overwhelming, but need to consider implications of if patients then begin to take other riskier pain medications •Overall cost of prescription NSAIDs supports inclusion and is a conservative estimate when one considers OTC use

Base (Sensitive) Criterion	Additional Specific Criteria
<p>Use >30 consecutive days</p> <p>*Use applies to PRN or standing dosing</p>	<ul style="list-style-type: none"> • COX-1 selective NSAID in patients at an increased risk of experiencing a GI bleed* and not prescribed a PPI (H) • COX-2 selective NSAID in patients with atherosclerotic cardiovascular disease (H) • Any NSAID (COX 1 or 2) in pts with chronic kidney disease (H) • History of peptic ulcer disease, other forms of upper gastrointestinal bleeding, coagulopathy, or concurrent use with other anticoagulants or NSAIDs (H)

Round 3: Prolonged Use of Non-Steroidal Anti-Inflammatories



Not valid (1-3)	•It may be hard to determine chronic use. Intermittent use is common
Of uncertain validity (4-6)	•Use of OTC NSAIDs will pose a challenge to measurement •There is solid evidence of harms, but not sure if evidence supports that occasional PRN dosing is harmful
Valid (7-9)	•Evidence of harm is overwhelming, but need to consider implications of if patients then begin to take other riskier pain medications •Overall cost of prescription NSAIDs supports inclusion and is a conservative estimate when one considers OTC use

Base (Sensitive) Criterion

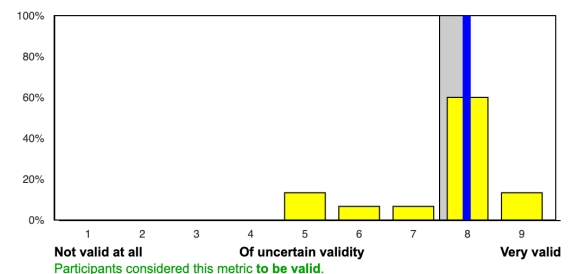
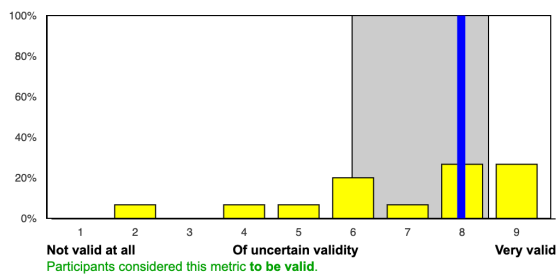
Use >90 consecutive days, excluding patients with pericarditis or a rheumatologic condition*

*Use applies to PRN or standing dosing

Additional Specific Criteria

- COX-1 selective NSAID in patients at an increased risk of experiencing a GI bleed* and not prescribed a PPI (H)
- COX-2 selective NSAID in patients with atherosclerotic cardiovascular disease (H)
- Any NSAID (COX 1 or 2) in pts Aged ≥75 OR chronic kidney disease (H)
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Round 3: Prolonged Use of Non-Steroidal Anti-Inflammatories



Base (Sensitive) Criterion

Use >90 consecutive days, excluding patients with pericarditis or a rheumatologic condition*

*Use applies to PRN or standing dosing

Additional Specific Criteria

- COX-1 selective NSAID in patients at an increased risk of experiencing a GI bleed* and not prescribed a PPI (H)
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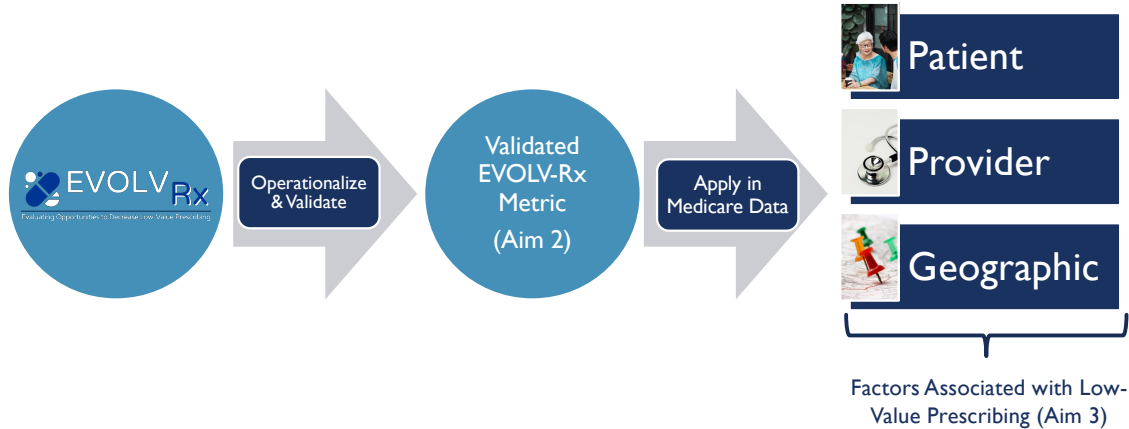
Table 1. Expert Panel Ratings and Characterizations of Scientific Validity and Clinical Usefulness of Candidate Low-Value Prescribing Practices

Candidate low-value prescribing practice	Median score ^a			
	Scientific validity		Clinical usefulness	
	Round 1	Round 3	Round 1	Round 3
Ineffective use^b				
Thyroid hormone for subclinical hypothyroidism	8	8	7	8
Testosterone for nonspecific aging symptoms	8	8	8	8
Docusate sodium for constipation	7	7	8	8
Gabapentinoids for non-neuropathic pain	8	8	8	8
Prolonged use^c				
PPIs	7	7	8	8
NSAIDs	8	8	7	7
DAPT after PCI	8	8	8	7
Inappropriate use^d				
Vitamin B ₁₂ supplementation	7	7	7	7
Antipsychotic drugs in patients with dementia	8	8	7	7
Antibiotics for respiratory conditions	8	8	8	8
Antiparkinsonian medications in patients prescribed an antipsychotic drug or metoclopramide hydrochloride	7	7	7	7
ACHE inhibitors for severe Alzheimer dementia	7	7	7	7
Potentially unsafe use^e				
DAPT and systemic anticoagulation drugs	7.5	7.5	8	8
Benzodiazepines	8	8	7	8
Skeletal muscle relaxants	7	7	7	7
Anticholinergic drugs	7	7	7	7
Overly intensive treatment^f				
Type 2 diabetes	8	8	8	8
COPD	8	8	8	8

Prescribing Practices Not Incorporated In EVOLV-Rx

Candidate prescribing practices that did not meet inclusion criteria				
Candidate prescribing practices rated as scientifically valid but of uncertain clinical usefulness				
Aspirin for primary prevention of ASCVD	6	7	6	6
Sedative or hypnotic sleeping aids	7	7	6	6
Opioids for treatment of noncancer pain	6	6.5	5	6
Candidate prescribing practices rated as having uncertain scientific validity				
Statins for primary prevention of ASCVD	5	5	4 ^g	5
Inappropriate use of iron supplementation	6	6	6	6
Nitrofurantoin for the treatment or prevention of UTI	5	6	5	5
Loop diuretics with a calcium channel blocker as part of a prescribing cascade	6	6	7	7
Genitourinary antispasmodic drugs in patients prescribed a cholinesterase inhibitor as part of a prescribing cascade	6	6	6	6
Overtreatment of hypertension	6	6	7	7

What's next? - Validation and Application (Aims 2 & 3)



OBJECTIVES



Define low-value prescribing, why it's a serious health problem, and existing research gaps



Review the overarching development process for EVOLV-Rx



Present qualitative research findings and results of the Delphi Panel that informed the development of EVOLV-Rx



Discuss the application of a theoretical model for a deprescribing intervention that incorporates EVOLV-Rx

Where Do We Go From Here?

- Low-value prescribing affects 1 in 3 VA-enrolled Veteran, including >50% of Veterans residing in a Community Living Center (CLC)
- CLCs represent an ideal setting to fully account for, and safely reduce, low-value prescribing.
- No intervention to broadly reduce low-value prescribing has been integrated into routine care and implemented at scale across CLCs

Evidence Based Tools And Expertise Available In VA

Computerized
clinical decision
support

Clinical
pharmacy
expertise

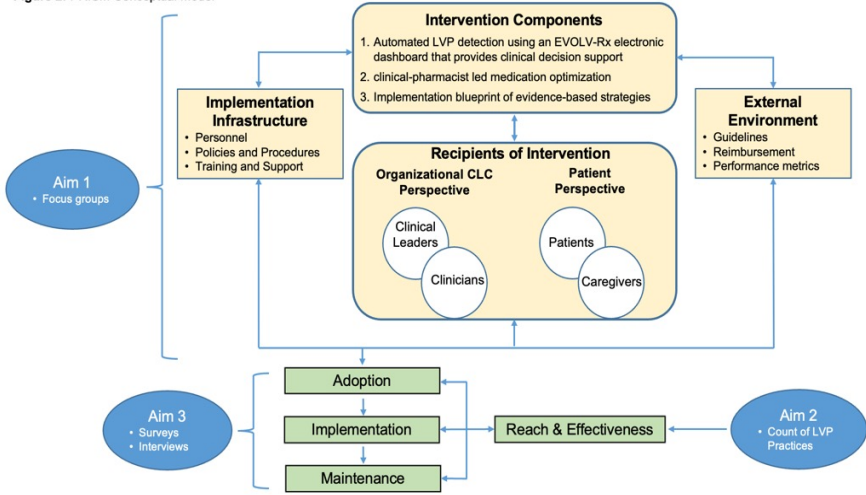
Academic
detailing

- *By themselves*, these approaches have not consistently reduced LVP or improved clinical outcomes
- Their optimal implementation in VA CLCs has not been rigorously studied
- There are little available data on the potential added value of bundling these approaches together

Study Objective

To develop, implement, and evaluate a multi-component intervention that incorporates EVOLV-Rx to proactively detect and reduce low-value prescribing among older Veterans who reside in CLCs in Veterans Integrated Service Network 4

Figure 2: PRISM Conceptual Model



Implementation Blueprint



Direct
Training



External
Facilitation



Clinical
Champions



Audit and
Feedback



Learning
Collaborative

SUMMARY

- Low-value prescribing and polypharmacy are serious health problems, affecting up to 50% of older adults
- Our study represents an approach to successfully integrate multiple qualitative approaches to systematically develop a low-value prescribing metric (EVOLV-Rx)
- EVOLV-Rx represents a scalable and patient-centered tool to detect low-value prescribing that enables clinicians to prioritize for deprescribing those medications with clinical impact and that are acceptable to be deprescribed from the perspective of patients/caregivers
- The PRISM and RE-AIM frameworks may provide a robust model for the development of de-implementation interventions

Research Mentors, Collaborators, & Funders

- Walid Gellad, MD, MPH
- Carolyn Thorpe, PhD, MPH
- Joe Hanlon, PharmD, MS
- Mark Roberts, MD, MPP
- Michael Fine, MD, MSc
- Megan Hamm, PhD
- Alicia Dawdani, BS
- Alison Decker, BS
- Aimee Pickering, MD
- Eric Walter, MD, MBA
- Dmitry Khodyakov, PhD
- CP3 Faculty
- Advisory Committee
- National Institute on Aging
- USDeN Jr. Investigator Program



Thank you!

Feel free to reach out with questions:

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