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Optimizing Imaging Among Men with Incident Prostate Cancer: A Framework-Based Approach

HSR&D Career Development Awardee Series

November 10, 2016

Poll Question #1

- What is your primary role in VA?
 - student, trainee, or fellow
 - clinician
 - researcher
 - Administrator, manager or policy-maker
 - Other

Poll Question #2

- If a clinician, what is your specialty?
 - Urology
 - Radiation Oncology
 - Medical Oncology
 - Primary Care
 - Other

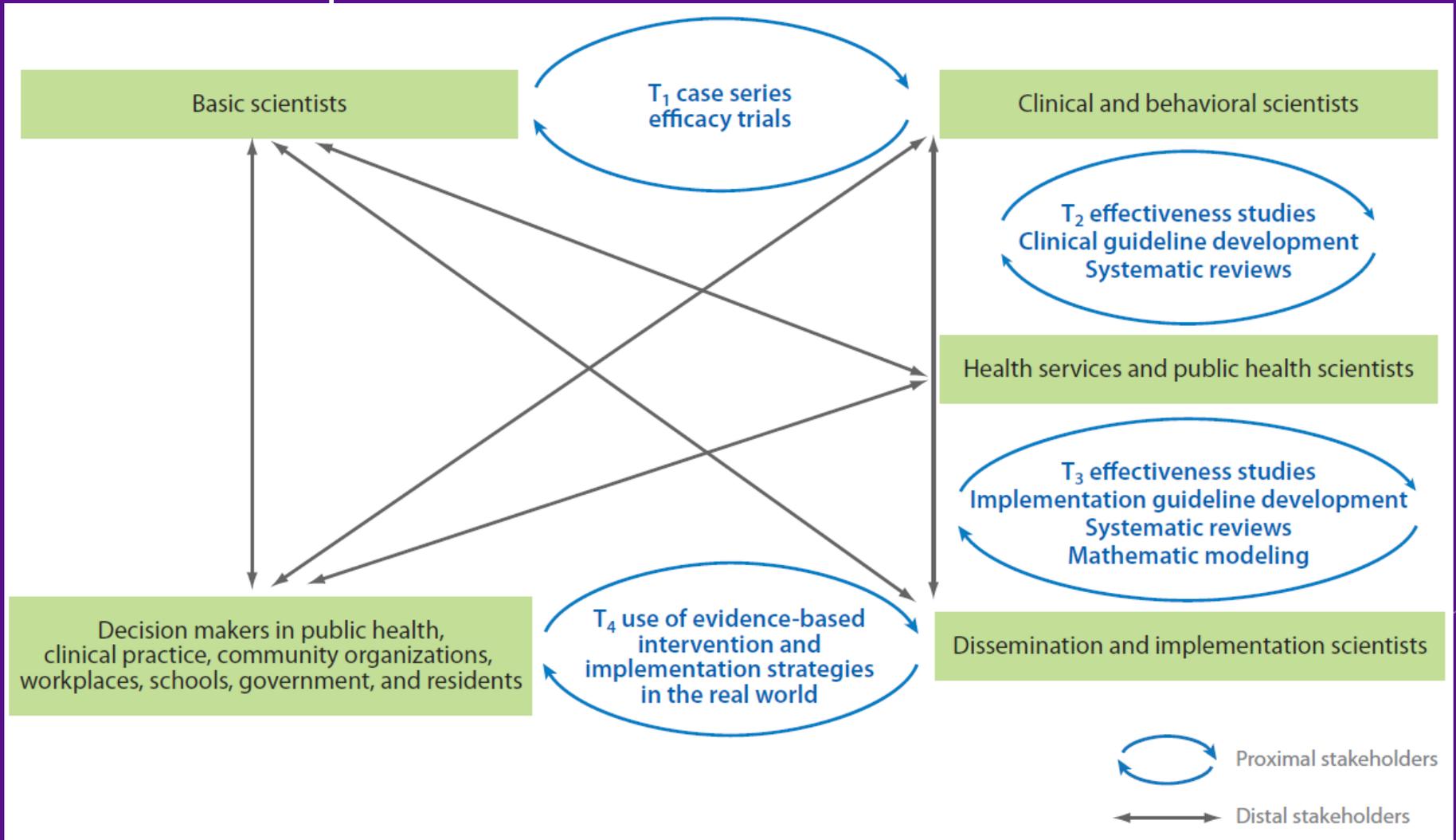
Poll Question #3

- Which best describes your research experience?
 - have not done research
 - have collaborated on research
 - have conducted research myself
 - have applied for research funding
 - have led a funded research grant

Poll Question #4

- If a researcher, what is the primary focus of your work?
 - Implementation science
 - Health services
 - Clinical epidemiology
 - Basic Science
 - Other

Examples of stakeholders at translational steps in the NIH Roadmap Initiative



VA QUERI Process: Framework for Implementation Science

1. Identify high-risk/high-volume diseases or problems.



2. Identify best practices.



3. Define existing practice patterns/outcomes, current variation from best practices.



4. Identify and implement interventions to promote best practices.



5. Document that best practices improve outcomes.



6. Document that outcomes are associated with improved health-related quality of life.

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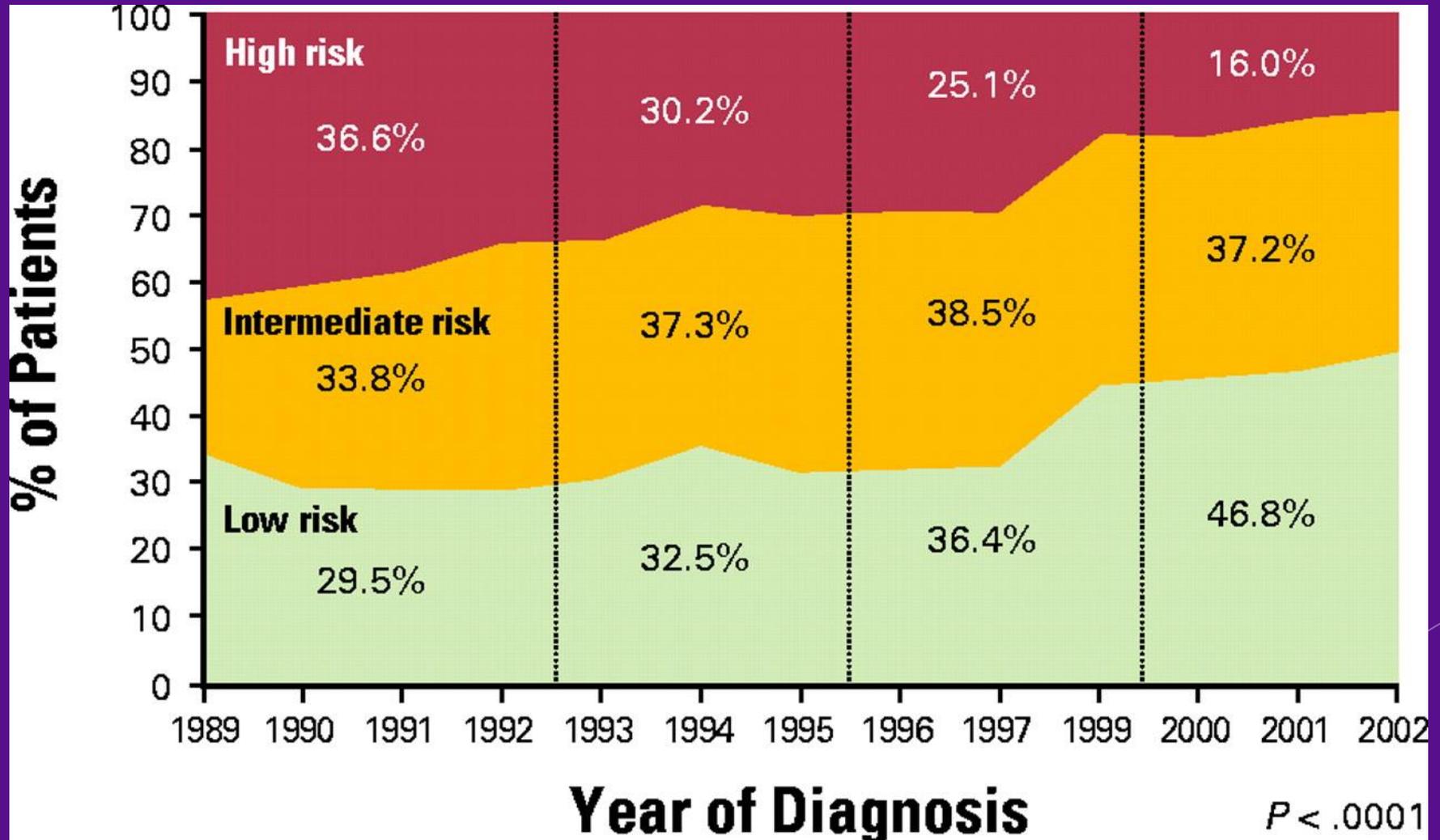


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Stage migration from PSA screening has made routine imaging to stage prostate cancer unnecessary



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There is a consensus among policy making bodies and professional societies that prostate cancer imaging is overused



American
Urological
Association



National
Comprehensive
Cancer
Network®

ACR®
AMERICAN COLLEGE OF
RADIOLOGY



eau European
Association
of Urology

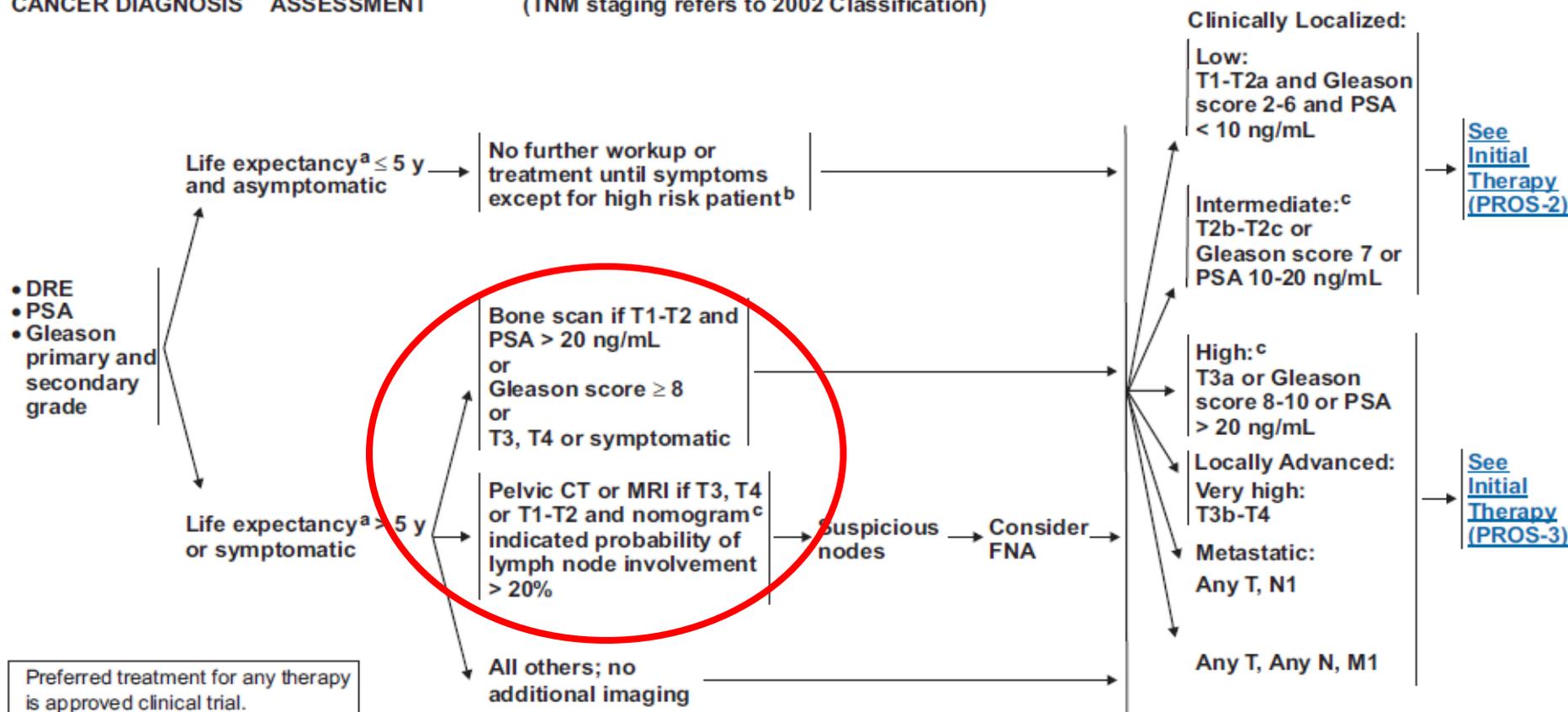
PQRS
Physician Quality Reporting Services

INITIAL PROSTATE
CANCER DIAGNOSIS

INITIAL CLINICAL
ASSESSMENT

STAGING WORKUP
(TNM staging refers to 2002 Classification)

RECURRENCE RISK



^a See Principles of Life Expectancy (PROS-A).

^b In selected patients where complications such as hydronephrosis or metastasis can be expected within 5 y, androgen deprivation therapy (ADT) or radiation therapy (RT) may be considered. High risk factors include bulky T3-T4 disease or Gleason score 8-10.

^c Patients with multiple adverse factors may be shifted into the next higher risk group.

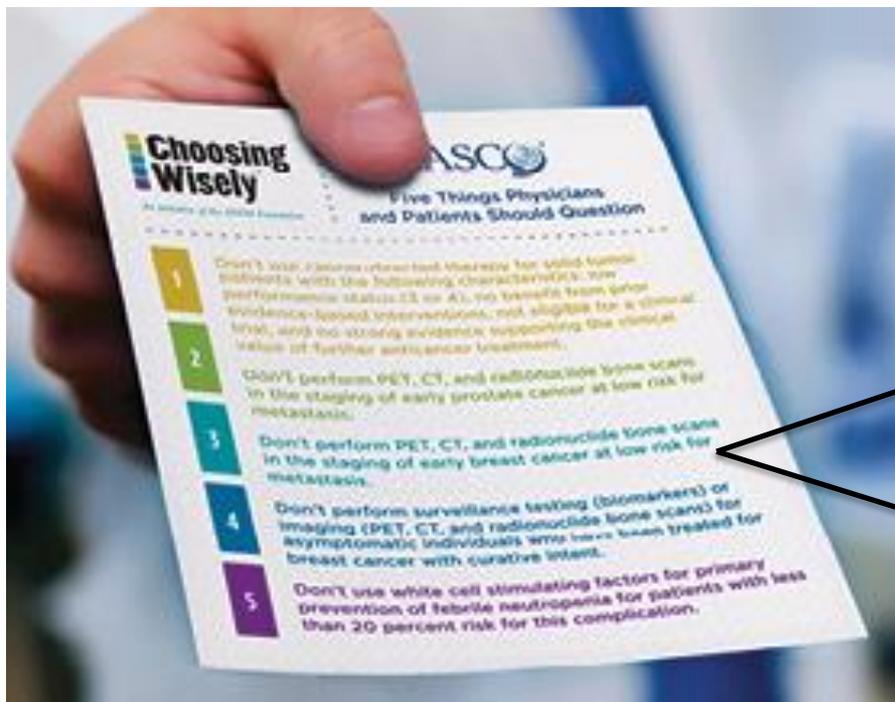
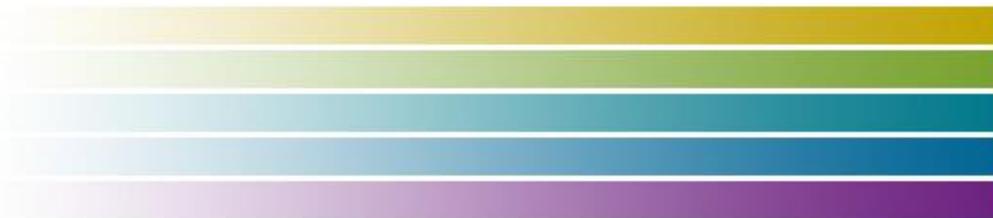
Note: All recommendations are category 2A unless otherwise indicated.

Clinical Trials: NCCN believes that the best management of any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

In response to still-high inappropriate imaging ASCO and AUA have included its reduction in their “Top Five” lists.

Choosing Wisely[®]

An initiative of the ABIM Foundation



#3 Don't perform PET, CT and radionuclide bone scans in the staging of early prostate cancer at low risk for metastasis.

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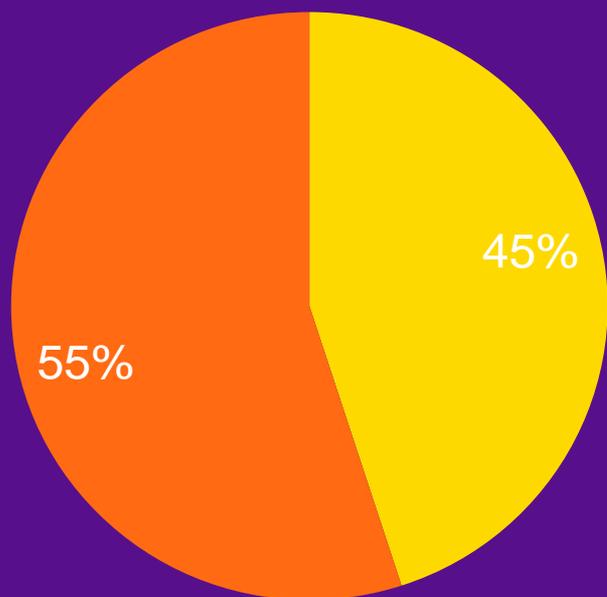
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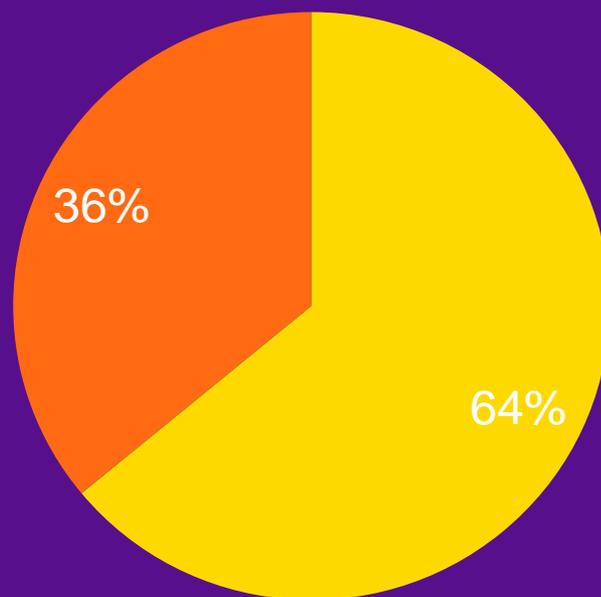
Use of imaging among men with prostate cancer in SEER-Medicare 2004-2005, stratified by indication (N=29,053)

Use of imaging among men with low risk prostate cancer (N=18,491)



■ Imaged ■ Not imaged

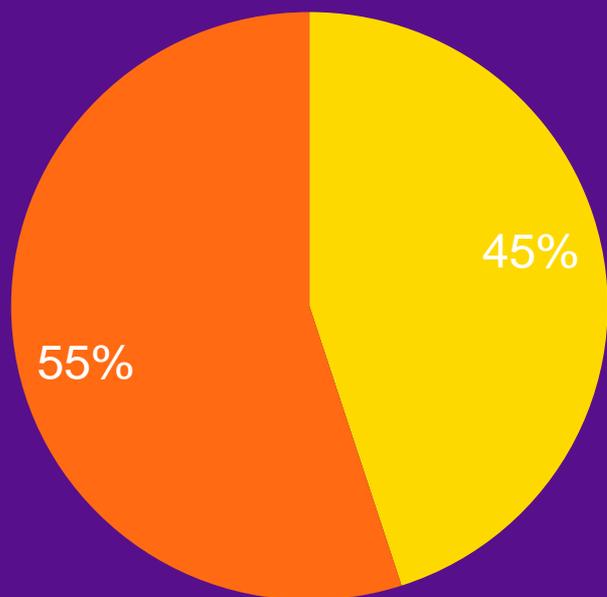
Use of imaging among men with high risk prostate cancer (N=10,562)



■ Imaged ■ Not imaged

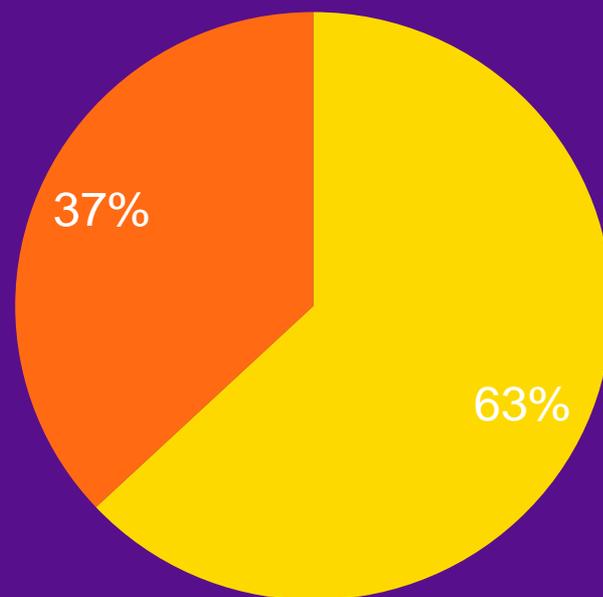
Use of imaging among men with prostate cancer in NPCR of Sweden 1998, stratified by indication (N=99,879)

Use of imaging among men with low risk prostate cancer (24,463)



■ Imaged ■ Not imaged

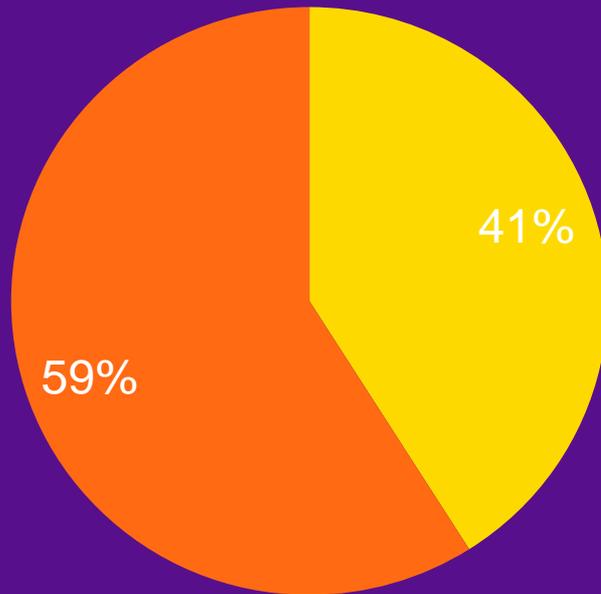
Use of imaging among men with high risk prostate cancer (48,338)



■ Imaged ■ Not imaged

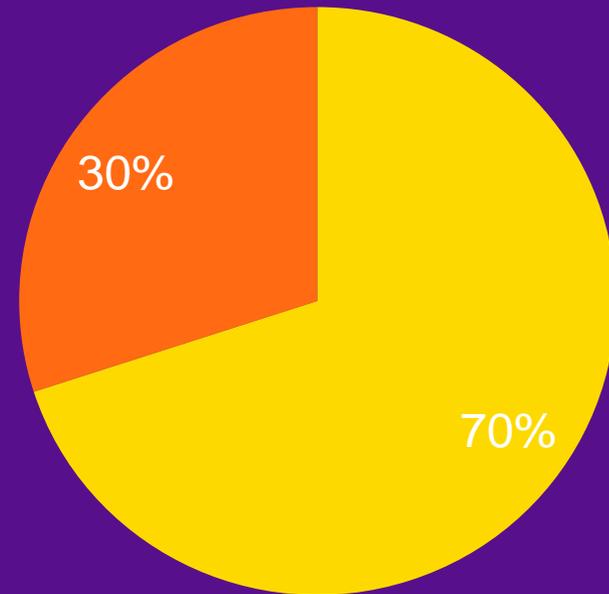
Use of imaging among men with prostate cancer in VACCR 2004-2008, stratified by indication (N=45,084)

Use of imaging among men with low risk prostate cancer (N=32,917)



■ Imaged ■ Not imaged

Use of imaging among men with high risk prostate cancer (N=12,167)



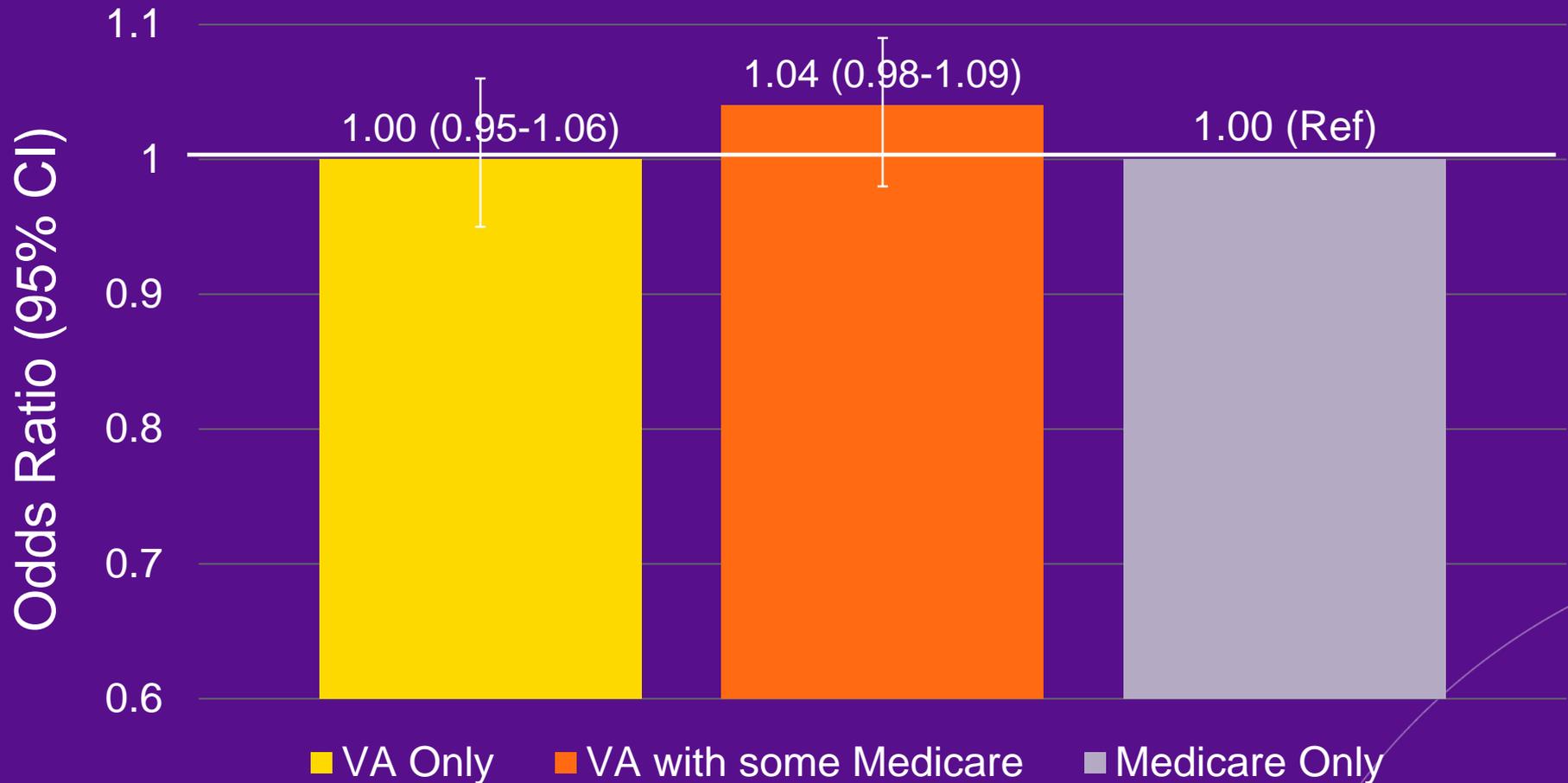
■ Imaged ■ Not imaged

Factors other than guidelines seem to influence imaging decision making

	Low Risk	High Risk
Insurance group:		
Medicare only	Reference	Reference
VA only	0.79* (0.67 0.92)	1.00 (0.95 1.06)
VA with some Medicare	0.87* (0.76 0.98)	1.04 (0.98 1.09)
Clinical stage:		
T1	Reference	Reference
T2NOS	1.03 (0.96 1.09)	1.08* (1.05 1.11)
T2A	1.07 (1.00 1.15)	0.99 (0.92 1.05)
T2B	1.25 (1.17 1.33)	1.07* (1.02 1.13)
T2C	1.21 (1.15 1.27)	1.08* (1.04 1.12)
T3		1.06
T4		0.98
Missing		1.03
Gleason grade:		
Less than 7	Reference	Reference
3+4	1.23* (1.17 1.28)	1.24* (1.15 1.35)
4+3	1.38* (1.30 1.46)	1.32* (1.20 1.43)
Greater than or equal to 8		1.45
Missing		1.14
PSA level (ng/mL):		
0 4	Reference	Reference
4 10	0.95 (0.92 0.99)	0.97 (0.93 1.01)
10 20	1.52* (1.39 1.64)	1.06* (1.02 1.11)
Greater than 20		1.10
Missing		0.91

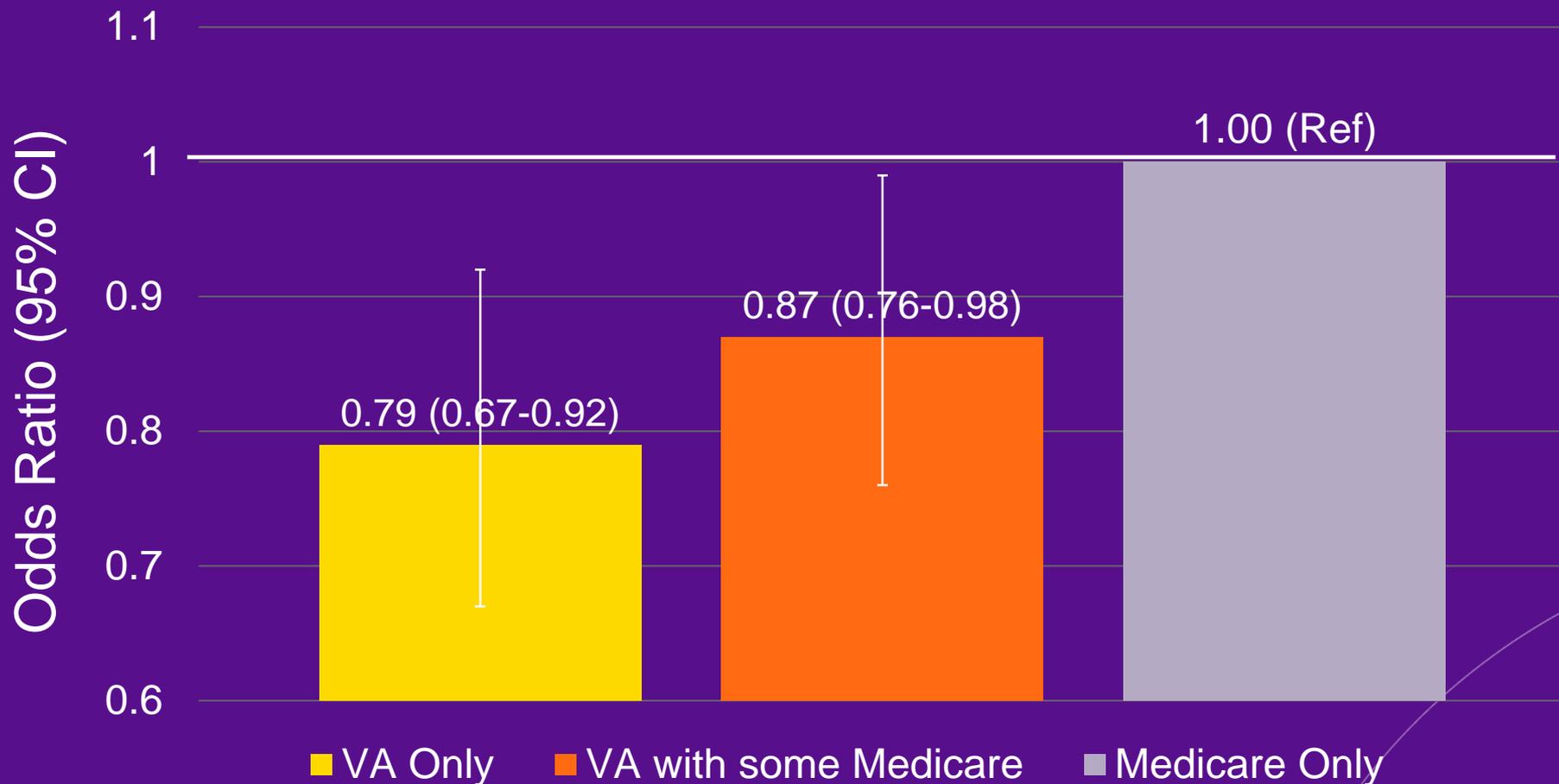
Adjusted for medical comorbidity, mental health comorbidity, age, race, marital status, income, disability status, academic affiliation, education, year of diagnosis, hospital volume

Factors other than guidelines seem to influence imaging decision making



Adjusted for medical comorbidity, mental health comorbidity, age, race, marital status, income, disability status, academic affiliation, education, year of diagnosis, hospital volume

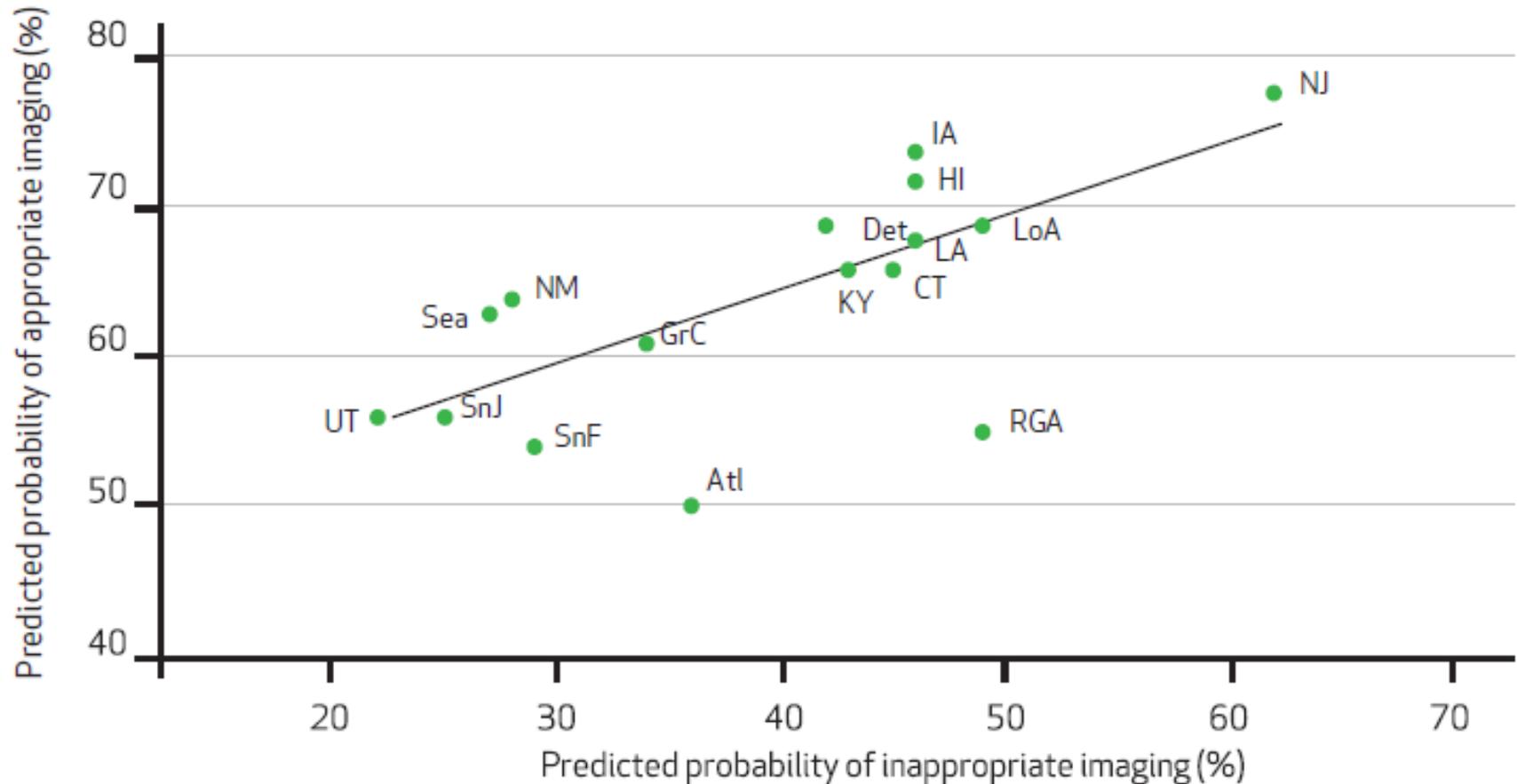
Men with low-risk prostate cancer undergo less inappropriate imaging with less exposure to Medicare



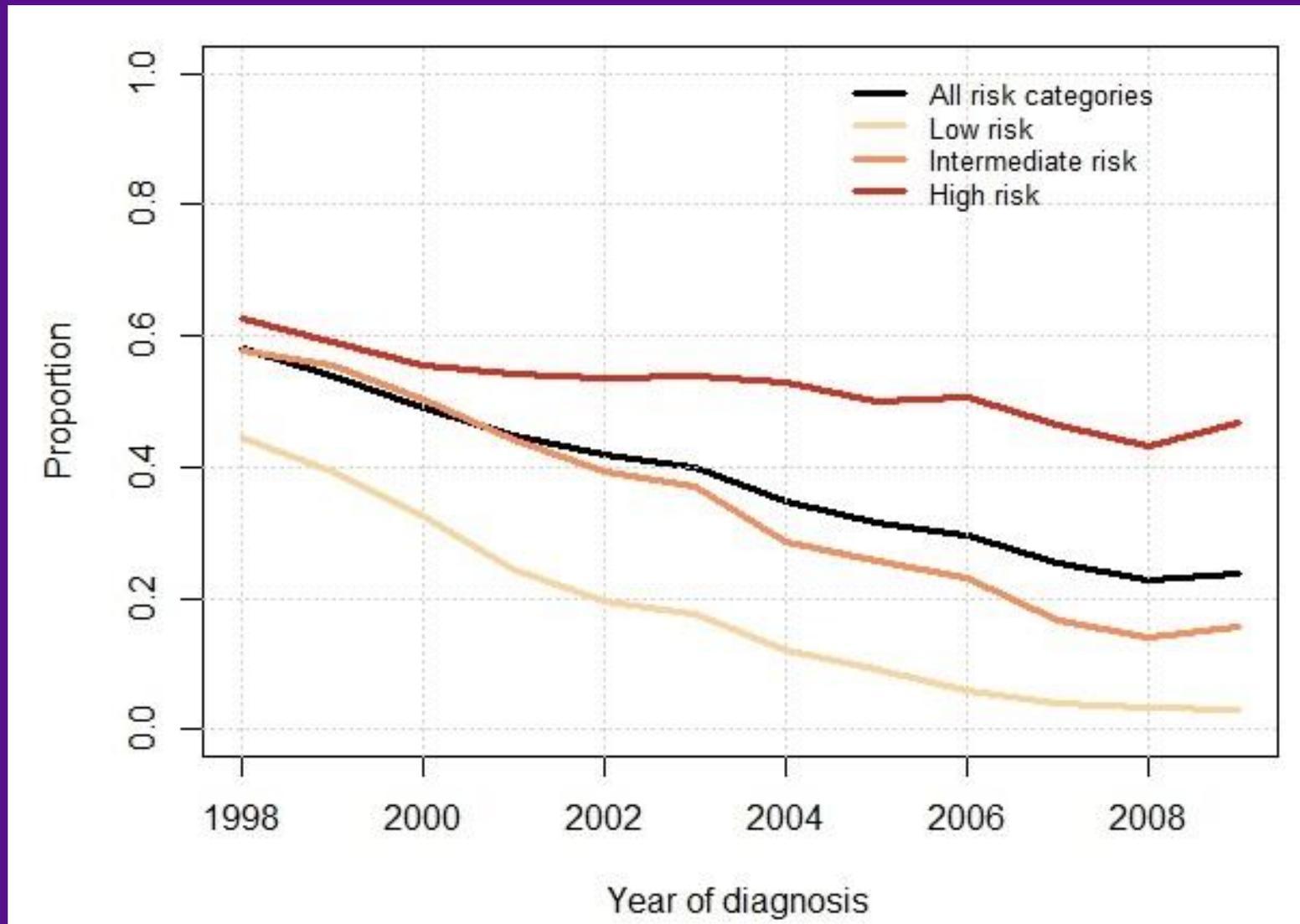
Adjusted for medical comorbidity, mental health comorbidity, age, race, marital status, income, disability status, academic affiliation, education, year of diagnosis, hospital volume

Appropriate and inappropriate imaging are associated with one another among prostate cancer patients in SEER-Medicare

Regional Patterns Of Appropriate Imaging As A Function Of Inappropriate Imaging Among Medicare Patients With Prostate Cancer



Imaging utilization for newly diagnosed prostate cancer decreased over time in all clinical risk categories



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Qualitative research seeks to understand the depth and breadth of human experience

Use Qualitative Research To:

- ✓ Develop an initial understanding of an issue or problem
- ✓ Look for a range of ideas and feelings about something
- ✓ Understand different perspectives between groups and categories of people
- ✓ Uncover underlying motivations and factors that influence decision making and opinions
- ✓ Provide information needed to design a quantitative study
- ✓ Explain findings from a quantitative study

Use Quantitative Research To:

- ✓ Recommend a final course of action
- ✓ Find whether there is consensus on a particular issue
- ✓ Project results to a larger population
- ✓ Identify evidence regarding cause-and-effect relationships
- ✓ Describe characteristics of relevant groups of people
- ✓ Test specific hypotheses and examine specific relationships
- ✓ Identify and size market segments

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Create **C** External Data **D** Analyze **A** Query **Q** Explore **E** Layout **L** View **V**

Text Search Word Frequency Coding Matrix Coding Compound Group

Last Run Query Add to Stop Words List

Run Query Store Query Results Other Actions

Create Actions

Look for: Search In: Find Now Clear Advanced Find

Free Nodes

Name	Sources	References	Created On	Created By	Modified On	Modified By
CAP SELF EFF	10	31	2/2/2015 2:58 PM	ES	2/10/2015 11:41 AM	ES
CONS BENEFIT	7	13	2/2/2015 2:57 PM	ES	2/10/2015 1:10 PM	ES
CONS EVAL	8	30	2/2/2015 2:56 PM	ES	2/9/2015 3:09 PM	ES
CONS HARM	5	19	2/2/2015 2:57 PM	ES	2/9/2015 3:10 PM	ES
CONS LITI	8	17	2/2/2015 2:57 PM	ES	2/10/2015 11:44 AM	ES
CONS MISSPATH	8	27	2/2/2015 2:56 PM	ES	2/10/2015 11:37 AM	ES
CONS N=1	4	4	2/2/2015 2:57 PM	ES	2/9/2015 2:59 PM	ES
CONS RAD	5	13	2/2/2015 2:56 PM	ES	2/9/2015 2:39 PM	ES
EMO ANT REG	1	1	2/2/2015 3:01 PM	ES	2/2/2015 3:30 PM	ES
EMO RES	5	8	2/2/2015 3:02 PM	ES	2/10/2015 11:34 AM	ES
ENV \$	10	26	2/2/2015 3:01 PM	ES	2/10/2015 11:39 AM	ES
ENV ACAD	2	3	2/3/2015 3:44 PM	ES	2/9/2015 2:38 PM	ES
ENV FAC USE	9	19	2/2/2015 3:00 PM	ES	2/10/2015 11:44 AM	ES
ENV NO TIME	3	5	2/2/2015 3:00 PM	ES	2/9/2015 11:42 AM	ES

Borin_Provider_Coded_Final Zhao_Provider_Coded_Final Text search - miss or missed - Karanikolas_Provider_Coded Node Structure Report - Repo

[Click to edit](#)

patients are are treated . . .
 RESPONDENT: Right.
 INTERVIEWER: . . . for for very low cost.
 RESPONDENT: Yeah.
 INTERVIEWER: Um, what do you think about ah, how this reflects on quality of care, overuse?
 RESPONDENT: Ah, well . . .
 INTERVIEWER: Cause that's, that's where, I guess, we're focusing more on on overuse in this discussion.
 RESPONDENT: Sure.
 INTERVIEWER: Yeah. █
 RESPONDENT: So so I think um, it draws away resources that could be utilized for um, treatments that have more efficacy for you know, it draws resources away from really all the other things you would do. Ah, and so, um, I think that's a huge problem. And um, it's a a you know, I think um, medicine should be ah, in a way made more algorithmic, more um, beta-driven, um, you know, Even, you know, we have to take care not to loose the kind of the **art** of medicine and and not ah, you know, put, just put people into boxes, but yet when there's good you know, kind of population based data on the outcome of the tests, you have to use that ah, for it.

In Nodes Code At

Theoretical Domains Framework



Domain: Beliefs about capabilities

- Physicians endorsed variety of opinions regarding whether they follow guidelines, intuition, or personal heuristic
- *“Well if there was some clinical factor that or some clinical suspicion that, you know, the guidelines are sort of intended to direct us and I mean I think it would be very, very infrequent that we’d veer from the guideline based on just my judgment alone.” [Low Imaging VAMC]*
- *“I understand the guidelines and I know them but I’m, I’m going to go against them for this particular reason and that’s why we go to medical school, to have our own opinion on certain things.” [High Imaging VAMC]*

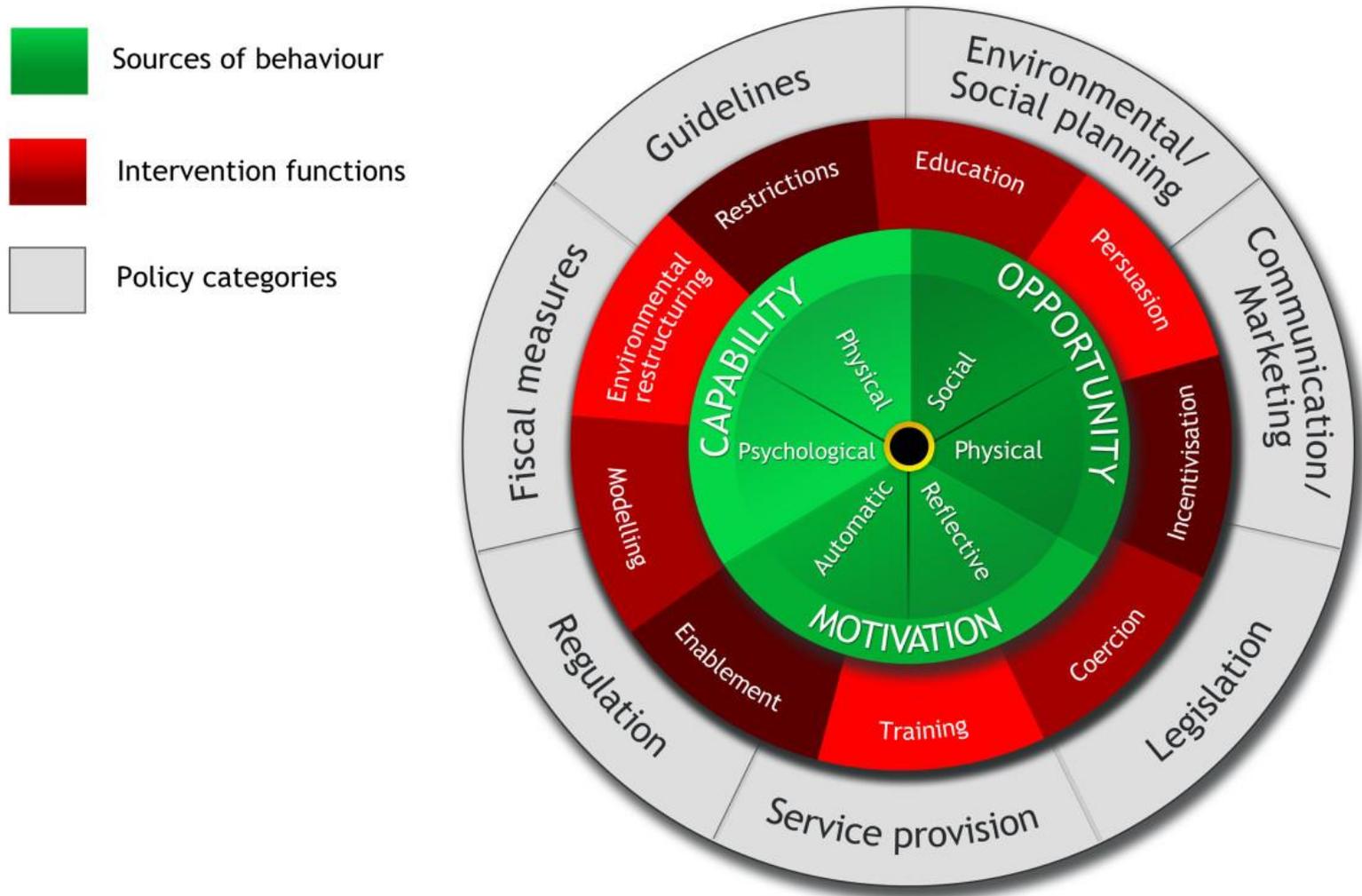
Theory-based domains relevant to prostate cancer imaging



Conclusions from analyses of physician/patient interviews

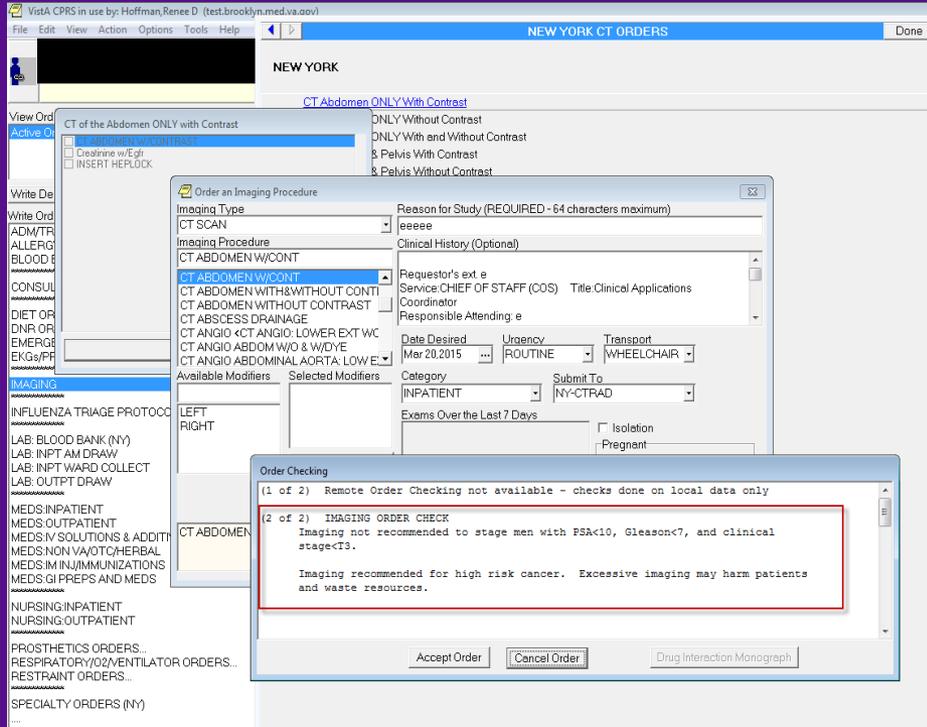
- Patients
 - Little concern for diagnostic imaging in pre-treatment period
 - Treatment-focused
 - Implicit trust in physicians
- Physicians
 - Have faith in imaging guidelines
 - Apt to follow intuition
 - Barriers to adoption of guidelines:
 - Medico-legal concerns
 - Gray-area patients
 - Not wanting to miss an associated diagnosis
 - Influence of imaging-avid colleagues
 - Many physicians suggested program to improve imaging in VHA

Behavior change wheel allows translation of qualitative findings into behavioral interventions



A multi-modal, physician-centered behavioral intervention

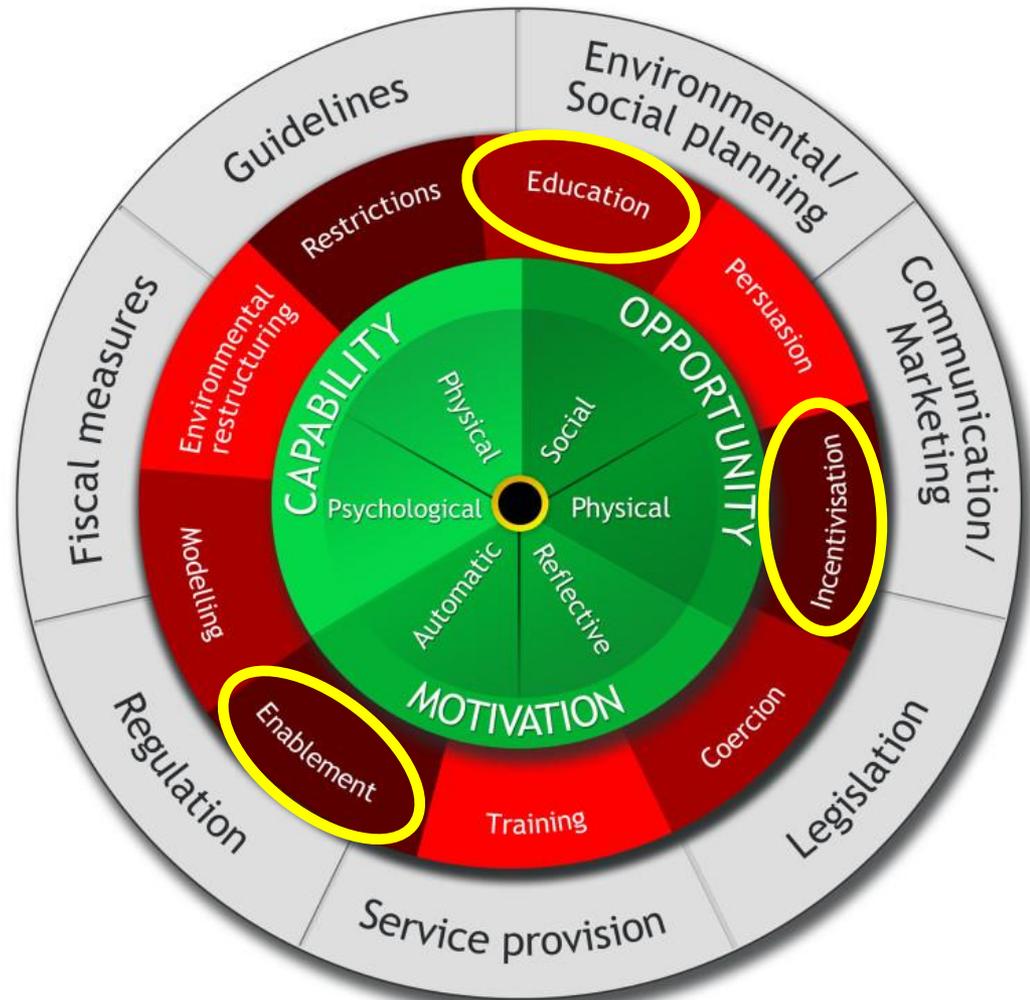
- Clinical Order Check in VA CPRS



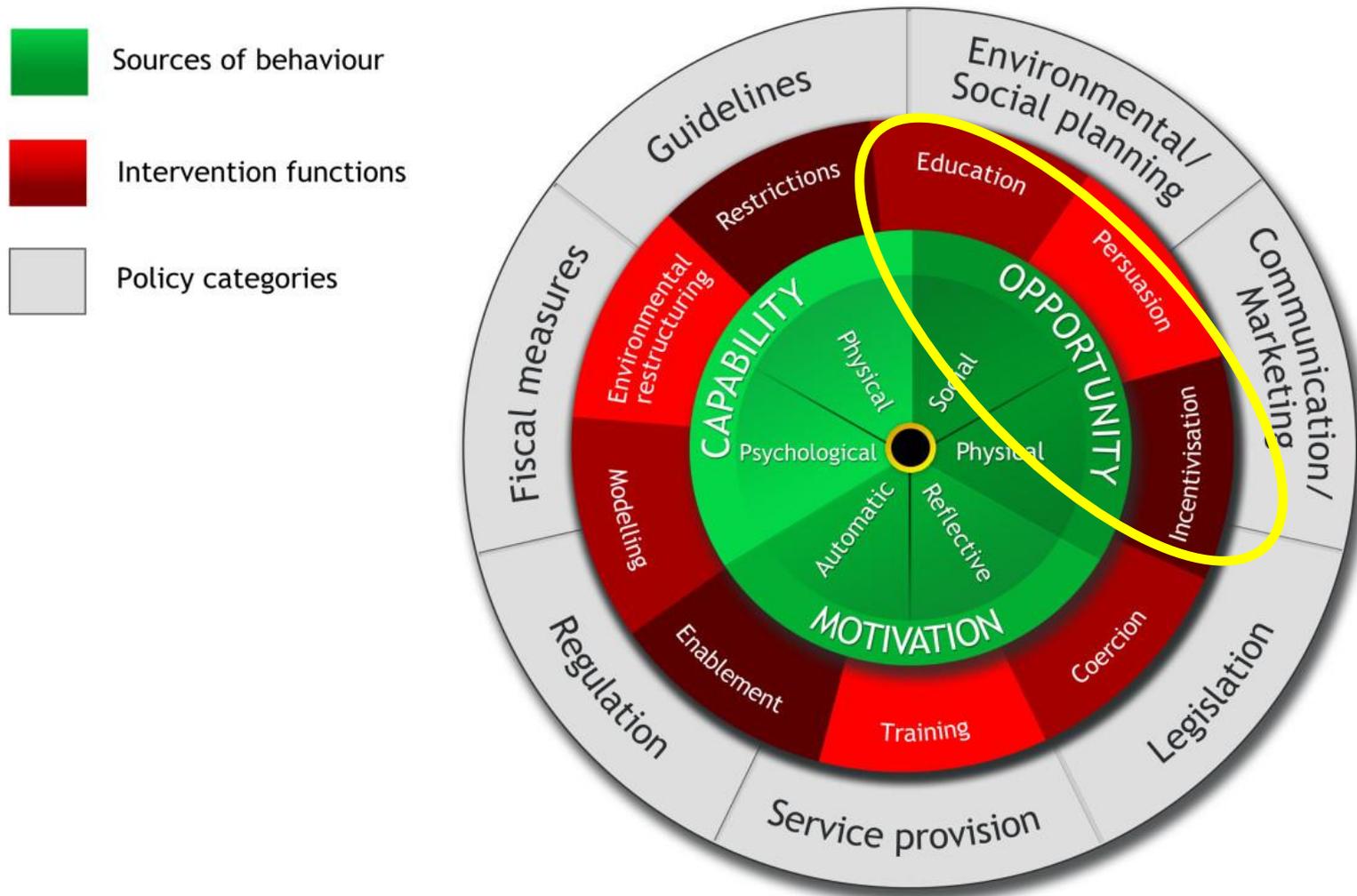
- Audit-and-Feedback
 - Urology sections
 - Individual providers
- “Academic Detailing”

Clinical order check addresses behaviors driven by beliefs about capabilities/consequences, knowledge, social influences, and environmental context and resources

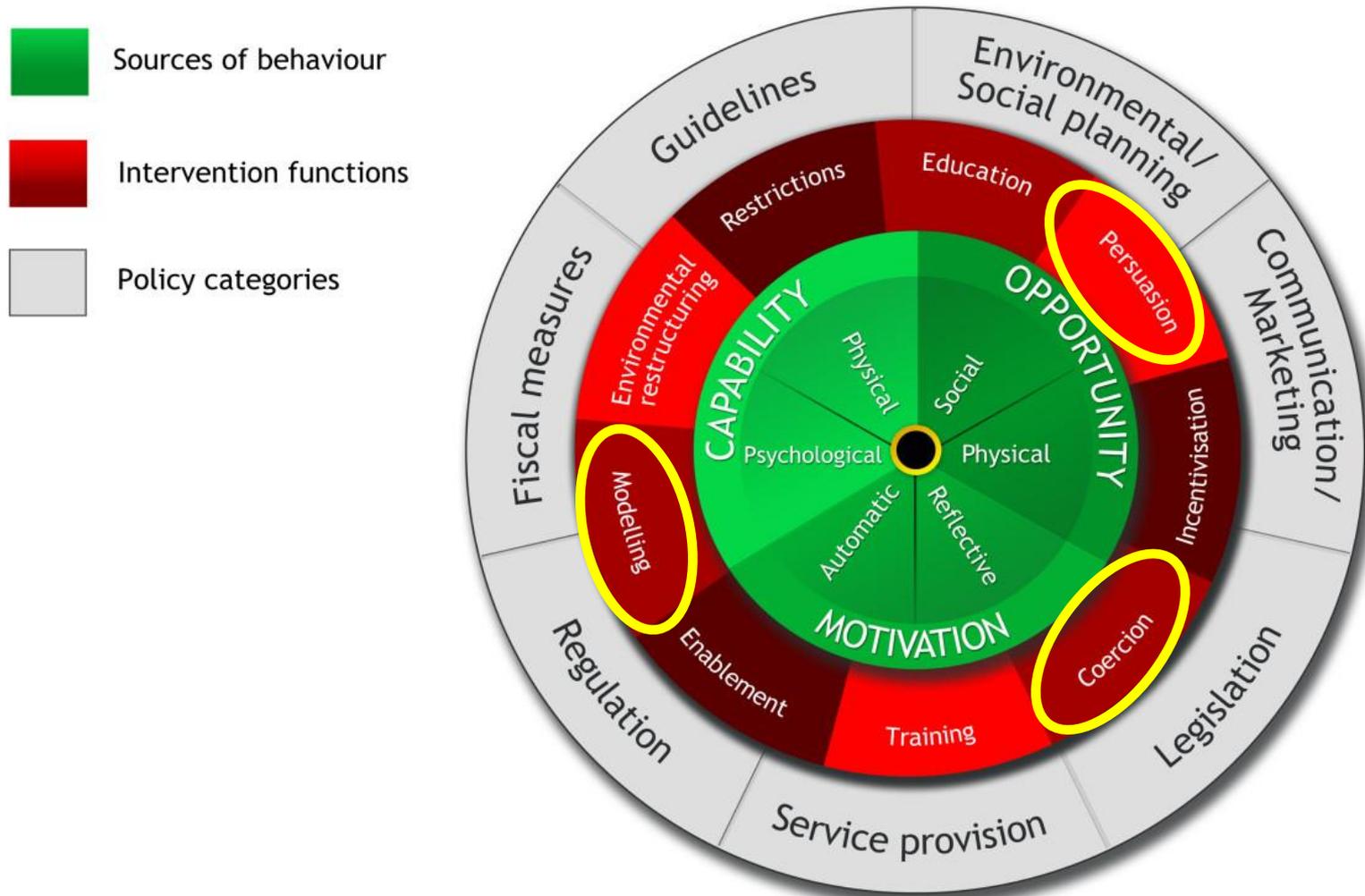
- Sources of behaviour
- Intervention functions
- Policy categories



Audit and Feedback addresses beliefs about capabilities/consequences, knowledge and social influence



Academic detailing addresses behaviors driven by beliefs about capabilities/consequences, knowledge, social influences, and environmental context and resources



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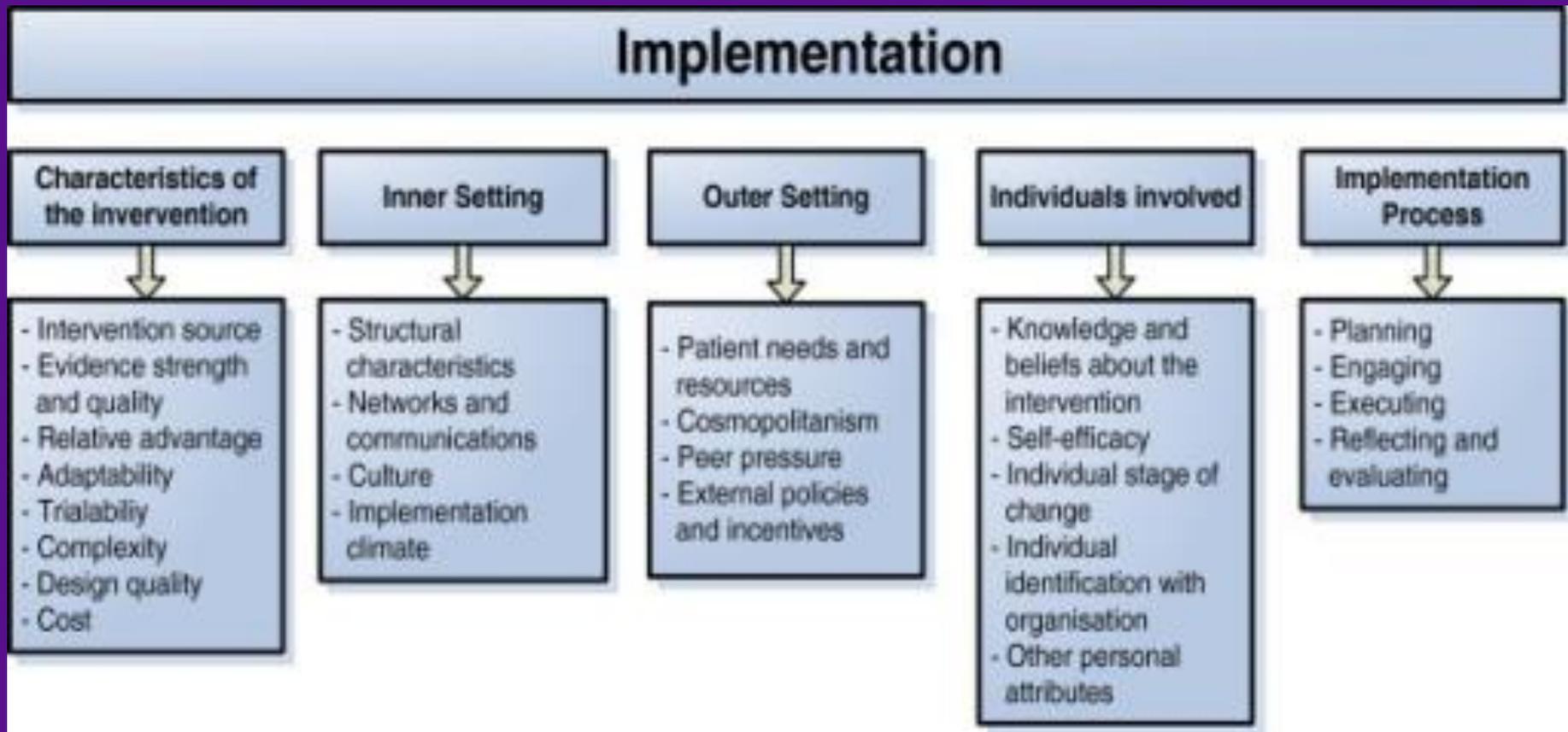


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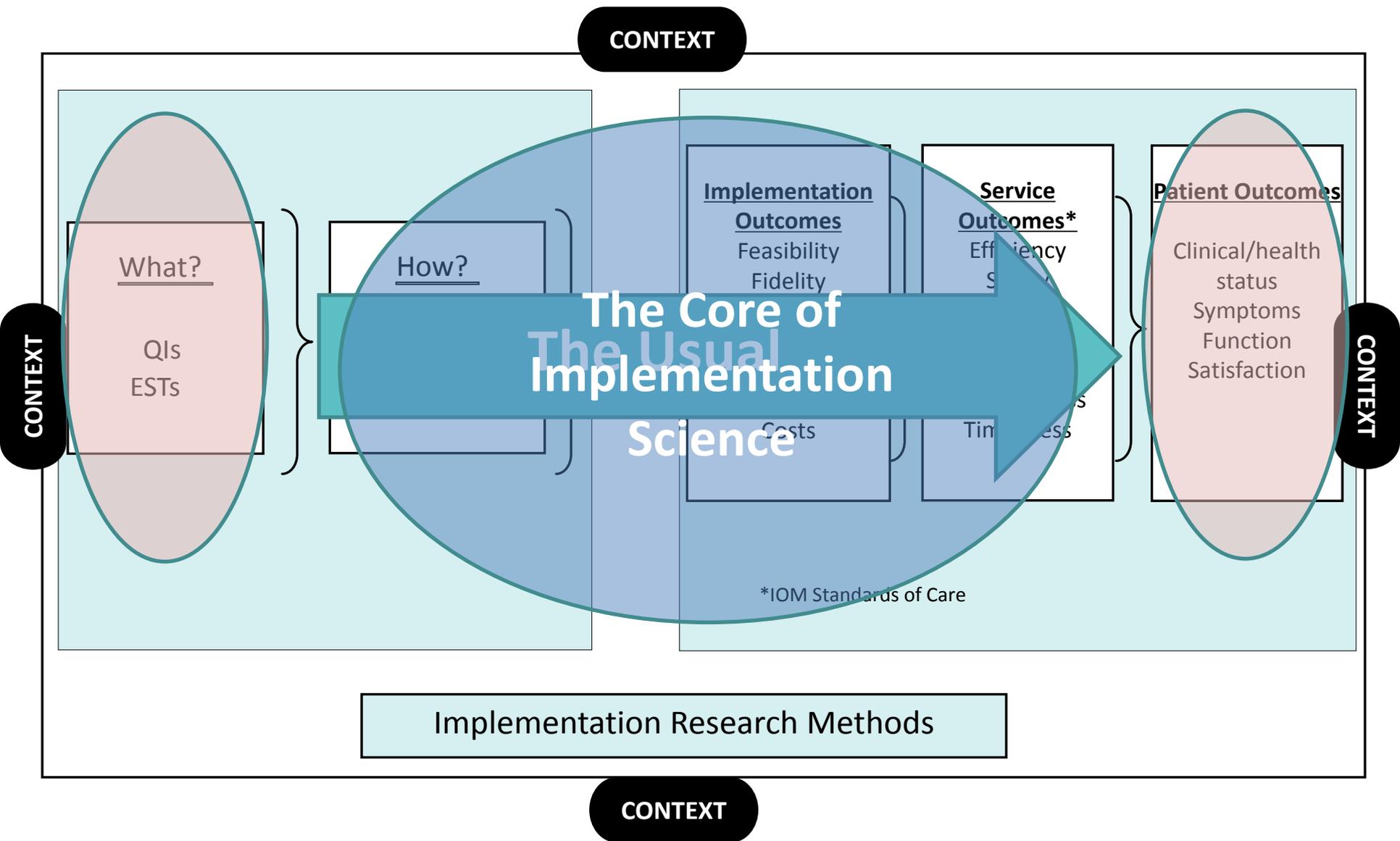


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Consolidated Framework for Implementation Research (CFIR)



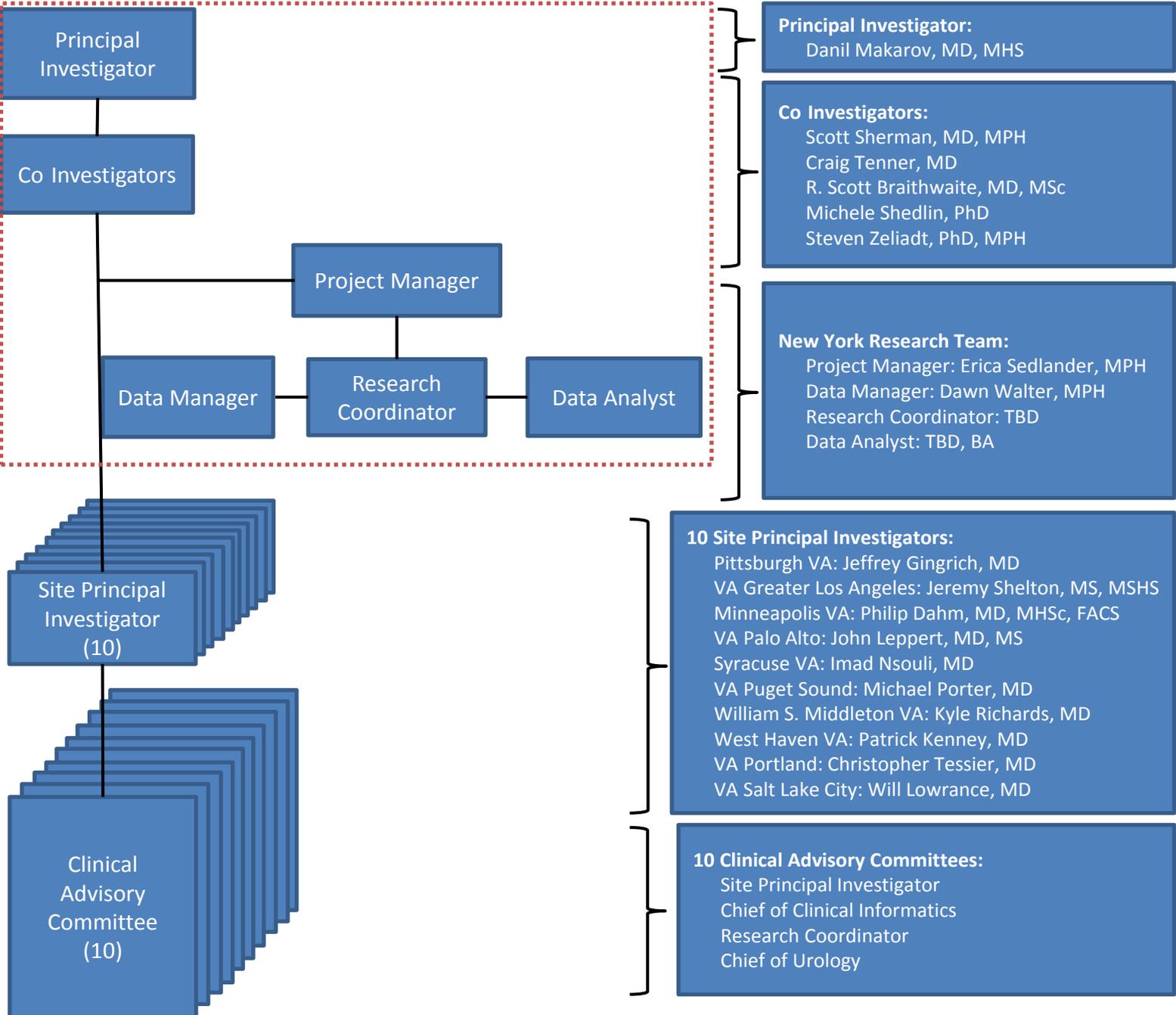
Conceptual Model for Implementation Research



1 I01 HX002038-01A2: Cluster randomized trial across 10 sites in VHA



Organizational chart

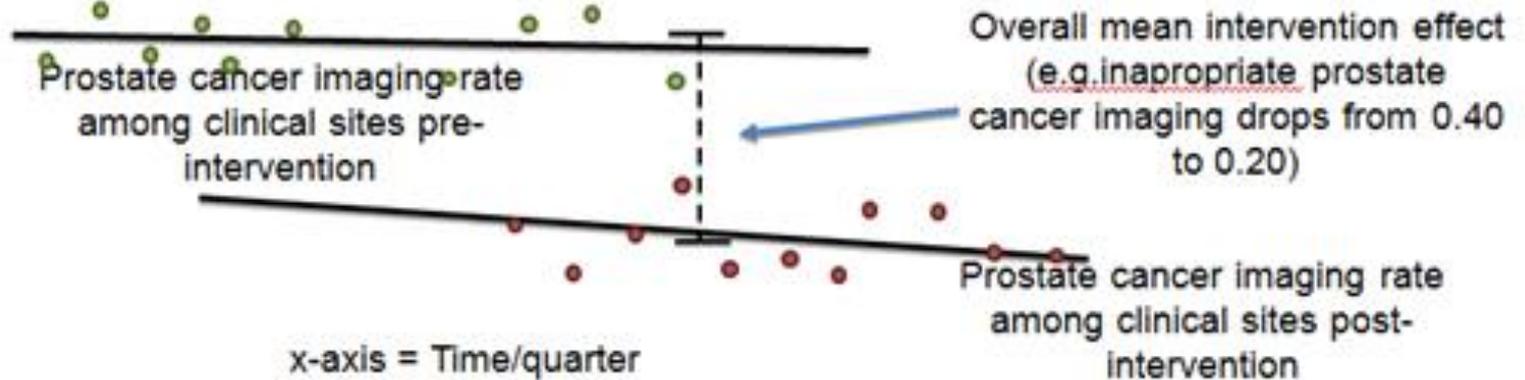


Plan to do a cluster randomized trial across 10 sites in VHA

	Time										
	1	2	3	4	5	6	7	8	9	10	11
1	0	1	1	1	1	1	1	1	1	1	1

C

Figure 6. Theoretical imaging rate as a function of time and intervention status in a stepped wedge roll out. Each dot represents the imaging rate for patients visiting a clinical site (cluster). Periods 1 and 12 have 1 dot, periods 2-11 have dots for provider clusters in each group: pre-intervention and post-intervention.



9	0	0	0	0	0	0	0	0	0	0	1	1
10	0	0	0	0	0	0	0	0	0	0	1	1

Treatment Schedules
0=control, 1=intervention.

Specific Aims and Hypotheses (Aim 1 Effectiveness)

- **Aim 1: To determine whether a multi-modal, physician-focused behavioral intervention can improve facility-level guideline-concordant utilization of prostate cancer imaging.**
- *H 1.1:* A physician focused intervention will decrease facility-level utilization of guideline-discordant imaging among low-risk men because it will address the causes of inappropriate imaging.
- *H 1.2:* A physician-focused intervention will increase facility-level utilization of guideline-concordant imaging among high-risk men because it will actively promote imaging among patients who need it most.

Specific Aims and Hypotheses (Aim 2 Implementation)

- **Aim 2: To use mixed methods to explore physician influence on guideline-concordant imaging.**
- *H 2.1:* Physicians who finished residency training more recently will be more likely to perform guideline-concordant imaging than their more experienced peers.
- *Objective 2.1:* Through semi-structured interviews, the research team will explore physicians' experiences with and perceptions of the intervention and how those perceptions relate to prostate cancer imaging use.

Specific Aims and Hypotheses (Aim 3 Cost)

- **Aim 3: To determine the cost and cost impact of a physician-focused behavioral intervention to improve guideline-concordant prostate cancer imaging.**
- *H 3.1:* The costs of the intervention (including physician time) and increased guideline-concordant imaging will be offset by savings made in reducing guideline-discordant prostate cancer imaging.

Acknowledgements

- Scott Sherman, MD, MPH, VANYHHS, NYU Population Health
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- David Penson, MD, MPH, Vanderbilt Urology
- Pär Stattin, MD, PhD, Umea University Urology

Questions/Comments?

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