Drivers of Low-Value Imaging
A Qualitative Investigation

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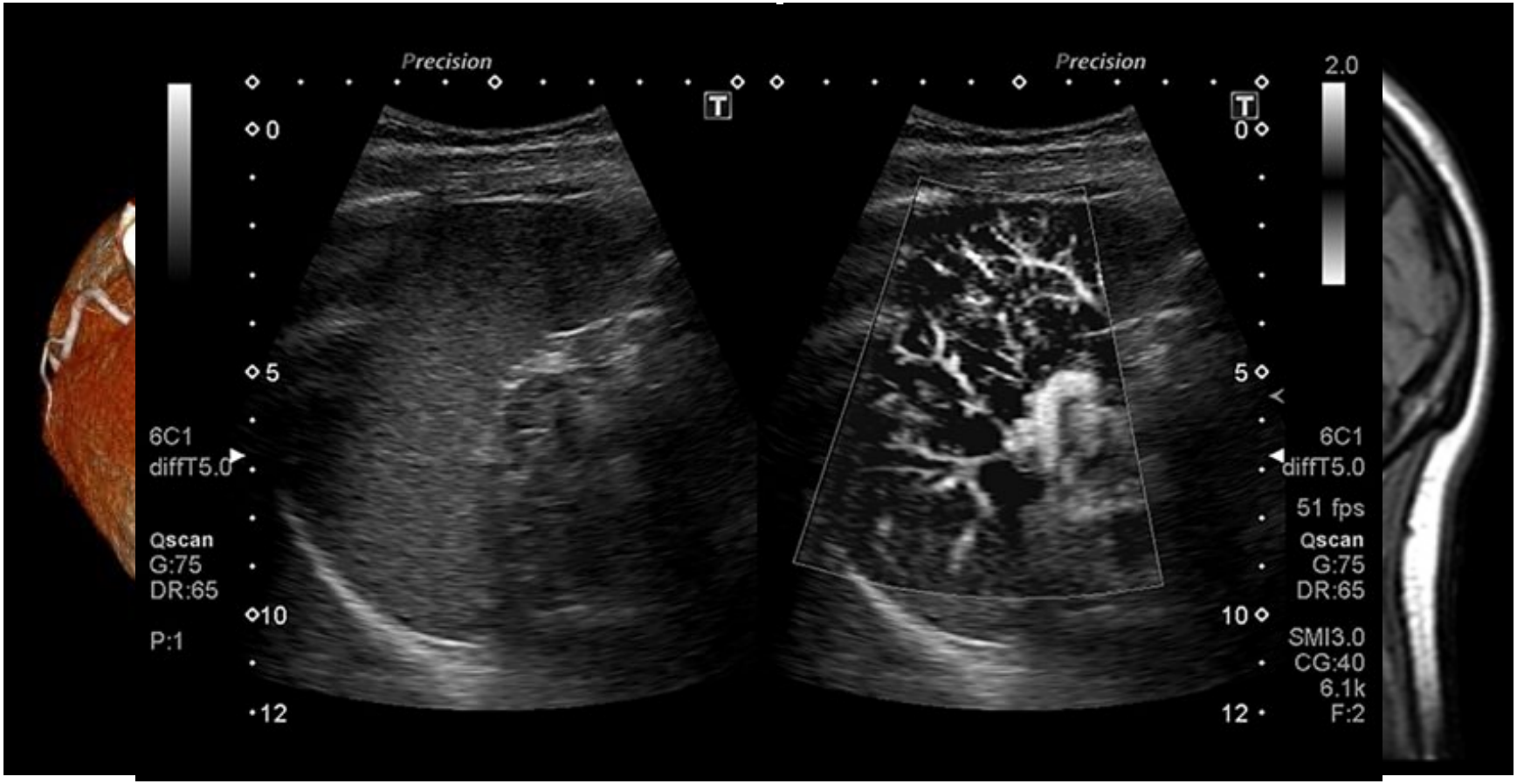
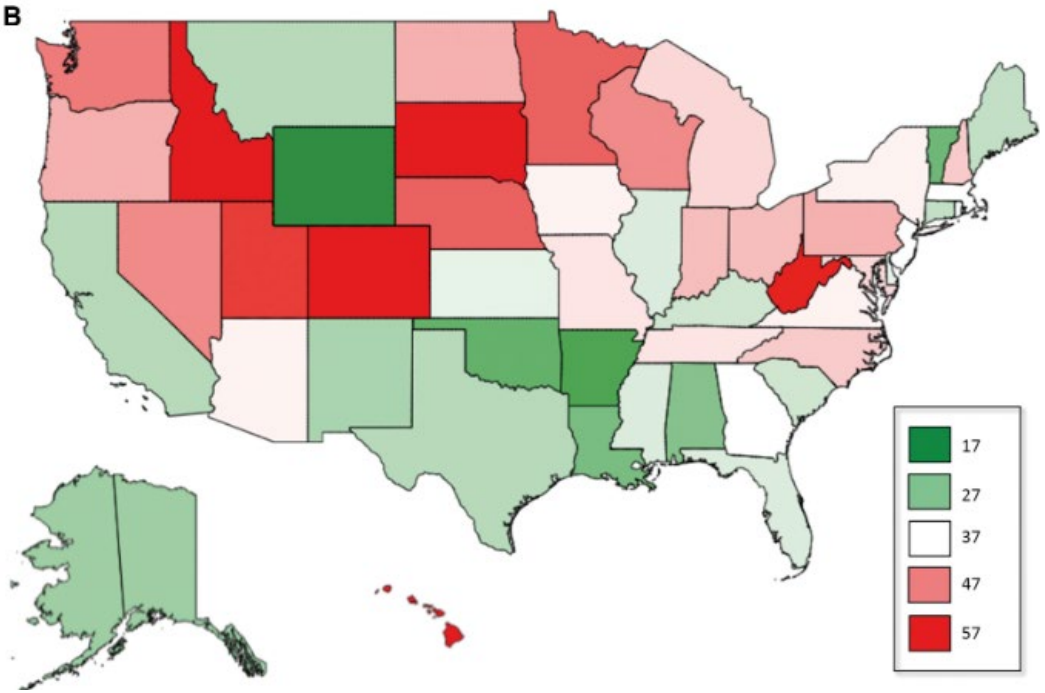
Veterans Health Administration

Noninvasive Imaging



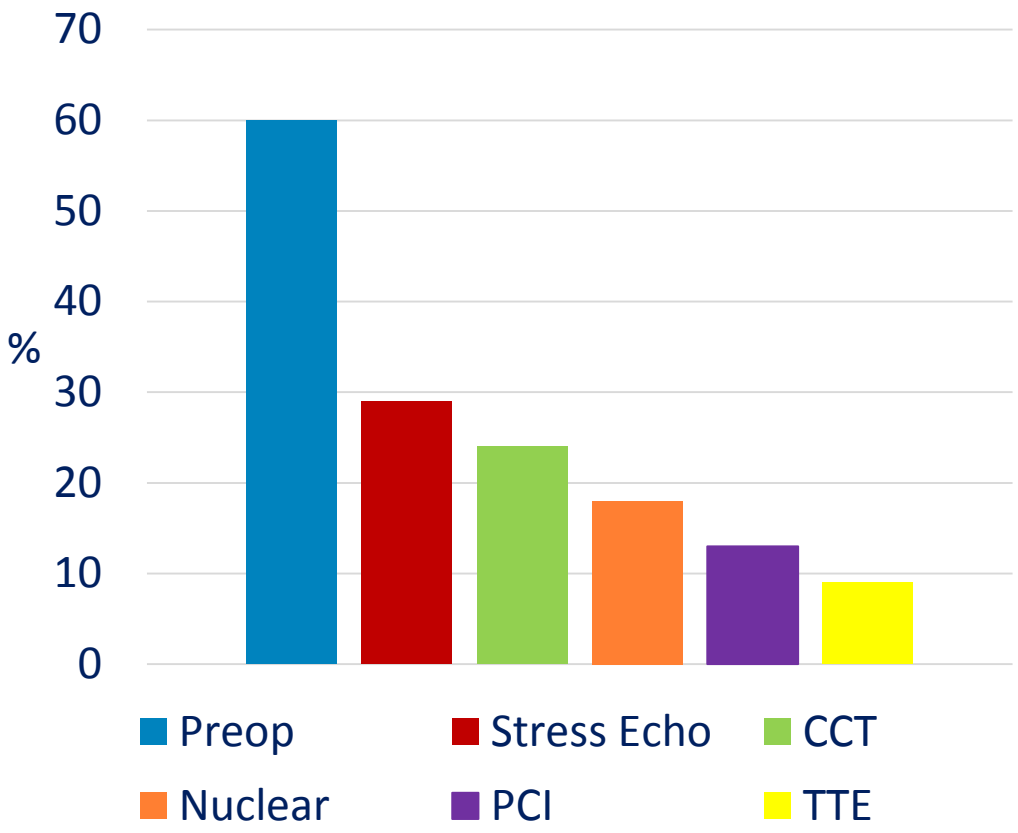
Growth of Noninvasive Imaging

- Chest CT Imaging use in the ED (1994-2015)
  - 5,942% ↑ per 1,000 Medicare enrollees
  - 3,915% ↑ per 1,000 ED visits



Chung J Am Coll Radiol 2019;16:674-82

Prevalence of Unnecessary Imaging



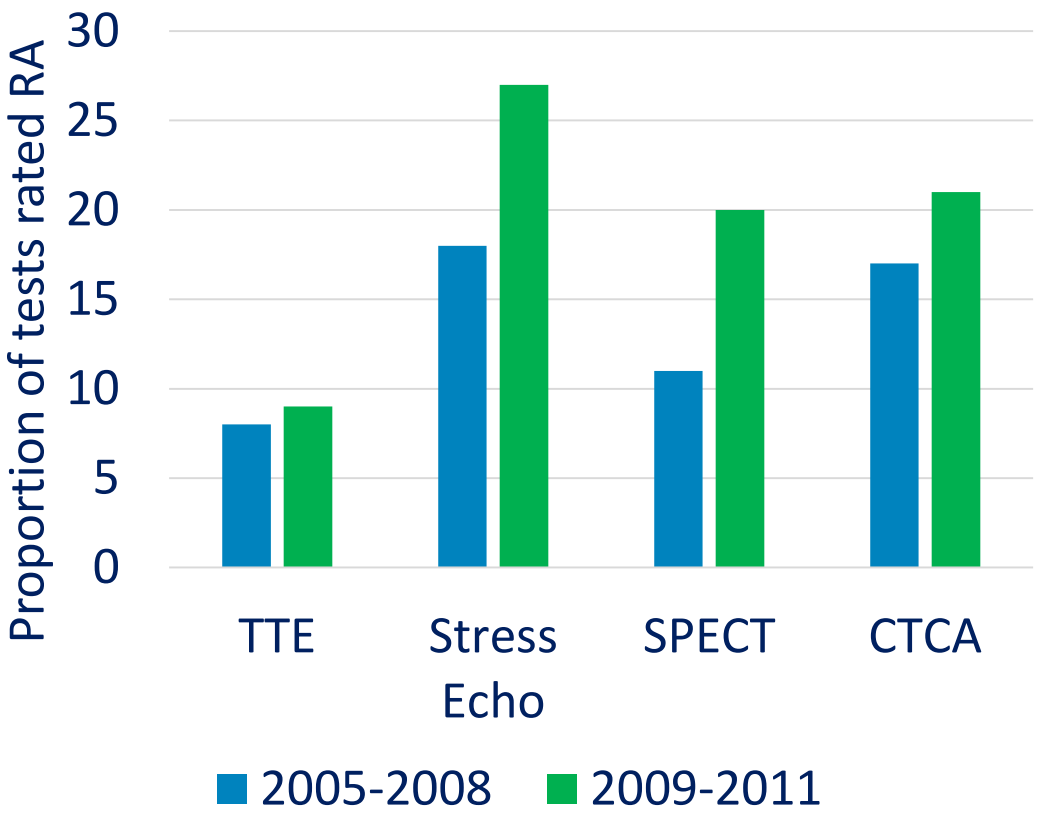
Ladapo PLOS One 2016;11:e0161153
Fonseca JACC 2015;65:763
Elgendy J Nucl Cardiol 2016;23:680
Peterson Am J Cardiol 2018;122:744
Chan JAMA 2011;306:53-61
Desai JAMA 2015;314:2045-2053
Bernier Can J Cardiol 2018;34:1677

Strategies to reduce unnecessary imaging

- Choosing Wisely
  - Image Wisely, Image Gently, Refer Wisely
- Appropriate Use Criteria
- Professional Liability Reform
- Reductions in reimbursement/bundling of care
- “Nudges”
  - Audit and Feedback, education, etc.
- Decision support software

Trends in Appropriateness

- Meta-analysis of 59 reports on 103,567 imaging tests
- No change in modalities over time



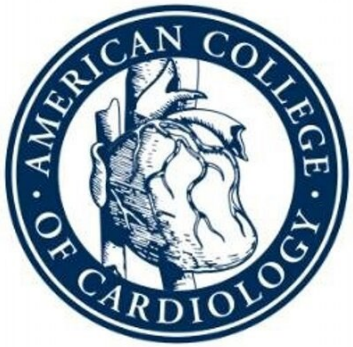
Fonseca JACC 2015; 65:763

Question

- What are appropriate use criteria (AUC)?
  - A: Recommendations from professional societies about the utility of a test or procedure
  - B: Medicare mandated criteria for reimbursement of noninvasive imaging
  - C: Third party payer justification for denial of services
  - D: All of the above

Appropriate Use Criteria

- American College of Radiology
  - 188 clinical topics
  - 1,670 clinical scenarios
- American College of Cardiology
  - 21 documents published in last 10 years
  - Covers a wide variety of imaging techniques and procedures



CMS Mandate

- 2014 Protecting Access to Medicare Act
- AUC must be consulted for all “advanced imaging” (CT, MRI, and nuclear)
  - Clinician consults AUC at time of order
  - Order request includes AUC data
  - Furnishing physician submits data along with request for reimbursement
- Numerous logistical challenges

Third Party Payers

- Radiology Benefits Managers
- Prior Authorization
- Increases profits
  - RBM sold for $300 million in 2007
- “Black box” decision trees
  - Supposedly based on AUC

Background

- Concern about overusing of testing, especially imaging, is widespread.
- Efforts to reduce unnecessary imaging have shown modest effects.
- Aim: Conduct a qualitative study to investigate the drivers of unnecessary noninvasive imaging

Study Team

- David E. Winchester, MD
- Ivette M. Freytes
- Magda Schmitzberger
- Kimberly Findley
- Rebecca J. Beyth, MD

Methods

- Qualitative study, phenomenological approach
- Rapid Assessment Process
- Email recruitment of physicians with purposeful sampling to represent a wide array of specialties
  - Internal Medicine
  - Emergency Medicine
  - Radiology

Methods: Framework

- Interview Guide built on Theoretical Domains Framework
- Addressed some specific known contributors
  - Professional liability
  - Peer expectations
- Also probed for unknown factors
- Guide tested with key informants

Table 5: Potential Multi-methods topics based on the Theoretical Domain Framework

Domain	Topics to explore
Knowledge	Are providers aware of AUC? Why do providers order unnecessary tests? How much waste exists in our healthcare system?
Skills	Can providers accurately assess clinical need and appropriateness of noninvasive imaging?
Social/professional role and identity	How do providers view their role in improving care? What role do guidelines and professional societies play in defining unnecessary testing?
Beliefs about capabilities	Are providers confident in their diagnostic skills?
Beliefs about consequences	Will a DST be effective or a waste of time? Do you worry what happens if you do not order tests? What are consequences of unnecessary testing?
Motivation and goals	What do providers think the prevalence of unnecessary testing should be?
Memory, attention, and decision processes	What processes do providers go through when deciding to order a test?
Environmental context and resources	Does the clinic environment affect ordering habits? What are barriers to ordering noninvasive tests? *How usable is the DST in a busy clinical environment?*
Social influences	How does your use of noninvasive imaging compare to your peers? How would providers respond to peer comparisons of ordering habits? What external pressures contribute to your use of noninvasive imaging?
Emotion	How do providers feel about the pressure to order tests more appropriately?
Behavioral regulation	Do providers self-regulate their ordering habits? How does feedback on ordering alter habits?
Nature of behaviors	Are providers aware of test ordering behaviors?

Results: Baseline

- N=14 physician participants
- Median years in practice = 15
- Most (n=9) reported that they ordered noninvasive imaging on a daily basis
- Most common tests:
  - CT Abdomen (n=7)
  - CT Head (n=5)
  - CT Lung Cancer screening (n=3)

Domain 1: Definition of Unnecessary Testing

- Three basic themes
  - Test is low value
  - Test being done to satisfy patient/clinician demands
  - Test will not change management
- Majority (n=9) reported that >10% of the tests they order are unnecessary

Domain 2: Pressure to Order Unnecessary Tests

- All but one participant reported feeling outside pressure to order unnecessary tests
- Nearly all reported their response is to communicate with the source (patient/clinician)
  - Without agreeable resolution, they order the test
- Sources of pressure:
  - Patients, families, consultants, other clinicians, nurses, self

Domain 3: Factors Contributing to Unnecessary Tests

- Time/travel burden for patients
- Limited clinician awareness
- Limited clinician access to resources on appropriateness
- Limited clinician time
- Liability risk/not a liability risk
- Peer review
- Teaching environment
- Patient expectations
- Patient advocate
- Patient unrealistic expectations about tests/demand
- Clinician peace of mind
- Efficiency
- Care driven by anecdote
- Habits developed in training/ practice
- Uncertainty about diagnosis/ self-doubt/fear of omission
- Nursing demand/triage
- Service ratings/disability

Domain 3: Contributing Factors

"Everybody has that story of 'this one time' and you can tell them about the other thousands times it wasn't, but that one time seems to loom larger"

"Based on your experience with peer review, that if you don't do something, people are going to be looking over your shoulder."

Domain 4: Good and Bad Outcomes of Unnecessary Testing

- Good
  - Unexpected diagnoses such as pulm embolus or malignancy
- Bad
  - Radiation
  - Increased LOS
  - AKI
  - "Incidentalomas"

"It's common to have one test done that shows an abnormality, that leads to further testing and anxiety that leads down this rabbit hole of serial testing. With each test, there's a possibility for another abnormal finding of borderline significance."

Domain 5: Factors Unique to VHA

- Impatient patients
- Variable physician quality
- Patient respect for authority
- More smoking
- Stoicism
- Higher expectations for care
- Self-referrals
- Patient advocate
- More common psychiatric disease
- Community care
- Travel distance
- Complexity of patients
- Duplicative care
- Malpractice risk (lower and higher)
- Service-ratings/disability
- Consumer driven care
- Interoperability
- Low health literacy

Domain 5: Factors Unique to the VHA

"You can't argue with Veterans, we've been told the patient is right and this is consumer driven…if you don't give Veterans what they want they'll go to the Chief of Staff's office, they go to the patient advocate, and they call their Senators."

Domain 6: Impact of Unnecessary Testing

Cost

Patient and Clinician Time

Patient Fear and Anxiety

Domain 7: Solutions to Unnecessary Testing

- Mixed opinions about whether guidelines help to reduce unnecessary imaging
- Most were aware of Choosing Wisely, but concerned about effectiveness

"Guidelines are only as good as the degree of their dissemination and whether the person reading it incorporates it into their practice."

Domain 7: Solutions to Unnecessary Testing

Domain 8: Current System for Ordering Tests

- Mixed Reviews
- No participants were aware of quality metrics related to ordering
- Concerns about implementation of quality metrics

"byzantine"

"Not that hard"

Domain 9: Decision Support Software

Improve ordering	Time/Efficiency
Encourage Use of GL's	Notification Fatigue
Reinforce Decision Making	Discourage Independent Thought
Improve Patient Interactions	Potential punitive actions

Themes mapped to TDF Domains

TDF Domain	Themes
Knowledge	Limited awareness of AUC
Skills	Practice habits/prior training
Social/Professional Role and Identity	Accommodating patient requests, minimizing patient burdens
Beliefs about capabilities	Self-doubt, reliance on experience
Beliefs about consequences	Awareness of low clinical utility, fear of missed diagnosis
Reinforcement	Peer review, professional liability
Memory, Attention, and Decision Processes	Limited time with patients
Environmental Context and Resources	Anecdotes, teaching environment, access to resources, services ratings/disability
Social Influences	Demands from patients/families/nurses/consultants/ specialists, peer review, patient advocate
Emotion	Anecdotes

Discussion: Prior work

- VHA study (HSR&D CDA recipient)
- 17 interviews with physicians providing prostate cancer care asked about imaging
- Similar themes identified

TDF Domain	Theme
Knowledge	Aware of Guidelines
Beliefs about capabilities	Rely on experience
Beliefs about consequences	Fear of missed diagnosis
Social Influences	Peer pressure

Makarov Imp Science 2016;11:118

Discussion: Peer Review

- Concerning observation the some perceive as punitive or coercive
- Scant publications on Peer Review
- Audit & feedback has some relevance
  - "effectiveness…seems to depend on baseline performance and how the feedback is provided"

Walker Int J Emerg Med 2018;11
Ivers Cochrane Database Syst Rev 2012

Discussion: Compensation and Pension

- Clinical care and C&P are separate workflows
- Clinicians report that patients are unaware of the difference
  - Some clinicians are likely unaware as well
- Has not been studied in the biomedical literature

Discussion: Patient Advocate

- Patient advocates help to bridge gaps between clinical team members and patients
  - May be clinically trained, or have an alignment with a patient population/background
- Not unique to the VA environment
- Within the VA, act as an “ombudsman” to field patient concerns about care
- Also not studied in the biomedical literature

Discussion: DSS

- Appropriate degree of optimism and skepticism about DSS
- As with other themes, strategy for adoption may be key to success

Future Directions

- Systematic Review of AUC Implementation (underway)
- Mixed Methods Evaluation of DSS (Aim 2)
- Patient Advocate research?
- Peer Review research?