CMSS Council of Medical Specialty Societies

CMSS Annual Meeting 2022
Specialty Societies: Stronger Together

November 9-11, 2022
Washington, DC

Patient Safety & Equity:
Embracing Care Coordination Across Specialties

Arjun Venkatesh, MD, Nadja Kadom, MD, Christopher Moore, MD,

Samantha Shugarman, MS, Judy Burleson, MHSA

David Seidenwurm, MD, FACR
Sutter Health, Sacramento, California

American College of Radiology

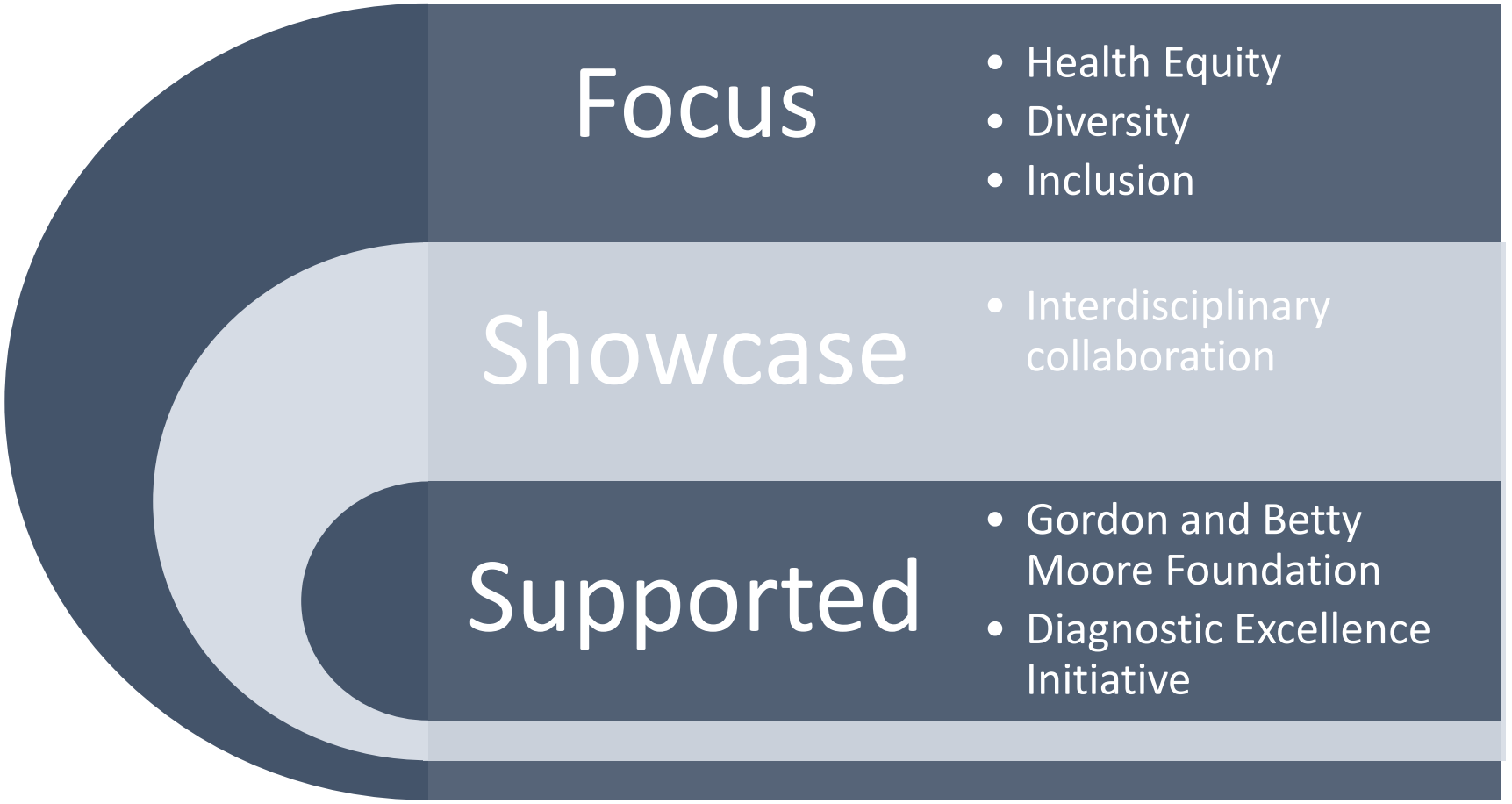
Nadja Kadom, MD
Emory University, Atlanta, Georgia

Arjun K Venkatesh, MD, MBA, MHS
Yale University, New Haven, Connecticut

American College of Emergency Physicians

Christopher L Moore, MD
Yale University, New Haven, Connecticut

Three initiatives improving patient safety

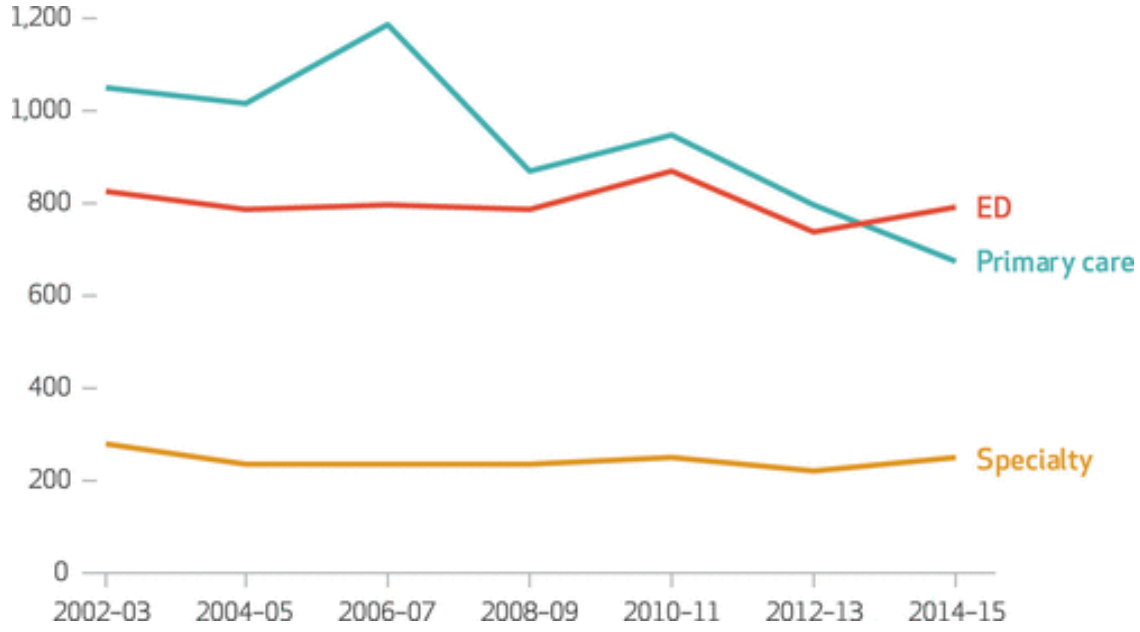


Arjun K Venkatesh, MD, MBA, MHS
Associate Professor
Chief of the Section of Administration
Department of Emergency Medicine
Yale University

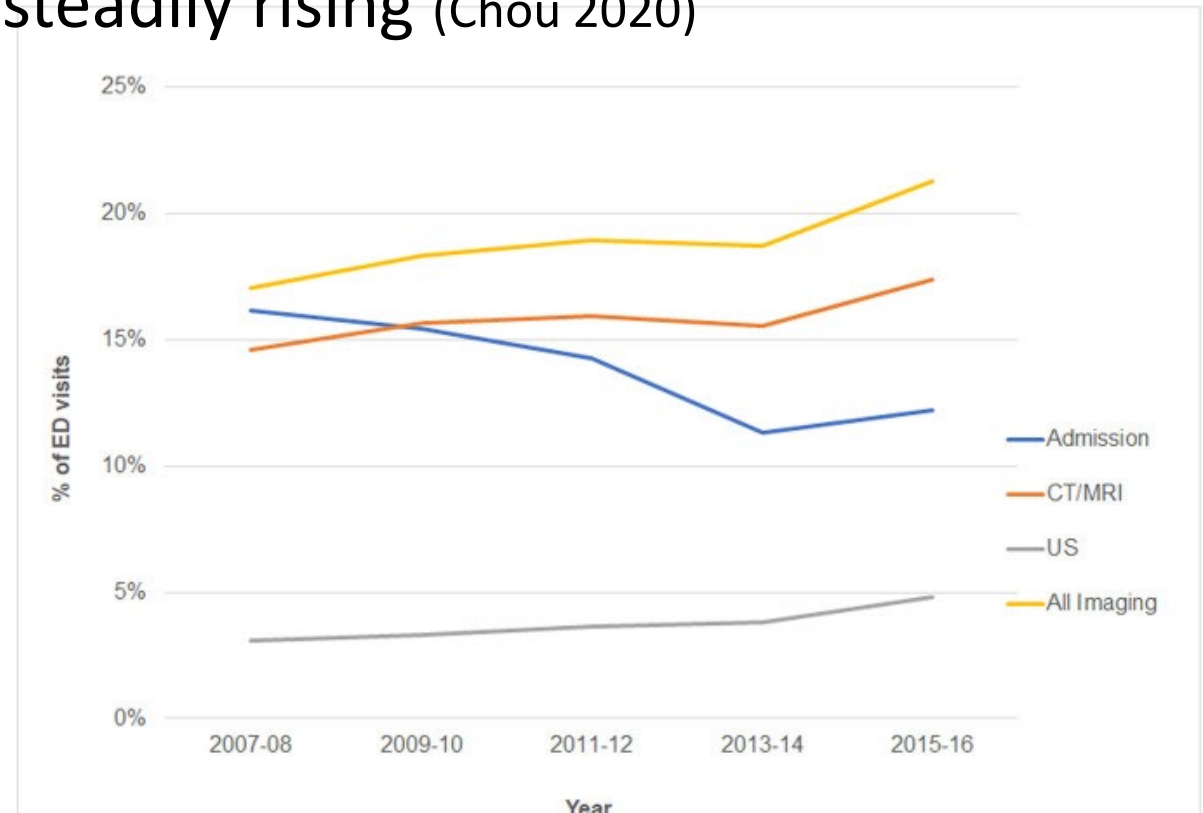
Opportunities for Cross-specialty Collaboration

Emergency Medicine and Radiology: Peas in a Pod

- The ED is the de-facto setting for acute unscheduled care (Chou 2019)



- ED use of advanced imaging steadily rising (Chou 2020)



2015-2019: ACEP Emergency Quality Network

CMS CENTERS for MEDICARE & MEDICAID SERVICES

TCPi Transforming Clinical Practice Initiative

Reduce Avoidable Testing
for low risk patients through implementation of Choosing Wisely Recommendations

E·QUAL EMERGENCY QUALITY NETWORK

R-SCAN®
Radiology Support, Communication and Alignment Network

Early Success Together

Guidelines co-published

Imaging in Suspected Renal Colic: Systematic Review of the Literature and Multispecialty Consensus

Christopher L. Moore, MD*; Christopher R. Carpenter, MD, MSc; Marta E. Heilbrun, MD; Kevin Klauer, DO, EJD; Amy Krambeck, MD; Courtney Moreno, MD; Erick M. Remer, MD; Charles Scales, MD; Melissa M. Shaw, BS; Kevan M. Sternberg, MD

The Data

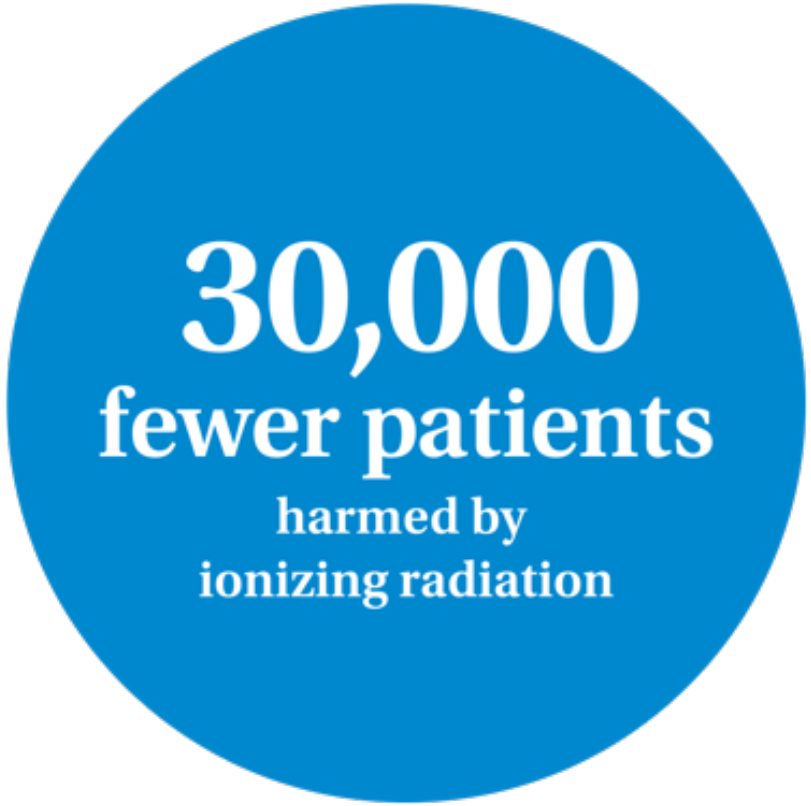
Choosing wisely in emergency medicine: Early results and insights from the ACEP emergency quality network (E-QUAL)

Arjun K. Venkatesh, MD, MBA [a,b,*], Jean Elizabeth Scofi, MD [a], Craig Rothenberg, MPH [a], Carl T. Berdahl, MD, MS [c,d], Nalani Tarrant, MPH [e], Dhruv Sharma, MS [e], Pawan Goyal, MD [e], Randy Pilgri Kevin Klauer, DO, JD [e], Jeremiah D. Schuur, MD, MHS [g]

Table 2
Comparison of imaging utilization rates in 2017 vs 2018 for ED sites participating in both years.[a]

	2017 *Mean Utilization Rate (n ED Sites)*	2018 *Mean Utilization Rate (n ED Sites)*	2017 vs 2018 *Difference in Mean UR (95% CI) P-Value*
Atraumatic low back pain			
XR	36% (n = 104)	33.3% (n = 104)	−2.7% (−5.9%, −0.5%) p = .095
CT	20.1% (n = 104)	17.7% (n = 104)	−2.4% (−5.1%, −0.4%) p = .09
MRI	0.8% (n = 104)	0.7% (n = 104)	−0.1% (−0.4%, −0.3%) p = .777
Syncope			
CT	56.4% (n = 103)	48.0% (n = 103)	−8.4% (−12.7%, −4.1%) p < .001
Minor head injury			
CT	76.3% (n = 102)	72.1% (n = 102)	−4.2% (−7.3%, −1.1%) p = .008


$55,093,582
saved
from fewer avoidable
imaging studies and
hospitalizations


30,000
fewer patients
harmed by
ionizing radiation

What Next?

- Coordination of TEP, Guideline, White Paper, and Committees Activities

- Emerging Areas for Collaboration
  - Actionable Incidental Findings
  - Health Equity

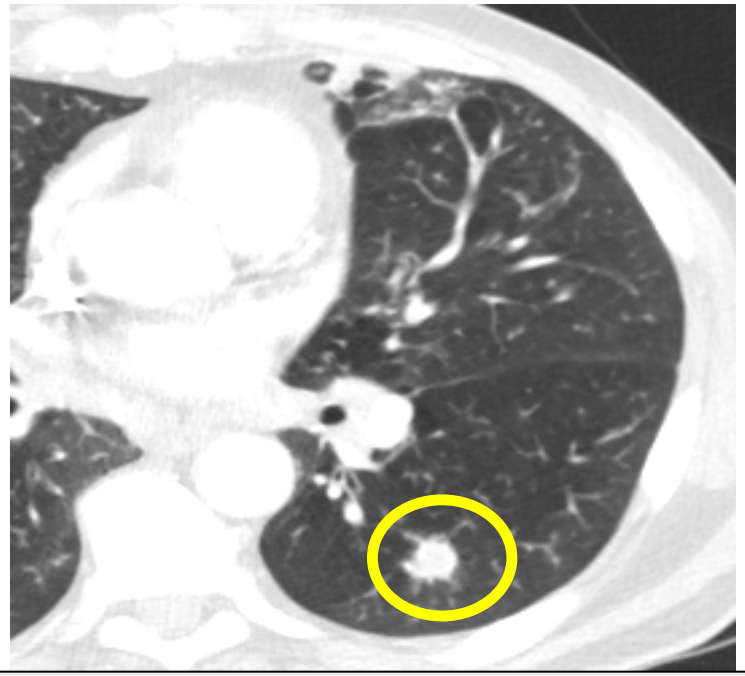
Nadja Kadom, MD
Professor of Radiology
Interim Medical Director Radiology Quality
Department of Radiology
Emory University

Closing the Completion Loop on Radiology Follow-up Recommendations for Noncritical Actionable Incidental Findings

The Patient Safety Gaps

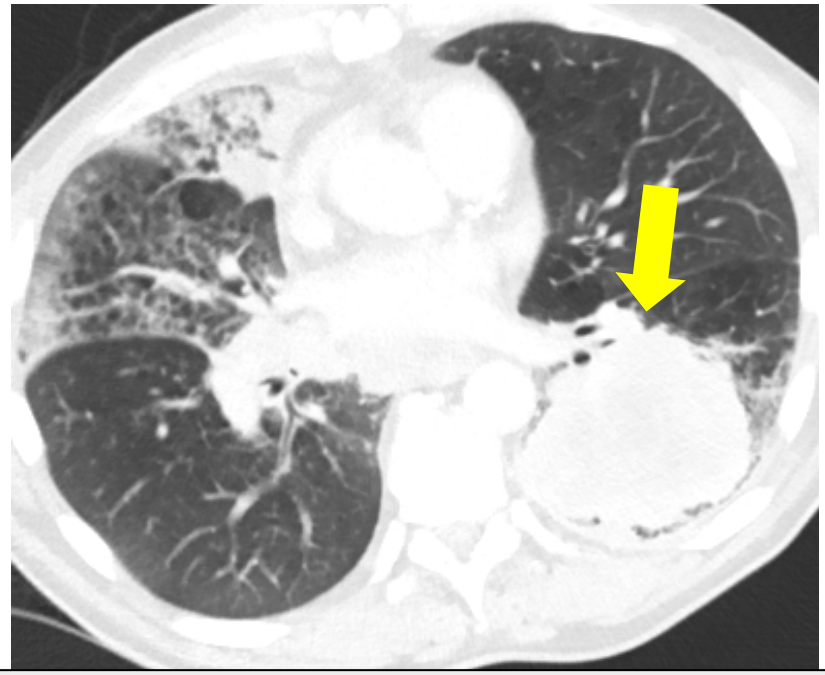
- Care coordination and communication of actionable incidental findings (AIFs)
- ~ 30% of AIFs without follow-up documented
- ED imaging exams follow-up completion as low as 17%, lower for patients based on SDOH
- Completed follow-up results in diagnoses in 45% of patients, with ~ 5% cancer diagnoses

Chest CT performed in the ED for trauma



Early stage lung cancer
59% survival at 5 years

Missed recommended follow-up



Advanced stage lung cancer
6% survival at 5 years

ELSEVIER

Journal of the American College of Radiology
Volume 19, Issue 7, July 2022, Pages 881-890

Clinical Practice Management
Original Article

Novel Quality Measure Set: Closing the Completion Loop on Radiology Follow-up Recommendations for Noncritical Actionable Incidental Findings

Nadja Kadom MD [a], Arjun K. Venkatesh MD, MBA, MHS [b], Samantha A. Shugarman MS [c], Judy H. Burleson MHSA [d], Christopher L. Moore MD [e], David Seidenwurm MD [f]

Objective

- Develop quality measures to improve completion of evidence-based follow-up recommendations for actionable incidental radiology findings.

Patients & Practice, Policy & Education

Patient-level factors influencing adherence to follow-up imaging recommendations

Andrés Ángel-González Calvillo M.D. [a], Laura Caroline Kodaverdian [b], Roxana Garcia M.D., M.P.H. [a], Daphne Y. Lichtensztajn M.D. [c], Matthew D. Bucknor M.D. [d]

Show more

+ Add to Mendeley Share Cite

https://doi.org/10.1016/j.clinimag.2022.07.006

Get rights and content

Highlights

- Patients with Medicaid had lower odds of completing follow-up imaging recommendations than those with commercial insurance.
- More research is needed to understand disparities in follow-up imaging adherence that are related to different insurances.
- Radiology departments should work to develop equitable workflows in follow-up imaging that meet the needs of all patients.

J Card Surg. 2022 Apr;37(4):831-839. doi: 10.1111/jocs.16173. Epub 2021 Dec 6.

Socioeconomic disparities in surveillance and follow-up of patients with thoracic aortic aneurysm

Michael Shang [1], Gabe Weininger [1], Makoto Mori [1], Arianna Kahler-Quesada [1], Ellelan Degife [1], Cornell Brooks [1], Sameh Yousef [1], Matthew Williams [1], Roland Assi [1], Arnar Geirsson [1], Prashanth Vallabhajosyula [1]

Affiliations + expand

PMID: 34873754 DOI: 10.1111/jocs.16173

Abstract

Background: Thoracic aortic aneurysm (TAA) is a significant risk factor for aortic dissection and rupture. Guidelines recommend referral of patients to a cardiovascular specialist for periodic surveillance imaging with surgical intervention determined primarily by aneurysm size. We investigated the association between socioeconomic status (SES) and surveillance practices in patients with ascending aortic aneurysms.

Methods: We retrospectively reviewed records of 465 consecutive patients diagnosed between 2013 and 2016 with ascending aortic aneurysm ≥4 cm on computed tomography scans. Primary outcomes were clinical follow-up with a cardiovascular specialist and aortic surveillance imaging within 2 years following index scan. We stratified patients into quartiles using the area deprivation index (ADI), a validated percentile measure of 17 variables characterizing SES at the census block group level. Competing risks analysis was used to determine interquartile differences in risk of death before follow up with a cardiovascular specialist.

Results: Lower SES was associated with significantly lower rates of surveillance imaging and referral to a cardiovascular specialist. On competing risks regression, the ADI quartile with lowest SES had lower hazard of follow-up with a cardiologist or cardiac surgeon before death (hazard ratio: 0.46 [0.34, 0.62], $p < .001$). Though there were no differences in aneurysm size at time of surgical repair, patients in the lowest socioeconomic quartile were more frequently symptomatic at surgery than other quartiles (92% vs. 23%-38%, $p < .001$).

Conclusion: Patients with lower SES receive less timely follow-up imaging and specialist referral for TAAs, resulting in surgical intervention only when alarming symptoms are already present.

Materials & Methods

- A multistakeholder TEP was assembled
- Project scope: Noncritical AIFs
- Goal: Encourages practices to develop and implement systems ensuring appropriate communication and follow-up to completion.

TEP Member Selection

- Multi-disciplinary
- Inclusive of patients
- Diverse panel (gender, ethnicity, location, etc.)

Panelist ID	Member Category	Stakeholder Representation
1	Cochair	Radiologist
2	Cochair	Radiologist
3	Cochair	Emergency medicine physician
4	Cochair	Emergency medicine physician
5	Member	Radiologist
6	Member	Radiologist
7	Member	Radiologist
8	Member	Radiologist
9	Member	Radiologist
10	Member	Internal medicine and oncology physician
11	Member	Urologist
12	Member	HIT consulting, practice manager
13	Member	HIT vendor CMIO, MD
14	Member	PFA
15	Member	PFA
16	Member	PFA
17	Member	Measure developer/ methodologist, MD
18	Member	Hematology and oncology physician, quality director
19	Member	Practice manager/quality administrator
20	Member	Practice manager/quality administrator
21	Member	Payer

Results

Nine measures developed

- 4 outcome measures
- 5 process measures follow-up to completion.

Outcome Measures

Closing the loop on completion of follow-up recommendations for **(any)** actionable incidental findings
Closing the loop on completion of follow-up recommendations for actionable incidental findings of **AAA**
Closing the loop on completion of follow-up recommendations for actionable incidental findings of **pulmonary nodules**
Patients' cancer detection rate with follow-up imaging (surveillance measure)

Process Measures

Communication and tracking of AIFs:	Specificity of follow-up imaging recommendations for actionable incidental findings (lesion descriptor, modality, time interval)
	Inclusion of available evidence or guidelines
	Communication of AIFs to the practice managing ongoing care
	Identifying when AIFs have been communicated to patients
	Employing tracking and reminder systems for AIFs

The Patient Voice

Include direct communication from radiology to patients

Consider patient factors that constitute exceptions

Published 2021

Moore, C.L., Kadom, N.K., Seidenwurm, D., Nicola, G., Fredericks, N., Shugarman, S. Venkatesh, A. (2021). **Incidental Findings: A Survey of Radiologists and Emergency Physicians.** Journal of the American College of Radiology. https://doi.org/10.1016/j.jacr.2020.12.027

Radiologists and emergency physicians *agree* that:

- IFs present an increased risk
- the occurrence of closed-loop communication and AIF tracking

Disagree that:

- the clinician responsible for communicating the AIF

Published 2021

Kadom, N., Moore, C.L., Seidenwurm, D., Fredericks, N, Shugarman, S.A., Venkatesh, A. (2021). **Closing the Compliance Loop on Follow-up Imaging Recommendations: Comparing Radiologists' and Administrators' Attitudes.** Current Problems in Diagnostic Radiology. https://doi.org/10.1067/j.cpradiol.2021.08.003

Radiologists and non-clinical healthcare professionals *agree* that:

- IFs present little to moderate risk
- Communicating AIFs lies with the primary care or ordering provider

Disagree that:

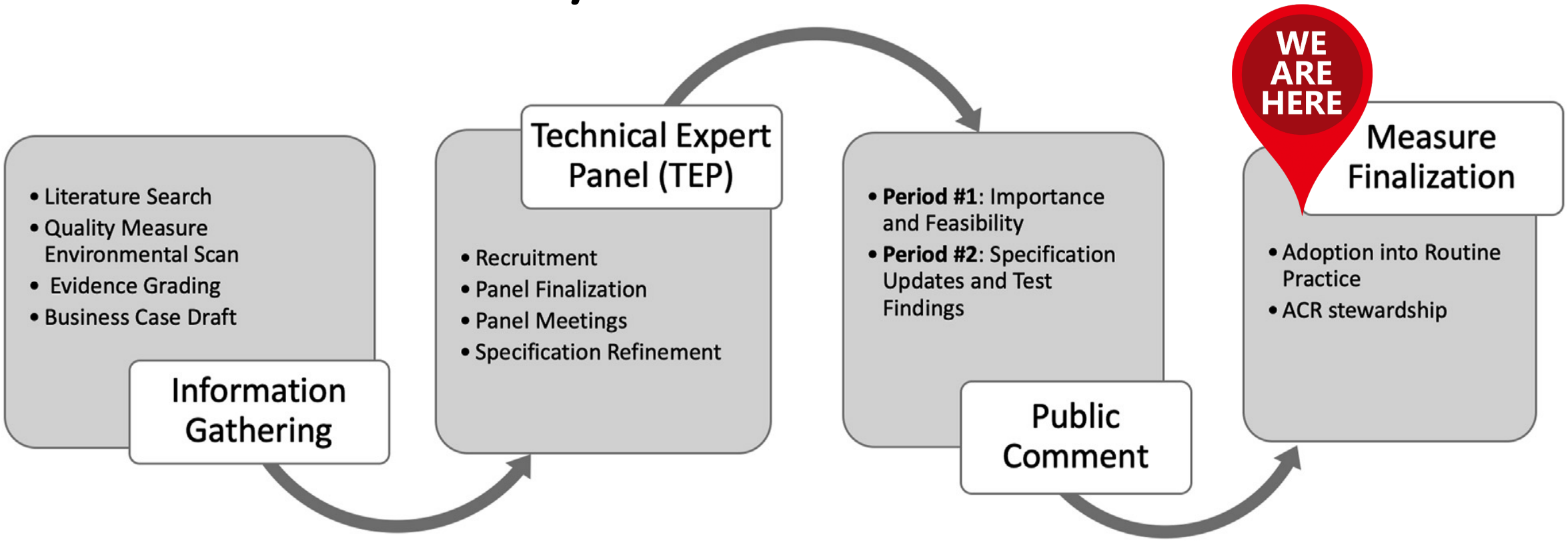
- there is widespread accessibility of AIF follow-up recommendation tracking

Published 2022

Kadom, NK., Venkatesh, A., Shugarman, S., Burleson J., Moore, C.L., Seidenwurm, S. (Submitted for publication, 2022) **Novel Quality Measure Set: Closing the Completion Loop on Radiology Follow-up Recommendations for Non-Critical Actionable Incidental Findings** https://doi.org/10.1016/j.jacr.2022.03.017

Summary of the measure development process to improve radiologist awareness and utilization of measurement tools regarding AIF.

Measure Pathway



Chris Moore, MD
Professor, Department of Emergency Medicine
Yale University

Impact of Follow-up Tracking on Disparities of Care

Communication and follow-up of actionable incidental findings: ED Issues

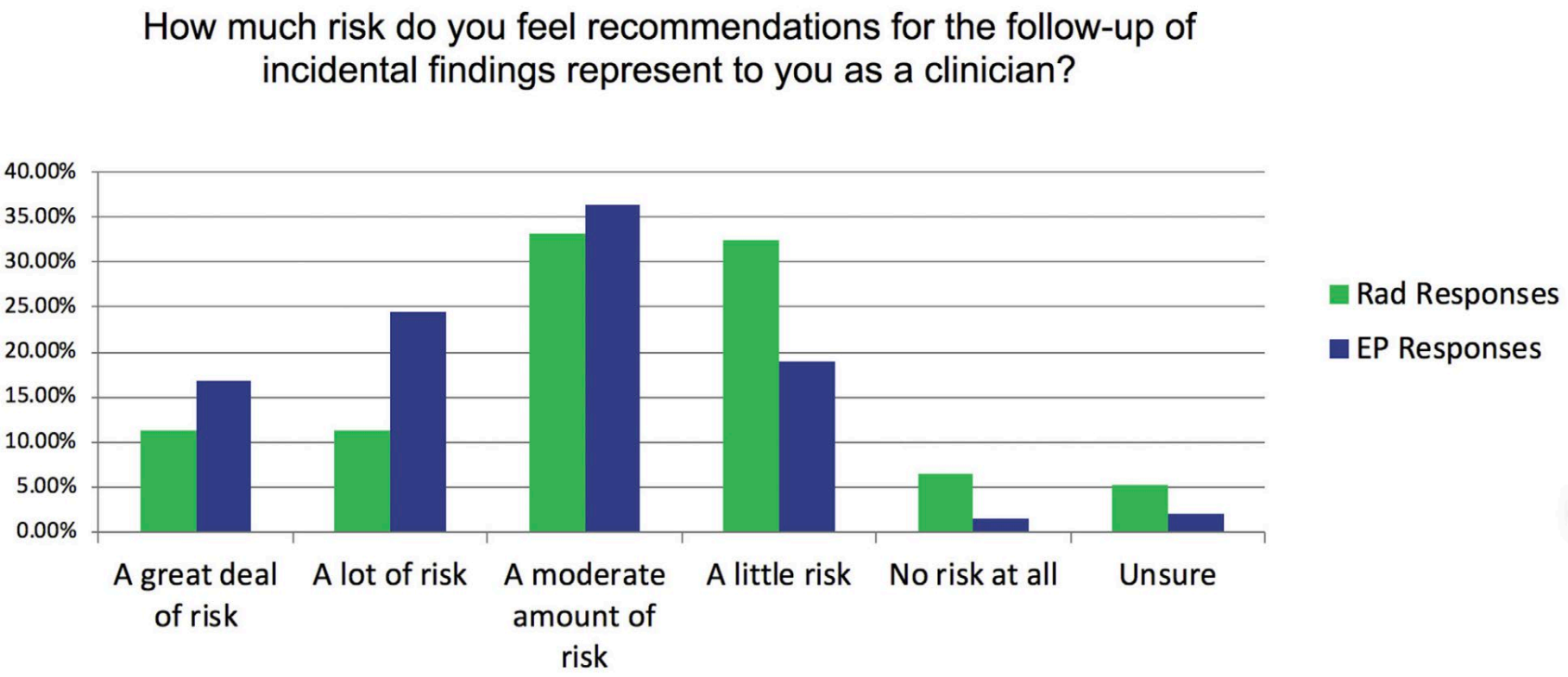
- Clinicians, and patients, are justifiably focused on acute life or limb threat
  - May cause neglect of communication about IFs
  - Patient may not be able to “hear” at that time
- No ongoing relationship with patient
- 24/7/365 – 2am on a Saturday not always a good time for communication

Incidental Findings: A Survey of Radiologists and Emergency Physicians

Christopher L. Moore, MD, Nadja Kadom, MD, David Seidenwurm, MD, Gregory Nicola, MD, Nancy Fredericks, Samantha Shugarman, MS, Arjun Venkatesh, MD

Journal of the American College of Radiology

Volume 18, Issue 10, October 2021, Pages 1373-1374

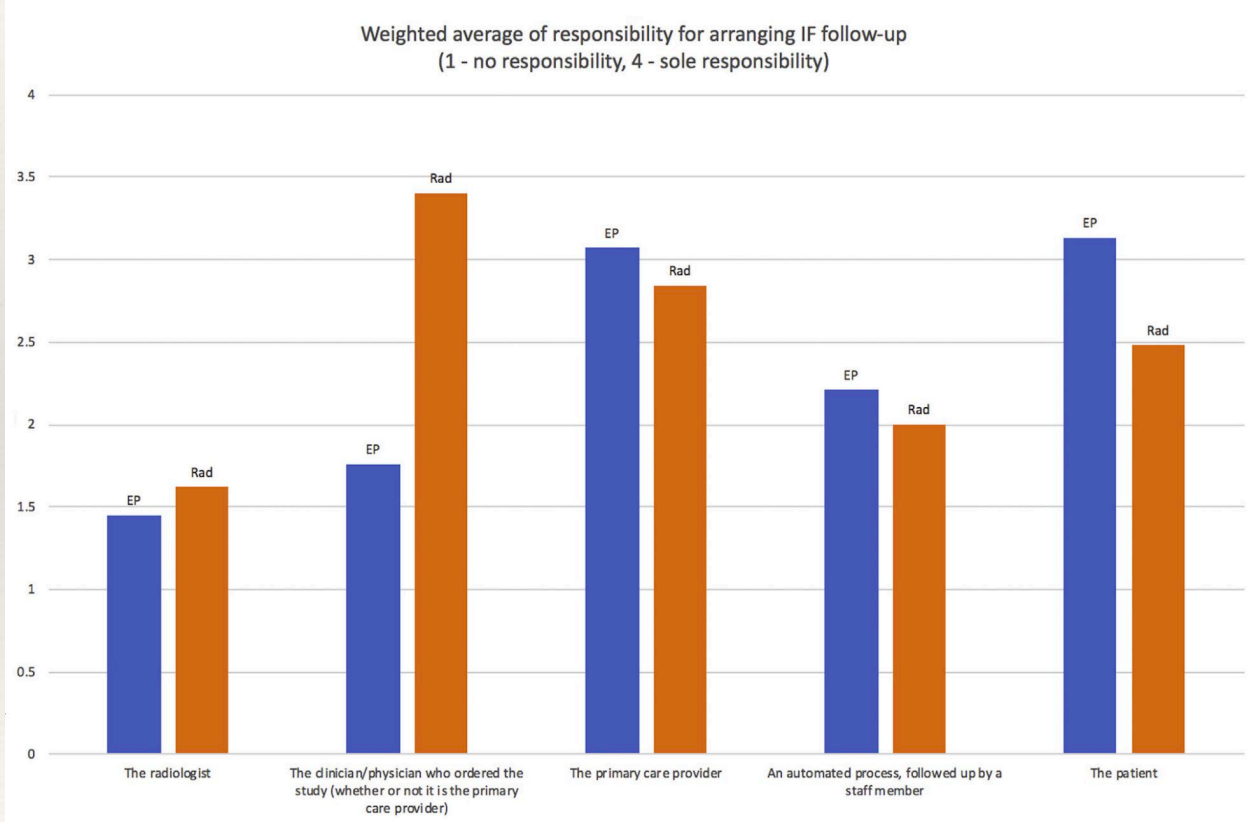


Incidental Findings: A Survey of Radiologists and Emergency Physicians

Christopher L. Moore, MD, Nadja Kadom, MD, David Seidenwurm, MD, Gregory Nicola, MD, Nancy Fredericks, Samantha Shugarman, MS, Arjun Venkatesh, MD

Journal of the American College of Radiology

Volume 18, Issue 10, October 2021, Pages 1373-1374

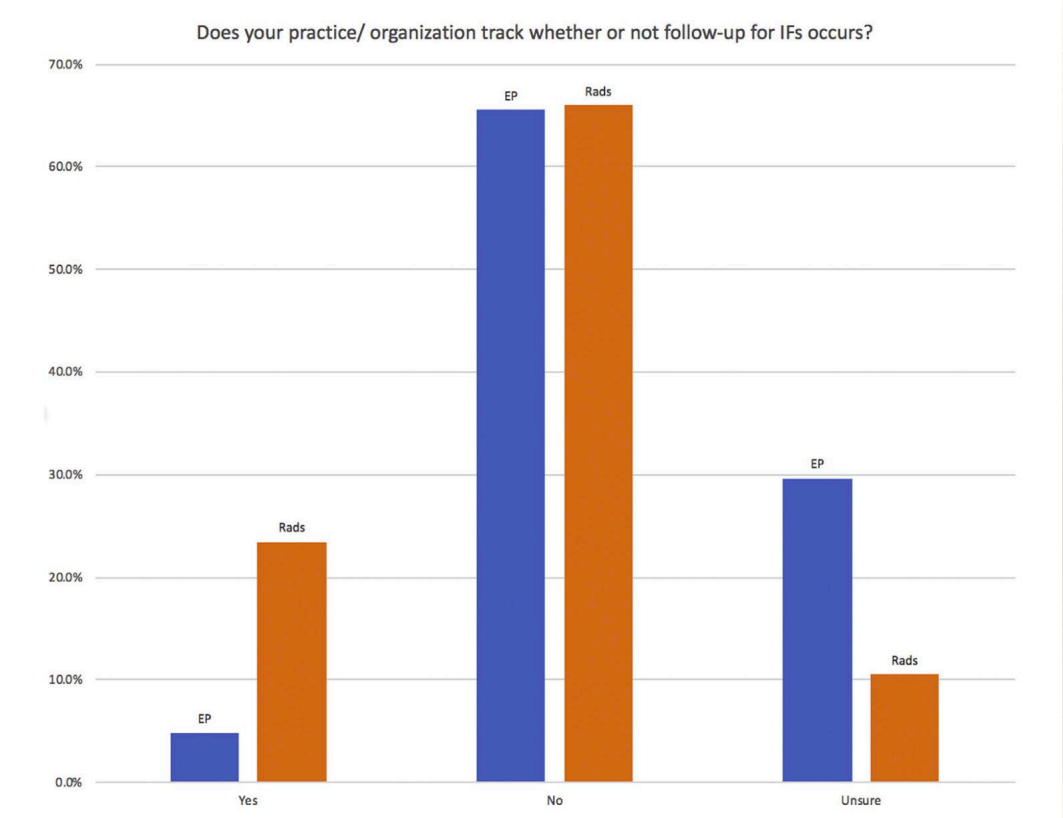


Incidental Findings: A Survey of Radiologists and Emergency Physicians

Christopher L. Moore, MD, Nadja Kadom, MD, David Seidenwurm, MD, Gregory Nicola, MD, Nancy Fredericks, Samantha Shugarman, MS, Arjun Venkatesh, MD

Journal of the American College of Radiology

Volume 18, Issue 10, October 2021, Pages 1373-1374



White Paper: Best Practices in the Communication and Management of Actionable Incidental Findings in Emergency Department Imaging

- Collaboration between ACR and the American College of Emergency Physicians (ACEP)
- Formed 15 member panel: 5 EPs, 5 radiologists, 5 quality/safety/IT/patient
- Modified Delphi process
- Currenty under review at JACR and by ACEP Board[29]

White Paper: Best Practices in the Communication and Management of Actionable Incidental Findings in Emergency Department Imaging

- Consensus on report elements and location:

Report elements	Report location
presence of an actionable incidental finding (AIF)	Both body and summary
lesion size/ location/ characteristics	Both body and summary
lesion characteristics	Body only
follow-up modality and timeframe	Summary only
evidence supporting recommendations (if available)	Summary only
documentation of notification/ communication	Summary only
patient facing language	Summary only

White Paper: Best Practices in the Communication and Management of Actionable Incidental Findings in Emergency Department Imaging

- Consensus on areas:
  - Communication of findings with the patient (verbal and written D/C)
  - Communication between providers
  - Follow-up and tracking systems
    - Take home consensus is that this is a systems issue

THE PRACTICE OF EMERGENCY MEDICINE/ORIGINAL RESEARCH

Catching Those Who Fall Through the Cracks: Integrating a Follow-Up Process for Emergency Department Patients with Incidental Radiologic Findings

[Ann Emerg Med. 2022;80:235-242.]

Study objective: Abnormal findings unrelated to the indication for testing are identified on emergency department (ED) imaging studies. We report the design and implementation of an electronic health record–based interdisciplinary referral system and our experience from the first 13 months of ensuring that patients with incidental radiology findings were connected with the appropriate outpatient surveillance.

Results: Over the first 13 months after implementation, 932 ED patient visits had critical radiology alert referrals, for a total of 982 incidental findings. The primary outcome (confirmed post-ED communication and documented follow-up plan) was attained in 888 (95.3%, 95% confidence interval [CI] 93.9% to 96.6%) ED patient visits with confirmed post-ED communication and documented follow-up plans. The team was unable to contact or confirm follow-up with 44 (4.7%, 95% CI 3.4 to 6.1) patients by telephone or through the health care system's electronic communication tools.

Actual Cancers and Outcomes

THE PRACTICE OF EMERGENCY MEDICINE/EDITORIAL

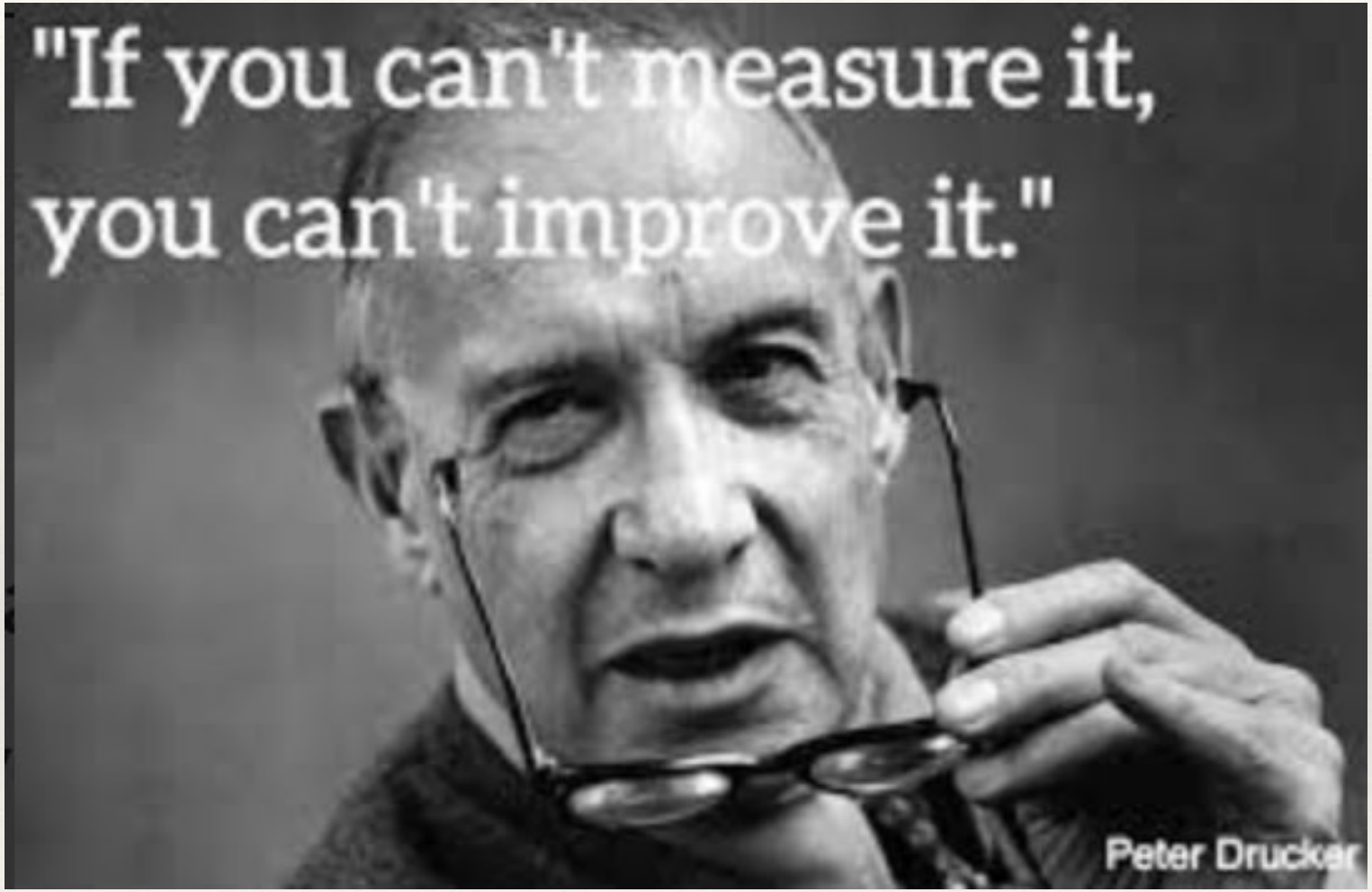
Follow-up of Incidental Radiology Findings: Is the Cart Ahead of the Horse?

Charissa B. Pacella, MD*; Donald M. Yealy, MD

There are potential negative consequences to further action on all incidental findings: added radiation exposure, patient anxiety, unnecessary procedures with attendant complications, and health care costs–each one of these magnified if the "finding" is spurious or not truly associated with an early recognition benefit. In addition, the lack of standardized classification and reporting confounds our ability to accurately estimate risk versus reward.

33

This leaves us wondering: are we building carts now without the horse? To drive meaningful improvement in this area, we need to know whether processes designed around incidental findings benefit patients, society, or both. Although directly answering outcome questions is not feasible, we can better estimate risks and rewards. The first step is to use a uniform, validated classification system for incidental radiology findings. The next step is to determine the most appropriate follow-up. Once these pieces are in place, we will have a stronger foundation to investigate improvement opportunities that work to reduce disparities and extend beyond single or limited sites.


"If you can't measure it,
you can't improve it."
Peter Drucker

Moore Foundation (no relation!)

- Funded in fall of 2021 to develop an *equity measure* of the follow-up of incidental findings (specifically ED chest CT incidental lung nodules) will provide a *within-institution* measure of equity in this space, providing a metric for improvement

Overview of measure(s)

Actionable Incidental Findings Equity Measures			
Description: Proportion of ED chest CT Reports with Actionable Incidental Findings, for which follow up is recommended			
Numerators:	1) # of patients having timely follow up imaging	2) Time to Initial Cancer Diagnosis (days)	3) Proportion of late stage (III/IV) cancers
Denominator: Number of ED chest CTs with actionable incidental findings for which follow-up is recommended; AND Patient 18 years of age or older Excluding Known Active/Prior Malignancy, Do Not Resuscitate Orders, Undergoing Palliative Care			

- Within-institution equity measures
  - Black/Latinx vs. White/non-Latinx
  - Commercial insurance vs. Medicaid/self pay
  - Low vs. high socioeconomic status (by zip code)

ED Chest CTs

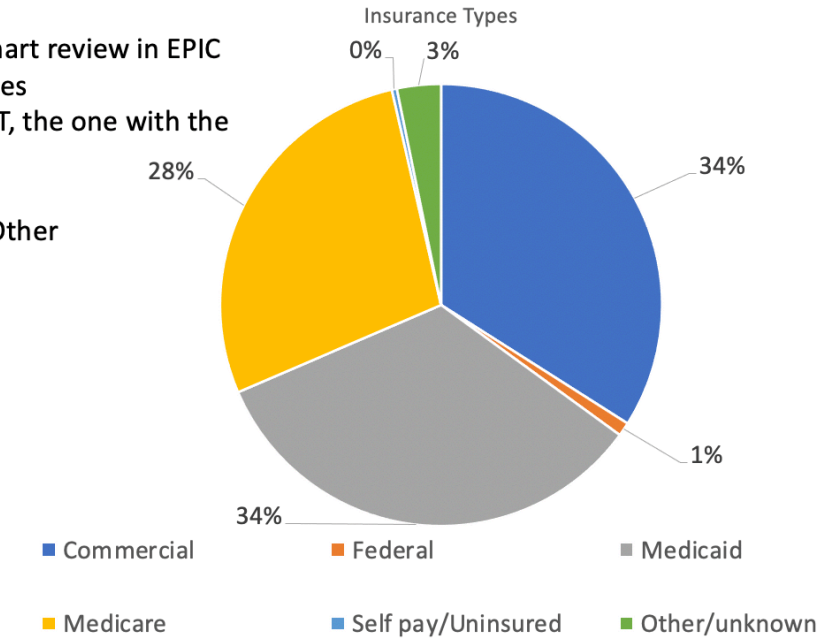
- ED Chest CTs in one of our 3 main EDs 2014 to present
- 26,545 CTs
- Follow up recommendations
- Actual follow-up
- Actual cancers: Connecticut tumor registry (CTR)

Insurance

Insurance

- 26,545 CTs analyzed
  - 26,444 payor instances identified via chart review in EPIC
- Insurance vs. CT Date alignment Discrepancies
- For multiple insurances in chart at time of CT, the one with the most likely payor was used
- Payor prioritization
  - Medicare>Federal>Medicaid>Private>Other

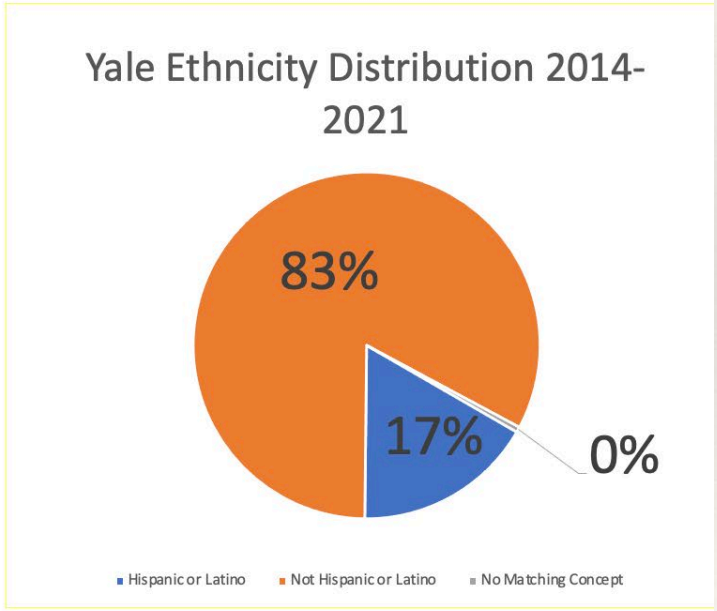
Insurance Payor Category	Count
Commercial	8993
Federal	266
Medicaid	8866
Medicare	7371
Self pay/Uninsured	98
Other/unknown	850



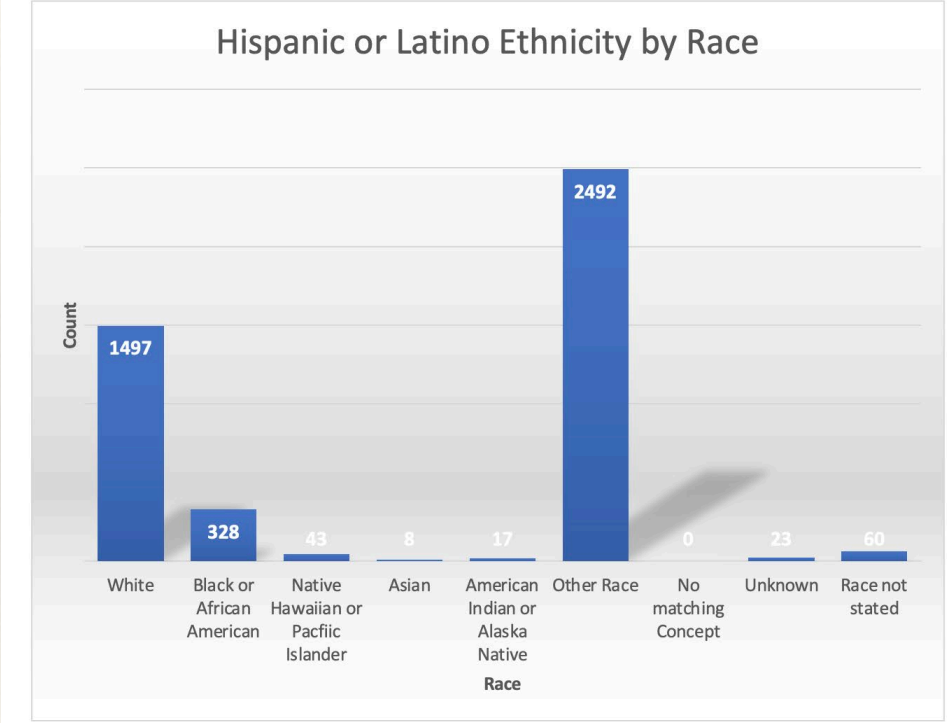
Insurance

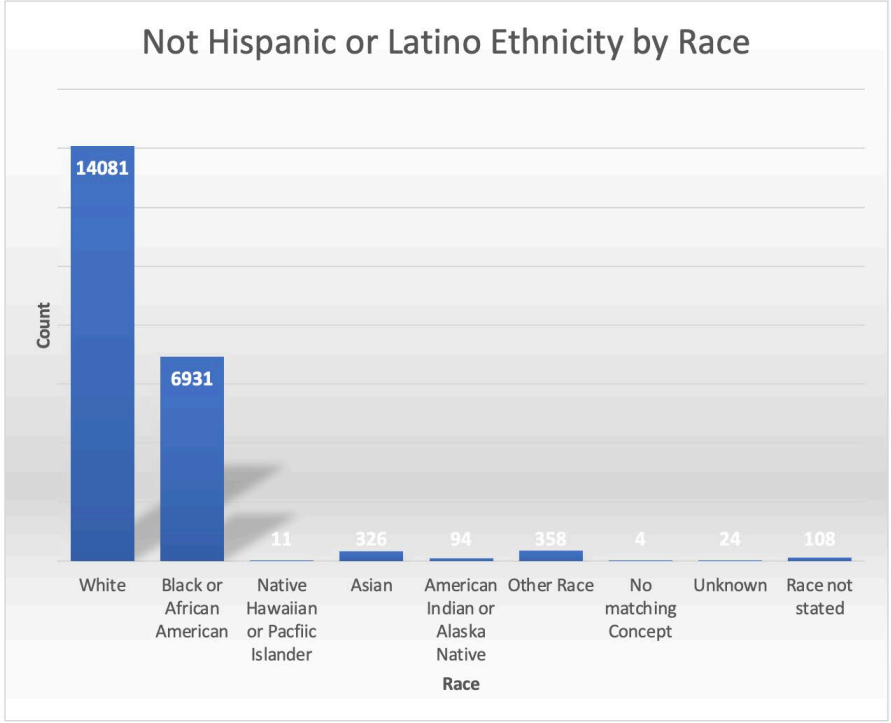
Yale ED Ethnicity Distribution

Distribution by Ethnicity	Count
Hispanic or Latino	4468
Not Hispanic or Latino	21937
No Matching Concept	132



Race and Ethnicity





Natural Language Processing (NLP)

- Needed to define the ***denominator***
  - Patients with CT *reports* that specify a need for follow-up
    - We are not looking at actual images, or parsing reports that may need follow-up based on nodule description or characteristics
  - "Hard" follow-up – follow-up no matter what
  - "Conditional" follow-up – need for f/u based on risk factors (particularly smoking)
  - Exceptions that NLP may be able to help with:
    - Active cancer being treated/ followed
    - CT that shows actual cancer or metastatic disease rather than just a "suspicious" nodule

Progress – NLP Denominator

Confusion Matrices

	NLP*			
Ryan	No f/u	Cond f/u	Hard f/u	Total
No f/u	130	2	14	146
Cond f/u	8	64	13	85
Hard f/u	12	9	48	69

	NLP			
Moore	hard	cond	no	total:
no f/u	3	0	97	100
hard	43	9	12	64
cond	21	64	10	95

Moore	Precision	Recall	F1- Score	Specificity
no f/u	0.81512605	0.97	0.88584475	0.86163522
hard	0.641791045	0.671875	0.65648855	0.87692308
cond	0.876712329	0.673684211	0.76190476	0.94512195

Ryan	Precision	Recall	F1- Score	Specificity
no f/u	0.86666667	0.89041096	0.87837838	0.87012987
hard	0.64	0.69565217	0.66666667	0.88311688
cond	0.85333333	0.75294118	0.8	0.94883721

Intended use and impact

- We feel this measure is likely to be most useful as part of the Outpatient Quality Reporting (OQR) Program
  - Mandated by Tax Relief and Healthcare Act of 2006
  - Requires hospitals to submit data on measures of quality of care in the outpatient setting
  - Failure is a 2% reduction in Outpatient Protective Payment System (OPPS)
- More appropriate than MIPS as this is systems issue
- Current OQR measures do not include an equity measure

Anticipated challenges

- Data:
  - Accurate determinations from the electronic health record (EHR): Race/ethnicity; insurance; SES
  - Follow-up if outside of institution
  - Determination of cancer – pre-existing, time/stage at diagnosis
- Scalability outside of our institution
- Incorporation, stewardship, and sustainability into quality measure framework
- Incentivizing use

Take Home

- AIFs are common in imaging – and there is a LOT of ED imaging
- There are large disparities in the follow-up of AIFs
  - Location based (ED, inpatient vs. outpatient)
  - Race/ ethnicity/ insurance/ SES
- Significant patient safety[4,5] medicolegal issue
- *Systems Issue*
- Looking at measuring and quantifying discrepancies

Questions or Comments?

Q & A